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YOKOGAWA

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Measuring Instruments

All Products Guide

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Vol. 1

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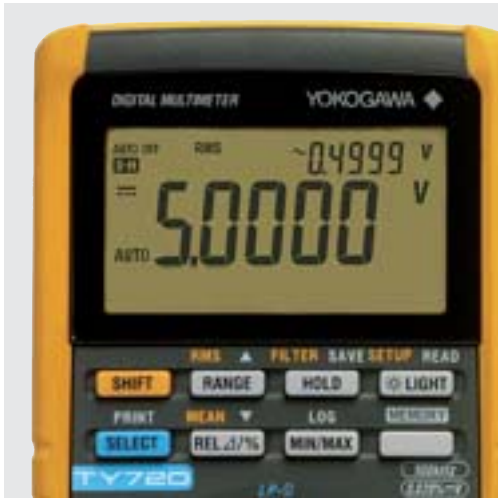
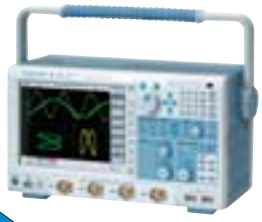


Pick-up Products

Mixed Signal Oscilloscopes
DL9000 Series MSO Models

p4

Digital Oscilloscopes
DL9000 Series



p5

Mixed Signal Oscilloscopes
DLM2000 Series

p7

Vihicle Serial Bus Analyzer
SB5000

NEW

FlexRay™

p12

Precision Power Analyzer
WT3000

p17

Digital Power Analyzer
WT500

NEW

p19

High-Speed Data Acquisition Unit
SL1000

GiGAZoom ENGINE™

NEW

p24

Optical Spectrum Analyzer
AQ6370B/AQ6375

NEW

p28, 29

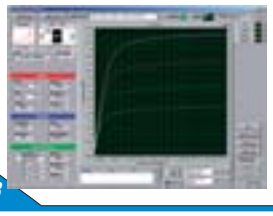
Optical Time Domain Reflectmeter
AQ7275

NEW

p32

GS Series Accessory Software
765670

NEW



p38

Transport Analyzer
NX4000

NEW

p39

Data Acquisition Unit DAQMASTER
MW100
MX100

DAQMASTER

Upgrade

p48

MVAdvanced
MV1000
MV2000

MVAdvanced

p51

DXAdvanced
DX1000
DX2000

DXAdvanced R3

Upgrade

p55

For Green Series Controllers
PC-Based Parameter Setting Tool
LL100/LL200/LL1100/LL1200

Upgrade

USB connection available

p62

Data Acquisition Software Suite
DAQWORX

Upgrade

DAQWORX® Data Acquisition Software Suite

Support for Windows Vista

p65

Data Logger
Datum-Y XL120

p66

Application Software for Datum-Y
Datum-Logger XL900

Upgrade

p66

Handy Calibrator
CA150

p68

Digital Multimeter
TY700 Series
TY500 Series

NEW

p70

Measuring Instruments All Products Guide Vol.11

Contents

Oscilloscopes

Digital and Mixed Signal Oscilloscopes Selection Guide....2
DL Series Serial Bus Analyzer Selection Guide....2
Scope Corder Series Selection Guide....3
Digital and Mixed Signal Oscilloscopes....4
ScopeCorder....10
Vehicle Serial Bus Analyzer....12
USB2.0 Compliance Test Solution....13
Oscilloscope Application Software....13
Oscilloscope Accessories....14
ScopeCorder Accessories....15

Digital Power Analyzers

Digital Power Analyzers Selection Guide....16
Precision Power Analyzer....17
Digital Power Meters....18
Digital Power Analyzer....19
Power Analyzer....21
Power Measurement Application Software....22
Current Sensor Units....22
Current Transducer....22
Digital Power Analyzers Accessories List....23

Data Acquisition Equipment

High-Speed Data Acquisition Unit....24
PC-Based Measuring Instruments....26

Optical Measureing Instruments

Optical Spectrum Analyzer....28
White Light Source....31
WDM Monitor & Channel Monitor....31
Optical Fiber Strain Analyzer....31
Fiber Optic Distributed Temperature Unit....31
FBG Sensor Monitor....31
Optical Time Domain Reflectmeter....32
Multi Application Test System....34
Handy Optical Powermeters & Light Source....35
Optical Power Meter....35
Multimedia Display Tester....35

Generators, Sources

Source Measure Units....36
Voltage/Current Source....37
Synthesized Function Generators....38

Next Generation, Datacomm Measuring Instruments

Transport Analyzer....39
Traffic TesterPro....40
Traffic TesterMini....41

Wireless Communication Test Instruments

Wireless Communication Tester....42
WCDMA/GSM Mobile Phone Tester....42
Shield box with an antenna coupler....42

Other Test & Measurement Instruments

Digital Multimeters....43
Digital Thermometer....43
Universal Counters....43
Pneumatic Pressure Standard....43
Manometers....44
Time Interval Analyzers....45

Recorders

Recorders Selection Guide....46
DAQMASTER Series....48
MVAdvanced....51
Laboratory Recorders....52
DARWIN Series....53
DXAdvanced....55
DAQSTATION Series....56
Hybrid Recorders....57
Industrial Recorders....58

Control Products

POWERCERT Power and Energy Meter....59
UT100 Series Temperature Controllers....59
GREEN Series Digital Indicating Controllers....59
GREEN Series Program Controllers....61
GREEN Series Digital Indicator with Alarms....61
GREEN Series Digital Indicating Controller with Industrial Ethernet....62
PC-Based Parameters Setting Tools....62
Signal Conditioner....63

Data Acquisition Software Suite

DAQWORX Data Acquisition Software Suite....65
DAQOPC OPC Interface Package....65

Portable Test Instruments

Data Logger....66
Clamp-on Power Meters....67
Handy Calibrators....68
Digital Multimeters....70
Clamp-on Testers....72
Digital Insulation Tester....74
Analog Insulation Testers....75
Earth Tester....76
Leakage Current Tester....76
Digital Illuminance Meters....76
Digital Thermometers....76
Thermo-Collectors....77
Standard Resistors....78
Decade Resistance Boxes....78
Slide Resistors....78
Portable Wheatstone Bridge....78
Precision Double Bridge....78

Meters Products

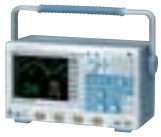
Portable Instruments....79
Switchboard Instruments....79
Panel Meters....79
0.5 Class Transducer for Power Applications....79

CE Products with this mark conform to the EMC standards (regulations on electromagnetic interference) of European Community.

Waveform Measuring

Digital and Mixed Signal Oscilloscopes Selection Guide

■ The DL series digital oscilloscopes have high-speed sampling and a wide range of bandwidths that can be utilized for design and development of electronic devices.
They can also execute computations on repetitive waveforms and automatically extract waveform parameters.
The DL Series offers an extensive selection of digital oscilloscopes with large-capacity memories, powerful triggering functions, unique History Memory function and internal printers. It also can save and load data to and from internal or external media.

Item \ Model		DL9700L/DL9500L Series	DL9040/9140/9240 Series	DL7400 Series	DLM2000 Series
					
Features		Analog 4ch+Logic 32/16bits input Max. 5GS/s Serial bus analysis functions Power supply analysis functions "Virtual DA" functions Probe power connectors Supports USB Storage USB mouse/keyboard	Fast screen update & all points display Compact & lightweight, 4 ch Max. 10 GS/s I²C, SPI, CAN, LIN and UART bus analysis functions Probe power connectors Supports USB Storage USB mouse/keyboard Power supply analysis functions	Fast screen update & all points display High speed 8 ch + 16 bits logic input Max. 2 GS/s Web server function Serial bus analysis functions Power analysis functions USB mouse/keyboard Probe power connectors Supports USB Storage FlexRay Signal Analyzer	Fast screen update & all points display Compact & lightweight Analog 4ch/Analog 3ch+Logic 8bits Max. 2.5GS/s UART,I²C,SPI,CAN and LIN bus analysis functions Power supply analysis functions Probe power connectors Supports USB Storage
Max. Sampling Rate		5GS/s	10 GS/s(*2)	2 GS/s	2.5 GS/s
Bandwidth		1.0GHz(*2)	1.5 GHz(*2)	500 MHz	500 MHz(*2)
Number of analog input channels		4	4	DL7440/7480: 4 ch/8 ch	DLM2022,DLM2032,DLM2052:2ch DLM2024,DLM2034,DLM2054:4ch
Logic Input		DL9705L, DL9710L: St'd:32 (8bits × 4) DL9505L, DL9510L: St'd:16 (8bits × 2)	–	St'd: 16 bits (8 bits × 2)	DLM2024, DLM2034, DLM2054: St'd 8 bits
Max. vertical sensitivity (1:1)		2 mV/div	2 mV/div	2 mV/div	2 mV/div
Vertial axis resolution		8 bits	8 bits	8 bits	8 bits
Max. sweep sensitivity		500 ps/div	500 ps/div	1 ns/div	1 ns/div
Max. record length	**St'd**	6.25 MW	DL9040, DL9140, DL9240:2.5 MW DL9040L, DL9140L, DL9240L:6.25 MW	701450, 701470: 4 MW 701460, 701480: 16 MW	12.5 Mpoints
	Optional				62.5 Mpoints 125 Mpoints
Internal Media drive	**St'd**	PC card (2)	PC card	PC card	–
	selectable	–	–	FDD, Zip®	–
Internal Strage	**St'd**	90MB(*3)	90MB(*3)	–	100 MB
	Optional	40 GB (HDD, FAT32)	40 GB (HDD, FAT32)	–	1.8 GB
Interface	**St'd**	USB	USB	USB/GP-IB	USB
	Optional	Ethernet (LXI compliant)	Ethernet (LXI compliant)	Ethernet/SCSI	Ethernet/GP-IB
Internal printer	**St'd/ Optional**	Optional: 112 mm width	Optional: 112 mm width	Optional: 112 mm width	Optional: 112 mm width
Others	**Optional**	I²C bus analysis SPI bus analysis CAN & LIN bus analysis UART bus analysis Probe power connectors Power supply analysis functions User define math functions	I²C bus analysis SPI bus analysis CAN & LIN bus analysis UART bus analysis Probe power connectors Power Supply analysis functions User define math functions	I²C bus analysis CAN bus analysis SPI bus analysis User-defined Math Power Analysis Four additional probe power (total: 8, DL7480 only) (*4) FlexRay bus analysis	I²C bus analysis SPI bus analysis CAN & LIN bus analysis UART bus analysis 2/4 Output Probe Power Power supply analysis functions User-defined math functions
Display (TFT LCD)		8.4-inch color, XGA	8.4-inch color, XGA	8.4-inch color, VGA	8.4-inch color, XGA
External Dimensions W × H × D (mm)		350 × 200 × 285	350 × 200 × 178	373 × 210.5 × 355.3	226 × 293 × 193
Weight (kg)		Approx. 7.7	Approx. 6.5	Approx. 10	Approx. 4.2

*1: See each product catalog for more detaled specifications
*2: Depends on model
*3: Flash Mem: Approx. 30 MB. System memory: Approx. 60 MB.
Flash Mem is the part of the memory in which the user can load and save data through file operations.
*4: The DL7400 series comes standard with four probe power connectors.

DL Series Serial Bus Analyzer Selection Guide

Bus Types	Functions \ Models	SB5000	DL9700L/9500L Series	DL9040/9140/9240 Series	DL7400 Series	DLM2000 Series
I²C	Triggers	◎	◎	◎	○	○
	Trigger Types	Every Start, Non-Ack Address&Data, General Call Start Byte/HS mode			Start, Non-Ack, Address&Data	Every Start, Non-Ack Address&Data, General Call Start Byte/HS mode
	Analysis & Search	◎(*1)	○(*1)	○(*1)	○	○
CAN	Triggers	◎	◎	◎	○	○
	Trigger Types	SOF, Error Frame ID Std/Data, ID Ext/Data ID/Data OR			SOF, ID, RTR Data Field, Error Frame	SOF, Error(Frame, Stuff, CRC) ID Std/Data, ID Ext/Data ID/Data OR
	Analysis & Search	◎(*1)	○(*1)	○(*1)	○	○
	CAN dbc files	◎	×	×	×	○
LIN	Triggers	◎	◎	◎	×	○
	Trigger Types	Break Synch ID/Data, ID/Data OR Error	Break Synch			Break Synch ID/Data, ID/Data OR Error
	Analysis & Search	◎(*1)	○(*1)	○(*1)		○
SPI	Triggers	◎	◎	◎	○	○
	Trigger Types	Data1 pattern (3W) Data1&Data2 pattern (4W)			A Data pattern, B Data pattern A→B Data pattern, Byte count	Data1 pattern (3W) Data1&Data2 pattern (4W)
	Analysis & Search	◎(*1)	○(*1)	○(*1)	◎	○
UART	Triggers	◎	◎	◎	×	○
	Trigger Types	Every Data Data Error(Framing/Parity)	Every Data			Every Data Data Error(Framing/Parity)
	Analysis & Search	◎(*1)	○(*1)	○(*1)		○
FlexRay	Triggers	◎	×	×	○	×
	Trigger Types	Frame Start Indicator, Frame ID Cycle Count, Data Indicator, Frame ID Cycle Count, Data (OR) BSS/FES/CRC Error (OR)			Frame Start Payload preamble indicator Null Frame indicator Sync Frame indicator Startup frame indicator Frame ID Cycle count, Data, CRC Error	
	Analysis & Search	◎(*1)			○	
	FIBEX database files	◎			×	
Serial Bus Auto Setup Function		◎	○	○	×	○

◎ : Standards, ○ : Optional, × : NA
*1: Real-time Analysis and Display

Waveform Measuring

ScopeCorder Series Selection Guide

■ The ScopeCorder series can be used to capture single-shot or infrequently recurring signals.
They can also execute computations on repetitive waveforms, and automatically extract waveform parameters.
The ScopeCorder series offers an extensive selection with large-capacity memories, powerful triggering functions, and internal printers. It also can save and load data to and from internal or external media.
DL750P and SL1400 can provide big paper output capability for many applications in the field.

Item \ Model		DL750	DL750P	SL1400
				
Features		Compact, 16 ch isolated inputs (8 module slots) GigaZoomEngine and Max 1 GW Dual Capture Eleven kinds of plug-in input modules Web server functions A6 (112 mm) printer Probe power connectors	Compact, 16 ch isolated inputs (8 module slots) GigaZoomEngine and Max 1 GW Dual Capture Eleven kinds of plug-in input modules Web server functions A4 (210 mm) Big Printer Probe power connectors	Compact, 16 ch isolated inputs (8 module slots) Eleven kinds of plug-in input modules Web server functions A4 (210 mm) Big Printer Probe power connectors
Max. sampling rate		10 MS/s (*2)	10 MS/s (*2)	10 MS/s (*2)
Bandwidth		3 MHz (*2)	3 MHz (*2)	3 MHz (*2)
Number of analog input channels		Plug-in module: 16 ch (isolation)	Plug-in module: 16 ch (isolation)	Plug-in module: 16 ch (isolation)
Logic input		St'd: 16 (8 bits × 2)	St'd: 16 (8 bits × 2)	St'd: 16 (8 bits × 2)
Max. vertical sensitivity (1:1)		100 µV/div (*2)	100 µV/div (*2)	1 mV range
Vertial axis resolution		Max. 16 bits (*2)	Max. 16 bits (*2)	Max. 16 bits (*2)
Max. sweep sensitivity		500 ns/div (*2)	500 ns/div (*2)	100 µs Setting
Max. record length	**St'd**	50 MW max/2.5 MW (16 ch)	50 MW max/2.5 MW (16 ch)	50 MW max/2.5 MW (16 ch)
	Optional	1 GW max/50 MW (16 ch)	1 GW max/50 MW (16 ch)	–
Internal media drive	**selectable**	PC card, FDD and Zip	PC card, FDD	PC card
Internal HDD	**Optional**	40 GB (FAT32)	40 GB (FAT32)	40 GB (FAT32)
Interface	**St'd**	USB/GP-IB/RS232/SCSI	USB/GP-IB/RS232/SCSI	USB/GP-IB/RS232/SCSI
	Optional	Ethernet	Ethernet	Ethernet
Internal printer	**St'd**	112 mm width	210 mm width	210 mm width
Others	**Optional**	DSP channels User-defined Math computations Probe Power Connectors DC 12 V model available	DSP channels User-defined Math computations Probe Power Connectors	Probe Power Connectors
Display (TFT LCD)		10.4-inch color, SVGA	10.4-inch color, SVGA	10.4-inch color, SVGA
External dimensions W × H × D (mm)		355 × 250 × 180	355 × 250 × 225	355 × 250 × 225
Weight (kg)		Approx. 6.6 *3	Approx. 8.0 *3	Approx. 8.0 *3

*1: See each product catalog for more detaled specifications
*2: Depends on input module
*3: Plug-in modules are not included

Input	Model No.	Sample Rate / Resolution	Channel Number	Isolation	Maximum Input Voltage (DC + ACpeak)	DC Accuracy	Features
Analog Voltage	701250	10MS/s, 12-bit	2	Isolated	600 V *4 250 V *5	± 0.5%	10 MS/s, 12 bit, broad bandwidth (3 MHz), high accuracy (0.5%), high noise immunity
	701251	1MS/s, 16-bit	2	Isolated	600 V *4 140 V *5	± 0.25%	1 MS/s, 16 bit, bandwidth: 300 kHz, high accuracy (0.25%) High sensitivity range (10 mV), low noise (±100 µVtyp), and high noise immunity
	701260	100kS/s, 16-bit	2	Isolated	1000 V *4 850 V *5	± 0.25%	High voltage (direct 850 V input), high accuracy (0.25%), with RMS, and high noise immunity
Temperature	701261/62	100kS/s (Voltage), 500S/s (Temperature)	2	Isolated	42 V	± 0.25% (Voltage)	Universal modules (voltage/temperature), voltage 100 kS/s, 16-bit, temperature 500 S/s Voltage (50 mV to 200 V range), thermocouple (K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel), with AAF (701262)
	701255	10MS/s, 12-bit	2	Non-isolated	600 V *4*6 250 V *5	± 0.5%	10 MS/s, 12-bit Non-Isolation (non-isolation version of model 701250)
Temperature	701265	500S/s, 16-bit	2	Isolated	42 V	± 0.08% (Voltage)	Both temperature and voltage input, frequency range of 100 Hz, thermocouple (K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel), High accuracy voltage (0.08%), high sensitivity range (1 mV), and low noise (±4µVtyp)
Acceleration	701275	100kS/s, 16-bit	2	Isolated	42 V	± 0.25% (Voltage) ± 0.5% (Acceleration)	Both acceleration and voltage input, built-in anti-aliasing filter Supports built-in amp type acceleration sensors (4 mA/22 V)
Strain	701270	100kS/s, 16-bit	2	Isolated	42 V	± 0.5% (Strain)	Supports strain NDIS, high accuracy (0.5%), 2, 5, 10 V built-in bridge power supply
	701271	100kS/s, 16-bit	2	Isolated	42 V	± 0.5% (Strain)	Supports strain DSUB, high accuracy (0.5%), 2, 5, 10 V built-in bridge power supply, and shunt CAL
Frequency	701280	25kS/s, 16-bit	2	Isolated	420 V *4 42 V *5	± 0.1% (Frequency)	Measurement frequency of 0.01 Hz to 200 kHz, Measured parameters (frequency, rpm, period, duty, power supply frequency, distance, speed)

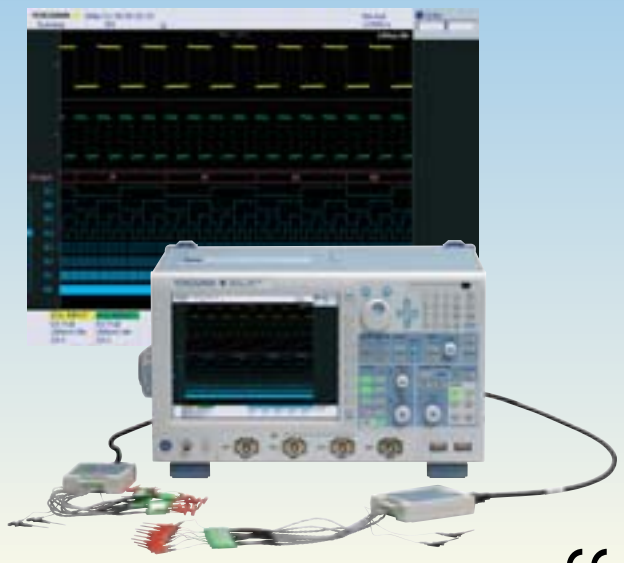
*4, When using the Isolation probe (700929 or 701947). *5, When using the 1:1 safety adapter lead (701901). *6, When using the 10:1 passive probe (701940)

Mixed Signal Oscilloscopes

DL9000 Series MSO Models

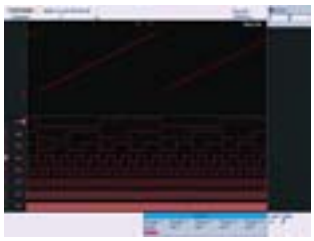
signal xplorer™

High performance and compact Mixed Signal Oscilloscope with 4 analog channels and 16/32-bit Logic input



Features

- Simultaneous measurement and analysis of 4 analog channels + 16/32-bit logic
- High speed acquisition and quick response
- Fast and powerful analysis of logic channels
- Capture and separate anomalies easily with History Memory
- Extensive trigger functions for handling the most complex waveforms
- Versatile zoom and search functions
- "Virtual D/A" Function
- Serial Bus Analysis (optional): UART (New!), I²C, SPI, CAN, LIN
- Power Supply Analysis (optional)



Model	DL9710L	DL9705L	DL9510L	DL9505L
Analog inputs channels	4ch			
Analog Frequency Bandwidth	1GHz	500MHz	1GHz	500MHz
Logic inputs channels	32bits		16bits	
Max. Logic toggle frequency	250MHz			
Max. Sampling Speed	5GS(Simultaneous sampling of analog and logic)			

Basic Specifications

Analog inputs

Analog Bandwidth	DC-1GHz(DL9710L, DL9510L) DC-500MHz(DL9705L, DL9505L)
Analog input	4ch
Vertical sensitivity	for 1MΩ input 2mV/div to 5V/div for 50Ω input 2mV/div to 500mV/div
DC accuracy	±(1.5% of 8div + offset voltage accuracy)
Vertical axis resolution	8-bit

Logic inputs

Number of input	32bits(8bits × 4) (DL9710L, DL9705L) 16bits(8bits × 2) (DL9510L, DL9505L)
Maximum toggle frequency	250 MHz (701981)
Input voltage range	±10 V (DC + AC peak, 701981)
Logic Threshold level	±10 V (0.1 V setting resolution, 701981)
Input impedance	approx. 10kΩ/approx. 9 pF (701981)

Common Specifications

Max. sampling rate	5GS/s
Sweep sensitivity	500ps/div to 50s/div
Max. record length	6.25MW
History memory	Max data: 2000 (2.5 kW), when using history 1600 (2.5 kW), when in N single mode
Trigger modes	Auto, Auto Level, Normal, Single, and N Single
Trigger types	Edge/State, Width, Event Interval, TV, Serial Bus (UART, I²C, SPI, CAN, LIN), Serial Pattern
Internal media drive	Flash ROM, 90MByte (Approx. 30M Byte is avilable for data storage)
Interface	USB Peripheral support, PC Card Interfaces, USB-PC Connection, Ethernet (optional)
Internal printer (optional)	Thermal line-dot, width 112mm
Other options	Serial Bus analysis (UART, I²C, SPI, CAN, LIN), User-defined Math, Power supply analysis, Internal HDD, Probe Power supply
Display (TFT LCD)	8.4-inch color TFT LCD
External dimensions	350(W) × 200(H) × 285(D)mm
Weight	Approx. 7.7kg (excluding printer)

Model Number and Suffix Codes

Model	Suffix Code	Description
701320		DL9505L: 4ch 500MHz + Logic 16bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701321		DL9510L: 4ch 1GHz + Logic 16bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701330		DL9705L: 4ch 500MHz + Logic 32bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
701331		DL9710L: 4ch 1GHz + Logic 32bits Max. 5 GS/s(2.5 GS/s/ch), 6.25 MW/ch
Power Cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
Logic Probe	-L0	No Logic Probe attached
	-L2	Attach two 250 MHz Logic Probes (701981)
	-L4*1	Attach four 250 MHz Logic Probes (701981)
Options	/B5	Built-in printer
	/P4*2	4 Probe power connections on rear panel
	/C8*3	Built-in HDD + Ethernet interface
	/C9*3	Built-in HDD + LXI compliant Ethernet interface
	/C10*3	Ethernet interface
	/C12*3	LXI compliant Ethernet interface
	/G2*4	User-defined math function
	/G4*4	Power Supply Analysis Function
	/F5*5	UART+I²C+SPI bus analyzer
	/F7*5	UART+CAN+LIN+SPI bus analyzer
	/F8*5	UART+I²C+CAN+LIN+SPI bus analyzer

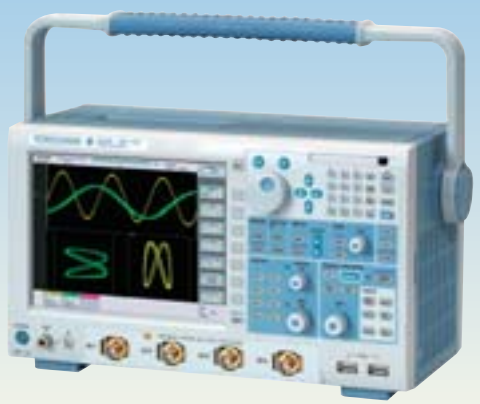
*1: Not available for DL9500 series
*2: Please order /P4 option if you use either current probes or differential probes such as 701920, 701922.
*3: Choose either one
*4: Choose either one
*5: Choose either one. UART, I²C, CAN, LIN and SPI triggers are standard.

Digital Oscilloscopes

DL9000

signalXplorer™

High-Performance 500 MHz/1 GHz/1.5 GHz Bandwidth Digital Oscilloscopes



DL9000

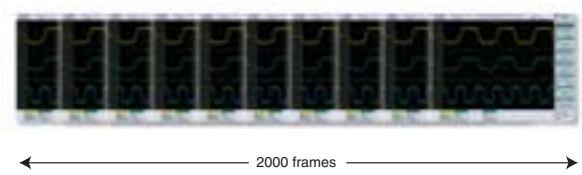
Overview

The DL9000 signalXplorer is Yokogawa's10(X)th generation digital oscilloscope. It allows users to select the most appropriate memory setting for a given measurement and then acquires and displays long and short memory records quickly, saving the waveforms to its segmented memory.
Advanced memory handling ensures that you get all the benefits of a long memory scope regardless of the record size you allocate for each acquisition. This is made possible by the state-of-the-art ADSE (advanced data stream engine) ASIC.

Features

● **History Memory**
Capture only the desired data for long periods of time.
Make full use of the large-capacity memory to increase development efficiency without acquiring useless data.

Waveform comparison using memory partitioned into up to 2,000 areas

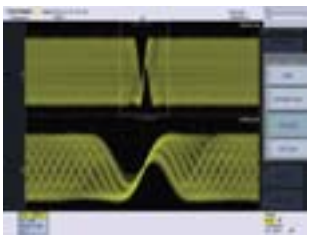


● **High Speed Response**
Fast display updates, even when processing mega-words of data.

● **Dot Density Display**
Displays waveforms like an analog oscilloscope.

● **UART(New!), I²C, CAN, LIN, SPI Bus Analysis (option)**

● **Auto Setup Function for Serial Bus Analysis (New!)**
Fast and Automatic Serial Bus Detection & Analysis with just one button



Overlaid waveforms using dot density display

Basic Specifications

Max. sampling rate
5 GS/s (2 channels) 2.5 GS/s (4 channels) (DL9040/DL9040L/DL9140/DL9140L)
10 GS/s (2 channels) 5 GS/s (4 channels) (DL9240/DL9240L)

Bandwidth
500 MHz (DL9040/DL9040L)
1 GHz (DL9140/DL9140L)
1.5 GHz (DL9240/DL9240L)

Number of analog input channels
4 input channels

Vertical sensitivity
For 1 MΩ input: 2 mV/div to 5 V/div (steps of 1-2-5)
For 50 Ω input: 2 mV/div to 500 mV/div (steps of 1-2-5)

DC accuracy
For 1 MΩ input: ±(1.5% of 8 div + offset voltage accuracy)
For 50 Ω input: ±(1.5% of 8 div + offset voltage accuracy)

Vertial axis resolution
8-bit (25 LSB/div)

Sweep sensitivity
500 ps/div to 50 s/div (steps of 1-2-5)

Max. record length
2.5 M word/channel (DL9040/DL9140/DL9240)
6.25 M word/channel (DL9040L/DL9140L/DL9240L)

Internal media drive
90 MB (Flash Mem: Approx. 30 MB. System memory: Approx. 60 MB.)
Flash Mem is the part of the memory in which the user can load and save data through file operations.

Interface
USB Peripheral Support/PC Card Interfaces/USB-PC Connections/Ethernet Communication (/C8 -/C12 options)

Internal printer
Thermal line-dot, Paper width 112 mm (option)

Other options
I²C Analysis Function, SPI Analysis Function, CAN Analysis Function, LIN Analysis Function, UART Analysis Function Internal Hard Disk Drive, User-defined math function, Power supply analysis function

Display (TFT LCD)
8.4-inch (21.3 cm) color TFT liquid crystal display

External dimensions
350 (W) × 200 (H) × 178 (D) mm
(when printer cover is closed, excluding handle and protrusions)

Weight (kg)
Approx. 6.5 kg

Model Number and Suffix Codes

Model	Suffix Code	Description
701307		DL9040 500 MHz max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701308		DL9040L 500 MHz max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701310		DL9140 1 GHz max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701311		DL9140L 1 GHz max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701312		DL9240 1.5 GHz max. 10 GS/s (5 GS/s/ch), 2.5 Mword/ch
701313		DL9240L 1.5 GHz max. 10 GS/s (5 GS/s/ch), 6.25 Mword/ch
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
	-HC	Chinese Help
	-HK	Korean Help
Options	/B5	Built-in printer
	/P2*1	2 Probe power connections on rear panel
	/C8*2	Built-in HDD + Ethernet interface
	/C9*2	Built-in HDD + LXI compliant Ethernet interface
	/C10*2	Ethernet interface
	/C12*2	LXI compliant Ethernet interface
	/G2*3	User-defined math function
	/G4*3	Power supply analysis function
	/F5*4	UART + I²C + SPI bus analyzer
	/F7*4	UART + CAN + LIN + SPI bus analyzer
	/F8*4	UART + I²C + CAN + LIN + SPI bus analyzer

*1: Please specify this /P2 option if you use either current probes or differential probes such as 701920, 701922, 701932 or 701933.
*2: Choose either one.
*3: Choose either one.
*4: Choose either one. UART, I²C, CAN, LIN and SPI triggers are standard.

Digital Oscilloscopes

DL7440/DL7480

SignalExplorer

The DL7400 Series Allows Multi-channel Capture of Analog and Logic Signals

DL7440

DL7480

CE

Overview

The DL7400 Series includes 4 and 8-channel analog input models. Each model has up to 16-bit logic inputs. All these inputs come in a convenient, benchtop-sized instrument. In additon to capturing up to 16 logic signals, the DL7400 Series lets you simultaneously measure up to 8 analog signals without needing to synchronize two separate oscilloscopes.

Features

- 4 or 8 analog channels and 16-bit logic input
- Maximum 16 MW recording memory
- USB compliant, USB mass storage supported
- Ethernet connectivity (optional)
- User-defined math (optional)
- 2 GS/s maximum speed
- 500 MHz analog bandwidth
- Supports 250 MHz logic probe
- PC card interface (Type II)
- Power supply analysis function (optional)
- Serial bus analysis function (optional)
- FlexRay signal analyzer (optional)

Basic Specifications

Input channels 4/8 analog (depends on model), and 16-bit logic
Voltage axis sensitivity setting range
For 1 MΩ input: 2 mV/div to 10 V/div (steps of 1, 2, or 5)
For 50 Ω input: 2 mV/div to 1 V/div (steps of 1, 2, or 5)
Frequency characteristics
For 1 MΩ input: (using passive probe model 700988; specified at probe tip) 10 V/div to 10 mV/div: DC to 400 MHz (500 MHz*)
*: When using Miniature passive probe model 701941; specified at probe tip.
A/D conversion resolution
8 bits (24 LSB/div)
Maximum sampling rate
2 GS/s
Maximum record length
701450/701470: 4 MW/channel
701460/701480: 16 MW/channel
DC accuracy ±(1.5% of 8 div + offset voltage accuracy)
Time axis setting range
1 ns/div to 50 s/div (for record length of 10 kW or greater)
Display 8.4-inch color TFT liquid crystal display
Built-in printer (optional)
Paper width: 112 mm
Interfaces GP-IB, USB-PC connector, USB peripheral connector, Ethernet (100BASE-TX, 10BASE-T; optional), SCSI (optional)
Other options I^2C bus analysis functions, CAN Bus Signal Analysis Function , SPI Bus Signal Analysis Function, Power Analysis Functions, FlexRay Signal Analyzer
External dimensions
373 (W) × 210.5 (H) × 355.3 (D) mm (when the printer cover is closed; does not include knobs and protrusions)
Weight Approx. 10 kg (24.2 lbs, including printer; does not include logic inputs)

Model Number and Suffix Codes

Model	Suffix Code	Description
701450		DL7440 with 4 CH input and maximum 4 MW memory
701460		DL7440 with 4 CH input and maximum 16 MW memory
701470		DL7480 with 8 CH input and maximum 4 MW memory
701480		DL7480 with 8 CH input and maximum 16 MW memory
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Internal storage drive	-J1	Floppy disk drive*1
	-J2	Zip® drive*1
Options	/B5	built-in printer
	/E4	Four additional passive probes(701470, 701480 only)*2
	/EX4	Attach four 701941 probes*7,*9
	/EA4	Add four 701941 probes*8,*9
	/P4	Four additional probe power connectors(701470, 701480 only)*3
	/N3	Logic input for 701450/701470*4 (Standard option)
	/N4	Logic input for 701460/701480*4 (Standard option)
	/C7	SCSI interface
	/C10	Ethernet interface
	/G2	User-defined math function*5
	/G4	Power Supply Analysis Function*5
	/F5	I^2C + SPI Bus Analyzer*6
	/F7	CAN + SPI Bus Analyzer*6
	/F8	I^2C + CAN + SPI Bus Analyzer*6
	/F9	FlexRay Signal Analyzer

*1: Select one only.
*2: The DL7400 Series is equipped with four passive probes (700988) as standard.
*3: The DL7400 Series is equipped with four probe power connectors as standard.
*4: Select /N3 for models 701450 and 701470, and /N4 for models 701460 and 701480. Logic probes are sold separately. These options can be installed free of charge.
*5: /G2 and /G4 cannot be ordered together. /G4 includes /G2
*6: Option /F5, /F7, and /F8 cannot be specified together. Select one only.
The SPI Bus Analysis and Search functions are standard feature. The SPI Bus Triggers are only available as an option.
*7: Four 700988 probes are not included when this option is specified.
*8: This option can be specified with model 701470, 701480 only.
*9: When the option /E4 is specified, neither /EX4 nor /EA4 can be specified together.

Mixed Signal Oscilloscope

DLM2000

DLM 2000

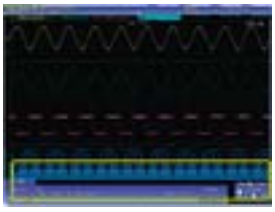
A compact personal mixed signal oscilloscope designed for easy viewing and ease of use.

DLM2000

Features

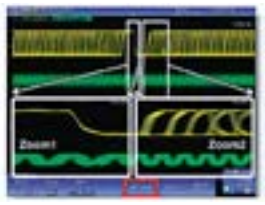
- **Easy-to-Use & Easy-to-See**
  We elevated the large (8.4-inch) LCD screen up into the line of sight. Also, the portrait format saves space on the desk or test bench.
- **Flexible MSO Input**
  Choose four analog channels or three analog channels + 8bits of logic input for a maximum of eleven channels, at the touch of one button.

3-ch analog
+ 8-bit logic



- **Large capacity (125 Mpoint) memory enables long-duration measurements**
- **You can replay waveforms later on, so you'll never miss an abnormal waveform - History Function -**
- **Real time filters**
- **Zooms into two different points**

Dedicated Zoom keys



Basic Specifications

Analog Signal input

Input channels	Analog input	DLM20x2: CH1, CH2 DLM20x4: CH1 to CH4 (CH1 to CH3 when using logic input)
Input coupling setting		AC, DC, DC50 Ω, GND
Input impedance	Analog input	1 MΩ ±1.0%, approximately 20 pF 50 Ω ±1.0% (VSWR 1.4 or less, DC to 500MHz)
Voltage axis sensitivity setting range	1 MΩ	2 mV/div to 10 V/div (steps of 1-2-5)
	50 Ω	2 mV/div to 500 mV/div (steps of 1-2-5)
Max. input voltage	1 MΩ	150 Vrms (CAT I)
	50 Ω	Must not exceed 5 Vrms or 10 Vpeak

Frequency characteristics (-3 dB attenuation when inputting a sinewave of amplitude ±3div)*1*2

	DLM202x	DLM203x	DLM205x
1 MΩ (when using passive probe)			
100 mV to 100 V/div	DC to 200 MHz	DC to 350 MHz	DC to 500 MHz
20 mV to 50 mV/div	DC to 150 MHz	DC to 300 MHz	DC to 400 MHz
50 Ω			
10 mV to 500 mV/div	DC to 200 MHz	DC to 350 MHz	DC to 500 MHz
2 mV to 5 mV/div	DC to 150 MHz	DC to 300 MHz	DC to 400 MHz

Maximum sample rate		
Real time sampling mode	Interleave OFF	1.25 GS/s
	Interleave ON	2.5 GS/s
Repetitive sampling mode		125 GS/s
Maximum record length	2 ch model (Standard)	Repeat/Single/Single Interleave: 1.25 M/6.25 M/12.5 MPoints
	2 ch model (/M1S)	Repeat/Single/Single Interleave: 6.25 M/25 M/62.5 MPoints
	4 ch model (Standard)	Repeat/Single/Single Interleave: 1.25 M/6.25 M/12.5 MPoints
	4 ch model (/M1)	Repeat/Single/Single Interleave: 6.25 M/25 M/62.5 MPoints
	4 ch model (/M2)	Repeat/Single/Single Interleave: 12.5 M/62.5 M/125 MPoints

Logic Signal Input (4 ch model only)

Number of inputs	8 bit (excl. 4 ch input and logic input)
Maximum toggle frequency*1	Model 701988: 100 MHz Model 701989: 250 MHz
Compatible probes	701988, 701989 (8 bit input) (701980, 701981 are available)
Display	8.4-inch TFT color liquid crystal display 1024 × 768 (XGA)
Rated supply voltage	100 to 240 VAC
Rated supply frequency	50 Hz/60 Hz
Maximum power consumption	170 VA
External dimensions	226 (W) × 293 (H) × 193 (D) mm (when printer cover is closed, excluding protrusions)
Weight	Approx.4.2kg With no options
Operating temperature range	5°C to 40°C

*1 Measured under standard operating conditions after a 30-minute warm-up followed by calibration.
*2 Value in the case of repetitive phenomenon.

Model Number and Suffix Codes

Model	Suffix code	Description
710105		Digital Oscilloscope DLM2022 2ch, 200MHz
710110*1		Mixed Signal Oscilloscope DLM2024 4ch, 200MHz
710115		Digital Oscilloscope DLM2032 2ch, 350MHz
710120*1		Mixed Signal Oscilloscope DLM2034 4ch, 350MHz
710125		Digital Oscilloscope DLM2052 2ch, 500MHz
710130*1		Mixed Signal Oscilloscope DLM2054 4ch, 500MHz
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help language	-HE	English Help (Menu and Panel)
	-HC	Chinese Help (Menu and Panel)
	-HK	Korean Help (Menu and Panel)
	-HG	German Help (Menu and Panel)
	-HF	French Help (Menu and Panel)
	-HI	Italian Help (Menu and Panel)
	-HS	Spanish Help (Menu and Panel)
Option	/LN	No switchable logic input (4 ch model only)
	/B5	Built-in printer
	/M1*2	"Memory expansion option (4 ch model only) During continuous measurement: 6.25 Mpoints; Single mode: 25 Mpoints (when interleave mode ON: 62.5 Mpoints)"
	/M2*2	"Memory expansion option (4 ch model only) During continuous measurement: 12.5 Mpoints; Single mode: 62.5 Mpoints (when interleave mode ON: 125 Mpoints)"
	/M1S	"Memory expansion option (2 ch model only) During continuous measurement: 6.25 Mpoints; Single mode: 25 Mpoints (when interleave mode ON: 62.5 Mpoints)"
	/P2*3	Probe power for 2 ch models
	/P4*3	Probe power for 4 ch models
	/C1*4	GP-IB Interface
	/C10*4	Ethernet Interface
	/C11*4	GP-IB + Ethernet Interface
	/C8	Internal storage (1.8 GB)
	/G2*5	User defined math (4 ch model only)
	/G4*5	"Power supply analysis function (includes /G2) (4 ch model only)"
	/F1*6	UART trigger and analysis (4 ch model only)
	/F2*6	I^2C + SPI trigger and analysis (4 ch model only)
	/F3*6	UART + I^2C + SPI trigger and analysis (4 ch model only)
	/F4	CAN + LIN trigger and analysis (4 ch model only)

*1: Logic probes sold separately. Please order the model 701988/701989 accessory logic probes separately.
*2: Only one of these may be selected at a time.
*3: Specify this option when using current probes or other differential probes such as models 701920 or 701922.
*4: Only one of these may be selected at a time.
*5: Only one of these may be selected at a time.
*6: Only one of these may be selected at a time.

Digital Oscilloscopes

DL1720E/DL1735E DL1740E/DL1740EL

SignalExplorer

These Compact, Lightweight Models Offer High-speed Sampling and Long Memory

DL1740EL

DL1740E

CE

DL1735E

DL1720E

Overview

This series has an A4 sized footprint, is compact, and space-saving and with 350 MHz or 500 MHz bandwidth and Max. 8 MW memory.

Features

- Maximum sampling rate
  1 GS/s: Real-time sampling
  100 GS/s: Repetitive sampling
- 500MHz analog bandwidth (DL1735E : 350 MHz)
- Maximum record length
  DL1740EL: 8 Mwords
  DL1740E, DL1735E: 2 Mwords
  DL1720E: 1 Mwords
- HDTV trigger
- I^2C and SPI bus trigger and analysis (optional)
- USB storage and USB peripherals
  Supports USB memory devices (flash memory, hard disk drive, MO drive, etc.)
  Supports a USB mouse, keyboard, or printer
- Ethernet function (optional)
  Web server, FTP server, and network printing
- PC card interface (Type II)
  (or select floppy disk for removable media type)
- Built-In printer (optional)

Basic Specifications

Input channels 4 (701725, 701730, 701740) 2 (701715)
Voltage axis sensitivity setting range
For 1 MΩ input: 2 mV/div to 10 V/div (steps of 1, 2, or 5)
For 50 Ω input: 2 mV/div to 1 V/div (steps of 1, 2, or 5)
Frequency characteristics
For 1 MΩ input (using passive probe model 700988; specified at probe tip): 10 V/div to 10 mV/div: DC to 400 MHz (500 MHz*), (DC to 350 MHz, 701725)
*: When using Miniature passive probe model 701941; specified at probe tip.
A/D conversion resolution
8 bits (24 LSB/div)
Maximum sampling rate
1 GS/s
Maximum record length
701715: 1 MW/CH
701725, 701730: 2 MW/CH
701740: 8 MW/CH
DC accuracy ±(1.5% of 8 div + offset voltage accuracy)
Time axis setting range
1 ns/div to 50 s/div (for record length of 10 kW or greater)
Display 6.4-inch color TFT liquid crystal display
Built-in printer (optional)
Paper width: 112 mm
Computer interface
GP-IB, USB-PC connector (USB Rev 1.1 compliant), Ethernet (100BASE-TX/10BASE-T compliant, optional)
Other options: I^2C + SPI bus analysis function, probe power
External dimensions
220 (W) × 265.8 (H) × 264.1 (D) mm
Weight Approx. 5.5 kg (with all options)

Model Number and Suffix Codes

Model	Suffix Code	Description
701715		DL1720E digital oscilloscope with 2 ch input, 500 MHz analog bandwidth and maximum 1 MW memory
701725		DL1735E digital oscilloscope with 4 ch input, 350 MHz analog bandwidth and maximum 2 MW memory
701730		DL1740E digital oscilloscope with 4 ch input, 500 MHz analog bandwidth and maximum 2 MW memory
701740		DL1740EL digital oscilloscope with 4 ch input, 500 MHz analog bandwidth and maximum 8 MW memory
Power cable	-D	UL and CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Internal storage drive	-J1	Floppy disk drive*1
	-J3	PC card interface (type II)*1
Options	/B5	Built-in printer
	/P2	Probe power for model 701715*2
	/P4	Probe power for models 701725, 701730 and 701740*2
	/C10	Ethernet interface
	/F5	I^2C + SPI bus analysis function*3
	/EX2	Attach two 701941 probes*4
	/EX4	Attach four 701941 probes*5

The instrument comes standard with passive probes (700988). Four probes are included with the 701725, 701730 and 701740, and two probes are included with the 701715.
*1. One or the other must be selected.
*2. Select /P2 for model 701715, or /P4 for models 701725, 701730 and 701740.
*3. Option for models 701725, 701730 and 701740 only.
*4. Option for model 701715 only. The 700988 probes are not included when this option is specified.
*5. Option for models 701725, 701730, 701740 only. The 700988 probes are not included when this option is specified.

Digital Oscilloscopes

DL1620/DL1640/DL1640L

SignalExplorer

Our Best-selling Models Support 3-mode Power Supplies and Weight just 3.9 kg

DL1640/DL1640L

DL1620

DC power model + battery box

Overview

With a three-mode power supply (AC, 12 VDC and battery) the DL1600 goes everywhere you need to make measurements.
It also has serial bus (I²C, SPI, CAN), signal capturing, and protocol analysis functions.

Features

- CAN bus signal analysis function (optional)
- DC Power model + Battery box
- I²C bus analyzer for 701610 and 701620
- 4 channels 200 MS/s (DL1640/DL1640L)
- 2 channels 200 MS/s (DL1620)
- 200 MHz analog bandwidth
- Maximum memory length:
  32 MW (DL1640L) and 8 MW (DL1640/DL1620)
- 6.4-inch wide-angle-view TFT color liquid crystal display
- Compact and lightweight (approx. 3.9 kg 10.8 lbs)
- A4 size or smaller footprint
- Internal storage media
  (select PC card, Zip® drive, or Floppy drive)
- USB compliant, USB storage Supported (optional)
- Ethernet connectivity (optional)
- Real-time digital filtering

Basic Specifications

Input channels	4 (701610, 701620) 2 (701605)
Sensitivity	2 mV/div to 10 V/div (in steps of 1, 2, or 5)
DC accuracy	10 mV/div to 10 V/div: 1.5% of 8 div + offset voltage accuracy
Frequency characteristics	10 mV/div to 10 V/div: DC to 200 MHz
Vertical resolution	8 bits (24 LSB/div)
Maximum sampling rate	200 MS/s
Maximum record length	701605, 701610: 8 MW/ch 701620: 32 MW/ch
Sweep time	2 ns/div to 800 s/div (varies depends on memory length)
Display	6.4-inch TFT color liquid crystal display
Built-in printer (optional)	112 mm paper width
Communication interfaces	Serial port (RS232), USB port (optional), USB-PC port (optional), GP-IB port (optional[1]), Ethernet port (complies with 100BASE-TX and 10BASE-T; optional)
Internal media drive	Floppy disk drive, Zip® drive, PC card drive
Other options	Built-in printer, Probe power, GP-IB + USB, Ethernet + USB, I²C bus signal analysis function, CAN bus signal analysis function.
External dimensions	220 (W) × 266 (H) × 224 (D) mm
Weight	Approx. 4.5 kg (10.8 lbs; with all options) Approx. 3.9 kg (8.6 lbs; without any options)

Model Number and Suffix Codes

Model/Options	Suffix code	Description
701605		DL1620 digital oscilloscope
701610		DL1640 digital oscilloscope
701620		DL1640L digital oscilloscope
	-AC	100 to 120 V & 200 to 240 AC
	-DC*1	12 VDC
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
	-Y	No power cable
Internal media drive	-J1	Floppy disk drive*2
	-J2	Zip® drive*2
	-J3	PC card drive (Type II)*2
Other options	/B5	Built-in printer
	/P2	Probe power for 701605
	/P4	Probe power for 701610 and 701620
	/C1	GP-IB + USB*3
	/C10	Ethernet + USB*3
	/F5	I²C bus analyzer for 701610 and 701620*4
	/F7	CAN bus signal analysis function*5

The main unit comes standard with four passive probes (700960) for 701610/701620 and two passive probes for 701605.
*1 Select "-Y" for the DC power model.
*2 Choose one.
*3 Choose one.
*4 The I²C bus analysis function includes the SPI analysis function.
I²C only be specified for model 701610 and 701620.
*5 The CAN bus analysis function includes the SPI bus analysis function.
It can only be specified for model 701610 and 701620.

Model/Options	Suffix code	Description
701680*6		Battery box and charger
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard

*6 The Battery box comes standard with the cable for connecting to the main unit.

ScopeCorder

DL750/DL750P

Innovative Solutions for Long-Term Recording to both Memory and Paper

DL750 CE

DL750P CE

Overview

ScopeCorder is a new measurement tool combining the functions of an oscilloscope for capturing instantaneous phenomena and a data recorder for monitoring long-term trends

Features

- Standard high resolution A4 thermal printer (DL750P)
- Effective print width is 200 mm (1600-dot resolution) (DL750P)
- Compact body and isolated 16 analog channels, 8 slots and 16-bits logic input.
- Eleven kind of plug-in modules offers high accuracy and low noise measurement and also offer various measurement (Voltage/Current/Temperature/Strain/Vibration/Frequency)
- 1 GW large memory and 30 days observation.
- 1 GW instantaneous display (GigaZoom Function)
- Simultaneous high-speed and low-speed recording using Dual Capture
- Cycle statistical calculation
- Many Ethernet functions (Web server/FTP server/Email)
- Various communication interfaces (USB/Ethernet/GPIB/RS232/SCSI)
- PC card drive available
- 40GB internal hard drive

Basic Specifications

Input
- Type: Isolated plug-in module
- Slots: 8 (16 channels)
- Logic inputs: 16 (8 bits × 2)

Sweep time: 500 ns to 3 days/div (10 div)
Display: 10.4-inch color TFT liquid crystal display
Built-in printer
- Printing method: Thermal line-dot printing
- Paper width: 112 mm (DL750)
  210 mm (Effective print width 200mm) (DL750P)

Communication interfaces: GP-IB, USB peripheral equipment jacks (USB keyboards and USB printers), USB (complies with Rev. 1.1, for connection to PC), Ethernet (complies with 100BASE-TX and 10BASE-T; with /C10 option), serial (RS232), and SCSI
Internal media drives: Floppy drive, Zip® drive (DL750), or PC card (choose one), and 40 GB hard drive (with /C8 option)
External dimensions
  355 (W) × 250 (H) × 180 (D) mm (DL750)
  355 (W) × 250 (H) × 225 (D) mm (DL750P)
Weight: Approx. 6.6 kg (DL750), 8.0 kg (DL750P), (main unit with full options, including M3, C8, C10, and P4)
  Approx. 9 kg (DL750), 10.3 kg (DL750P), (main unit and eight 701250 modules)

1 GW Memory for full-length display and instantaneous zooming (to user-specified size)

	Maximum Recording Time			
Sample Rate	Seconds	Minutes	Hours	Days
10 MS/s	**100 seconds**	1.67	0.028	0.001
1 MS/s	600	**10 minutes**	0.167	0.007
100 kS/s	9000	**150 minutes**	**2.5 hours**	0.10
10 kS/s	72000	1200	**20 hours**	**0.83 day**
1 kS/s	864000	14400	240.0	**10 days**
200 S/s	2592000	43200	720.0	**30 days**

Model Number and Suffix Codes

Model	Suffix Code	Description
701210		"DL750 main unit (16 isolated channels, 8 slots + 16-bit logic)[1] 112 mm width A6 thermal printer built-in"
701230		"DL750P main unit (16 isolated channels, 8 slots + 16-bit logic)[1] 210 mm width A4 thermal printer built-in"
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard (Complied with CCC)
Internal media drive[2]	-J1	Floppy drive
	-J2	Zip® drive (available for the DL750 only)[3]
	-J3	PC card drive
Default Help language	-HE	English
	-HJ	Japanese
	-HC	Chinese
	-HG	German
	-HF	French
	-HL	Italian
	-HK	Korean
Memory expansion	/M1	Memory expansion to 10 MW/CH[4]
	/M2	Memory expansion to 25 MW/CH[4]
	/M3	Memory expansion to 50 MW/CH[4]
Other specifications	/C8	Internal 40 GB HDD (FAT32)
	/C10	Ethernet interface
	/G2	User-defined math function
	/G3	DSP channel function
	/P4	Probe power (4-output)
	/DC	DC 12V Power (10-18VDC)[3]

1. Plug-in modules are not included.
2. Choose only one.
3. Zip drive and DC12V power supply cannot be specified together with the DL750P.
4. Cannot be specified together.

ScopeCorder LITE

SL1400

ScopeCorder

Easily & Quickly Saves Data to Memory and Paper

SL1400 CE

Overview

A plug-in module type chart recorder with a large built-in A4 sized high-resolution thermal printer

Features

- Easy-to-operate
- Standard high resolution A4 size thermal printer
- Effective print width is 200 mm (1600-dot resolution)
- Compact body and isolated 16 analog channels, 8 slots and 16-bits logic input
- Eleven kinds of plug-in modules offers high accuracy and low noise measurement and also offer various measurement, Voltage/ Current/Temperature/Strain/Vibration/Frequency
- 50MW large memory and 30 days observation
- Cycle statistical calculation
- Many Ethernet functions (Web server/FTP server/E-mail)
- Various communication interface USB/Ethernet/GP-IB/RS-232/ SCSI
- PC card drive is available
- 40 GB internal hard drive
- USB storage function is available

Basic Specifications

Input
- Type: Isolated plug-in module
- Slots: 8 (16 channels)
- Logic inputs: 16 (8 bits × 2)

Sweep time: 100 us to 30 days

Display: 10.4-inch color TFT liquid crystal display

Built-in printer
- Printing method: Thermal line-dot printing
- Paper width: 210 mm (Effective print width 200 mm)

Communication interface: GP-IB, USB peripheral equipment jacks (USB keyboards and USB printers), USB (compiles with Rev. 1.1, for connection to PC), Ethernet (complies with 100 BASE-TX and 10 BASE-T; with /C10 option), serial (RS232), and SCSI

Internal media drives: PC card or Drive less (choose one), and 40GB hard drive (with /C8 option)

External dimensions: 355(W) × 250(H) × 225(D) mm

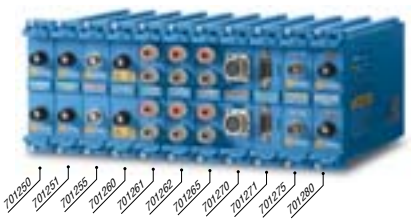
Weight: Approx. 8.0 kg (main unit with full options, including C8, C10 and P4)
Approx. 10.3 kg (main unit and eight 701250 modules)

Model Number and Suffix Codes

Model	Suffix Code	Description
701240		SL1400 main unit (16 isolated Channels, 8 slots + 16-bit logic)[1] 210 mm width A4 thermal printer built-in
Power cable[2]	-D	UL/ CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard (Complied with CCC)
Internal media drive[2]	-J0	non Drive
	-J3	PC card drive
Language[2]	-HE	English, Panel in English
	-HJ	Japanese, Panel in Japanese
	-HC	Chinese, Panel in English
	-HG	German, Panel in English
	-HF	French, Panel in English
	-HL	Italian, Panel in English
	-HK	Korean, Panel in English
	-HS	Spanish, Panel in English
Other specifications	/C8	Internal 40 GB HDD (FAT32)
	/C10	Ethernet option
	/P4	Probe power (4-output)

1. Plug-in modules are not included.
2. Choose only one.

Module Selection



* Above plug-in modules can be used among all ScopeCorder series.

Plug-in Module Model Numbers

Model	Description
701250	High-speed 10 MS/s 12-bit Isolation module (2 CH)
701251	High-speed 1 MS/s 16-bit Isolation module (2 CH)
701255	High-speed 10 MS/s 12-bit non-Isolation module (2 CH)
701260	High-voltage 100 kS/s 16-bit Isolation module (2 CH, with RMS)
701261	Universal module (2 CH)
701262	Universal module (with anti-aliasing filter, 2 CH)
701265	Temperature/high-precision voltage module (2 CH)
701270	Strain module (NDIS, 2 CH)
701271	Strain module (DSUB, Shunt-CAL, 2 CH)
701275	Accelaration module (with anti-aliasing filter, 2 CH)
701280	Frequency module (2 CH)

■ Probes not included with any modules.

Vehicle Serial Bus Analyzer

SB5000

Advanced Functions for FlexRay Waveform & Protocol Analysis Comprehensive In-Vehicle Serial Bus Analyzer

SB5710

Overview

The SB5000 Vehicle Serial Bus Analyzer is an invaluable tool for engineers involved in the development and use of in-vehicle communication buses. It can analyze FlexRay, an emerging bus technology employed by advanced ECU's and electronic vehicle control applications. Because it can measure logic signals of up to 32 bits simultaneously, a single SB5000 offers measurement and analysis of parallel bus signals from microprocessors and other sources.

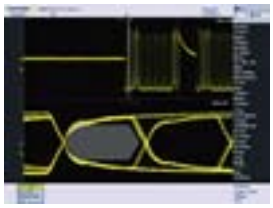
Features

- **Measure and Analyze 3 Vehicle Serial Buses + 3 General Purpose Serial Buses, and 32-Bit Max Parallel Buses —All on a Single Instrument**
- **Waveform(s), Analysis List and Decode Display**

Easy and efficient observation of the physical layer and simultaneous protocol analysis enable you to evaluate the performance of your bus communication system.

FlexRay waveform, list, decode display example

- **FlexRay Eye-Diagram Analysis**
- **CAN/FlexRay bus symbolic triggering, analysis, decoding, and trend display (Supports DBC database for CAN, FIBEX database for FlexRay)**



FlexRay Eye-diagram analysis example

FlexRay Fibex symbolic analysis, decode example

- **Auto Setup Dedicated to Serial Busses**

Major Specifications

Models

Model name (No.)	Max. sampling rate	Freq. BW	Max. record length	Input channels
SB5310 (701351)	5 GSps	1 GHz	6.25 MW (Mpts)	Analog 4 CH + Logic 8-bit
SB5710 (701361)	5 GSps	1 GHz	6.25 MW (Mpts)	Analog 4 CH + Logic 32-bit

FlexRay bus	FlexRay Protocol Version 2.1
Bit rate	10Mbps, 5 Mbps, 2.5 Mbps
FlexRay Trigger Types	Frame Start, ID/DATA, ID/DATA OR, Error, Message/Signal
CAN bus	CAN Version 2.0B
CAN Trigger Types	SOF, Error Frame, ID Std/Data, ID Ext/Data, ID Data OR, Message/Signal
LIN bus	LIN1.3 or LIN2.0
LIN Trigger Types	Break + Synch, ID/Data, ID/Data OR, Error
UART Trigger Types	Every Data, Data, Error
I²C bus	Bus transfer rate: Up to 3.4 Mbits/s
Address mode	7 bits/10 bits
I²C Trigger Types	Every Start, Address&Data, Non-Ack, General Call, Start Byte/HS Mode
SPI Trigger Types	Three-wire or Four wire Activate a trigger by comparing data from an arbitrary byte counts after the assertion of the CS. The length of data that is compared can be set to 1 to 4 bytes.
Display of Analysis Results	Simple & detailed analysis result displays are available for all buses.

Basic Specifications	
Input channels:	4 (CH1 to CH4)
Voltage axis sensitivity:	For 1 MΩ input : 2 mV/div to 5 V/div (steps of 1-2-5) For 50Ω input: 2 mV/div to 500 mV/div (steps of 1-2-5)
Maximum input voltage:	For 1 MΩ input: 150 Vrms CAT I (when frequency is under 1 kHz) For 50Ω input: 5 Vrms or less and 10 Vpeak or less
Rated supply voltage	100 to 120 VAC or 220 to 240 VAC (automatic switching)
Rated supply frequency	50/60 Hz
Maximum power consumption	300 VA
External dimensions	350 (W) × 200 (H) × 285 (D) mm (with printer cover put away, excluding handle and other projections)
Weight	Approx. 7.7 kg (without options)
Operating Temperature	5 to 40 °C

Model Number and Suffix Codes

Model	Suffix Code	Description
701351		SB5310: 4 ch 1.0GHz + Logic 8-bit Max. 5GS/s(2.5GS/s/ch), 6.25 MW (Mpts)/ch
701361		SB5710: 4 ch 1.0GHz + Logic 32-bit Max. 5GS/s(2.5GS/s/ch), 6.25 MW (Mpts)/ch
Power Cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
	-HC	Chinese Help
	-HK	Korean Help
Options	/B5	Built-in printer
	/P4*1	4 Probe power terminals on rear panel
	/C8*2	Built-in HDD + Ethernet interface
	/C9*2	Built-in HDD + LXI compliant Ethernet interface
	/C10*2	Ethernet interface
	/C12*2	LXI compliant Ethernet interface
	/G2*3	User-defined math function
	/G4*3	Power supply analysis function

*1: Please order /P4 option if you use either current probes or differential probes such as 701920, 701922, 701932 or 701933.
*2: Choose either one
*3: Choose either one

DL9240/DL9240L Accessory

USB2.0 Compliance Test Solution busXplorer™-USB

The USB 2.0 compliance test solution*1 busXplorer™-USB takes advantage of the wide variety of DL9000 trigger and analysis functions to offer a system for carrying out highly automated USB compliance tests. In addition to facilitating execution of the various tests from a PC via Ethernet, the newly developed test software displays detailed test procedures including the wiring method. This allows even inexperienced operators to easily perform the tests.

*1) busXplorer™-USB comprises a test fixture and test software.

USB2.0 Compliance Test Solution Equipments

- 701312/701313 DL9240/DL9240L
- 701985 USB Compliance Test Fixture & Software
- 701923 PBD2000 2GHz BW differential probe
- 701913 PBA2000 2.5GHz BW active probe
- 701933 50MHz BW current probe

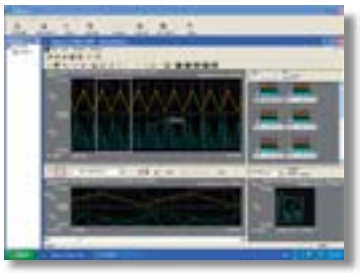
*The equipment that is required varies depending on the test. Please contact us for details.

Detailed analyses of signal waveforms can be performed by using the system in conjunction with the Xviewer Waveform Analysis Tool (sold separately).

Oscilloscope Application Software

X viewer/MATLAB tool kit

View Waveform Data on Your PC

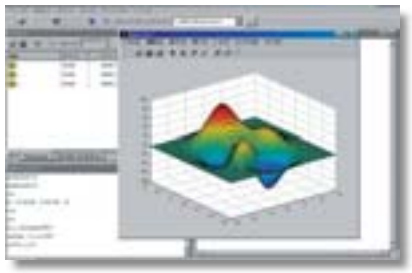


701992

Xviewer

Xviewer is a PC software application designed to work with Yokogawa's DL (M) Series and the DL750/750P/SL1400 Series ScopeCorders. Xviewer allows you to display DL-acquired waveform data (using the "Viewer" function), perform file transfers, and control DL (M) Series from a PC.

Plug-in for MATLAB software



701991

MATLAB tool kit

The MATLAB tool kit for the DL Series is a plug-in for MATALAB software. The toolkit can be used to control supported instruments using MATLAB or to acquire data from the instruments to use in MATLAB via a communication interface (GP-IB, USB, Ethernet).

In addition to the above, various kinds of accessory software, free software, LabVIEW drivers, and LabWindows/CVI drivers, can be downloaded from our web site.

Waveform Measuring

Oscilloscopes Accessories

Product	Part No.	Description		DL9700	DL9000	DL7400	DLM2000	DL1600	DL1700E	SB5000
PB500 (500 MHz passive probe)	**701943**	500 MHz BW, 10:1, 1.5 meters		●	●					●
PBA2500 (2.5 GHz active probe)	**701913**	2.5 GHz BW, 10:1, 1.2 meters		●	●		●			●
PBA1500 (1.5 GHz active probe)	**701914**	1.5 GHz BW, 10:1, 1.2 meters		●	●		●			●
PBA1000 (1.0 GHz active probe)	**701912**	1.0 GHz BW, 10:1, 1.2 meters		●	●		●			●
PBD 2000 (2 GHz differential probe)	**701923**	2 GHz BW, 10:1, Max. differential input voltage: ±5 V, 1.2 meters		●	●		●			●
PBL5000 (5 GHz low capacitance probe)	**701974**	5 GHz BW, 10:1, 20:1, 0.95 meters		●	●		●			●
200MHz passive probe	**701938**	200 MHz BW, 10:1, 1.5 meters					●			
500MHz passive probe	**701939**	500 MHz BW, 10:1, 1.3 meters					●			
400 MHz passive probe	**700988**	400 MHz BW (10:1) Allows the division ratio to be switched between 10:1 and 1:1. 1.5meters				●			●	
200 MHz passive probe	**700960**	200 MHz BW (10:1) Allows the division ratio to be switched between 10:1 and 1:1. 1.5meters						●		
500 MHz Miniature passive probe	**701941**	DC to 500 MHz, 10:1, 1.2 meters				●			●	
350 MHz Miniature passive probe	**701942**	DC to 350 MHz, 10:1, 3.0 meters				●			●	
100:1 High voltage probe	**701944**	400 MHz BW, 100:1, 1.2 meters		●	●	●	●	●	●	●
100:1 High voltage probe	**701945**	250 MHz BW, 100:1, 3.0 meters		●	●	●	●	●	●	●
900 MHz FET Probe	**700939**	DC to 900 MHz, Input impedance 1.8 pF		●	●	●	●	●	●	●
Logic probe	**701980**	Input impedance: 1 MΩ Max. toggle frequency: 100 MHz		●		●	●			●
Logic probe	**701981**	Input impedance: 10 KΩ Max. toggle frequency: 250 MHz		●		●	●			●
PBL100 (100MHz Logic probe)	**701988**	Input impedance MΩ Max. toggle frequency: 100 MHz		●			●			●
PBL250 (100MHz Logic probe)	**701989**	Input impedance: 100 kΩ Max. toggle frequency: 250 MHz		●			●			●
100 MHz differential probe	**701921**	DC~100 MHz, 10:1, 100:1, Max. differential input voltage: ±70 V (10:1), ±700 V (100:1)		●	●	●	●	●	●	●
200 MHz differential probe	**701922**	DC~200 MHz, 10:1, Max. differential input voltage: ±20 V		●	●	●	●	●	●	●
15 MHz differential probe	**700925**	DC~15 MHz, 10:1, 100:1, Max. differential input voltage: ±500 V (100:1), ±50 V (10:1)		●	●	●	●	●	●	●
100 MHz differential probe	**700924**	DC~100 MHz, 100:1, 1000:1, Max. differential input voltage: ±1400 V (1000:1),±350 V (100:1)		●	●	●	●	●	●	●
500 MHz differential probe	**701920**	DC~500 MHz, 10:1, Max. differential input voltage: ±12 V		●	●	●	●	●	●	●
50MHz differential probe	**701926**	DC~50 MHz, 100:1, 1000:1, Max. differential input voltage: 700Vpeak(100:1), 7000Vpeak(1000:1)		●	●	●	●	●	●	●
1GHz differential probe	**701924**	DC~1 GHz, 50:1 Max. differential input voltage: ±25V		●	●		●			●
Deskew signal source	**701935**	Output voltage: Approx. 0-5 V Output current: Approx. –100 to 0 mA		●	●	●	●			●
Current probe	**701933**	DC to 50 MHz 30 Arms		●	●	●	●	●	●	●
Current probe	**701930**	DC to 10 MHz 150 Arms		●	●	●	●	●	●	●
Current probe	**701931**	DC to 2 MHz, 500 Arms		●	●	●	●	●	●	●
Current probe	**701932**	DC to 100 MHz, 30 Arms		●	●	●	●	●	●	●
Current probe	**701929**	DC to 50MHz 30 Arms		●	●		●			●
Current probe	**701928**	DC to 100MHz 30 Arms		●	●		●			●
Probe power supply	**701934**	Large current output, external probe power supply (4 outputs)		●	●	●	●	●	●	●
50 Ω terminator	**700976**	Used to connect an oscilloscope having a 1 MΩ input to an instrument having a 50 Ω output.						●		
Probe stand	**701919**	Diameter of attachable probe ø8 to 13mm Weight : Approx. 1.5 kg		●	●	●	●	●	●	●

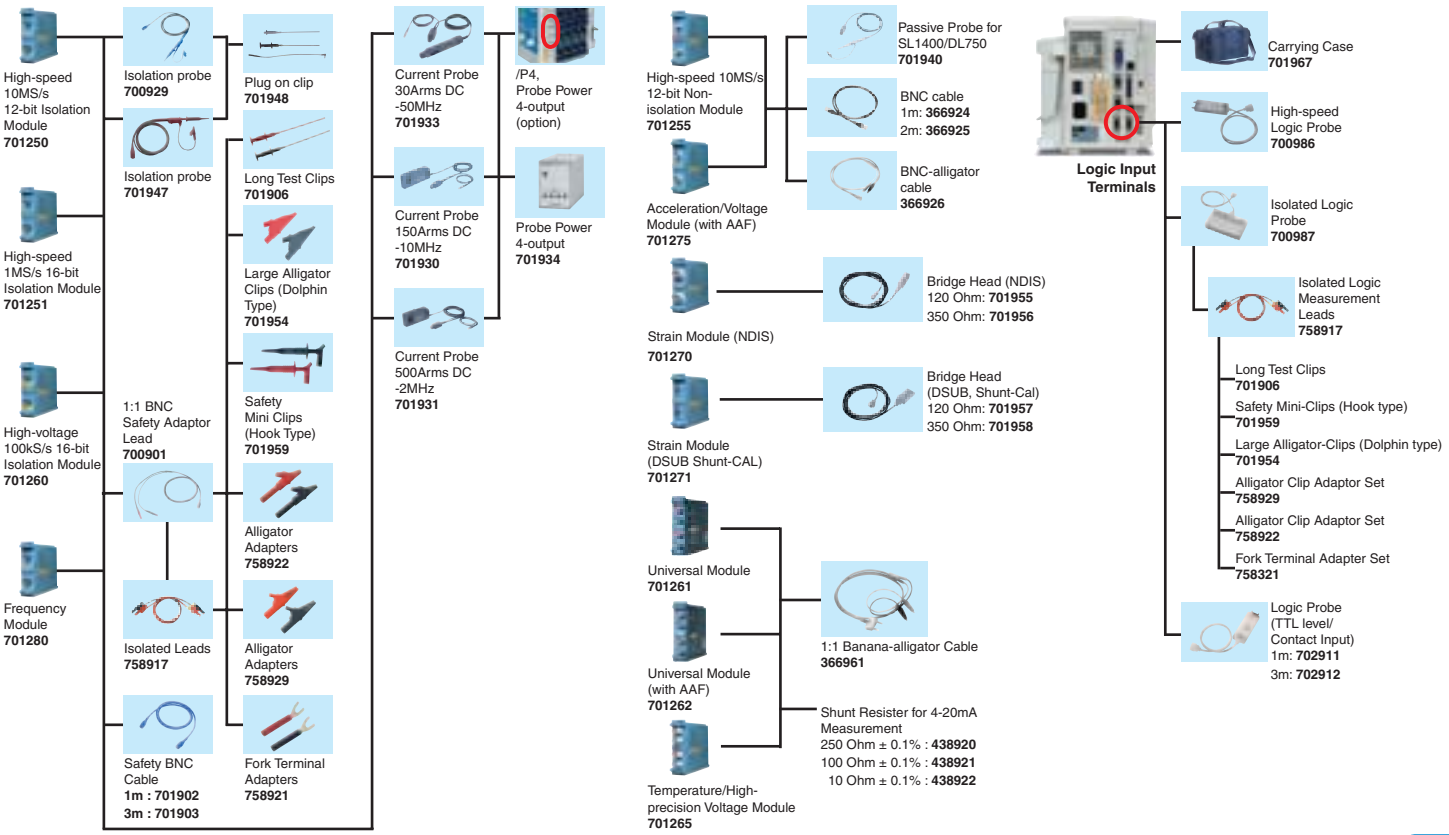
Waveform Measuring

ScopeCorder Accessories

Product	Model No.	Description*1
10:1 Probe (for Isolated BNC Input)	700929	1000 Vrms-CAT II
100:1 Probe (for Isolated BNC Input)	701947	1000 Vrms-CAT II/±3540 V(DC+ACpeak)-CAT I
Plug on clip	701948	1000 Vrms-CAT II (for 700929,701947)
1:1 Safety BNC Adapter Lead (in combination with followings)	701901	1000 Vrms-CAT II
Long Test Clips	701906	1000 Vrms-CAT II, 1 set each of red and black
Safety Mini-Clips (Hook type)	701959	1000 Vrms-CAT II, 1 set each of red and black
Large Alligator-Clips (Dolphin type)	701954	1000 Vrms-CAT II, 1 set each of red and black
Alligator Clip Adaptor Set	758929	1000 Vrms-CAT II, 1 set each of red and black
Alligator Clip Adaptor Set	758922	300 Vrms-CAT II, 1 set each of red and black
Fork Terminal Adapter Set	758321	1000 Vrms-CAT II, 1 set each of red and black
Passive Probe (10:1)*2	701940	Non-isolated 600 Vpk
1:1 BNC-Alligator Cable	366926	Non-isolated 42 V or less, 1m
1:1 Banana-Alligator Cable	366961	Non-isolated 42 V or less, 1.2m
Current Probe	701933	30 Arms, DC to 50 MHz, supports probe power
Current Probe	701930	150 Arms, DC to 10 MHz, supports probe power
Current Probe	709131	500 Arms, DC to 2 MHz, supports probe power
Probe Power Supply	701934	Supply (4 outputs), large current output, external probe power
Shunt Resister	438920/21/22	250 Ω/100 Ω/10 Ω±0.1%
Bridge Head (NDIS,120Ω/350Ω)	701955/56	With 5 m cable
Bridge Head (DSUB,120Ω/350Ω)	701957/58	With 5 m cable, Shunt-CAL
Safety BNC-banana Adapter	758924	500 Vrms-CAT II
Logic Probe (1m/3m)	702911/12	8-Bit, non-Isolated, TTL level/Contact Input (for SL1400)
High-speed Logic Probe	700986	8-Bit, non-Isolated, response speed: 1 µs
Isolated Logic Probe	700987	8-Bit, each channel isolated
Measurement Lead Set	758917	Measurement leads (2 per set)
Safety BNC-BNC Cable	701902/03	1000 Vrms-CAT II (BNC-BNC),1m/3m

*1 Actual allowable voltage is the lower of the voltages specified for the main unit, prob and cable.
*2 42 V is safe when using the 701940 with an isolated type BNC input.

Accessories Combinations



Digital Power Analyzers

Selection Guide

Digital Power Analyzer

Yokogawa's WT Series Power Meters and PZ4000 Power Analyzer:
Advanced Technology and High Reliability for a Wide Range of Power Measurement Solutions

WT Series

	WT Series			
Models / Items	WT3000	WT1600	WT500	WT210/WT230
				
Features	Top model of Digital Power Analyzer With basic power accuracy of ±0.02% of reading, DC and 0.1 Hz-1 MHz measurement bandwidth, and up to four input elements, the model provides higher-accuracy measurement of inverter I/O efficiency.	Middole Class model Up to six Input elements in one instrument (3 phase power input from two systems in one unit) 6.4-Inch TFT Color LCD Wide voltage and current input range	New Middle Class Power Analyzer Compact half rack size and easy use Max. 1000V and 40A input Simultaneous measurement U, I, P and those harmonics components External USB memory direct data saving	Entry class model Compact design (half-rack size) and superior cast performance 5 mA range for very low current measurements (model WT210 only)
Input elements	1 to 4	1 to 6	1 to 3	1 (WT210), 2 or 3 (WT230)
Basic power accuracy (50/60 Hz)	0.02% of rdg + 0.04% of rng	0.1% of rdg + 0.05% of rng	0.1% of rdg + 0.1% of rng	0.1% of rdg + 0.1% of rng
Power measurement frequency range	DC, 0.1 Hz to 1 MHz	DC, 0.5 Hz to 1 MHz	DC, 0.5Hz to 100kHz	DC, 0.5 Hz to 100 kHz
Input voltage range (for crest factor 3)	15/30/60/100/ 150/300/600/1000 V	1.5/3/6/10/15/30/60/ 100/150/300/600/1000 V	15/30/60/100/150/300/600/1000V	15/30/60/150/300/600 V
Input current range (for crest factor 3)	Direct input: 0.5/1/2/5/10/20/30 A or 5 m/10 m/20 m/50 m/100 m/200 m/500 m/1/2 A External input: 50 m/100 m/200 m/500 m/1/2/5/10 V	Direct input: 10 m/20 m/50 m/100 m/200 m/500 m/1/2/5 A or 1/2/5/10/20/50 A External input: 50 m/100 m/250 m/500 m/1/2.5/5/10 V	Direct input: 500m/1/2/5/10/20/40A External sensor input: 50m/100m/250m/500m/1/2/5/10V	Direct input: 5 m /10 m/20 m/50 m/100 m/200 m/500 m/1/2/5/10/20 A (WT210) Direct input: 500 m/1/2/5/10/20 A (WT230) External input (option): 2.5/5/10 V or 50 m/100 m/200 mV
Measurement parameters	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Apparent power integration, Reative power integration, Current integration, Corrected power, Crest factor, Efficiency, Harmonic analysis	Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Crest factor, Form factor, Impedance, Resistance, Reactance, Corrected Power, Harmonic analysis	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage frequency, Current frequency Active power integration and Current integration for both charge/discharge and sold/bought, crest factor, Efficiency, harmonic analysis	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Harmonic analysis
Display	8.4-inch TFT color LCD	6.4-inch TFT color LCD	5.7-inch TFT color LCD	7-segment LED, 3 displays
External dimensions (mm) (W × H × D)	426 × 177 × 459	426 × 177 × 400	213 x 177 × 408.5	213 × 88 × 379 (WT210) 213 × 132 × 379 (WT230)
Weight (kg)	15	15	6.5	3 (WT210), 5 (WT230)

WT Series & PZ4000 Power Analyzer

	WT Series	PZ4000
Models / Items	WT2000	PZ4000
		
Features	High Accuracy Power Meter Total harmonic measurement and analysis function Voltage fluctuation/flicker measurement function Higher power accuracy	A power analyzer that displays measured waveforms Wide bandwidth, high-precision measurements A power analyzer capable of dynamically capturing load fluctuations Graphical power analysis
Input elements	1 to 3	1 to 4 or 1 to 3 + Sensor input
Basic power accuracy (50/60 Hz)	0.04% of rdg + 0.04% of rng	0.1% of rdg + 0.025% of rng
Power measurement frequency range	DC, 2 Hz to 300 kHz	DC, 0.1 Hz to 1 MHz
Input voltage range	10/15/30/60/100/ 150/300/600 V	30/60/120/200/300/600/ 1200/2000 V peak
Input current range	Direct input: 1/2/5/10/20/30 A External input: 50 m/100 m/200 mV	Direct input 5 A: (253751, 253752) 0.1/0.2/0.4/1/2/4/10 Apeak Direct input 20 A: 1/2/4/10/20/40/100 Apeak (253752 only) External input: 100/200/400/1000 mVpeak
Measurement parameters	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Active power integration, Current integration, Efficiency, Harmonic analysis, Flicker measurement	Voltage, Current, Active power, Apparent power, Reactive power, Power factor, Phase angle, Peak voltage, Peak current, Voltage Frequency, Current Frequency, Crest factor, Form factor, Impedance, Resistance, Reactance, Efficiency, Corrected Power, Harmonic analysis
Display	7-segment LED, 4 displays	6.4-inch TFT color LCD
External dimensions (mm) (W × H × D)	426 × 132 × 400	426 × 177 × 450
Weight (kg)	13	15

***About CW series Clamp-on Power Meters, please refer to the page 67.**

Precision Power Analyzer

WT3000

High-end Power Analyzer with Best-in-Class Precision ±0.02% of Reading and High Stability

WT3000

Overview

For three-phase power measuring, the WT3000 Precision Power Analyzer provides a basic power accuracy of ±0.02% of reading. It also offers bandwidth for DC or 0.1 Hz–1 MHz and accepts up to 4 input elements, facilitating high precision efficiency measurements through simultaneous measurement during I/O of inverters and other items under test.
This, coupled with the ability to perform normal power and harmonic measurements simultaneously, means that the WT3000 can offer higher accuracy in evaluation of instruments and higher efficiency.

Model Number and Suffix Codes

Model	Suffix Codes		Description
760301			WT3000 1 input element model
760302			WT3000 2 input elements model
760303			WT3000 3 input elements model
760304			WT3000 4 input elements model
Element number	-01	30A input element	for 760301 model
	-02		for 760302 model
	-03		for 760303 model
	-04		for 760304 model
	-10	2A input element	for 760301 model
	-20		for 760302 model
	-30		for 760303 model
	-40		for 760304 model
Version	-SV		Standard Version
	-MV		Motor Version
Power cord	-D		UL/CSA standard
	-F		VDE standard
	-R		SAA standard
	-Q		BS standard
	-H		GB standard
Options	/G6		Advanced Computation (IEC standard testing*, harmonic, FFT, Waveform computation)
	/B5		Built-in Printer
	/DT		Delta Calculation
	/FQ		Add-on Frequency Measurement
	/DA		20ch D/A output
	/V1		VGA Output
	/C2	Select	Serial (RS-232) Interface
	/C12	one	USB port (PC)
	/C5		USB port (Peripheral)
	/C7		Ethernet function
	/CC		Cycle by Cycle
	/FL		Voltage Fluctuation, Flicker

* requires 761922 software

Note: Mixing of the 30 A and 2 A input elements is not supported, whether purchasing a new unit or reworking an existing one. Also, the unit cannot be modified to change the current range. Adding input modules after initial product delivery will require rework at the factory. Please choose your models and configurations carefully, and inquire with your sales representative if you have any questions.

Features

- High accuracy and wide frequency range
- Up to 4 input elements
- Low power factor error
- Effective input range: 1% to 130%
- Simultaneously measurement with 2 units
- Data update rate: 50 ms to 20 sec
- Variety of display formats:
  Numeric, Waveform, Bar graph, Vector, Trend, MATH, FFT, CC
- IEC harmonic measurement in combination with software (761922)
- IEC Flicker measurement (/FL option)
- Storage function (approximately 30 MB internal memory)
- Motor efficiency and total efficiency measurement (Motor version)

Basic Specifications

- Measurement voltage range: (for crest factor 3)
  15/30/60/100 /150/300/600/1000 V
- Measurement current range: (for crest factor 3)
  Direct input (30 A input element)
  500 mA/1/2 /5/10/20/30 A
  Direct input (2 A input element)
  5 m/10 m/20 m/50 m/100 m/200 m/500 m/1/2 A
  External sensor input
  50/100 /200/500 mV/1/2/5/10 V
- Frequency range:
  DC, 0.1 Hz to 1 MHz
- Accuracy (45 to 66 Hz):*greater than or equal to 500 mA range
  Voltage/current ±(0.01% of reading + 0.03% of range)
  Power ±(0.02% of reading + 0.04% of range)
- Influence of power factor (λ):
  When λ = 0
  Apparent power reading × 0.03% in the 45 to 66 Hz range
- External dimensions:
  Approx. 426 (W) × 177 (H) × 459 (D) mm
- Weight: Approx. 15 kg
  (including main unit, 4 input elements, and options)

Digital Power Meters

WT1600

A Precision, Wide Frequency Range, Digital Power Meter with up to Six Input Elements

WT1600

CE

Overview

The WT1600 is a power meter designed to measure extremely small currents in energy-saving equipments, as well as large currents for evaluating large-sized loads. The WT1600 works with voltages ranging from 1.5 V up to 1000 V and supports a wide range of applications. A WT1600 can measure I/O signals on inverters, because it can accept signal inputs for up to six phases

Model Number and Suffix Codes

Model	Suffix codes		Description						
760101			WT1600 digital power meter main unit						
			Element Number						
			1	2	3	4	5	6	
Element types and quantities The numbers in the "Descrip-tion" column have the following meanings. 50: 50 A input element 5: 5 A input element Blank: No element Elements are inserted in the order shown starting on the left side on the back.	-01		50						
	-02		50	50					
	-03		50	50	50				
	-04		50	50	50	50			
	-05		50	50	50	50	50		
	-06		50	50	50	50	50	50	
	-10		5						
	-11		5	50					
	-12		5	50	50				
	-13		5	50	50	50			
	-14		5	50	50	50	50		
	-15		5	50	50	50	50	50	
	-20		5	5					
	-21		5	5	50				
	-22		5	5	50	50			
	-23		5	5	50	50	50		
	-24		5	5	50	50	50	50	
	-30		5	5	5				
	-31		5	5	5	50			
	-32		5	5	5	50	50		
	-33		5	5	5	50	50	50	
	-40		5	5	5	5			
	-41		5	5	5	5	50		
	-42		5	5	5	5	50	50	
	-50		5	5	5	5	5		
	-51		5	5	5	5	5	50	
	-60		5	5	5	5	5	5	
Communication functions	-C1		GP-IB						
	-C2		Serial (RS-232)						
Power cord		-D	UL/CSA Standard						
		-F	VDE Standard						
		-R	SAA Standard						
		-Q	BS Standard						
		-H	GB Standard						
Option specifications		/B5	Internal printer						
		/C7	SCSI interface						
		/C10	Ethernet, HDD, SCSI						
		/DA	30-channel DA output						
		/MTR	Motor evaluation function						

* The WT1600 unit cannot be purchased without any elements. Select an element type (5 A or 50 A) and quantity.

Note: In order to add elements and options after the WT1600 has been delivered, the WT1600 must be modified at the factory. Be aware of this in making your product selections. For further details, see Yokogawa's home page or contact our sales office.

Features

- Up to six input elements in one instrument (3 phase power input from two systems in one unit)
- Wide frequency range
- Wide current input range: 10 mA to 5 A or 1 A to 50 A
- Wide voltage input range: 1.5 V to 1000 V
- 50 ms data storing interval
- Standard integration and harmonic measurement functions
- Variety of display formats:
  Numeric, Waveform, Bar graph, Vector, Trend
- Standard external current sensor input for use with current clamps
- Motor evaluation function (optional)
- 30ch D/A output (optional)
- Built-in printer (optional)
- Ethernet function (optional)

Basic Specifications

- Measurement voltage range: (for crest factor 3)
  1.5/3/6/10/15/30/60/100/150/300/600/1000 V
  (DC, 0.5 Hz to 1 MHz)
- Measurement current input range: (Direct input, for crest factor 3)
  5 A input element
  10/20/50/100/200/500 mA, 1/2/5 A
  (DC, 0.5 Hz to 1 MHz)
  50 A input element
  1/2/5/10/20/50 A (DC, 0.5 Hz to 100 kHz)
  External sensor input (same for 5 A and 50 A input elements)
  50/100/250/500 mV, 1/2.5/5/10 V (DC, 0.5 Hz to 500 kHz)
- Basic accuracy: (45 Hz ≤ f ≤ 66 Hz)
  Voltage/Current/Power:
  ±(0.1% of rdg + 0.05% of rng)
- Effective of power factor (at cos ϕ = 0)
  ±0.15% of rng added
- External dimensions:
  Approx. 426 (W) × 177 (H) × 400 (D) mm
- Weight: Approx. 15 kg (with 6-input element)

Digital Power Analyzer

WT500 Series

Compact and easy use. The Power Analyzer for the renewable energy generation

WT500

Overview

The WT500 is a new middle class power analyzer and it features a 5.7-inch color TFT and half width racking compact body that enable s single-phase and three-phase power measurement, achieving ±0.1% of reading basic and DC accuracy, maximum input of 1000Vrms, 40Arms and a measurement bandwidth up to 100kHz.

Basic Specifications

- Measurement voltage range: (for crest factor 3)
  15/30/60/100/150/300/600/1000V (for crest factor 3)
- Measurement current range: (for crest factor 3)
  Direct input 500m/1/2/5/10/20/40A
  External sensor input
  50m/100m/200m/500m/1/2/5/10V
- Frequency range:
  DC, 0.5Hz to 100kHz
- Measurement Accuracy:
  Basic Accuracy (45Hz ≤ f ≤ 66Hz) and DC
  Voltage/Current/Power
  ± (0.1% of rdg + 0.1% of rng)
- USB interface to PC is standard feature
- Ethernet communication function is available (optional)
- GP-IB communication function is available (optional)
- Effective of power factor (at cos ϕ =0)
  ± 0.2% of rng added
- External dimensions:
  Approx. 213(W) × 177(H) × 408.5(D) mm
- Weight: Approx. 6.5kg (with 3-input element)

Features

- Accurate efficiency measurement of DC and AC signals
- RMS, MEAN, DC, AC and RMEAN of voltages and currents simultaneously.
- Simultaneous measurement of normal U/I/P data and those harmonic data
- As fast as 100ms data capturing and store data with all channels
- Separate integration functions for charge/discharge and bought/sold power
- Integration of power, reactive power, apparent power, and current enables you to determine a device's average power consumption
- Harmonics (DC-50th order) and Total harmonic distortion (THD) can be measured
- Saving measured data directly to external USB memory
- Measurement values can be saved as images or numerical data, and can be pasted into reports, analyzed in spreadsheet software, or used in a variety of other ways
- Easy setup with cursor keys
- GP-IB, USB and Ethernet communication are available

Model Number and Suffix Codes

Model	Suffix Codes	Description
760201		WT500 1 input element model
760202		WT500 2 input elements model
760203		WT500 3 input elements model
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	SAA standard
	-Q	BS standard
	-H	GB standard
Options	/C1	GP-IB interface
	/C7	Ethernet interface
	/EX1	External sensor input for 760201
	/EX2	External sensor input for 760202
	/EX3	External sensor input for 760203
	/G5	Harmonic Measurement
	/DT	Delta computation (760202/03 only)
	/FQ	Add-on Frequency Measurement (760202/03 only)
	/V1	VGA Output

Note: Adding input modules after initial product delivery will require rework at the factory. Please choose your models and configurations carefully, and inquire with your sales representative if you have any questions.

Digital Power Meters

WT210/WT230

Digital Sampling Power Meters with Superior Cost Performance

WT210
For standby low-power measurements and rated-power measurements.
A single-phase model

WT230
For measurement applications from low-frequency equipment to high frequency inverters.
A three-phase model

Overview

The WT210 and WT230 are compact, half-rack sized power meters. They are suited for a wide range of applications from low-frequency instruments to inverters, and offer improved basic accuracy and bandwidth. WT210 also has the same 5 mA range as WT200 allowing measurement of the extremely small currents found in energy-saving designs and intermittent control devices.

Features

- Maximum input with assured accuracy: 26 A
- Compact design (half-rack size)
- 5 mA range for very low current measurements (model WT210 only)
- Line filter function
- High-speed data update (as fast as 10 readings per second)
- Harmonic measurement function available (optional)
- User calibration capability
- Large-current measurement capability using external sensor input (optional)

Basic Specifications

- Measurement voltage range: (for crest factor 3)
  Voltage: 15/30/60/150/300/600 V
- Measurement current range: (for crest factor 3)
  Direct input:
  5 m/10 m/20 m/50 m/100 m/200 mA/
  0.5/1/2/5/10/20 A (WT210),
  0.5/1/2/5/10/20 A (WT230)
  External Sensor input (optional):
  2.5/5/10 V or 50/100/200 mV
- Frequency range:
  DC and 0.5 Hz to 100 kHz
- Basic accuracy (45 Hz ≤ f ≤ 66 Hz)
  Voltage/current/power
  ±(0.1% of rdg + 0.1% of rng)
- Effect of power factor (at cos ϕ = 0)
  ±0.2% of rng added
- External dimensions:
  approx. 213 (W) × 88 (H) × 379 (D) mm (WT210)
  approx. 213 (W) × 132 (H) × 379 (D) mm (WT230)
- Weight: approx. 3.0 kg (WT210)
  approx. 5.0 kg (WT230)

- Wiring Types and Model Numbers

Wiring \ Model	760401	760502	760503
Single-phase 2-wire	✓	✓	✓
Single-phase 3-wire	–	✓	✓
Three-phase 3-wire (2 voltages, 2 currents)	–	✓	✓
Three-phase 3-wire (3 voltages, 3 currents)	–	–	✓
Three-phase 4-wire	–	–	✓

Model Number and Suffix Codes

Model number	Suffix code		Description	
760401			WT210 single-input element model	
Power cord	-D		UL/CSA standard	
	-F		VDE standard	
	-R		AS standard	
	-Q		BS standard	
	-H		GB standard	
Options	/C1		GP-IB communication interface	Select
	/C2		Serial (RS-232-C) communication interface	one
	/EX1		External input 2.5/5/10 V	Select
	/EX2		External input 50/100/200 mV	one
	/HRM		Harmonic measurement function	
	/DA4		4-channel DA output	Select
	/CMP		Comparator and D/A, 4 channels each	one

Note: The WT210 communication interface cannot be changed or modified after delivery.

Model number	Suffix code		Description	
760502			WT230 2-input element model	
760503			WT230 3-input element model	
Interface	-C1		GP-IB communication interface	Select
	-C2		Serial (RS-232-C) communication interface	one
Power cord	-D		UL/CSA standard	
	-F		VDE standard	
	-R		AS standard	
	-Q		BS standard	
	-H		GB standard	
Options	/EX1		External input 2.5/5/10 V	Select
	/EX2		External input 50/100/200 mV	one
	/HRM		Harmonic measurement function	
	/DA12		12-channel DA output	Select
	/CMP		Comparator and D/A, 4 channels each	one

Power Analyzer

PZ4000

An Innovative Power Analyzer that Uses High-speed Sampling, Wide Frequency Range, and Waveform Analysis to Capture Transient Power Values

PZ4000

Basic Specifications

- Measurement voltage range
  30/60/120/200/300/600/1200/2000 Vpk (Max. 1000 Vrms)
- Measurement current range
  Direct input:
  0.1/0.2/0.4/1/2/4/10 Apk
  (Max. 5 Arms) for 253751 and 253752
  1/2/4/10/20/40/100 Apk
  (Max. 20 Arms) for 253752
  External input:
  100/200/400/1000 mVpk
  (Max. 500mVrms)
- Frequency range: DC to 2 MHz
- Basic accuracy (45 Hz ≤ f ≤ 66 Hz)
  Voltage/current: ±(0.1% of rdg 0.05% of rng)
  Power: ±(0.1% of rdg +0.025% of rng)
  Effect of power factor: ±0.15% of S reading added
  (S: apparent power)
- External dimensions: Approx. 426 (W) × 177 (H) × 450 (D) mm
- Weight: Approx. 15 kg (with 4-input module)


253751


253752


253771

- 253751 Power measurement module:
  Voltage direct input ranges:
  30, 60, 120, 200, 300, 600, 1200, 2000 Vpk (1000 Vrms)
  Current direct input ranges: 0.1, 0.2, 0.4, 1, 2, 4, 10 Apk (5 Arms)
  Current sensor input ranges: 0.1, 0.2, 0.4, 1 Vpk (500 mVrms)
- 253752 Power measurement module:
  Voltage direct input ranges:
  30, 60, 120, 200, 300, 600, 1200, 2000 Vpk (1000 Vrms)
  Current direct input ranges:
  0.1, 0.2, 0.4, 1, 2, 4, 10 Apk (5 Arms, upper terminal)
  1, 2, 4, 10, 20, 40, 100 Apk (20 Arms, lower terminal)
  Current sensor input ranges: 0.1, 0.2, 0.4, 1 Vpk (500 mVrms)
- 253771 Sensor input module:
  Torque computing analog input: 1 /2 /5 /10 /20 /50 Vpk
  Revolution speed computing analog input: 1 /2 /5 /10 /20 /50 Vpk
  Revolution speed computing pulse input:
  Maximum input range ±5 Vpk
  Effective input range Min. 1 Vp-p

Overview

In the power electronics field, power measurement requires wide bandwidth performances to evaluate low to high frequencies and distorted waveform signals. The PZ4000 offers wide measurement bandwidths of up to 2 MHz and 5MS/s high-speed sampling to make accurate power measurement. With its LCD color display, the PZ4000 can display a wide variety of measurement parameters and analyze input waveforms as well. Various analysis functions are available to measure fluctuated or transient power during power activation or changes of motors, lighting, etc, which are difficult to measure with conventional power meters.

Features

- Wide measurement bandwidth (DC, up to 2 MHz).
- Accurate capturing of input waveforms using high-speed (maximum 5 MS/s) sampling.
- Voltage and current waveform display and analysis functions to enable power calculations on fluctuating inputs.
- Harmonic analysis (up to 500th order) and Fast Fourier Transform (FFT) functions to enable high-frequency power spectrum analysis.
- Multiple channel, synchronized measurements using multiple units and Master-Slave trigger function simplifies complex investigations.
  Variety of display formats: Numeric, Waveform, Bar graph, Vector, X-Y
- Sensor input module option enables evaluation of motor efficiency and total efficiency including the motor drive.

Model Number and Suffix Codes

Main unit

Model	Suffix Code		Description
253710			PZ4000 Power Analyzer
Power cord		-D	UL/CSA Standard
		-F	VDE Standard
		-R	SAA Standard
		-Q	BS Standard
		-H	GB Standard
Options		/M1	Memory extension to 1 M word/CH
		/M3	Memory extension to 4 M word/CH
		/B5	Built-in printer
		/C7	SCSI interface

Plug-in modules

Model	Suffix Code	Description
253751		Power measurement module Voltage: 1000 V Current: 5 A Current sensor: 500 mV
253752		Power measurement module Voltage: 1000 V Current: 5 A and 20 A Current sensor: 500 mV
253771 *		Sensor input module Torque / Revolution speed input
Module specifications	-E1	Plug-in unit

* Sensor input module can be used element 4 slot only.

Digital Power Meters — WT2010/WT2030

For Precision Harmonic Analysis and Voltage Fluctuation/Flicker Measurement

WT2010/WT2030
Digital Power Meters

- Basic power accuracy: 0.04% of reading
- Harmonics analysis function
- Voltage fluctuation and flicker measurement
- Best resolution of 50000 counts
- Holding function for peak and maximum values

WT2010/WT2030 Specifications

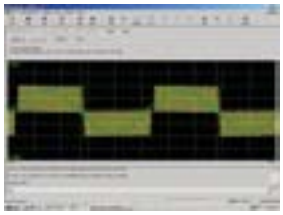
- Rated values (range, for crest factor 3)
  Voltage: 10/15/30/60/100/150/300/600 V
  Current
  Direct input: 1/2/5/10/20/30 A
  External shunt input: 50/100/200 mV
- Frequency range:
  DC and 2 Hz to 500 kHz (for power, up to 300 kHz)
- Basic accuracy (45 Hz ≤ f ≤ 66 Hz)
  Voltage/current:
  ±(0.03% of rdg + 0.03% of rng)
  Power: ±(0.04% of rdg + 0.04% of rng)
- Effect of power factor (at cos ϕ = 0)
  ±0.1% of rng added
- External Dimensions:
  approx. 426 (W) × 132 (H) × 400 (D) mm
- Weight: Approx. 13 kg (3-element model)
  Approx. 10 kg (1-element model)

■ Model and suffix codes

Model	Suffix codes	Description
253101		Single phase mode
253102		3-phase, 3-wire model
253103		3-phase, 4-wire model
Interface	-C1	GP-IB
	-C2	RS-232-C
Supply voltage	-1	100 V AC (50/60 Hz)
	-3	115 V AC (50/60 Hz)
	-5	200 V AC (50/60 Hz)
	-7	230 V AC (50/60 Hz)
Power cord	-M	UL/CSA standard 3 to 2 pin conversion adapter
	-D	UL/CSA standard
	-F	VDE standard
	-R	SAA standard
	-J	BS standard
	-H	GB standard
Additional specifications	/B5	Built-in printer
	/HRM	Harmonic analysis function
	/DA	D/A output (14 channels)
	/FL	Flicker measurement function

Power Measurement Application Software — 760122/761922

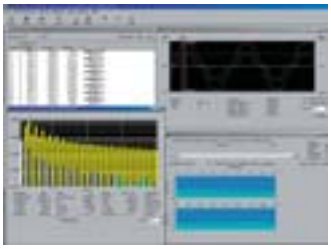
View Numeric Data on Your PC



760122
WTViewer Software

WTViewer is an application software tool that reads numeric, waveform, and harmonic data measured with the WT3000, WT1600, WT500, WT210 and WT230.

Software for Standards-Compliant Measurements



761922
Harmonic/Flicker Measurement Software (WT3000/G6 and/FL are required)

The 761922 Harmonic/Flicker Measurement Software enables users without specialized knowledge to perform a range of operations using the WT3000 including judging the latest standards compliance and outputting test reports. Supported standards are IEC61000-3-2, IEC61000-3-3, IEC61000-3-11, IEC61000-3-12 and JIS C61000-3-2.

Current Sensor Units — 751521/751523

Accessory for Digital Power Meters and Power Analyzer

751521
(for single-phase measurements)

751523
(for three-phase measurements)

751521/751523
Current Sensor Units

Use model 751521 for single-phase measurements and model 751523 for three-phase measurements.
- Wide dynamic range –600 A-0A-600 A (DC), 600 A peak (AC)
- Wide bandwidth DC-100 kHz
- High accuracy ±(0.05% of reading + 40 µA)
- Achieves superior noise resistance and CMR characteristics from its optimized rectangular design
- Accuracy assurance and calibration when combined with the WT digital power meters or the PZ power analyzer

751521/751523 Specifications

Input format: Floating input method using a CT (s)
Rated Current:
DC –600 A-0-600 A
AC 600 A peak
Output current: 400 mA (when the rated 600 A input current is flowing)
Input/Output Ratio: 1500 : 1
Accuracy:
DC ±(0.05% of rdg + 40 µA)
45 Hz ≤ f ≤ 66 Hz ±(0.05% of rdg + 40 µA)
Frequency Band: DC-100 kHz (-3dB)
- External dimensions
  751521: Approx. 426 (W) × 221 (H) × 430 (D) mm
  751523: Approx. 426 (W) × 355 (H) × 430 (D) mm
  (excluding the input terminal, feet, and other protrusions)
- Weight
  751521: Approx. 14 kg
  751523: Approx. 24 kg

Current Transducer — 751574

Accessory for Digital Power Meters and Power Analyzer

751574
Current Transducer

Yokogawa's current transducer model 751574 is a large-current measurement DC-CT used inside current sensor units 751521 and 751523. It is especially valuable for applications with limited installation space such as measurements in embedded systems and measurements in actual vehicles (e.g., EV/HEV). (Note: A separate drive DC power supply is required. In addition, precision guarantee conditions may differ from those of the current sensors, depending on conditions such as the conductor position of the input primary wiring.)

- Wide dynamic range –600 A-0A-600 A (DC), 600 A peak (AC)
- Wide bandwidth DC-100 kHz
- High accuracy ±(0.05% of rdg + 40 µA)

751574 Specifications

Rated Current:
DC –600 A-0-600 A
AC 600 A peak
Output current: 400 mA (when the primary rated current of 600 A is flowing)
Current transformation Ratio: 1500:1
Accuracy:
DC ±(0.05% of rdg + 40 µA)
50/60 Hz ±(0.05% of rdg + 40 µA)
Frequency band: DC-100 kHz (-3dB)
External dimensions:
Approx. 122 (W) × 98 (H) × 57 (D) mm
(excluding the connector, primary cable guide, and other protrusions)
Weight: Approx. 1 kg.

Accessories List

Product	Part No.	Description		WT3000	WT1600	WT500	WT210/WT230	PZ4000
1:1 BNC safety adapter lead	701901	1000 Vrms-CAT II, 1.8 m long Safety BNC (male) to safety banana (female) use in combination with 701959, 701954, 758921, 758922 or 758929		●	●	●	●	●
Measurement leads	758917	Two leads in a set. Use 758917 in combination with 758922 or 758929. Total length: 75 cm Rating: 1000 V, 32 A		●	●	●	●	●
Small alligator adapters	758922	For connection to measurement leads (758917). Two in a set. Rating: 300 V		●	●	●	●	●
Large alligator adapters	758929	For connection to measurement leads (758917). Two in a set. Rating: 1000 V		●	●	●	●	●
Safety terminal adapter set	758923	(spring-hold type) Two adapters in a set.		●	●	●	●	●
Safety terminal adapter set	758931	Screw-fastened adapters. Two adapters in a set. 1.5 mm Allen wrench included for tightening.		●	●	●	●	●
Fork terminal adapter	758921	Two adapters (red and black) to a set. Used when attaching banana plug to binding post.		●	●	●	●	●
Conversion adapter	758924	For conversion between BNC and female banana plug		●	●	●	●	●
Conversion adapter	366971	9-pin/25-pin conversion adapter		●	●			●
External sensor cable	B9284LK	For the external input of the WT210 and WT230. Length: 50 cm		●	●	●	●	●
BNC cable	366924	BNC cable BNC–BNC, 1 m		●	●	●		●
BNC cable	366925	BNC cable BNC–BNC, 2 m		●	●	●		●
Compact instrument cart	701960	500 (W) × 560 (D) × 705 (H) mm /A: keyboard, mouse table /B: 3-prong power strip		●	●	●	●	●
Deluxe instrument cart	701961	570 (W) × 580 (D) × 893 (H) mm /A: keyboard, mouse table /B: 3-prong power strip		●	●	●	●	●
All-Purpose instrument cart	701962	467 (W) × 693 (D) × 713 (H) mm		●	●	●	●	●
Rack mounting kit	751535-E4	For EIA		●	●	●		●
Rack mounting kit	751535-J4	For JIS		●	●	●		●
Rack mounting kit	751533-E2	For WT210 EIA standalone installation					●	
Rack mounting kit	751533-J2	For WT210 JIS standalone installation					●	
Rack mounting kit	751534-E2	For WT210 EIA connected installation					●	
Rack mounting kit	751534-J2	For WT210 JIS connected installation					●	
Rack mounting kit	751533-E3	For WT230 EIA standalone installation					●	
Rack mounting kit	751533-J3	For WT230 JIS standalone installation					●	
Rack mounting kit	751534-E3	For WT230 EIA connected installation					●	
Rack mounting kit	751534-J3	For WT230 JIS connected installation					●	

High Speed Data Acquisition Equipment

SL1000 High Speed Data Acquisition Unit

Fast Acquisition, Transfer, and Storage

SL1000

Basic Specifications

Plug & Play:	Auto-recognition of units and modules
Input type:	Plug-in module (A/D converters built in to each unit)
Maximum number of input channels:	
	16 (One unit operation) 128 (8 units synchronous operation)
Maximum sample rate:	100 MS/s on all channels
Measuring mode:	Free Run and Triggered
Clock source:	Internal and external
Maximum record length (internal memory):	
In Free Run mode	1 module: 32 MW/ch 2 modules: 16 MW/ch 3 to 4 modules: 8 MW/ch 5 to 8 modules: 4 MW/ch
In Single Trigger mode	1 module: 50 MW/ch 2 modules: 25 MW/ch 3 to 4 modules: 10 MW/ch 5 to 8 modules: 5 MW/ch
Measuring groups:	Up to 4 groups definable with independent sample rates
Trigger mode:	Normal, Single, and Single(N)
Trigger source:	Input channel, External, LINE , Time
Record conditions:	
For Free Run mode	Immediate, abs. time, time divided, alarm, and external trigger
For Trigger mode	Each trigger
Internal hard disk:	40 GB (with the /HD1 option)
Maximum real-time hard disk recording speed:	
Internal hard disk	1.6 MS/s (= 200kS/s × 8ch = 100 kS/s × 16ch)

Features

- Fast Acquisition

- Up to 100 MS/s on all channels (10 ns sampling interval)
- Supports parallel testing: Perform measurements with up to four simultaneously independent sample rates

- Fast Transfer and Storage

- Stream data to PC via high speed USB 2.0 or 1000BASE-T Gigabit Ethernet
- Stream data to a PC hard disk or the SL1000's internal hard disk in real time (at speeds of 1.6 MS/s = 100 kS/s × 16ch)[1]
- Maximum 8 synchronized units

1: Speed depends on PC performance and measuring conditions.

- Easy to use

- Easy to use Standard Acquisition Software

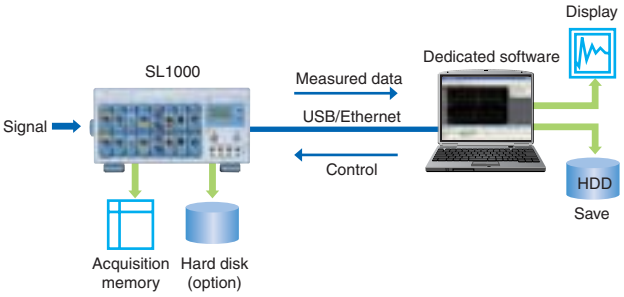
- Can operate "Standalone"

- Store data directly on the SL1000 without PC

- Wide Library of Plug-In Modules

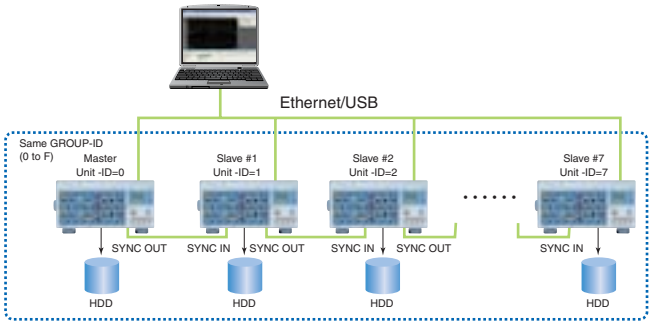
- Eight module slots are available in each unit
- Select now from twelve different plug-in modules

Signal and Data flow



Synchronous Operation

You can synchronize the operation of up to eight SL1000s.



Real time HDD recording for the long term measuring and the triggered mode for the high-speed measuring

Maximum sampling rate at real time recording to the SL1000 Hard Disk

Continuously measured data can be saved in real time to the SL1000's internal hard disk.

High-speed and long time measuring is available.

Number of Channels	Maximum sampling rate
1	1MS/s
2	500kS/s
4	200kS/s
8	200kS/s
10	100kS/s
16	100kS/s

Maximum measuring time (unit: sec) at Single triggered measurement

		Number of Measuring Channels			
		2ch	4ch	8ch	16ch
Sampling rate	100MS/s	0.5	0.25	0.1	0.05
	50MS/s	1	0.5	0.2	0.1
	10MS/s	2.5	1.25	0.5	0.25
	1MS/s	25	12.5	5	2.5
	500kS/s	100	50	20	10
	200kS/s	250	125	50	25
	1kS/s	50000	25000	10000	5000

PC monitor display

File Utility
The file utility allows you to process waveform data files that have been recorded using the SL1000.

Merging files, Dividing files, Converting waveform data files to CSV files

Xviewer Waveform viewer
Offline waveform display and computation

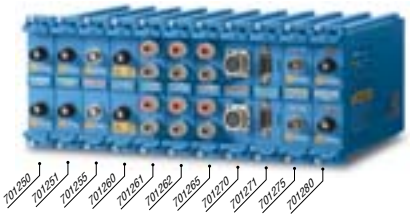
Recording conditions

- **Recording destination**
  PC HDD, HDD of the SL100 or both
- **Start condition**
  Trigger, Immediate, Specified time, Alarm
- **Stop condition**
  Manually, Specified time, Recording time, Alarm, External trigger

Module Selection

High-speed 100 MS/s 12-Bit Isolation Module (720210) Specifications

Input channels	2
Input coupling	AC, DC, GND
Maximum sample rate	100 MS/s
A/D conversion resolution	12-bit (1,500 LSB/range)
Frequency range (-3 dB)	DC-20 MHz
Maximum input voltage (1 kHz or less)	
In combination with 700929 or 701947	1000 V (DC + ACpeak)
Direct input (1:1)	200 V (DC + ACpeak)
DC accuracy	± (0.5% of range)
Input impedance	1 MΩ ±1%, approximately 35 pF
Connector type	Isolated type BNC connector
Input filter	OFF/2 MHz
Laser safety standards	class 1 (IEC 60825-1)



* Above plug-in modules can be used among all ScopeCorder series.

Model Number and Suffix Codes

Model/Options	Suffix Code	Description
720120		SL1000 High-Speed Data Acquisition Unit*1 Including Xviewer Standard Edition (1 license)(701992-SP01)
Power cable	-D	UL and CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard (Complied with CCC)
Others	/HD1	Internal 40 GB HDD
	/C10	Ethernet Interface
	/P4	Probe power (4-output)
	/XV0	Without Xviewer
	/XV1	With the Xviewer Math Edition (1 license)(701992-GP01)

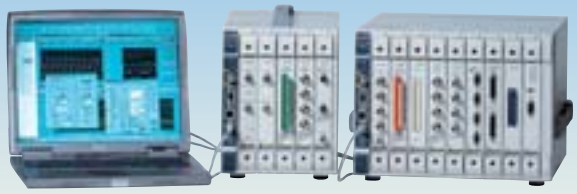
*1: Plug-in modules and PC not included with the SL1000.

Model	Description
720210	High-speed 100MS/s 12-Bit Isolation Module (2ch)
701250	High-speed 10MS/s 12-Bit Isolation Module (2ch)
701251	High-speed 1MS/s 16-Bit Isolation Module (2ch)
701255	High-speed 10MS/s 12-Bit non-Isolation Module (2ch)
701260	High-voltage 100kS/s 16-Bit Isolation Module (with RMS, 2ch)
701261	Universal Module (2ch)
701262	Universal Module (with Anti-Aliasing Fileter, 2ch)
701265	Temparature / High-precision voltage Module (2ch)
701275	Acceleration / Volatage Module (with Anti-Aliasing Filter 2ch)
701270	Strain Module (NDIS, 2ch)
701271	Strain Module (DSUB, Shunt-CAL, 2ch)
701280	Frequency Module

PC-Based Measuring Instruments

WE7000

Modular Type Measuring Instruments for Easy Operation



WE500 WE900 CE

only on sale in the United States, the United Kingdom, Germany, France, the Netherlands, Spain, Italy, South Korea, Australia, and Japan.

Features

- Modular Design for easy operation
- Modules for a Variety of Signals and Extensive Features
- Easily Control All Modules Using the Control Software
- Control Software that brings out the full functionality of the WE7000
- Network-Friendly Measuring Instrument

  USB2.0

  Simply connect a USB cable and communication is ready

  Provides high-speed data communication using USB 2.0 (up to 480 Mbps)

  Ethernet (100Base-TX/10Base-T)

  Enables remote monitoring and measurement using the network such as a corporate LAN
- Utility Software for More Convenience
- Transformation into Dedicated Measuring Instrument by Customization
- Embedded Modules That Enable High Speed and Independent Processing (Option)

Overview

- **Simple data acquisition without any software development**
  Each WE7000 system includes the standard control software and each module has its firmware resident within the module.
- **Isolation and noise immunity**
  Isolation and noise immunity are very important for mechanical electronics. WE7000 has great isolation from the base station to the input modules as well as channel to channel (depending on the module) isolation.
- **Various precision modules with traceability**
  WE7000 has various modules from 2 Hz to 20 MS/sec digitizing rates. There are also modules with signal output capability, including a precision D/A and a function generator.
- **Remote control and monitoring using Ethernet Communication**
  WE7000 control, monitoring, and real time saving of data are all available using Ethernet communication.

Specifications

Number of slots:

WE500:

5 measurement modules

WE900:

9 measurement modules

Interface for communicating withthe PC:

USB (Complies with USB Rev. 2.0), Ethernet (10Base-T or 100Base-TX)

External dimensions:

WE500:

Approx. 213 (W) × 266 (H) × 360 (D) mm (projections excluded)

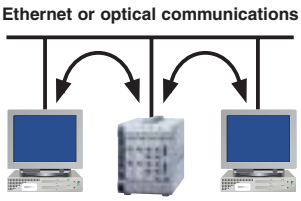
WE900:

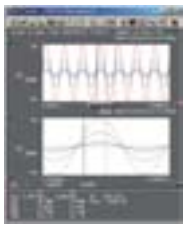
Approx. 350 (W) × 266 (H) × 360 (D) mm (projections excluded)

List of Measurement Module Features

Product	Model Number	Bandwidth	Number of Channels	Isolation	Input Coupling	Range	Resolution bit	Maximum Memory (point)	Memory Partition	I/O Connector	Link Feature	Maximum number of waveforms displayed simultaneously	Scaling Feature	Other Features	Power Consumption	Number of Used Slots Weight
WE7116 2-CH, 20 MS/s Digitizer Module	7071 16/HE	DC to 8 MHz	2	No	DC/AC /GND	±100 mV to 50 V (1-2-5 steps)	12	4 M	Up to 1024	BNC	Yes	18 When 9 modules are linked	Yes	Calibration signal output	Approx. 10 VA	1 Approx. 0.7 kg
WE7275 2-CH, 1 MS/s Isolated Digitizer Module	7072 75/HE	DC to 400 kHz	2	Yes	DC/AC	±100 mV to 200 V (1-2-5 steps), 350 V	14	4 M	Up to 256	BNC	Yes	18 When 9 modules are linked	Yes	Anti-aliasing filter OFF/20 Hz to 40 kHz (2-4-8 steps)	Approx. 14 VA	1 Approx. 0.8 kg
WE7273 8-CH, 100 kS/s Isolated Digitizer Module	7072 73/HE	DC to 40 kHz	8	Yes	DC/AC	±50 mV to 50 V (1-2-5 steps)	16	8 M	Up to 256	Clamp terminal	Yes	72 When 9 modules are linked	Yes		Approx. 20 VA	1 Approx. 0.9 kg
WE7271 4-CH, 100 kS/s Isolated Digitizer Module	7072 71/HE	DC to 40 kHz	4	Yes	DC	±1 V to 20 V (1-2-5 steps), ±35 V	16	4 M	Up to 256	Clamp terminal	Yes	36 When 9 modules are linked	Yes		Approx. 12 VA	1 Approx. 0.7 kg
WE7272 4-CH, 100 kS/s Isolated Digitizer Module	7072 72/HE	DC to 40 kHz	4	Yes	DC	±1 V to 20 V (1-2-5 steps), ±35 V	16	4 M	Up to 256	BNC	Yes	36 When 9 modules are linked	Yes		Approx. 12 VA	1 Approx. 0.7 kg
WE7251 10-CH, 100 kS/s Digitizer Module	7072 51/HE	DC to 10 kHz	10	No L end common	DC	±1 V to 20 V (1-2-5 steps)	16	1 M	Up to 256	Input unit sold separately	Yes	90 When 9 modules are linked	Yes	Multiplex type	Approx. 8 VA	1 Approx. 0.7 kg
WE7241 10-CH Thermometer Module	7072 41/HE	Scan interval 0.5 s or longer	10	Yes	DC	K, E, J, T, L, U, N, R, S, B, W, KPvsAU7Fe ±50 mV to 50 V (1-2-5 steps)	14	None	--	Input unit sold separately	Yes	90 When 9 modules are linked	Yes	Multiplex type	Approx. 7 VA	1 Approx. 0.8 kg
WE7245 4-CH, 100 kS/s Strain Module	7072 45/HE	DC to 20 kHz	4	Yes	DC	1000 μ to 20000 μ strain, ±100 mV to ±20 V (1-2-5 steps)	15	4 M	Up to 256	Dsub (9-pin)	Yes	36 When 9 modules are linked	Yes	1, 2, or 4 gauges, DC bridge Gauge resistance 120 to 1 kΩ, auto balance	Approx. 15 VA	1 Approx. 1 kg
WE7235 4-CH, 100 kS/s Accelerometer Module	7072 35/HE	DC to 40 kHz	4	No	DC (voltage only) /AC	Gain: x1 (5 V) to x100 (50 mV) (1-2-5 steps)	16	4 M	Up to 256	BNC	Yes	36 When 9 modules are linked	Yes	Anti-aliasing filter OFF/20 Hz to 40 kHz (2-4-8 steps)	Approx. 12 VA	1 Approx. 0.8 kg
WE7521 4-CH Timing Measurement Module	7075 21/HE	100 ns to 20 s	4	No	DC/AC	Period, time interval, totalize count, up and down count, and frequency ratio measurements	--	4 M	Up to 256	BNC	Yes	32 When 8 modules are linked	Yes	Time stamp measurement	Approx. 8 VA	1 Approx. 0.7 kg
WE7281 4-CH, 100 kS/s D/A module	7072 81/HE	DC to 20 kHz	4	Yes	--	±1 V to 10 V (1-2-5 steps)	16	4 M	Up to 256	Clamp terminal	Yes	--	--	Sweep function, arbitrary waveform output	Approx. 15 VA	1 Approx. 0.9 kg
WE7282 4-CH, 100 kS/s D/A Module	7072 82/HE	DC to 20 kHz	4	Yes	--	±1 V to 10 V (1-2-5 steps)	16	4 M	Up to 256	BNC	Yes	--	--	Sweep function, arbitrary waveform output	Approx. 15 VA	1 Approx. 0.7 kg
WE7262 32-Bit Digital I/O Module	7072 62/HE	--	32	No	--	TTL level (input), CMOS level (output)	--	None	--	Dsub (25-pin)	No	32	--	2-MHz counter feature Connect the 707823/707824 and input/output contact signals	Approx. 4 VA	1 Approx. 0.6 kg
WE7081 CAN Bus Interface Module	7070 81/HE									Dsub (9-pin)		64	Yes	CAN data I/O	Approx. 5 VA	1 Approx. 0.7 kg
WE7562 Multi-Channel Analyzer Module	7075 62/HE	2 inputs, 0 to 10 V, AD channels: 512 to 16 k 6 stages, shaping time > 500 ns						2000 frames (1 kCH)		BNC	Yes	2	Yes	PHA, MCS, LIST Mode	Approx. 15 VA	1 Approx. 0.8 kg

Application Software for WE7000
7077 02/7077 03/7077 14/7077 51/7077 61





7077 02
Computation Function Setup Software

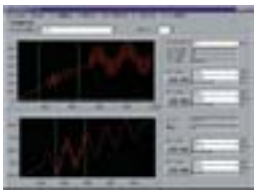
- Software utility that adds data computation function to the WE7000 Control Software.
- Enables four arithmetic operations, FFT analysis, filter functions, waveform parameter measurement, etc.

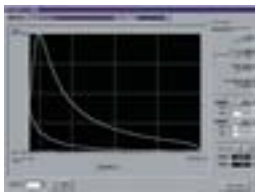
7077 03
Remote Monitor Add-On Software

- Multiple PCs can use a single measuring station.
- Other PCs can monitor the waveform while one PC is performing measurements. Measurement parameters can also be viewed.
- Able to block other PCs from starting or stopping measurements or changing measurement parameters while one PC is using the measuring station (Access Authority Control).
- Able to block other PCs from controlling or viewing the measuring instrument (Lock function).

7077 14
Computation Waveform Viewer

- Can display waveforms of the WE7000 or DL Series data as well as compute and analyze the data on the PC
- Equipped with extensive computation functions





7077 51
Arbitrary Waveform Editor

- Create and edit data for the WE7121 and WE7281/82
- Can edit waveforms of up to 4 M data points
- Can load measured data (WVF format) and Excel (CSV format) files
- Edit data within the specified interval (functions and dots)

7077 61
Engine Combustion Pressure Analysis Package

- Offline analysis software for the measured data for the WE7275
- Supports 4- to 8-cyclinder engines
- Equipped with standard analysis items (functions) required for the combustion pressure analysis

WE7000 Utility Software

Type	Product	Model Number	Specifications
Added on to the Control Software	Computation Function Setup Software	707702	Adds computation functions to the Control Software
	Remote Monitor Add-On Software	707703	Adds remote monitor function to the Control Software
Package software	Computation Waveform Viewer	707714	Waveform Viewer for the WE7000, DL, etc.
	Arbitrary Waveform Editor	707751	Arbitrary waveform data editor for the WE7121 and WE7281/82
	Engine Combustion Pressure Analysis Package	707761	Offline combustion pressure analysis for the WE7275

Software for developing user application programs

Product	Model Number	Specifications
WVF File Access API	707712	API for accessing WVF
WVF File Access Tool Kit for MATLAB	707713	MATLAB toolkit for accessing WVF
WE Control API	707741	Functions for controlling the WE7000
Add On Tool for WE API Vol. 1	707742	ActiveX controls for Visual Basic
Add On Tool for WE API Vol. 2	707743	ActiveX controls for Visual Basic (for display)
Control Tool Kit for LabVIEW	707746	Toolkit for LabVIEW
Control Tool Kit for MATLAB	707747	Toolkit for MATLAB

Optical Spectrum Analyzer

AQ6370B

Redefining Optical Spectrum Measurement Excellence

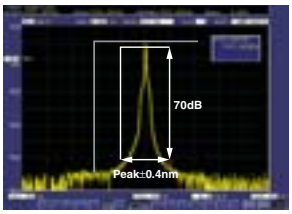
Features

- World Class Optical Performance & Flexibility
  High wavelength resolution: 0.02 nm
  Wide close-in dynamic range: 70dB typ.
  Single and multimode fiber test capability (up to GI 62.5/125µm)
- Improved Measurement Throughput
  Fast measurement and fast data transfer
- Enhanced User Friendliness
  USB for Mouse, keyboard, and external storage devices
  Bright 10.4" LCD
  Trace zoom capability
  Various built-in analysis functions
- Expedites Development of Automated Test Systems
  Supports GP-IB, RS-232C, and Ethernet interfaces
  Compatible with SCPI and supports AQ6317 series remote commands
  Built-in simple macro programming function
- Includes Wavelength Calibration Source
- AQ6370 Viewer: Emulation/Remote control software (Optional)

Basic Specifications

- Measurement wavelength range: 600 to 1700 nm
- Wavelength accuracy: ±0.02 nm (1520 to 1580 nm),
  ±0.04 nm (1450 to 1520 nm, 1580 to 1620 nm), ±0.1 nm (Full range)
- Measurement data point: 101 to 50001
- Wavelength resolution setting: 0.02 to 2.0 nm
- Level sensitivity:
  -90 dBm (1300 to 1620 nm, resolution: 0.05nm or wider, sensitivity: HIGH3)
- Maximum input power: +20 dBm (Per channel, full span)
- Close-in dynamic range (at 1523nm):
  37 dB (±0.1 nm from peak, resolution: 0.02 nm)
  55 dB (±0.2 nm from peak, resolution: 0.02 nm)
  45 dB (±0.2 nm from peak, resolution: 0.05 nm)
  62 dB (±0.4 nm from peak, resolution: 0.05 nm)
  40 dB (±0.2 nm from peak, resolution: 0.1 nm)
  57 dB (±0.4 nm from peak, resolution: 0.1 nm)
- Applicable fiber: SM (9.5/125 µm), GI (50/125 µm, 62.5/125 µm)
- Data storage: Internal memory and external (USB storage)
- Printer: Built-in high-speed thermal printer (Factory option)
- Display: 10.4-inch color LCD (Resolution: 800x600)
  Power requirement: 100 to 240 VAC, 50/60Hz, approx. 150VA
  Dimensions and mass: Approx. 426 (W) × 221 (H) × 459 (D) mm,
  Approx. 19kg (without printer option)

World-class optical performance



Close-in Dynamic Range

70 dB at peak±0.4 nm, resolution setting 0.02 nm (typical)

DWDM signal measurement

DWDM channels allocated at 50GHz spacing can be measured and analyzed.

Model Number and Suffix Codes

Model	Suffix Codes	Descriptions
735302		Optical Spectrum Analyzer AQ6370B
Power cable	-D	Power cord (UL3P)
	-F	Power cord (CEE-C7)
	-R	Power cord (SAA-3P)
	-Q	Power cord (BS3P Rectangular)
	-H	Power cord (BS3P Round)
Factory Installed Options	/FC	AQ9447(FC) Connector adapter for optical input
	/SC	AQ9447(SC) Connector adapter for optical input
	/ST	AQ9447(ST) Connector adapter for optical input
	/RFC	AQ9441(FC) Universal adapter for calibration output
	/RSC	AQ9441(SC) Universal adapter for calibration output
	/RST	AQ9441(ST) Universal adapter for calibration output
	/B5	Built-in thermal printer

Improved Measurement Throughput

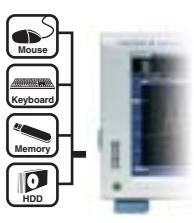
10x Measurement speed

100x Key & Command response

100x Data transfer Speed

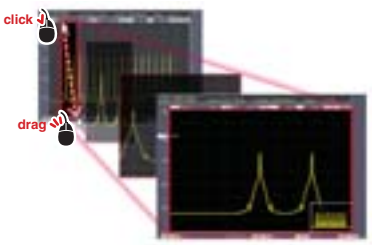
(in comparison with AQ6317C Optical spectrum Analyzer)

Enhanced User Friendliness



USB interface

Supports mouse, keyboard, and external storage devices.



Trace zoom function

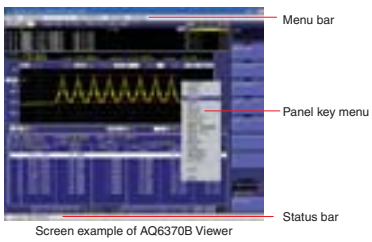
Enlarges a designated area

AQ6370 Viewer Emulation/Remote Control Software (Optional)

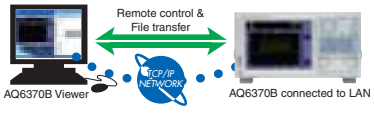
Note. AQ6370 Viewer contains AQ6370 Viewer, AQ6370B Viewer, and AQ6375 Viewer.

The AQ6370B Viewer is a PC application software that has the same user interface and functions as the AQ6370B so that you can easily display and analyze waveform data acquired by the AQ6370B.

- **Viewer function**
  Trace data files saved on the AQ6370B can be retrieved and analyzed on a PC.
- **Remote Control function**
  The remote control allows you to set measurement conditions and to execute a measurement on AQ6370B Optical Spectrum Analyzer from anywhere on the Ethernet network.
- **File Transfer function**
  Files can be exchanged between AQ6370B and PC.



Screen example of AQ6370B Viewer



Optical Spectrum Analyzer

AQ6375

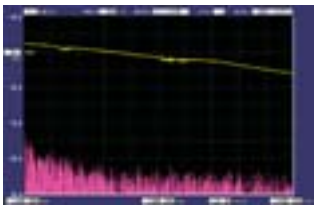
Long Wavelength OSA 1200 - 2400nm

Features

- Unparalleled Performance
  - Long wavelength: 1200 - 2400nm
  - High sensitivity: +20 to -70dBm
  - High resolution & wide dynamic range
- Greater Efficiency
  - High speed measurement
  - Fast command processing and data transfer
- Support Multimode Fiber
  - Free-space optical input
- Intuitive Easy Operation
  - Mouse & keyboard operation
  - Trace zoom function
- Easy Calibration
  - Built-in calibrator
- AQ6375 Viewer: Emulation/Remote control software (Optional)

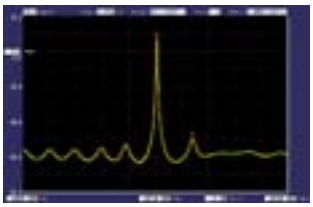
Unparalleled Optical Performance

■ **High sensitivity in long wavelength**



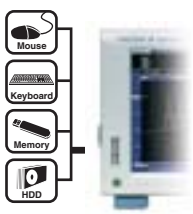
The spectrum of a white light source (yellow) and the background noise of AQ6375 (red)

■ **Measurement Example**

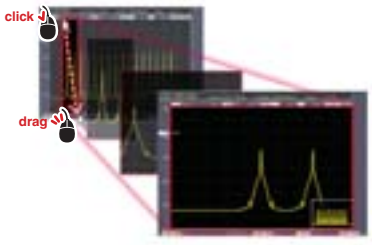


2010nm DFB-LD
Resolution: 50 pm, Span: 20 nm Sensitivity: HIGH1/CHOP

Easy Operation



USB interface
Supports mouse, keyboard, and external storage devices.



Trace zoom function
Enlarges a designated area

Basic Specifications

- Measurement wavelength range: 1200 to 2400 nm
- Wavelength accuracy: ±0.05 nm (1520 to 1580 nm), ±0.1 nm (1580 to 1620 nm), ±0.5 nm (Full range)
- Measurement data point: 101 to 50001
- Wavelength resolution setting: 0.05 to 2.0 nm
- Level sensitivity:
  -70 dBm (1800 to 2200 nm, resolution: 0.1nm or wider, sensitivity: HIGH3)
- Maximum input power: +20 dBm (Per channel, full span)
- Close-in dynamic range (at 1523nm):
  45 dB (±0.4 nm from peak, resolution: 0.05 nm)
  55 dB (±0.8 nm from peak, resolution: 0.05 nm)
- Applicable fiber: SM (9.5/125 µm), GI (50/125 µm, 62.5/125 µm)
- Data storage: Internal memory and external (USB storage)
- Printer: Built-in high-speed thermal printer (Factory option)
- Display: 10.4-inch color LCD (Resolution: 800x600)
- Power requirement: 100 to 240 VAC, 50/60Hz, approx. 150VA
- Dimensions and mass: Approx. 426 (W) × 221 (H) × 459 (D) mm, Approx. 27kg (without printer option)

Model Number and Suffix Codes

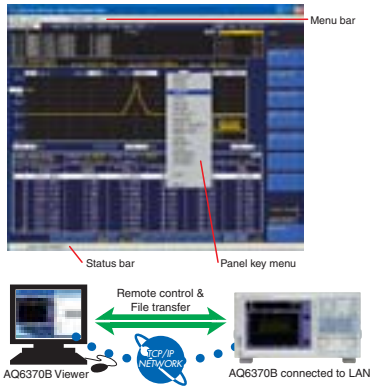
Model	Suffix Codes	Descriptions
735305		Optical Spectrum Analyzer AQ6375
Power cable	-D	Power cord (UL3P)
	-F	Power cord (CEE-C7)
	-R	Power cord (SAA-3P)
	-Q	Power cord (BS3P Rectangular)
	-H	Power cord (BS3P Round)
Factory Installed Options	/FC	AQ9447(FC) Connector adapter for optical input
	/SC	AQ9447(SC) Connector adapter for optical input
	/ST	AQ9447(ST) Connector adapter for optical input
	/RFC	AQ9441(FC) Universal adapter for calibration output
	/RSC	AQ9441(SC) Universal adapter for calibration output
	/RST	AQ9441(ST) Universal adapter for calibration output
	/B5	Built-in thermal printer

AQ6370 Viewer Emulation/Remote Control Software (Optional)

Note. AQ6370 Viewer contains AQ6370 Viewer, AQ6370B Viewer, and AQ6375 Viewer.

The AQ6375 Viewer is a PC application software that has the same user interface and functions as the AQ6375 so that you can easily display and analyze waveform data acquired by the AQ6375.

- **Viewer function**
  Trace data files saved on the AQ6375 can be retrieved and analyzed on a PC.
- **Remote Control function**
  The remote control allows you to set measurement conditions and to execute a measurement on AQ6375 Optical Spectrum Analyzer from anywhere on the Ethernet network.
- **File Transfer function**
  Files can be exchanged between AQ6375 and PC.



Optical Spectrum Analyzer

AQ6319

A New-Generation Optical Spectrum Analyzer for High-Precision Ultra-DWDM Signal Analysis

Features

Best optical performance

- High wavelength accuracy: ±10 pm
- High wavelength resolution: 10 pm
- High wavelength resolution accuracy: ±2%
- Wide close-in dynamic range

Fast sweep and quick response

- Measurement time is as low as 1/5 compared to the conventional models (AQ6317 Series)*
- Faster auto-ranging in all sensitivities
- Quicker key response as measurement conditions change

* Depends on measurement settings and input light condition.

User-friendly GUI and powerful functions

- Easy operation with mouse/keyboard
- Compatible with multiple interfaces (GP-IB, LAN, printer, etc.)
- Large data storage area and fast data transfer (FTP)
- Enhanced built-in applications

Specifications

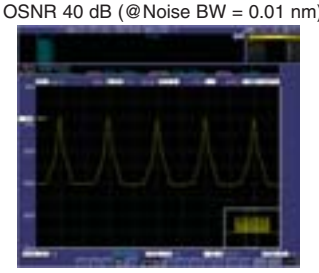
Applicable fiber		SM (9.5/125 µm), GI (50/125 µm)
Measurement wavelength range		600 to 1700 nm
Span		0.1 nm to full range and zero span
Wavelength repeatability [1), 2), 3), 4)]		±2 pm (1 min, or less, 1450 to 1620 nm)
Number of samplings		101 to 50001
Resolution bandwidth		0.01, 0.02, 0.05, 0.1, 0.2, 0.5 and 1 nm
Resolution accuracy [1), 3), 4), 5)]		±2% (RES.: 0.1 nm or wider, 1450 to 1620 nm) ±2.5% (RES.: 0.05 nm, 1450 to 1620 nm) ±6% (RES.: 0.02 nm, 1450 to 1620 nm)
Level linearity [1), 3), 5), 7)]		±0.05 dB (-50 to +10 dBm, RES.: 0.02 nm or wider, SENS.: HIGH 1 to 3)
Close-in dynamic range [1), 5), 7), 9)]		40 dB (±50 pm from peak at 1523 nm, RES.: 0.01 nm) 60 dB (±100 pm from peak at 1523 nm, RES.: 0.01 nm) 70 dB (±200 pm from peak at 1523 nm, RES.: 0.01 nm) 60 dB (±200 pm from peak at 1523 nm, RES.: 0.01 nm)
Interface	Remote control	AQ6317 Series compliant commands (IEEE488.1), IEEE488.2 full support
	Others	GPIB × 2, RS232C, Printer port, External SVGA, PS/2 × 2, LAN
Power requirement		100 to 240 (±10%) V, 50/60 Hz, approx. 400 VA
Dimensions and mass [10)]		Approx. 425 (W) × 222 (H) × 500 (D) mm, 33 kg

Notes:
1) With 9.5/125µm SMF, after 1hour warm-up, after optical alignment
2) At 15 to 30˚C
3) At chop mode off
4) Horizontal scale: wavelength display mode
5) At 23 ± 3˚C
7) Wtih applied input fiber Type B1.1 9.5/125µm SMF defined on IEC60793-2 (Mode field diameter: 9.5µm, NA: 0.104 to 0.107, PC polished), attenuation off, vertical scale: absolute power display mode
9) Sensitivity setting is HIGH3 and chop mode on
10) Except protector

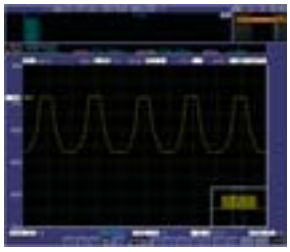
Measurement Examples

25 GHz spacing DWDM signals

OSNR 40 dB (@Noise BW = 0.01 nm)



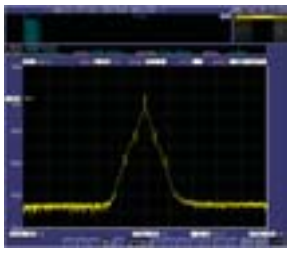
Wavelength resolution at 0.01 nm



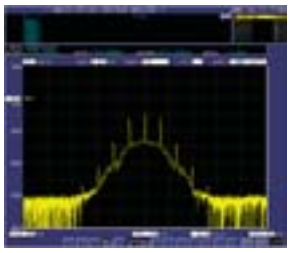
Wavelength resolution at 0.05 nm

The wide close-in dynamic range makes it possible to accurately measure OSNR of DWDM signals with 25 GHz (or narrower) spacing. Even at 0.05 nm resolution setting, ASE noise between channels can be measured flatly.

Modulated signal measurement



10 Gbps, NRZ, PRBS 2^31, wavelength resolution at 0.01 nm



40 Gbps, RZ, PRBS 2^7, wavelength resolution at 0.01 nm

With its high resolution and wide close-in dynamic range, a side-band at 10 Gbps or 40 Gbps modulated signal can be observed clearly.

Ordering Information

Model

Product name: AQ6319 Optical Spectrum Analyzer

Model: 810804600-□-□/□□

- CE: CE marking
- Power cord
  - D: UL/CSA standard (UL3P)
  - F: VDE standard (CEE-C7)
  - G: SAA standard (SAA-3P)
  - Q: BS standard (BS546 3P)
  - H: BS standard (BS 2P)
- Fuse type
  - 1: 5 A (AC 100 V to AC 120 V)
  - 5: 3.15 A (AC 200 V to AC 240 V)

Accessory

Print paper (Roll type)

Parts No.: 955-990000320
(model name: TF50KS – E2)

White Light Source — AQ4305

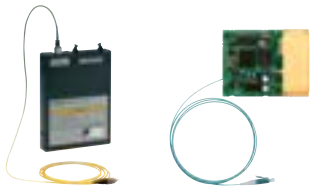
Broadband Light Source for testing passive devices and optical fibers

AQ4305
White Light Source

The AQ4305 is a high power broadband light source that uses a halogen lamp. The AQ4305 can measure wavelength dependent loss characteristics of optical devices and optical fibers in conjunction with an optical spectrum analyzer.

WDM Monitor & Channel Monitor — WD300 & WD30

Reliable and High Performance Optical Monitor for WDM Networks



WD300 & WD30
WDM Monitor & Channel Monitor

The WDM montor WD300 is a polychromator based optical system having no moving parts and features excellent long term reliability. The WD300 can accurately and quickly perform wavelength, optical power and OSNR measurements that are required for the telecommunication equiqment application, and is suitable for monitoring of DWDM system with 50GHz and 100GHz channel spacing.
The WD30, a miniaturized model, offers the best perfomance as a monitor of the RODAM applications.

Optical Fiber Strain Analyzer — AQ8603

Monitoring the strain distribution along buildings and constructions

AQ8603
Optical Fiber Strain Analyzer

The AQ8603 is an optical fiber sensing system which can measure strain distribution in the optical fiber axial direction from one end by utilizing both Brillouin scattering light detecting technology and OTDR technology. The AQ8603 provides low cost monitoring in various structures and foundations such as architectural stuctures, civil engineering constructions, marine vessels, and aircraft.

Fiber Optic Distributed Temperature Unit — AQ8920

Monitoring the temperature distribution along pipe lines and furnace

AQ8920
Fiber Optic Distributed Temperature Unit

The AQ8920 is an optical fiber temperature distribution measuring instrument using Raman spectroscopy and OTDR technology, and can measure the temperature distribution along a fiber from one end. The AQ8920 provides low cost solutions in various plant applications such as the temperatue monitoring of pipeline and furnace and the fire detection.

FBG Sensor Monitor — FB200

High speed monitoring of temperature, strain, and pressure.

FB200
FBG Sensor Monitor

The FB200 is a FBG monitor that uses an Optical Fiber Bragg Grating (FBG) as a sensor and measures the changes of temperature, strain and pressure as a wavelength shift. The FB200 can quickly measure multiple FBGsensors deployed along a fiber. Its small, light and reliable design is ideal for constant monitoring

Optical Time Domain Reflectmeter

AQ7275

Superior cost performance, easy to operate Makes your work more efficient

Specifications

- Display: 8.4 inch color TFT (640 × 480 pixels)
- Horizontal Axis Parameters:
  - Sampling resolution: 5 cm, 10 cm, 20 cm, 50 cm, 1 m, 2 m, 4 m, 8 m, 16 m, 32 m
  - Readout resolution: 1 cm (Min.)
  - Number of sampling: Up to 50,000 points
- Vertical Axis Parameters:
  - Vertical axis scale: 0.2 dB/div, 0.5 dB/div, 1 dB/div, 2 dB/div, 5 dB/div, 7.5 dB/div
  - Readout resolution: 0.001 dB (Min.)
- Memory capacity: 1000 waveforms or more
  Can store measured waveforms, and measurement conditions
- External dimensions: 287 (W) × 197 (H) × 85 (D) mm
  (not including projections or options)
- Weight: Approx. 2.8 kg (not including options)

Features

Meets a broad range of measurement needs from FTTH to metro, core networks.

- Short dead zone (0.8 m)
- Quick Startup within 10 Seconds
- Wide range of models available supporting FTTH to core networks
- High performance & easy to use OTDR
- Built-in dummy fiber option for near-end measurement
- Bright & high contrast 8.4 inch LCD screen

Event Dead Zone 0.8 m

The AQ7275's short event dead zone enables detection of closely spaced events in cables installed in offices and customer premises.

High Dynamic Range up to 45 dB

The high dynamic range model (735034) can achieve the dynamic range of 45 dB. This high dynamic range is effective in measuring a transmission line consisting

Quick Startup within 10 Seconds

Now measurements can be started quickly upon arrival at the site. 10 seconds to power-up from completely OFF to fully ON!
With such a fast power-up time, battery life can be extended by turning the power off while not in use at the job site without any concern about the power-up time when the next job is ready. It's ready when you're ready!

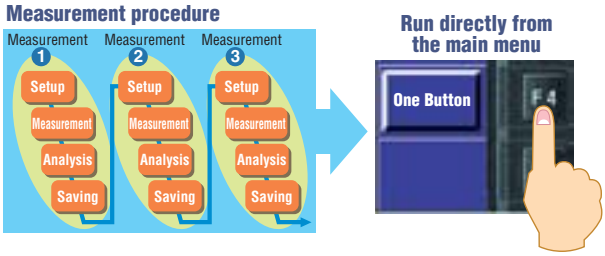
Model	735031	735032	735033	735034	735035
Wavelength	1650 ±5nm, ±10nm	1310/1550 ±25nm	1310/1550 ±25nm	1310/1550 ±25nm	1310/1490/1550 ±25nm
Applicable fiber	SM (ITU-T G.652)				
Distance Range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km				
Pulse width	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1µs, 2 µs, 5µs, 10µs, 20µs				
Dynamic range	30dB	34/32dB	40/38dB	43/41dB, 45/43 dB (typ.)	34/30/32dB
Event dead zone	0.8m	0.8m	0.8m	0.8m	0.8m
Attenuation dead zone	12m (typ.)	7/8m (typ.)	7/8m (typ.)	7/8m (typ.)	7/8/8/m (typ.)

Model	735036	735037	735038	735041	
Wavelength	1310/1550 ±25nm 1625 ±25nm	1310/1550 ±25nm 1650 ± 5nm, ±10nm	1310/1550/1625 ±25nm	1310/1550 ±25nm	850/1300 ±30nm
Applicable fiber	SM (ITU-T G.652)				GI (62.5/125 µm, 50/125 µm)
Distance Range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km				500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1µs, 2µs, 5µs, 10µs, 20µs				3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1 µs, 2 µs, 5 µs
Dynamic range	40/38/33dB	40/38/30dB	40/38/36dB	40/38dB	21.5/23dB (50/125 µm) 22.5/24dB (62.5/125 µm)
Event dead zone	0.8m	0.8m	0.8m	0.8m	1m
Attenuation dead zone	7/8/12m (typ.)	7/8/12m (typ.)	7/8/12m (typ.)	7/8m (typ.)	6/10m

Note. Specifications may be under specific conditions and are subject to change without notice. Please refer to AQ7275 product catalog for details.

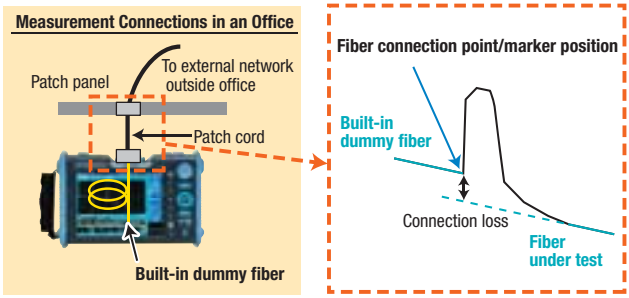
Easy to Operate for Beginners and Experts

- **Full Auto Measurement Mode**
- **Multi Wavelength Measurement Mode**
- **Batch measurement with Predefined Procedure –One Button Mode**



- **Measurement Wizard –Assistance setting up measurements**
- **Built-in Dummy Fiber**

You can use the dummy fiber to effectively detect abnormal near-end connection loss.
* The dummy fiber option cannot be used for the 735041.
* The built-in dummy fiber is not attachable and removable.



- **USB Function**

The AQ7275 has two USB 1.1 compliant connector ports as standard (Type A and Type B).
Type A port is for USB memory and USB hard disk drive for storage. Type B port is for connecting external PC. AQ7275 can be remotely controlled from external PC, and the internal memory of AQ7275 can be accessed from external PC directly.


Type A


Type B

Factory Installed Options

Stabilized Light Source Function (/SLS option)

Optical connector	Shared with the OTDR (at the same port)
Center wavelength	OTDR's center wavelengths
Light output level	-5 dBm or more (at 23°C±2°C)
Output level stability	±0.1 dB (±0.15 dB for 1650 nm) (Constant temperature for 5 minutes)
Modulation frequency	CW, 270 Hz

* Unavailable for the 735041 (MMF)

Visible Light Source (/VLS option)

Optical connector	Port is not shared with the OTDR
Center wavelength	650 nm ±20 nm
Light output level	Peak value -3 dBm or more
Modulation frequency	2 Hz
Laser safety standard	Class 3R

*Unavailable for the 735036, 735037 and 735041

Power Monitor Function (/PM option)

Optical connector	Shared with the OTDR (at the same port) (735036, 735037 : 1310/1550 nm port)
Measurement wavelength	1310, 1490, 1550, 1625, 1650 nm
Measurement range*1	-50 to -5 dBm
Measurement accuracy*2	±0.5 dB

*1 CW light, absolute maximum input level 0 dBm (1 mW)
*2 CW light, wavelength 1310 nm, -10 dBm for input, 23°C±2°C
*Unavailable for the 735031 and 735041 (MMF)

Built-in Printer/LAN Function (/PL option)

Printing method	Thermal line-dot
Dot density	576 dots/line
Paper width	80 mm
Operating environment	Temperature 0 to 40°C Humidity 10 to 80% RH (no condensation)
Storage temperature	-20 to 60°C
LAN function	10BASE-T/100BASE-TX (RJ-45)×1

Dummy Fiber (/DF option)

Optical fiber	SM (ITU-T G.652)
Optical fiber length	Approx. 100 m

* Dynamic range declines by 0.5 dB

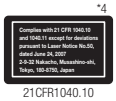
General Specifications

Operating environment	Temperature 0 to 45°C (0 to 35°C when charging the battery) Humidity 85% RH or less (no condensation)
Storage temperature	-20 to 60°C
Battery	Operation time 6 hours (18 hours with external large capacity battery)*1 Recharge time 5 hours*2
Rated power voltage	100 to 240 VAC
Rated supply frequency	50 to 60 Hz
Power consumption	Max 70 W (when charging battery and printing with optional printer)
Dimensions	(W) 287 × (H) 197 × (D) 85 mm (excluding projections or options)
Weight	Approx. 2.8 kg (excluding options)
Laser safety standards	Class 1 M (IEC 60825-1:1993 + A2:2001)*3 21CFR1040.10*4
Safety standard	EN61010-1
Emission	EN61326-1 Class A EN55011 Class A Group 1
Immunity	EN61326-1 Table 2

*1 Measurement for 30 seconds in every 10 minutes without any options and in power save mode (Auto Power OFF 1 minute)
*2: Ambient temperature of 23°C, power OFF

*3

IEC 60825-1

*4

21CFR1040.10

Models and suffix codes

AQ7275 OTDR

Model	Option availability						Remarks
	Optical power monitor	Stabilized light source	Visible light source	Printer/ LAN	Dummy fiber	Shoulder belt	
735031	—	√	√	√	√	√	1-port, SM1650nm, filter
735032	√	√	√	√	√	√	1-port, SM1310/1550 nm
735033	√	√	√	√	√	√	1-port, SM1310/1550 nm, High DR
735034	√	√	√	√	√	√	1-port, SM1310/1550 nm, Higher DR
735035	√	√	√	√	√	√	1-port, SM1310/1490/1550 nm
735036	√	√	—	√	√	√	2-port, SM1310/1550/1625 nm, filter
735037	√	√	—	√	√	√	2-port, SM1310/1550/1650 nm, filter
735038	√	√	√	√	√	√	1-port, SM1310/1550/1625 nm
735041	√*1	√*1	—	√	—	√	2-ports, MM850/1300 nm, SM1310/1550 nm

*1 : MMF is not supported.
√ : Available.

	Suffix Codes	Description
Optical Connector	-SCC	SC type connector
	-FCC	FC type connector
	-NON	No universal adapter
	-USC	Universal adapter (SC)
	-UFC	Universal adapter (FC)
	-ASC	Angled-PC connector (SC) *2
Language	-HE	English
	-HC	Chinese/English
	-HK	Korean/English
	-HR	Russian/English
Power Cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS/Singapore standard
	-H	GB standard, Complied with CCC
	-P	Korean standard
Options	/PM	Optical power monitor
	/SLS	Stabilized light source
	/VLS	Visible light source
	/PL	Built-in printer, LAN
	/DF	Dummy fiber (SMF)
	/SB	Shoulder belt

*2: An angled-PC connector cannot be used in the MM port of the 735040. -USC needs to be attached.

Example: 735033-USC-HE-D/PM/SLS
AQ7275 OTDR 1310/1550nm, high dynamic range, with SC universal adapter, English version, with a UL/CSA standard power cord, with optical power monitor function and with stabilized light source function.

Standard Accessories

Power cord, AC adapter, battery pack, hand belt, user's manual (CD-ROM), operation guide

Application Software

Model	Suffix Codes	Specifications
735070		AQ7932 Emulation Software (Ver3.0 or later)
	-EN	English

Multi Application Test System

AQ2200

Build Your Own Test Configurations in Small Footprint

Features

The AQ2200 Multi Application Test System is the ideal system for measuring and evaluating a wide range of optical devices and optical transmitters.

- Flexible and space effective
- Easy-to-View TFT color display
- Remote operation through Ethernet network
- Built-in applications
  - Optical power stability measurement
  - Short-term optical power fluctuation measurement
  - Wavelength dependent loss measurement
  - Bit error rate test (BERT)
  - Optical return loss and insertion loss measurement
- Wide variety of plug-in modules
- Hot-swappable modules

Applications

- 10Gbit/s transceiver measurement system
- GE-PON ONU/OLT measurement system
- GE-PON optical three wavelength filter measurement
- Optical amplifier measurement system
- MUX/DEMUX measurement system

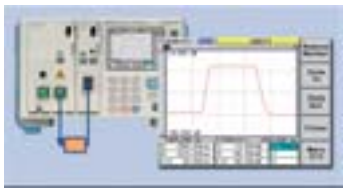
Frame and Module Lineup

- Frame controllers
  AQ2201 Frame controller (3 slots for modules)
  AQ2202 Frame controller (9 slots for modules)
- Light source modules
  AQ2200-111 DFB-LD module (C & L Band, 1310nm, 1490nm, 1-slot)
  AQ2200-136 TLS module (1440-1640nm, SMF, 2-slot)
  AQ2200-141 FP-LD module (1310nm, 1550nm, 1-slot)
  AQ2200-142 DUAL FP-LD module (1310/1550nm, 1-slot)
- Sensor modules and Sensor Heads
  AQ2200-211 Sensor module (-110dBm, 700-1700nm, 1-slot)
  AQ2200-215 Sensor module (+30dBm, 970-1660nm, 1-slot)
  AQ2200-221 Sensor module (Dual sensor, 800-1700nm, 1-slot)
  AQ2200-201 Interface module (for AQ2200-231 and -241, 1-slot)
  AQ2200-231 Optical sensor head (Large diameter, 800-1700nm)
  AQ2200-241 Optical sensor head (Large diameter, 400-1100nm)
- Optical Return Loss module
  AQ2200-271 ORL module (SMF)
- Optical attenuator modules
  AQ2200-311A ATTN module [w/ Monitor output (optional)] (SMF or MMF, 1-slot)
  AQ2200-331 ATTN module [w/built-in optical power meter] (SMF or MMF, 1-slot)
- Optical switch modules
  AQ2200-411 OSW module (1×4 or 1×8, SMF or MMF, 1-slot)
  AQ2200-412 OSW module (1×16, SMF, 1-slot)
  AQ2200-421 OSW module (1×2 or 2×2, SMF or MMF, 1-slot)
- 10Gbit/s BERT modules
  AQ2200-601 10 Gbit/s BERT module (3-slot)
  AQ2200-621 10 Gbit/s optical modulator (1.55 µm, SMF, 1-slot)
  AQ2200-622 10 Gbit/s optical modulator (1.31 µm, SMF, 1-slot)
  AQ2200-631 10 Gbit/s optical receiver (1.31/1.55 µm, SMF, 1-slot)
  AQ2200-641 XFP interface module

AQ2200 series modules

Passive component test applications

TLS-OSA Sync Sweep



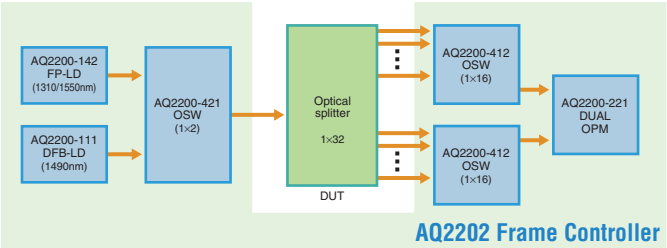
TLS-OPM Sync Sweep

10Gbit/s BERT applications

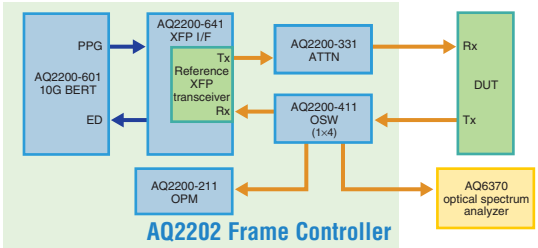
Electrical 10Gbit/s BERT System

Optical 10Gbit/s BERT System

Optical splitter measurement system for PON



10 Gbit/s transceiver measurement system



Handy Optical Powermeter & Light Source — AQ2160-01/AQ2160-02/AQ4270-01

Simplified Functions Bring Superior Cost Performance

AQ2160-01
Optical Powermeter

The AQ2160-01 is a compact, lightweight, cost-effective optical powermeter designed for optical fiber line installation and maintenance. The AQ2160-01 is a new de facto standard of handheld optical powermeters focusing on the ease of use, including simple operation, convenient backlighting, and safe transport using the neck strap.

Powerful Tools for Installation of Optical Fiber Networks with High-performance, Durability and Robustness

AQ2160-02
Optical Powermeter

The AQ2160-02 is a full-featured handheld optical power meter that can measure the relative and absolute optical power for CW and chopped light, and is equipped with the data storage capability. With the USB interface the AQ2160 can transfer the measured data from an internal memory to a PC.

AQ4270-01
LD Light Source (1310/1550 nm)

The AQ4270-01 is a rugged durable handheld LD light source that is operable in the temperature from 0°C to 50°C and conforms the waterproofing standard IEC60529 IP×1.
The AQ4270-01 can output two wavelengths (1310/1550 nm), and is easy to maintain due to a user cleanable input connector.

Optical Power Meter — TB200

Supports All Blue, Red and Near Infrared Wavelength Bands

TB200
Optical Power Meter

- Sufficient margin provided by 18 mm dia. sized photo-receiving surface even at high NA (0.85)
- Influence of multiple reflection alleviated by low-reflectivity sensor surface
- High-power measurement up to 100 mW
- Measurement interval of about 100 msec
- Full remote control enabled by standard USB interface

TB200 Specifications

Power Meter Unit
- Display resolution
  0.01 dB (When W unit is selected, floating point 4 digits past decimal point)
- Unit Display
  Absolute value: dBm, mW, µW, nW
  Incremental value: dB
- Measurement Interval
  Approx. 100 msec
- Interface
  USB (type B)
- Power supply
  AC adapter (rated input voltage: 100 to 240 V) 7 VA
  AA alkali dry cell (operation time: approx. 24 hours)

Power Sensor Unit
- Wavelength range
  400 to 850 nm
- Light-receiving element
  Si-PD
- Received light power range
  1 µW (-30 dBm) to 100 mW (+20 dBm)
- Max. light receiving level
  +20 dBm (100 mW)
- Max. power density
  5 mW/mm^2

Multimedia Display Tester — 3298F

Luminance, Contrast, Flicker and Chromaticity Measurements All with Just one Device

3298F
Multimedia Display Tester

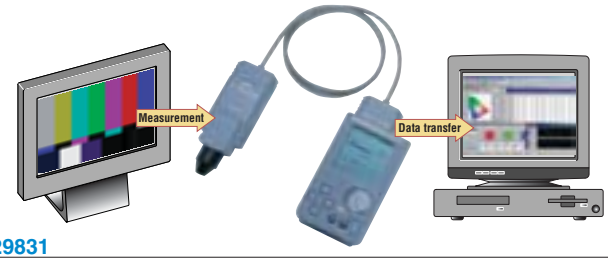
- Luminance, contrast, flicker and chromaticity measurements
- Digital and bar graph indications
- Shading cylinder type optical system
- Luminance measurement range of 0.01 to 40,000 cd/m^2
- Memory for measured data from 200 displays
- GO/NO-GO determination functions
- User-specified color calibration coefficients
- Light source color calibration coefficients
- Easy operation
- Compact and lightweight
- Battery-driven

3298F Specifications

- Luminance measurement range
  0.01 to 40,000 cd/m^2
- Luminance measurement range settings
  400.0/4,000/40,000 cd/m^2
- Luminance measurement precision
  ±4% of indicated value + ±0.035% of full-scale value
- Spectral responsivity
  Approximates CIE 1931 color matching functions
- Color system
  Chromaticity coordinates: (x, y, L) or (u', v', L)
  Tristimulus values: (X, Y, Z) or (R, G, B) or (RGB ratio)
  Correlated color temperatures: (Tc, duv, L)
- Chromaticity precision
  (deviation in x and y values)
  ±0.002 or less, for type A standard light source (at 23 ± 3°C, 70% RH or less, and luminance of at least 2% of the set range's full-scale value)
  ±0.03 or less, for combination of type A standard light source/three-wavelength fluorescent lamp + color filters (at 23 ± 3°C, 70% RH or less, and luminance of at least 1% of the set range's full-scale value)
- External dimensions
  Sensor dimensions: approx. 67 (W) × 150 × (H) × 40 (D) mm; tester dimensions: Approx. 107 (W) × 176 (H) × 55 (D) mm
- weight
  Approx. 1 kg
- Power supply
  Four AA batteries or optional AC adapter

Light Measurement Data Management Software — 329831

For Multimedia Display Tester 3298/3298F



329831
Light Measurement Data Management Software

This light measurement data management software downloads measurements from a multimedia display tester (3298/3298F) to a PC and displays data tables, chromaticity diagrams, deviation charts, and trend graphs. The program can also read data stored in the display tester's memory.

- The program can be used to display data for each measurement parameter in table format and save the data to text files.
- A graphing function provides easy-to-understand graphical displays of luminance and chromaticity measurements according to the particular management application.
- Diagrams such as chromaticity diagrams can be copied and pasted to other Windows programs using the Windows clipboard.
- Diagrams such as chromaticity diagrams can be printed out as hard copies.
- Setting parameters can be saved to files.
- Memory data can be loaded into tables.

329831 Specifications

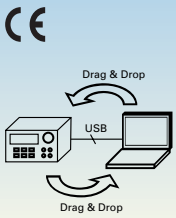
Functions
- Data table (measurement data)
  Displays data for each measurement parameter in table format.
  Any of the available parameters can be selected for display.
- Trend graph
  Displays trends for luminance, flicker, and chromaticity.
  The number of measurements is shown on the horizontal axis.
- Chromaticity diagram
  Displays chromaticity measurements (x, y/u', v' table color system) in graph format. The screen size of the chromaticity diagram can be switched between two different sizes.Three different plot modes are available: refresh, trace, and scatter.
- Deviation chart
  Up to six reference colors can be set for chromaticity measurements.
  Reference colors can be input numerically or through measurements.
  Three different plot modes are available: refresh, trace, and scatter.
- Surface distribution graph
  Displays deviations for luminance and chromaticity according to position (color irregularity).
- The graphical part of any graph or chart can be copied to the clipboard as a bitmap.
- The graphical part of any graph or chart can be printed.
- File saving
  Information shown in a data table can be saved in text format.
- Settings
  Various coefficients can be set (color correction coefficient, etc.).
- Memory data
  Specified parameters in memory can be displayed in data tables.

System Specifications
PC: PC with a Pentium 133 MHz or faster and at least 32 MB RAM, running Windows98/NT/2000. The PC should have a serial port conforming to the RS-232 standard. Screen: 640 × 480 resolution, 256 or more colors (65,000 or more colors recommended).
Maltimedia displaytester:
3298F (model: 329802) ROM Version 1.00 or later
3298 (model: 329801) ROM Version 1.05 or later

Multi Channel Source Measure Unit

GS820

Highly Accurate 2-Channel Voltage/Current Source Measure Unit



USB STORAGE

Features

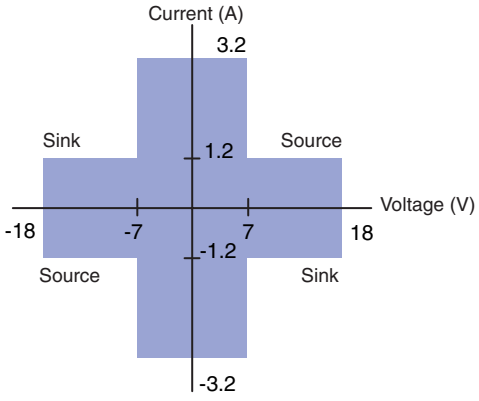
The GS820 is a highly accurate and highly functional 2-channel programmable DC voltage/current source that incorporates voltage/current generation and measurement functions.

- Isolated 2-channel source and measurement function
- Source and measurement ranges: 7 V and 3.2 A or 18 V and 1.2 A
- Minute current ranges with 200-nA or 1-pA resolution
- Generate arbitrary waveforms consisting of up to 100,000 points at 100-µs intervals
- Channel expansion through master-slave synchronization link
- Fast test speeds
- 16-bit digital I/O (model 765602)

2-channel display example (256 x 64 dot matrix display)

Source and Measurement Range

Four-quadrant operation consisting of source operation (current source) and sink operation (current sink) is available with ranges up to 7 V and 3.2 A or 18 V and 1.2 A.
The output and measurement resolutions are 5.5 digits.



Functions

Source

Function:	Voltage or current
Mode:	DC or pulse (pulse width: 50 µs to 3,600 s)
Sweep mode:	Linear, logarithmic, or program (up to 100,000 steps)
Trigger source:	External or internal timers 1 and 2 (period: 100 µs to 3600 s)
Sweep start source:	External or internal timers 1 and 2 (period: 100 µs to 3600 s)
Source delay:	15 µ to 3600 s
Response characteristics:	Normal or stable

Measurement

Function:	Voltage, current, auto, voltmeter mode, ammeter mode, or resistance meter mode
Integration time:	0.001 to 25 PLC (Power Line Cycle)
Trigger source:	External or internal timers 1 and 2 (period: 100 µs to 3600 s)
Measure delay:	0 µs to 3600 s
Measurement data storage:	Up to 100000 data points
Average:	Moving average (average count: 2 to 256)
Voltage sense:	Two-wire system or four-wire system
Auto zero:	Measure the internal zero reference every measurement and correct the measured value
NULL computation:	Computes the difference with respect to the current measuredvalue or user-defined value
User-defined computation:	Computes user-defined equations in real-time
Operators:	+[addition], -[subtraction], *[multiplication], /[division], ^ [exponentiation], % [mod],	[logic OR], & [logic AND], ! [negation], < <= > >= == != [comparison], = [substitution],
Functions:	ABS() [absolute value], SQRT() [square root], LN(), LOG() [logarithm], SIN(), COS(), TAN() [trigonometric functions], ASIN(), ACOS(), ATAN() [inverse trigonometric functions], SINH(), COSH(), TANH() [hyperbolic functions], RAND() (random number generation), EDGE() [logic change extraction], TRUNC(), FLOOR() [rounding to an integer], ISINF() [infinity judgment], ISNAN [not-a-number judgment]
Conditional statement:	IF-THEN-ELSE

Communication Interface

GPIB

Electrical and mechanical specifications:	Conforms to IEEE St'd 488-1987
Functional specifications:	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0
Protocol:	Conforms to IEEE St'd 488.2-1987
Address:	0 to 30

RS232

Electrical specifications:	Conforms to EIA RS232
Connection format:	Point-to-point
Transmission mode:	Full-duplex
Synchronization mode:	Start-stop synchronization
Baud rate:	9600, 14400, 19200, 38400, 57600, 115200 bps

USB

Number of ports:	1
Connector type:	Type B connector (receptacle)
Electrical and mechanical specifications:	Conforms to USB Rev. 2.0
Protocol:	Mass storage class, USB-TMC

Ethernet

Number of Ethernet ports:	1
Connector type:	RJ-45 connector
Electrical and mechanical specifications:	Conforms to IEEE 802.3
Transmission system:	100BASE-TX/10BASE-T
Data rate:	100 Mbps or 10 Mbps
Protocol:	VXI-11 server, HTTP server, FTP server, DHCP client, and command socket

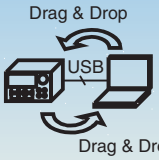
Model and Suffix code

Model	Suffix Code	Notes
765601		GS820 Multi Channel Source Measure Unit Standard Model
765602		GS820 Multi Channel Source Measure Unit Digital I/O Installed Model
Power cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard

Source Measure Unit

GS610

Combines High Accuracy and High Speed in a Single Unit



USB STORAGE

CE

Features

The GS610 is a highly accurate and highly functional programmable voltage/current source that incorporates voltage/current generation and measurement functions. The maximum output voltage and current are 110 V and 3.2 A, respectively. Evaluation of over a wide range of basic electrical characteristics is possible, because the GS610 can operate as a current source or a current sink.

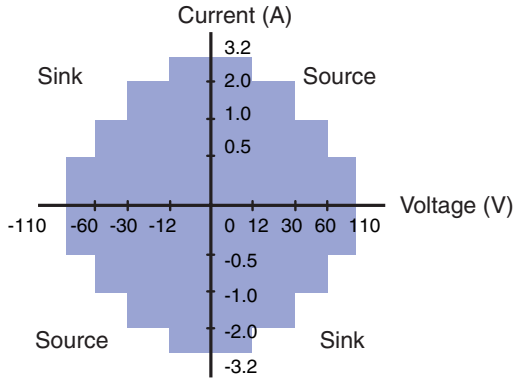
- Source and sink operation up to 110 V/3.2 A (four-quadrant operation)
- Basic accuracy: ±0.02% *1
- Sweep output at up to 100 µs intervals
- Comes with abundant sweep patterns (linear, logarithmic, and arbitrary)
- Stores up to 65535 points of source measure data in the internal memory
- Easy file operation with the USB storage function
- Remote control and FTP using Web server function (Optional)

*1: DC voltage generation

Voltage/Current Generation and Measurement Range

Four-dimensional operation with source operation (current source) and sink operation (current sink) is possible at up to 110 V, 3.2 A, and 60 W. The output and measurement resolutions are 5.5 digits.

Voltage generation/measurement range: 200mV to 110 V
Current generation/measurement range: 20 µA to 3.2 A
Maximum output current:
±3.2 A (at an output voltage of ±12 V or less)
±2 A (at an output voltage of ±30 V or less)
±1 A (at an output voltage of ±60 V or less)
±0.5 A (at an output voltage of ±110 V or less)



Voltage/Current Source

7651

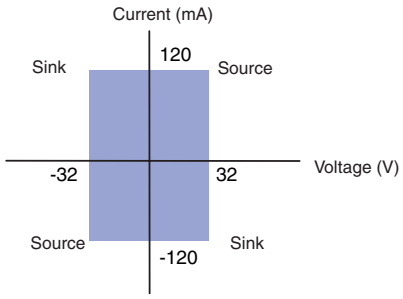
Programmable DC Source with Sink and Source Function

7651
Programmable DC Source

- High accuracy:
  ±0.01% of setting (voltage)
  ±0.02% of setting (current)
- High resolution: 100 nV, 10 nA
- Fast response: 10 ms/±0.1%
- High resolution: 100 nV (DC V, 10 mV range)
  High-speed response: 10 ms/±0.1%
  Low noise: 15 µVp-p (1 V range, DC to 10 Hz)
- Applicable to electronic loads owing to sink action

7651 Specifications

- Output voltage: 10 mV to 30 V, 5 ranges
  Maximum output current: ±120 mA
- Output current: 1 mA to 100 mA, 3 ranges
  Maximum output voltage: ±32 V
- Response time: 10 ms or less
- Communication function: GP-IB

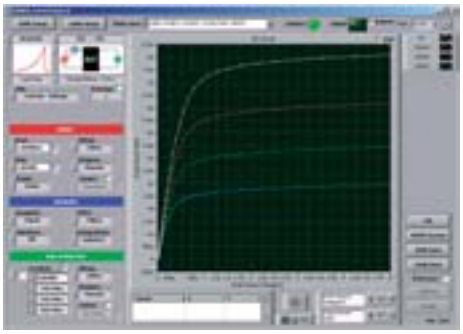


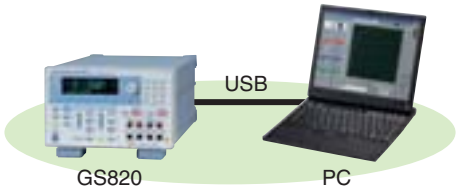
- Program function: up to 50 steps
  Seven patterns can be stored with an IC memory card
  Setting of interval/sweep time
- Compact and high accuracy
- Power consumption: about 30 VA
- External dimensions:
  213 (W) × 88 (H) × 350 (D) mm
- Weight: 3.6 kg
- Other features
  - External trigger function
  - Software calibration function
  - Programmable voltage/current limiter function
  - No glitch design at polarity reversal

*About CA series Handy Calibrators, please refer to the page 68 to 69.

GS Series Accessory Software

765670 Curve Tracer Software for the GS series





Product Overview

This product is a high-speed, high-accuracy real-time V-I curve tracer that consists of the GS series Source Measure Unit and the 765670 Curve Tracer Software. It is particularly well-suited to DC parametric tests of minute signals.

Features

■ Simple system configuration, easy connection, compact, and light

This system is configured by connecting the GS series Source Measure Unit to a PC that contains the 765670 Curve Tracer Software via USB.
You can perform high speed, high-accuracy curve tracing despite its compact size, light weight, And simple system configuration.

■ Real-time, High-Speed Drawing

The GS series is high-speed communication and sweep features allow high-speed graph update rate up to 20 pages/s(GS820).
You can use the real-time curve tracer with comfort.

■ Field of Applications

- Discrete semiconductors such as transistors and diodes
- Analog ICs such as voltage regulators and op- amps
- MOS logic and other digital ICs
- LEDs and other optical devices
- Solar battery cells

Specifications

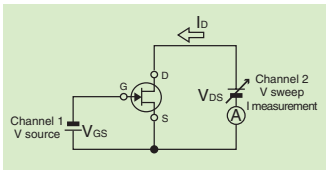
- **Graph drawing:**
  Voltage vs. current, voltage vs. voltage, gain vs. voltage, voltage vs. timestamp, current vs. voltage, current vs. current, gain vs. current, current vs. timestamp

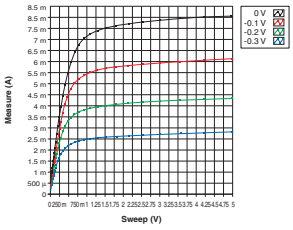
Sweep axis:	**Voltage source or current source**
Measurement axis:	**Voltage measurement or current measurement**
Parameter:	**Voltage source or current source**
Sweep shape:	**Ramp (linear or log), triangle (linear or log), rectangle**
Sweep points:	**5, 10, 20, 50, 100, 200, 1000**
Scaling:	**Auto scale or fixed scale**
Averaging count:	**2 to 100**

- **Analysis feature:**
  Cursor, zoom & scroll, reference curve designation
- **File operations:**
  CSV data storage and loading, graphic image storage, panel image storage, setup storage and recall

Examples of Measurements of Characteristics

● FETs
Vds-Id characteristics





Synthesized Function Generators

FG210/FG220/FG310/FG320/FG120/FG110

Frequency Range 1 µHz to 15 MHz

CE

FG210, FG220, FG310, FG320

Synthesized Function Generators

- Generating frequencies:
  1 µHz to 15 MHz (sine waves and square waves)
  1 µHz to 200 kHz (triangular, pulsed, and arbitrary)
- Independent 2 channels (FG220/FG320)
- Multiple sweep functions and modulation functions
- Intuitive operation with large LCD panel and touch screen

FG200/FG300 Specifications

- Number of signal outputs:
  1 (for FG210 or FG310)
  2 (for FG220 or FG320)
- Output waveforms: sine waves
  Square waves (duty ratio 50% fixed)
  Triangular waves (symmetry variable)
  Pulse waves (duty ratio variable)
  Arbitrary waves (FG310/FG320)
- Operation mode:
  continuous, trigger or gate oscillation, DC output
- Frequency range
  Sine and square waves:
  1 µHz to 15 MHz
  Triangular and pulse waves:
  1 µHz to 200 kHz
  Arbitrary waves: 1 µHz to 200 kHz
- Frequency resolution:
  1 µHz or 9 digits max.
- Max. output voltage: ±10 V (high-impedance load)
- Output impedance: 50 Ω ± 1%
- Sweep types:
  linear, log, linear step, log step, and arbitrary patterns (FG310/FG320)
- Sweepable parameters:
  frequency, amplitude, offset phase, duty ratio, frequency and amplitude
- Modulation types:
  AM, DSB-AM, FM, phase modulation, offset modulation, or PWM
- External dimensions:
  approx. 213 (W) × 132 (H) × 350 (D) mm
- Weight: Approx. 5 kg

Frequency Range 1 µHz to 2 MHz

CE*

FG120/FG110

Synthesized Function Generator

- Completely independent 2-channel output (FG120)
- Output waveform: sine, square, triangular, ramp and pulse
- Output frequency: DC and 1 µHz to 2 MHz (sine and square waves)
- Max. output voltage: ±10 V
- Compact (A4 size), lightweight (approx. 3.6 kg) and low cost

FG120/FG110 Specifications

- Number of signal outputs:
  1 (use 706011 (FG110))
  2 (use 706012 (FG120))
- Output waveforms:
  sine, triangular, square wave (duty ratio 50% fixed), ramp, pulse (duty ratio 5 to 95% variable)
- Operation mode:
  continuous, trigger or gate oscillation, DC output
- Output frequency range
  Sine and square waves:
  1 µHz to 2 MHz
  Triangular, ramp, and pulse waves:
  1 µHz to 100 kHz
- Frequency resolution: 1 µHz or 10 digits
- Max. output voltage: ±10 V*
- Output impedance: 50 Ω ± 1%
- GP-IB interface equipped as standard
- External dimensions:
  approx. 213 (W) × 100 (H) × 330 (D) mm
- Weight: Approx. 3.6 kg

*(Maximum amplitude plus offset with high-impedance load)

CE*: except 706011-1/-4, 706012-1/-4 models

Transport Analyzer

NX4000

40G SONET/SDH and 43/44G OTN

Features

Built for 40G Next Generation Networks, the NX4000 is designed to measure the transmission and reception of communication frames, alarm/error characteristics, and the transmission characteristics, such as the transmission delay time, of 40Gbit/s SONET/SDH/OTN networks.

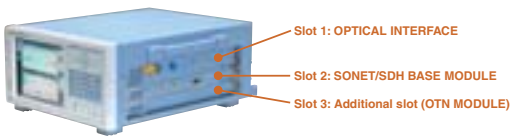
- SONET/SDH/OTN all in one set
- Flexible and cost-effective upgrade path
- Advanced optional modulation format compliant
- Main Measurement Functions
  - Various alarm and error measurements
  - Bit error (BER) measurement
  - Delay time measurement
  - Simultaneous measurement for mapped multiple channels
- Editing and Monitoring Function
- Ease of Operation
  - Large 10.4-inch display with Touch panel

Selection for Each Test

Pluggable modules provide for a tailored solution.

- SONET/SDH test system
  System can be upgraded at minimum cost.
- OTN test system
  NX4000 can be upgraded for OTN testing by adding a single module.
- Optical modulation formats
  Only optical interface modules need to be replaced to use the unit for various optical modulation formats.
  - 40 Gbit/s NRZ optical interface, (NX4120, single rate)
  - 40/43 Gbit/s NRZ optical interface, (NX4120, dual rate)
  - 43 Gbit/s DPSK optical interface, C-band (planned)
  - 43/44 Gbit/s DQPSK optical interface (NX4121,C or L-band)
  - 43 Gbit/s ODB optical interface, C-band (planned)

Optical IF module



Module / Bit rate (Gbit/s) / Test Application	Basic Module: NX4000 Transport Analyzer (Main frame)	Basic Module: NX4100 SONET/SDH Base module	Extension Module: NX4110 OTN module	Optical Interface Module: NX4120 (NRZ, Single rate)	Optical Interface Module: NX4120 (NRZ, Dual rate)	Optical Interface Module: NX4121 (DQPSK, C-band)	Optical Interface Module: NX4121 (DQPSK, L-band)
				39.81	39.81/43.02	43.02/44.57	43.02/44.57
40 G SONET/SDH	√	√		○	○		
43 G OTN & 40 G SONET/SDH	√	√	√		√		
43 G / 44 G OTN (10 G LAN)	√	√	√			○	○

√ mark: Required. ○ mark: Optional DQPSK-C: A C-band tunable laser is incorporated. DQPSK-L: A L-band tunable laser is incorporated.

Basic Specifications

SONET/SDH Function

Operation mode	SONET/SDH	OC-768/STM-256
	Non Frame	39.81 Gbit/s
SONET/SDH Interface rate		39.81 Gbit/s
NON FRAME Patterns	PRBS	PRBS31, PRBS31inv, PRBS23, PRBS23inv, PRBS15, PRBS15inv, PRBS11, PRBS11inv, PRBS10, PRBS10inv, PRBS9, PRBS9inv, PRBS7, PRBS7inv
Delay time measurement	Measure range	0.1 µs to 10 µs, >Time Out
	Item	Current, Maximum, Minimum, Average

OTN Function

Operation mode	OTN frame	44 G OUT-3 (Four 10 G LAN PHY Mapping) 43 G OTU-3 (SONET/SDH Mapping)
	Non Frame	43.02 Gbit/s, 44.57 Gbit/s
OTN (Line) Interface rate		43.02 Gbit/s, 44.57 Gbit/s
10 G LAN-PHY (Client) Mapping		Async mode
SONET/SDH (Client) Mapping		Sync mode, Async mode
NON FRAME Pattern	PRBS	PRBS31, PRBS31inv, PRBS23, PRBS23inv, PRBS15, PRBS15inv, PRBS11, PRBS11inv, PRBS10, PRBS10inv, PRBS9, PRBS9inv, PRBS7, PRBS7inv
Delay time measurement	Measure range	0.1 µs to 10 s, >Time Out
	Item	Current, Maximum, Minimum, Average

NX4120 OPT I/F MODULE (NRZ)

Interface rate		39.81 Gbit/s (suffix code: -R1) 39.81 Gbit/s, 43.02 Gbit/s (suffix code: -R2)

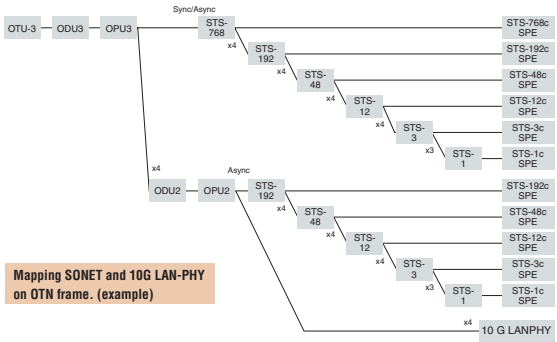
NX4121 OPT I/F MODULE (DQPSK)

Interface rate		44.57 Gbit/s, 43.02 Gbit/s

NX4000 TRANSPORT ANALYZER (Main Frame)

Display	Size	10.4 inchs, with touch screen
	Resolution	XGA (1024 × 768 pixels)
Module slots	SLOT1	Dedicated to the Optical I/F module
	SLOT2	Dedicated to the SONET/SDH BASE module
	SLOT3	OTN module
Dimensions and weight	Dimensions	426 (W) × 221 (H) × 559 (D) mm (excluding protrusions)
	Weight	Approx. 30 kg (when all module are installed)

Mapping



Mapping SONET and 10G LAN-PHY on OTN frame. (example)

Model Number and Suffix Codes

Model	Suffix codes	Descriptions
731210		NX4000 TRANSPORT ANALYZER
Power cord	-D	UL, CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard complied with CCC
731211		NX4100 SONET/SDH BASE MODULE
731212		NX4110 OTN MODULE
731213		NX4120 OPT I/F MODULE (NRZ)
Signal speed	-R1	40 G Single rate
	-R2	40/43 G Dual rate
Reference Clock	/RC	Reference Clock Output
731214		NX4121 OPT I/F MODULE (DQPSK)
Wavelength range	-W1	Tunable laser for C-band
	-W2	Tunable laser for L-band
Reference Clock	/RC	Reference Clock Output

TrafficTesterPro

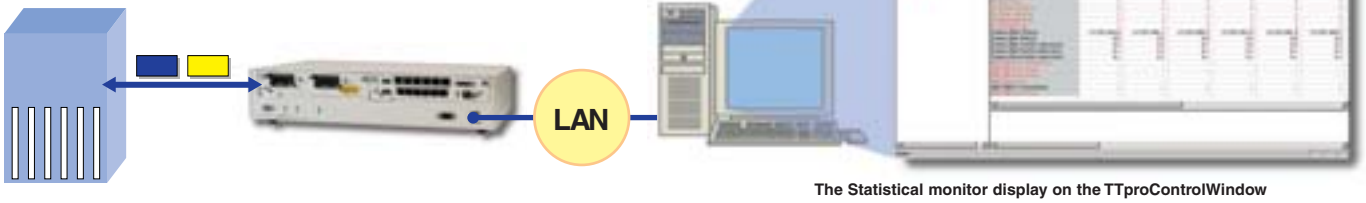
AE5511

Cost Effective Multi-port IP Performance Test Tool

AE5511 TrafficTesterPro is an IP traffic generation tester that provides test solutions to evaluate and inspect network equipment such as LAN switches, routers, and GE-PON. TrafficTesterPro offers flexible modular designs. Customers can choose and exchange units to support their specific needs or to adapt to new interfaces and standards. Yokogawa is offering a wide variety of units, from highly functional type units, which have all the necessary functions to develop and inspect IP network equipment to affordable units, which provide cost-cutting at production and during shipping inspections.

Features

- Supports 10 Mbit/s to 10 Gbit/s Ethernet
- A PC can control up to 16 frames (max. 512 ports)
- Full-wire rate traffic generation and statistics monitor function
- Frame BERT (Bit Error Rate Test) capability
- Frame latency and IFG measurement function
- Frame capture function
- Multi-user function allows up to eight users to share a unit
- Ethernet-OAM supported (AE5523 and AE5524)



The Statistical monitor display on the TTproControlWindow

Unit	Interface	Number of Ports
AE5520 10/100BASE-T unit 	10BASE-T, 100BASE-TX	16 ports
AE5521 1000BASE-X unit 	1000BASE-SX, 1000BASE-LX	4 ports (GBIC)
AE5522 10GBASE-X unit 	10GBASE-LR, 10GBASE-ER, 10GBASE-SR	2 ports (XENPAK)
AE5523 1000BASE-T unit 	10BASE-T, 100BASE-TX, 1000BASE-T	12 ports
	1000BASE-SX/LX	1 port (SFP)
AE5524 1000BASE-X unit 	1000BASE-SX, 1000BASE-LX	12 ports (SFP)

Applicable Functions by Unit

FUNCTIONS	AE5520	AE5521	AE5522	AE5523	AE5524
Full-wire rate traffic generation	✔	✔	✔	✔	✔
Latency measurement	✔	✔	✔	✔	✔
Frame BERT	✔	✔	✔	✔	✔
Data Capture	-	-	✔	✔	✔
Multi user Sharing	✔ *1	✔ *1	✔ *1	✔	✔
Link down generation	✔ *2	✔ *2	✔ *2	✔	✔
IPv4 emulation	✔	✔	✔	✔	✔
IPv6 emulation	-	-	-	✔	✔
Sequence check	-	-	-	✔	✔
Alarm logging	-	-	-	✔	✔
QoS Statistics monitoring	-	-	-	✔	✔
PoE measurement	-	-	-	✔	-
TX clock adjustment	-	-	-	✔	✔
Clock Master/Slave	-	-	-	✔	-
LFS	-	-	✔	-	-
Ethernet-OAM	-	-	✔ *3	✔	✔

*1:Can share per unit *2:Only for single link down generation *3:Suppors the frame generation and the capture

Model Number and Suffix Code

Product Name	Model Name	Suffix Code	Specification
AE5511 TrafficTesterPro	417322900		
		-L	JAPAN standard
		-C	UL/CSA standard
		-E	VDE standard
		-G	SAA standard
		-S	BS standard
		-V	GB standard
		-LNJ	Japanese
		-LNE	English
AE5520 10/100BASE-T Unit	417322901		
AE5521 1000BASE-X Unit	417322902		
AE5522 10GBASE-X Unit	417322904		
AE5523 1000BASE-T Unit	731010		
AE5524 1000BASE-X Unit	731011		
RFC2544 Test application for AE5511	731070		

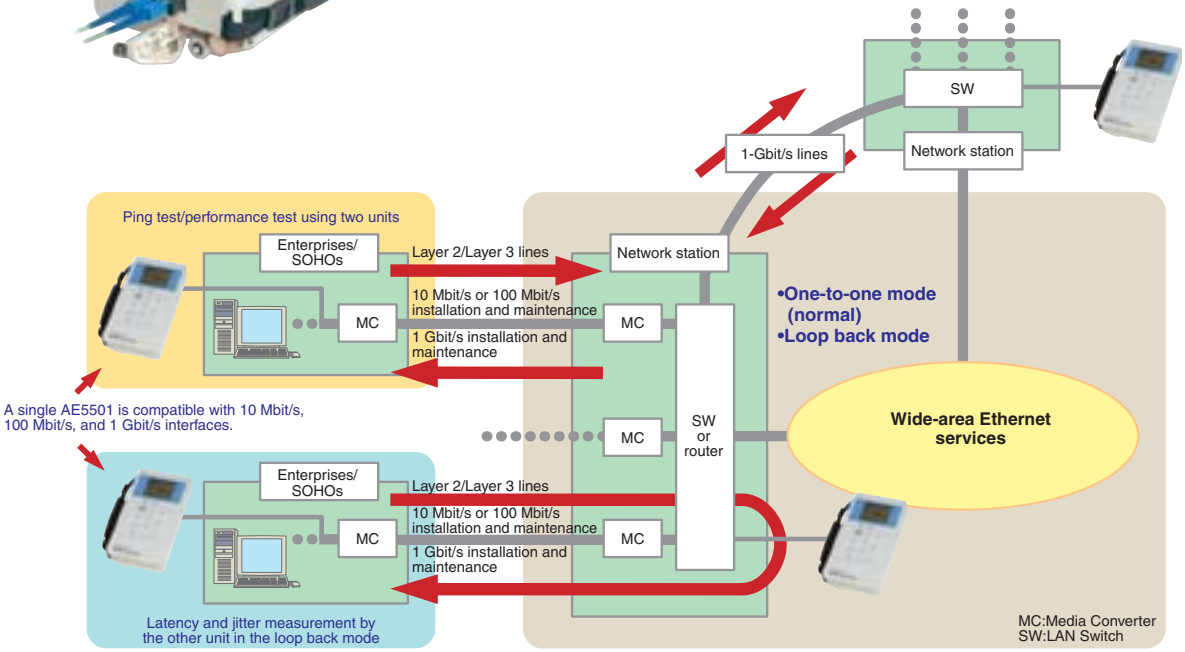
Traffic TesterMini

AE5501

A single unit can test Ethernet network at 10 Mbit/s, 100 Mbit/s, and 1 Gbit/s

AE5501
TrafficTesterMini

AE5501 is designed for installation and maintenance of networks such as wideband Ethernet and CATV access networks, working in Layer 2 to Layer 3. It has various hardware interfaces (10BASE-T upto 1000BASE-T, SX, LX) to flexibly adapt to multiple Ethernet networks, in a simple operation.



Wireless Communication Tester

VC3300

Saves Time, Money and Space for Testing and Programming

Features

- High-end tester class performance
  - Good power accuracy
  - Typical test items are measured: approx. 0.2s
- 3 test mode for each usage
  - TxRx mode for component calibration (No signaling)
  - Manual mode for radio characteristics test (With signaling)
  - Scenario mode for automatic Go/No-Go test (With signaling)
- Support multiple wireless system
  GSM/GPRS/EDGE/WCDMA/HSDPA
- Function test item: Call processing, Voice loop back, TV loop back, Emergency call, Frequency handover, System handover (WCDMA to GSM)
- Compact design and light weight

Specification

- Frequency band
  GSM900/DCS1800, GSM850/PCS1900
  WCDMA (I, II, III, IV, V, VI, VIII, IX)
- Downlink transmission power: -120dBm to -10dBm
- Uplink reception power:
  Measurement range:
  -70dBm to +35dBm (WCDMA)
  -40dBm to +35dBm (GSM)

Model	Suffix code	Description
733020		VC3300 Main frame
Power Cable	-D	UL and CSA
	-F	VDE
	-Q	BS
	-R	AS
	-H	GB
Options	/G*1	GSM test software pre-install
	/E*1	GSM/GPRS EDGE test software pre-install
	/W*1	WCDMA test software pre-install
	/HD1*1	WCDMA/HSDPA test software pre-install
	/C1	GPIB interface

Model	Description
733021	GSM Test software
733022	WCDMA Test software
733023	GSM/GPRS/EDGE Test software
733025	WCDMA/HSDPA Test software
733026	HSDPA Test software
733065-E02	TEST-USIM card

*1 Ether option should be selected

WCDMA/GSM Mobile Phone Tester

VC200

High C/P 2G/3G Mobile Phone Testing

GSM

- Call Processing
- Frequency Handover
- Power Measurement
- Phase and Frequency Error
- Rx Quality
- Rx Level
- Loop Back BER/FER
- Burst Timing
- Voice Loop Back

GSM Band

GSM850, P-GSM, E-GSM, R-GSM, DCS1800, PCS1900

WCDMA

- Call Processing
- Frequency Handover
- Maximum Output Power Measurement
- Minimum Output Power Measurement
- Open Loop Power Control
- Inner Loop Power Control
- EVM/Frequency Error
- Reference Sensitivity (BER)
- Maximum Input Power (BER)
- Voice Loop Back

Model & Suffix Code

Model	Suffix codes		Description
733016			VC200 Mobile Phone Tester
	-D	Power Code	UL/CSA standard
	-F		VDE standard
	-Q		BS standard
	-R		AS standard
	-H		GB standard
	-N		Type-N RF Connector
	-T		Type-TNC RF Connector
	/G		GSM Test Software Pre-install
	/W		WCDMA Test Software Pre-install

Shied box with an antenna coupler

VC-SHIELD

733062

VC-SHIELD Shield Box

- Including the phone fixture
- Frequency Range: 800MHz to 2500MHz
- Shield Characteristics: < -60dB
- RF Cable Interface:
  External RF Connector type N
  Internal RF Connector type SMA

Model	Suffix code	Description
733062		VC-SHIELD Shield box

Digital Multimeters — 7555/7561/7562

5.5 Digits Digital Multimeter

7555
Digital Multimeter

- Fast sampling at 125 times/s
- Communication function
  Adoption of command languages used in our and other companies' DMMs
- Large current measurement up to 200 A DC (with the use of 751106 current clamp)
- Scanner Function for multi-points measurement. (Up to 8 ch, optional)
- D/A output and BCD output functions

7555 Specifications

- DC voltage (DCV)
  Range: 200 mV to 1000 V
- DC current (DCA)
  Range: 2 mA to 2000 mA
  Measurable up to 200 A if current clamp (751106) is used.
- AC voltage (ACV)
  Range: 200 mV to 700 V (true rms value measuring method)
- AC current (ACA)
  Range: 2 mA to 2000 mA
  Measurable up to 150 A if current clamp (751106) is used.
- Resistance measurement (OHM, 2 W/4 W)
  Range: 200 Ω to 200 MΩ
- Maximum indication: 199999
- RS-232C interface (standard)
- GP-IB interface (optional)
- External dimensions:
  approx. 213 (W) × 88 (H) × 379 (D) mm
- Weight: approx. 3.5 kg

6.5 Digits Digital Multimeter

7561/7562
Digital Multimeters

- High accuracy (DC voltage-based accuracy)
  ±0.0045% of reading ± 15 digits
- Fast sampling at 333 times/s
- Large capacity buffer memory: up to 8000 data items
  IC memory card usable
- GP-IB interface (standard)

7561/7562 Specifications

- DC voltage (DCV)
  Range: 200 mV to 1000 V
- DC current (DCA)
  Range: 2 mA to 2000 mA
- AC voltage (ACV)(7562 only)
  Range: 200 mV to 700 V
- AC current (ACA)(7562 only)
  Range: 2 mA to 2000 mA
- Resistance measurement (OHM, 2 W/4 W)
  Range: 200 Ω to 200 MΩ
- Maximum indication: 1999999
- External dimensions:
  approx. 213 (W) × 88 (H) × 330 (D) mm
- Weight: approx. 3 kg

Temperature Measuring Instrument — 7563

Precision Digital Thermometer

7563
Digital Thermometer, 6.5 Digits

- Thermometer has a 6.5-digits display
  Twelve types of TC's and four types of RTD's
- Basic accuracy in temperature measurement: 0.006% (TC)
- Basic accuracy in DCV measurement: 0.0045% (2000 mV range)
- Basic accuracy in resistance measurement: 0.006% (2000 Ω range)
- Number of sampling times: up to 100 times/s (4.5 digits)

7563 Specifications

Maximum display: ±1999999
Resolution: Voltage 100 nV
Resistance 100 μΩ
Thermocouple 0.1°C
RTD 0.01°C
Reference junction compensation accuracy: ±0.2°C
Various computation functions
Software calibration function
Memory function
- Internal memory up to 1000 data items
- IC memory up to 8000 data items

Communication function: GP-IB
Analog output (optional):
code /DA specified
Power consumption: 20 VA
External dimensions:
213 (W) × 88 (H) × 350 (D) mm
Weight: approx. 3 kg
Other features:
- Multipoint measurement up to 50 points available when 750101 programmable scanner is used

Universal Counters — TC110/TC120

Wide Measuring Range from 1 mHz to 2 GHz (TC120)

TC110/TC120
Universal Counter

- Measuring frequency range:
  1 mHz to 2 GHz (TC120)
  1 mHz to 120 MHz (TC110)
- Resolution of 8 digits in 1 s
- Easy 1-action operation with 1 key
- Convenient auto-trigger function
- Measurement of revolution (TC110 only)

TC110/TC120 Specifications

- Frequencies A, B, and C
  Measurable range
  A: 1 Hz to 120 MHz (1/2-prescaler)
  B: 1 mHz to 60 MHz
  C: 100 MHz to 2 GHz (1/128-prescaler)
- Period B
  Measuring range: 20 ns to 999.999999 s
- Time interval A→B
  Measuring range: 60 ns to 999.999999 s
- Pulse width B
  Measuring range: 20 ns to 999.999999 s
- Duty ratio B
  Measuring range: 0.00000001 to 0.99999999
  Input range: 20 ns to 999.999999 ns
- Frequency ratio A/B
  Measuring range: A and B:
  1 mHz to 60 MHz
- Totalization A
  Input frequency range: 1 mHz to 50 MHz
  Counting capacity: 0 to 999999999
- Revolution B (TC110 only)
  Measuring range: 60 mrpm to 120 Mrpm
- Peak voltage A and B
  Measuring voltage range:
  ±5 V (ATT = x1)
  Frequency range: 50 Hz to 20 MHz
- External dimensions:
  approx. 213 (W) × 100 (H) × 330 (D) mm
- Weight: Approx. 3.6 kg

Pressure Standard — MC100

Pneumatic Pressure Standard

MC100
Pneumatic Pressure Standard

- High accuracy: ±0.05% of full scale
- Output ranges and resolution
  0 to 200 kPa (resolution 0.01 kPa)
  0 to 25 kPa (resolution 0.001 kPa)
- Functions useful for instrument calibration
  Divider output, auto-step output, and sweep output
- Excellent temperature coefficient
  Zero point: ±0.003% of full scale/°C
  Span: ±0.002% of full scale/°C

MC100 Series Specifications

- Supply pressure
  0 to 200 kPa range model:
  280 kPa ±20 kPa
  0 to 25 kPa range model: 50 kPa ±10 kPa
- Accuracy
  ±0.05% of full scale (at 23°C ±3°C)
- Output noise: ±0.02% of full scale
- Effect of mounting orientation
  Forward/backward incline of 90°
  0 to 200 kPa range model: ±0.01% of full scale
  0 to 25 kPa range model: ±0.1% of full scale
  Sideways incline of 30°
  0 to 200 kPa range model: ±0.2% of full scale
  0 to 25 kPa range model: ±2.5% of full scale
- Pressure display units (selectable):
  kPa, kgf/cm^2, mmH_2O, mmHg
  kPa, psi, inH_2O, inHg
- External dimensions:
  213 (W) × 132 (H) × 400 (D) mm
- Weight: approx. 9.5 kg

Manometers

MT210/MT210F/MT220/MT10

Precision Digital Manometer

MT210
Digital Manometer

- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range model)
- A wide range pressures, from a low differential pressure of 1 kPa to a high gauge pressure of 3000 kPa, and absolute pressure of 130 kPa
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210 Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Measuring range (differential pressure)
  0 to 1 kPa, 10 kPa, 130 kPa and 700 kPa
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Resolution
  0 to 1 kPa range model: 0.00001 kPa
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH_2O, inHg, kPa, kgf/cm^2, mmH_2O, mmHg
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 6.5 kg (0 to 130 kPa range model)

Fast Response Digital Manometer

MT210F
Digital Manometer

- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range model)
- Select from three measurement modes: normal speed, medium speed, and high speed
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT210F Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Response time (0 to 130 kPa range model, at high speed mode)
  50 msec max.
- Readout update interval (at medium and high speed mode)
  100 msec
- Resolution
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH_2O, inHg, kPa, kgf/cm^2, mmH_2O, mmHg
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 6.5 kg (0 to 130 kPa range model)

Digital Manometer For Efficient Field Calibration

MT220
Digital Manometer

- The de facto standard of field celibrators for pressure and ditferential pressure transmitters
- High accuracy: ±(0.01% of reading + 3 digits) (130 kPa range model)
- DCV/DCA measurement function (DMM function)
- 24 VDC power supply for driving the transmitter
- % display, error display, and measured data memory
- D/A conversion output, comparator output, and external trigger input (optional)
- Both gases and liquids measurable
- External attachable battery pack (optional)

MT220 Series Specifications

- Measuring range (gauge pressure: positive)
  0 to 10 kPa, 130 kPa, 700 kPa and 3000 kPa
  Measuring range (gauge pressure: negative)
  -80 to 0 kPa, -10 to 0 kPa
- Measuring range (absolute pressure)
  0 to 130 kPa abs
- Accuracy (for 0 to 10 kPa range model)
  ±(0.01% of reading + 0.015% of full scale) (at positive pressure)
- Resolution
  0 to 10 kPa range model: 0.0001 kPa
  0 to 130 kPa range model: 0.001 kPa
  0 to 700 kPa range model: 0.01 kPa
  0 to 3000 kPa range model: 0.01 kPa
- Maximum allowable input (for gauge pressure positive)
  0 to 10 kPa range model: 500 kPa gauge
  0 to 130 kPa range model: 500 kPa gauge
  0 to 700 kPa range model: 3000 kPa gauge
  0 to 3000 kPa range model: 4500 kPa gauge
- Pressure display units (selectable):
  psi, inH_2O, inHg, kPa, kgf/cm^2, mmH_2O, mmHg
- Measurement range of DCV/DCA measurement function
  0 to ±5.25 V
  0 to ±21 mA
- Accuracy of DCV/DCA measurement function (6 months after calibration)
  ±(0.05% of reading + 3 digits)
- 24 VDC output
  24 ± 1 VDC, 30 mA max.
- External dimensions:
  213 (W) × 132 (H) × 350 (D) mm
- Weight
  Approx. 7.0 kg (0 to 130 kPa range model)

Handheld Digital Manometer

MT10
Mini-Manometer

- Compact and lightweight (approx. 700 g), battery-operated
- High reliability (silicon resonant sensor adopted)
- Accuracy: ±(0.04% of rdg + 0.03% of FS) for 130 kPa model
- Three models for 130 kPa, 700 kPa, and 3000 kPa (gauge pressure)
- Data hold function
- RS-232-C interface
- Comes with carrying case

MT10 Series Specifications

- Type of pressure: gauge
- Three measuring ranges
  0 to 130 kPa, 0 to 700 kPa, and 0 to 3000 kPa
- Measurement display range:
  -2.5 to 110% of FS
- Accuracy:
  0 to 130 kPa range model
  ±(0.04% of rdg + 0.03% of FS)
  0 to 700 kPa and 0 to 3000 kPa range models
  ±0.1% of FS
- Resolution
  0 to 130 kPa range model: 0.01 kPa
  0 to 700 kPa range model: 0.1 kPa
  0 to 3000 kPa range model: 1 kPa
- Maximum allowable input
  0 to 130 kPa range model: 500 kPa
  0 to 700 kPa range model: 1000 kPa
  0 to 3000 kPa range model: 4500 kPa
- Effect of temperature
  Zero: ±0.02% of FS/10°C or less
  Span: ±0.02% of FS/10°C or less
- Pressure display units (specified at shipment)
  kPa, kgf/cm^2, mmH^2O, mmHg, Psi, inH^2O, inHg
- External dimensions:
  Approx. 72 (W) × 174 (H) × 60 (D) mm
  (excluding input connections)
- Weight: Approx. 700 g (including battery)

Time Interval Analyzers

TA720/TA220/TA120F

Continuous Measurement Up to 80 MS/s

TA720

Time Interval Analyzer

- Maximum Continuous Sampling Rate 80 MS/s
- Sampling rate:
  80MS/s continuous (at Single measurement function)
  50MS/s continuous (at Dual measurement function)
- Sampling Modes:
  Time stamp mode (T.S. Mode), Hardware histogram mode (H.H. Mode), Inter-symbol interference analysis mode (ISI mode)
- Dual Measurement Function
  This function enables two measurements to be done simultaneously.
- Inter-Symbol Interference Analysis Function
- Ethernet/PC Card Interface (optional)
- Built-in Printer (standard)
- GP-IB Interface (standard)
- 3.5-inch floppy drive (standard)
- TFT color LCD screen

Jitter Measuring Instrument Designed for Production Line Applications for Blu-ray Disc

TA220

Digital Jitter Meter

- Blu-ray Disc equalizer and PLL
- Limit equalizer (optional)
- Capable of measuring data-to-clock jitter and pulse width jitter
- Standard-equipped with function for analyzing data-to-clock jitter excluding 2T
- Inhibit function and block sampling function
- Standard-equipped with Ethernet and GP-IB interfaces
- A variety of display capabilities, with analog meter and two LED indicators
- Measurement Items
  Data-to-clock phase difference jitter and average value
  Pulse width jitter and average value (arbitrarily set window range LEFT or RIGHT)
  Level measurement
  Measuring range: 100 mVp-p to 2 Vp-p (3 mVp-p resolution)
- Equalizer
  Conventional equalizer circuit: ON/OFF
  (Blu-ray Disc standard Part1 Version 1.0 compliant)

High Precision, TIA Jitter Measurement

TA120F

Digital Jitter Meter

- High-precision, high-repeatability measurements using the TIA measurement principle
- High-speed measurements (maximum speed: 50 ms)
- Applicable to CD/DVD
- External synchronization enabled by inhibit and external arming functions
- Bi-phase measurement (optional)
- External I/O control (optional)
- Level measurement (optional)

TA120F Specifications

- Sampling rate: 10 MSps (at data-to-clock phase difference jitter measurements)
- Internal jitter: 3T jitter: 300 ps rms
  Data-to-clock phase difference jitter: 400 ps rms
- Measured parameters: 3T jitter, data-to-clock phase difference jitter, and moving average
  3T jitter: CDx1/arbitrary (x1.0 to x10)
  Data-to-clock phase difference jitter: 0 ns to 40 ns
- Measurement update rate: maximum 50 ms (at 100,000 samples, DVDx1, measurement on both edges)
- Sample size: 100,000 samples/100 ms/500 ms/arbitrary (1.0 ms to 1 second, 0.1 ms steps)
- Input specifications:
- RF input
  Input signal: RF signal (before/after passing equalizer, equalizer ON/OFF switching), binary signal (minimum input pulse width: 15 ns)

Trigger level: MAN = -5 V to +5 V (1 mV steps),
AUTO = Auto-slice,
AUTO + MANUAL = AUTO + set value

- Clock input:
  maximum input frequency: 25 MHz to 60 MHz
  Phase adjustment:
  0 to 40 ns (0.1 ns steps)
- Preset function:
  up to 7 settings can be saved
  The desired setting can be loaded
- External dimensions:
  Approx. 213 (W) × 132 (H) × 350 (D) mm
- Weight: Approx. 5 kg

Recorders **Selection Guide**

Recorders Panel mount type

Model / Item	DX1000	DX2000	DX1000N	DX100P	DX200P	CX1000	CX2000
							
Series	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION	DAQSTATION
Models	DX1002/DX1004/DX1006/DX1012	DX2004/DX2008/DX2010/DX2020/DX2030/DX2040/DX2048	DX1002N/DX1004N/DX1006N/DX1012N	DX102P/DX104P/DX106P/DX112P	DX204P/DX208P/DX210P/DX220P/DX230P	CX1000/CX1006/CX1200/CX1206	CX2000/CX2010/CX2020/CX2200/CX2210/CX2220/CX2410/CX2420/CX2610/CX2620
	Industrial recorder	Industrial recorder	Removable chassis model	Pharmaceutical model (21 CFR Part11)	Pharmaceutical model (21 CFR Part11)	Control and measurement station	Control and measurement station
Recorder type	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless
Number of inputs	2/4/6/12ch	4/8/10/20/30/40/48ch	2/4/6/12ch	2/4/6/12ch	4/8/10/20/30ch	0/6ch	0/10/20ch
Display	5.5 inch TFT color LCD	10.4 inch TFT color LCD	5.5 inch TFT color LCD	5.5 inch TFT color LCD	10.4 inch TFT color LCD	5.5 inch TFT color LCD	10.4 inch TFT color LCD
Max measurement interval	25 ms or 125 ms	25 ms or 125 ms	25 ms or 125 ms	125 ms or 1 s	125 ms or 1 s	1 s	1 s
Controlled points	–	–	–	–	–	Up to 2	Up to 6
Types of measurement inputs	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI
Chart speed	–	–	–	–	–	–	–
Alarm	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH
Number or alarm relay outputs	Up to 6 (optional)	Up to 24 (optional)	Up to 6 (optional)	Up to 6 (optional)	Up to 24 (optional)	Up to 6 (optional)	Up to 6 (optional)
Internal memory	80 MB or 200 MB (Flash memory)	80 MB or 200 MB (Flash memory)	80 MB or 200 MB (Flash memory)	5 MB (Flash memory)	5 MB (Flash memory)	1.2 MB (Flash memory)	1.2 MB (Flash memory)
External media	CF card	CF card	CF card	Zip disk, CF card	Zip disk, CF card	3.5-inch floppy disk, Zip disk, CF card	3.5-inch floppy disk, Zip disk, CF card
Standard communication interface	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
Optional communication interface	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485	RS232 or RS-422/485
Environmental worthiness	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C	IP65/NEMA4 0 to 50°C (5 to 40°C when Zip drive operation)	IP65/NEMA4 0 to 50°C (5 to 40°C when Zip drive operation)	IP65/NEMA4 0 to 50°C (5 to 40°C, if a floppy disk or Zip drive is in operation)	IP65/NEMA4 0 to 50°C (5 to 40°C, if a floppy disk or Zip drive is in operation)
Power supply	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC
Dimensions W×H×D (mm)	144×144×228.5	288×288×226	144×144×258.5	144×144×218	288×288×220	144×144×223.6	288×288×225.5

Recorders Desktop type

Model / Item	MV1000	MV2000	DR130	DR231	DR232
					
Series	MVAdvanced	MVAdvanced	DARWIN	DARWIN	DARWIN
Models	MV1004, MV1006, MV1008, MV1012, MV1024	MV2008, MV2010, MV2020, MV2030, MV2040, MV2048	DR130	DR231	DR232
	Portable desktop type	Portable desktop type	150 mm type	250 mm type	250 mm type
Recorder type	Paperless	Paperless	Chart	Chart	Chart
Number of inputs	4/6/8/12/24 ch	8/10/20/30/40/48 ch	Max. 20 ch	Max. 30 ch	Max. 300 ch
Display	5.5inch TFT color LCD	10.4inch TFT color LCD	VFD	VFD	VFD
Max measurement interval	25 ms or 125 ms	25 ms or 125 ms	2 s	2 s	500 ms
Controlled points	–	–	–	–	–
Types of measurement inputs	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor
Chart speed	-	-	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)
Alarm	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch
Number or alarm relay outputs	Up to 6 (optional)	Up to 12 (optional)	Up to 10 (optional)	Up to 10 (optional)	Alarm contact output option (10 CH) requied
Internal memory	80 MB (standard) 200 MB (large)	80 MB (standard) 200 MB (large)	512 KB (optional)	512 KB (optional)	512 KB (optional)
External media	CF card or USB memory	CF card or USB memory	3.5-inch floppy disk	3.5-inch floppy disk	3.5-inch floppy disk
Standard communication interface	Ethernet	Ethernet	–	–	–
Optional communication interface	RS232 or RS-422/485	RS232 or RS-422/485	Ethernet, RS232, or GP-IB	Ethernet, RS232, RS422A/485, or GP-IB modules	Ethernet, RS232, RS422A/485, or GP-IB modules
Environmental worthiness	0 to 40°C	0 to 40°C	0 to 50°C (5 to 40° C when Floppy disk operation)	0 to 50°C (5 to 40° C when Floppy disk operation)	0 to 50°C (5 to 40° C when Floppy disk operation)
Power supply	90 to 132 or 180 to 264 VAC, 10.0 to 28.8 VDC	90 to 132 or 180 to 264 VAC, 10.0 to 28.8 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC
Dimensions W×H×D (mm)	189×173×258	281×273×260	338×221×335	438×291×336	438×291×301

μR10000	μR10000	μR20000	μR20000	DR241	DR242
					
μR10000	μR10000	μR20000	μR20000	DARWIN	DARWIN
436101,436102,436103, 436104	436106	437101,437102,437103, 437104	437106,437112,437118, 437124	DR241	DR242
100 mm pen type	100 mm dot type	180 mm pen type	180 mm dot type	250 mm type	250 mm type
Chart	Chart	Chart	Chart	Chart	Chart
1/2/3/4ch	6ch	1/2/3/4ch	6/12/18/24ch	Max. 30ch	Max. 300ch
VFD	VFD	VFD	VFD	VFD	VFD
125 ms	1 s	125 ms	1 s or 2.5 s	2 s	500 ms
–	–	–	–	–	–
DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI	DCV, TC, RTD, DI, strain, mA, Pulse, Power monitor
5 to 12000 mm/h (82 increments)	1 to 1500 mm/h (1 mm step)	5 to 12000 mm/h (82 increments)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)	1 to 1500 mm/h (1 mm step)
4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH	4 levels/CH
Up to 6 (optional)	Up to 6 (optional)	Up to 12 (optional)	Up to 24 (optional)	Up to 10 (optional)	Alarm contact output option (10 CH) requied
–	–	–	–	512 KB (optional)	512 KB (optional)
–	–	–	–	3.5-inch floppy disk	3.5-inch floppy disk
–	–	–	–	–	–
RS-422/485, or Ethernet	RS-422/485, or Ethernet	RS-422/485, or Ethernet	RS-422/485, or Ethernet	Ethernet, RS232, RS422/485 GP-IB	Ethernet, RS232, RS422/485, or GP-IB modules
IP54 0 to 50°C	IP54 0 to 50°C	IP54 0 to 50°C	IP54 0 to 50°C	0 to 50°C (5 to 40°C when Floppy disk operation)	0 to 50°C subunit:-10 to 60 °C (5 to 40°C when Floppy disk operation)
90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 132 or 180 to 264 VAC	90 to 250 VAC	90 to 250 VAC
144×144×220	144×144×220	288×288×220	288×288×220	444×284×343	444×284×308

Module type

Model / Item	MW100	MX100	DA100-1	DA100-2	DC100-1	DC100-2
						
Series	DAQMASTER	DAQMASTER	DARWIN	DARWIN	DARWIN	DARWIN
Models	MW100	MX100	DA100-1	DA100-2	DC100-1	DC100-2
	Stand-alone model	PC measurement unit	Stand-alone model	Expandable model	Stand-alone model	Expandable model
Recorder type	Paperless	Paperless	Paperless	Paperless	Paperless	Paperless
Number of inputs	Max. 60 ch/unit	Max. 1200ch (20 units)	Max. 40 ch	Max. 300 ch	Max. 40 ch	Max. 300 ch
Display	–	–	–	–	VFD	VFD
Max measurement interval	10 ms	10 ms	500 ms	500 ms	500 ms	500 ms
Controlled points	–	–	–	–	–	–
Types of measurement inputs	DCV, TC, RTD, DI, strain, mA, pulse	DCV, TC, RTD, DI, strain, mA, pulse	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor	DCV, TC, RTD, DI, strain, mA, pulse, Power monitor
Chart speed	–	–	–	–	–	–
Alarm	4 levels/ch	2 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch	4 levels/ch
Number or alarm relay outputs	DO module (10 CH) required	DO module (10 CH) required	Alarm contact output option (10 CH) requied	Alarm contact output option (10 CH) requied	Alarm contact output option (10 CH) requied	Alarm contact output option (10 CH) requied
Internal memory	–	–	–	–	1 MB, 2 MB, or 4 MB	1 MB, 2 MB, or 4 MB
External media	CF Card (Max 2 GB, optional)	CF Card (Max 2 GB, optional)	–	–	3.5-inch floppy disk	3.5-inch floppy disk
Standard communication interface	Ethernet (Modbus/TCP)	Ethernet	–	–	–	–
Optional communication interface	RS232, RS-422/485, or CANBus	–	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules	Ethernet, RS232, RS422/485, or GP-IB modules
Environmental worthiness	-20 to 60°C	0 to 50°C	0 to 50°C	0 to 50°C (subunit:-10 to 60°C)	5 to 40°C	5 to 40°C (subunit: 0 to 60°C)
Power supply	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC	90 to 250 VAC, 10 to 32 VDC
Dimensions W×H×D (mm)	455×131×159	442×131×159	422×176×100	336×165×100	338×236×157	338×236×157

PC-based Data Acquisition Unit

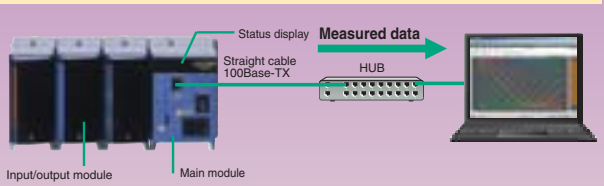
MX100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

Get Your System Set Up Quickly, from Desktop Measurement to Large-scale Data Logging

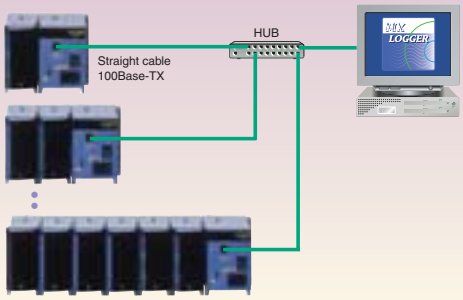
DAQMASTER

Connection between a single MX unit and a single PC (measurement of 24 channels/10 ms or 60 channels/100 ms)



CE

Connection between multiple MX units and a single PC



Overview

With its modular configuration that offers flexible scalability, the MX100 platform enables you to construct the optimal data logging system for your measuring environment with the freedom of high speed Ethernet, minimal wiring, and lack of constraints with regard to wiring distance. The MX gets you up and running in a short amount of time with a highly reliable, real time data logging system that meets your requirements for R&D, durability testing, quality assurance, and facilities monitoring.

Features

Maximum Performance...

■ High-Speed, Multi-Channel Capability, High withstand Voltage
- Shortest measurement interval of 10 ms (high-speed measurement of 10 ms on 24 channels or 100 ms on 60 channels is possible).
- Possible to acquire data from up to 1,200 channels (when using Yokogawa's proprietary software).
- Reinforced insulation between the input terminal and the case handles 3700 Vrms for one minute, or 600 Vrms/VDC continuous.

■ Multi-Interval Measurement
- Mixed use of three types of measurement intervals is enabled within the system (measurement intervals are set for each module).

Ease of Use...

■ Flexible System Configuration
By configuring modules, a system can be built or modified to utilize 4 to 1,200 channels, and measurement intervals of 10 ms to 60 s.

■ Versatile PC-Based Software Options
Software developed by Yokogawa, an API, and a LabVIEW driver are available.

■ Easy Software Setup
PC software developed by Yokogawa automatically identifies any connected MX100s.

■ No Re-Wiring between Measurements
A removable terminal unit is available.

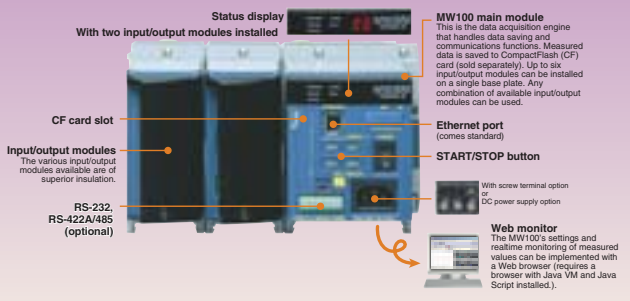
Data Acquisition Unit

MW100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

Combined Web Browser Monitoring and Data Logging of Plant and Equipment Data

DAQMASTER



CE

Overview

With your web browser, access any number of MW100s within a plant or installed on equipment to see real-time site conditions and equipment operating statuses. The functionality of the Web browser allows you to share information from multiple locations, and construct highly distributed remote monitoring/data acquisitions systems that are ideal for facilities management and equipment monitoring.

Features

Anytime, Anyplace...
- In a wide range of temperatures: -20 to 60°C[1,2,3,4]
- Reinforced insulation: Between input terminal and case[5], 3700 Vrms (one minute) or 600 Vrms/VDC (continuous)
- A wide variety of network functions: HTTP, FTP, DHCP, SNTP, E-mail, and others.
- DC power supply (12 V–28 V) option available.

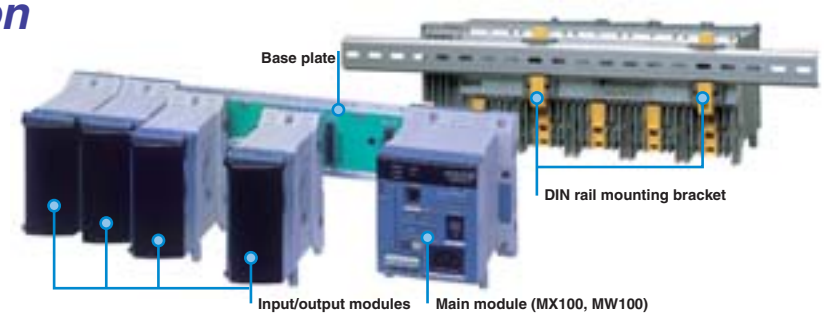
Smart Logging...
- High speed measurement with a single unit (10 channels/10 ms or 60 channels/100 ms): Shortest measurement interval of 10 ms
- Multi-interval: Enables mixing of three different measurement intervals in a single unit (measurement intervals can be set for each module)
- Supports CompactFlash (CF) cards[6] of up to 2 GB
Continuous data acquisition is possible on 60 channels at 100 ms for approximately ten days with a 2-GB card, or for three months on 60 channels at 1 s.
- MATH function on the main module available with the /M1 option.
- Collective data acquisition on 360 channels (via Modbus with the /M1 option)

1. The operating temperature range for the input modules and main module. The operating temperature range of the output modules is -20 to 50°C.
2. Note that the power cord supplied with the main module differs depending on the operating temperature range (see the specifications on page 7). If the operating temperature range specification of the supplied standard power cord does not meet your requirements, we recommend that you select a screw-type terminal rather than the plug type for the main module power inlet, and supply your own power input cable.
3. The operating temperature range of the AC adapter used with DC power supplies is 0 to 40°C.
4. Please consult with a representative for applications involving temperatures below -20°C.
5. The withstand voltage value with the MX110 input module. For the withstand voltage values of other input and output modules, please refer to the specifications for those modules (GS 04M10B01-01E).
6. CF card not included (sold separately).

DAQMASTER

System Configuration

The MX can be configured for your specific measurement needs by combining the main module, input/output modules, and a base plate. Assembled units can be used as-is on the desktop, or can be rack-or panel-mounted with provided DIN rails (DIN rail mounting brackets come standard with the MX150).



Input Modules

MX100 and MW100

Name	Model	Number of channels	Shortest measurement interval	Description
Universal Input Modules	MX110-UNV-H04	4	10 ms	DC voltage, thermocouple, 3-wire RTD, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
	MX110-UNV-M10	10	100 ms	DC voltage, thermocouple, 3-wire RTD, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
	MX110-VTD-L30	30	500ms	DC voltage, thermocouple, DI (non-voltage contact, Level (5 V logic)). Mixed input allowed.
4-Wire RTD and Resistance Input Module	MX110-V4R-M06	6	100 ms	DC voltage, 4-wire RTD, 4-wire resistance, DI(non-voltage contact, Level (5 V logic)). Mixed input allowed.
Strain Input Modules	MX112-B12-M04	4	100 ms	Built-in bridge resistance of 120 Ω
	MX112-B35-M04			Built-in bridge resistance of 350 Ω
	MX112-NDI-M04			For connection with an external bridge head and strain gauge type sensor (NDIS connector)
Pulse Input Module	MX114-PLS-M10	10		Non-voltage contact, open collector, and Level (5 V logic). Mixed input allowed. 10 kpulse/s
5 V Digital Input Module	MX115-D05-H10	10	10 ms	Non-voltage contact, open collector, and Level (5 V logic). Mixed input allowed.
24 V Digital Input Module	MX115-D24-H10	10	10 ms	Level (24 V logic), Vth = 12 V

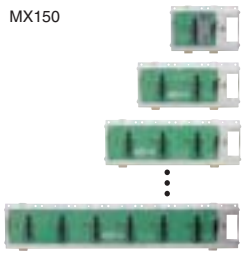
Output Modules

MX100 and MW100

Name	Model	Number of channels	Output update interval	Description
Analog Output Module	MX120-VAO-M08	8	100 ms	Allows mixed voltage (±10 V) and current (4-20 mA) output
PWM Output Module	MX120-PWM-M08	8	100 ms	Pulse width modulation output module
Digital Output Module	MX125-MKC-M10	10	100 ms	"A" contact (SPST)

Base Plate

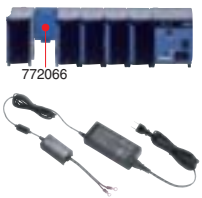
MX150



Base plates available for mounting the various MX100/MW100 I/O modules.

No. of slots	Model
1	MX150-1
2	MX150-2
3	MX150-3
4	MX150-4
5	MX150-5
6	MX150-6

Accessories



- Connector Cover
  Connector cover for open slots
- AC Adapter (772075)
  AC adapter for the DC power model.
  Operating temperature range: 0 to 40°C

Removable Terminal Plate/Connector

Input/output module's terminal plate can be removed, making wiring easier

(NDIS strain: excluding MX112-NDI-M04)

Model	Description
772061	Used in combination with the external M4 screw terminal block, RJC (reference junction compensation), and 772062. Applies to MX110-UNV-M10, MX115-D□□-H10
772062	Used in combination with the input module -M4 screw terminal block connection cable and 772061. Applies to MX110-UNV-M10 and MX115-D□□-H10
772063	Plate with clamp terminals (with RJC), applies to MX110-UNV-M10 and MX115-D□□-H10
772064	Clamp terminal, applies to MX110-UNV-H04
772065	Clamp terminal, applies to MX120-VAO-M08, MX120-PWM-M08, and MX125-MKC-M10
772067	Plate with clamp terminals, applies to MX110-V4R-M06
772068	Plate with clamp terminals with 120 Ω built in bridge resistance, applies to MX112-B□□-M04
772069	Plate with clamp terminal with 350 Ω built in bridge resistance, applies to MX112-B□□-M04
772080	Plate with M3 screw terminals (with RJC), applies to MX110-UNV-M10 and MX115-D□□-H10
772081	Plate with clamp terminal for current with 10 Ω built in bridge resistance, applies to MX110-UNV-M10
772082	Plate with clamp terminal for current with 100 Ω built in bridge resistance, applies to MX110-UNV-M10
772083	Plate with clamp terminal for current with 250 Ω built in bridge resistance, applies to MX110-UNV-M10

DAQMASTER
Quick Start Package

MX100 MW100

PC-based Data Acquisition System

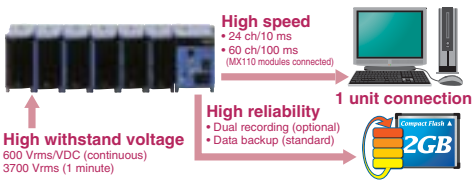
MX100
Quick Start Package

Simple! Compact Size! Ready to Run!
Fast set up- attach sensors, connect to your network, load software, and you are ready to measure and record data

- Universal inputs (DCV/TC/RTD/DI)
- 100 ms scan speed
- Multi-interval measurement and logging
- Trending and logging software with historical viewer included

Model	Suffix Code	Description
MX100		Main module
Software language	-E	English (with MX100 standerd software)
Supply voltage	-1	100 VAC-240 VAC
Power supply inlet and power supply cord	□	Power supply code
Options	/DS	Dual save function
Quick Start Package	/SL1	10 ch Quick Start Package
	/SL2	20 ch Quick Start Package
	/SL3	30 ch Quick Start Package

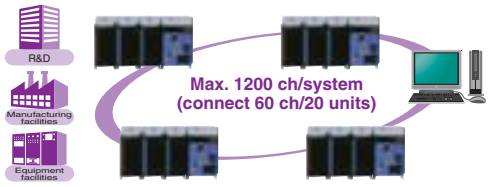
Single Unit Data Logging



MXStandard software (comes standard with the MX100) is designed for connections to a single unit, and is ideal for small-scale data acquisition at 24 ch/10 ms or 60 ch/100 ms.

The main unit is equipped with a CF card that adds to the reliability of your acquisition system by backing up data upon communication disconnections, and through the Dual recording function (optional).

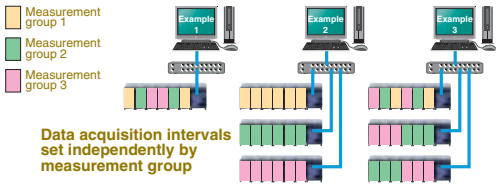
Multi Unit Data Logging



With MXLOGGER (sold separately), you can quickly set up a large-scale data acquisition system of up to 1200 ch/20 units with no programming required.

Equipped with high speed Ethernet communication (100Base-TX), enables creation of flexible measuring systems without the constraints of total cable length and connection formats.

Multi Interval Data Logging



By assigning input modules to one of three measurement groups, you can set measuring intervals for signals from transients to temperature on a group-by-group basis.

Through separate waveform observation by measurement group, you can easily find correlations in waveform changes and identify trends, improving efficiency of analysis of phenomena

Web-enabled Data Acquisition and Data Logging System

MW100
Quick Start Package

Simple! Compact Size! Ready to Run!
Fast set up- attach sensors, connect to your network, configure with your web browser, and you are ready to measure and record data- no special software needed. Built-in data logging to high capacity Compact Flash media

- Real-time data monitoring with a web browser
- Universal inputs (DCV/TC/RTD/DI)
- 100 ms scan speed
- Multi-interval measurement and logging to high capacity CompactFlash media
- Email messaging and file transfer via FTP

Model	Suffix Code	Added Specifications Code	Description
MW100			Main module *1, 2
Language	-E		English (comes with MW100 Viewer Software)
Supply voltage	-1		100 VAC-240 VAC
	-2		12 to 28 VDC, with AC adapter *3
	-3		12 to 28 VDC, without AC adapter *4
Power input type and power supply cord	□		Power supply code
Options		/C2	RS-232 communication interface *5, 6
		/C3	RS-422-A/485 communication interface *5, 6
		/M1	MATH functions *6, 7
Quick Start Package		/SL1	10 ch Quick Start Package
		/SL2	20 ch Quick Start Package
		/SL3	30 ch Quick Start Package

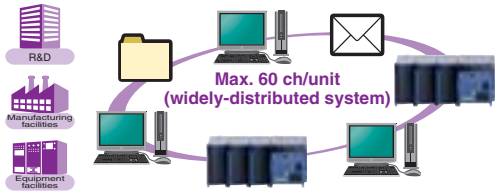
*1 CF (compact flash) card not included.
*2 Modbus/TCP function comes standard
*3 "W" cannot be selected with "-2"
*4 With -3, only W (screw terminal) can be selected
*5 /C2 and /C3 cannot be selected together.
*6 /C2 or /C3 must be selected when using the Modbus/RTU slave function. Also, "/M1" must be selected for use of the Modbus/RTU master function.
*7 /M1 must be selected when using the Modbus/TCP client function.

On-Demand, Remote Measuring System

Point a Web browser to URL of the MW100, access the MW100 at the site, and browse any data, any time.

From changing settings to Starting/Stopping data acquisition, the MW100 is easy to operate with a familiar, Web browser interface.

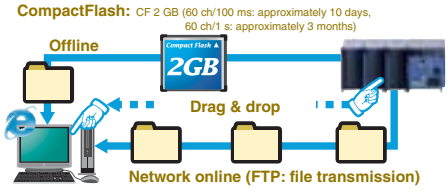
Multi-User & Multi-Access



Use measuring and networking technology to share a broad range of data from the field and access multiple facilities simultaneously with a Web browser to check on the status of equipment.

Comes with DHCP (automatic IP address assignment) and SNTP (time correction function) for connections with Modbus-compatible instruments (requires the /M1 MATH option on the client side)

Long Duration Memory & File Transmission



Point a Web browser to URL of the MW100 to send MW100 data files with drag-and-drop ease

Files can be sent automatically as they are created, or manually transferred with the CF card in the main unit

MVAdvanced

MV1000/MV2000

Powerful & Portable Data Acquisition Stations

MVAdvanced

Features

- Multi-channel universal inputs Best-in Class
  MV1000: up to 24 input channels
  MV2000: up to 48 input channels
- Secure, high capacity memory Best-in Class
  Internal memory: 200 MB
  (Example: Save 12 channels of data every second for about 75 days!)
  Choice of CompactFlash and USB removable storage media
- Removable input terminals simplify field wiring
- Lightweight aluminum construction (MV2000)
- Choice of secure binary or versatile text data file formats
- Advanced network connectivity with Email, file transfer, and web server functions.

Standard Universal Inputs With The Capacity You Need

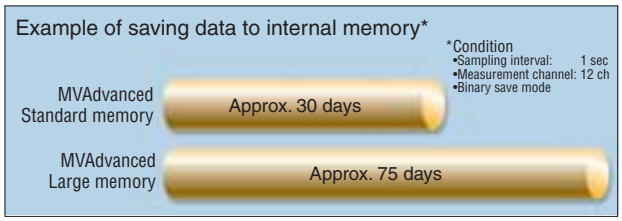
MV1000: up to 24 input channels, MV2000: up to 48 input channels MV2000 is expandable to 348 channels (48 local plus 300 external) using optional external data acquisition hardware Measures thermocouples, RTD, DI, and almost any DC voltage sensor.

Fast Setup And Multilingual Menus

Quick setting menu the system is ready to measure after visiting three menus. USB port attach a PC keyboard for setup or use a memory device to transfer setting files and data between a PC and MVAdvanced. Multilingual menus, supporting Chinese, English, French, German, Japanese, and Korean languages.

Large Memory

Up to 200 MB of secure, non-volatile flash memory is used for real-time data storage. Saved data is retained during power outages of any duration, and the MVAdvanced automatically resumes measurement and storage immediately after power is restored. CompactFlash removable media stores archived data files for convenient transport to your PC environment.



Removable Input Terminals

Plug-in connectors attach quickly to your wiring and enhance portability. Extra connectors are a low cost accessory.

Text File Format

MVAdvanced can save data files in a .txt text file format, which allows a wide range of common software applications to readily open and access your test data. For data security, a binary file format can also be used.

MV1000/MV2000 Specifications

Models and Input Capacity

Input channels and measurement interval

Model	Type	Measurement Interval*
MV1000	MV1004 (4 channels), MV1008 (8 channels)	125 ms (25 ms)
	MV1006 (6 channels), MV1012 (12 channels), MV1024 (24 channels)	1 s (125 ms)
MV2000	MV2008 (8 channels)	125 ms (25 ms)
	MV2010 (10 channels), MV2020 (20 channels), MV2030 (30 channels), MV2040 (40 channels), MV2048 (48 channels)	1 s (125 ms)

* Numbers in parentheses are when in high-speed mode.

Memory

Internal memory
Capacity: standard: 80 MB
large: 200 MB

Removable Storage Media

Type: Compactflash (CF) memory card, USB memory
Capacity: Up to 2 GB (32 MB CF card included)
Format: FAT16 or FAT32

Software

Includes configuration and file viewer and conversion PC software

Dimensions

MV1000: 189 (W) × 177 (H) × 259 (D) mm
MV2000: 307 (W) × 273 (H) × 260 (D) mm

Weight

MV1000: approximately 3.5 kg
MV2000: approximately 5.6 kg

Laboratory Recorders

LR12000E/LR8100E

http://www.yokogawa.com/ns/daq/daq-index_penrecorder.htm

Intelligent Pen Recorders

CE

LR12000E
Multipen Laboratory Recorder

- Ten- or twelve-pen models
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR12000E Specifications

- Operating method: digital servo
- Number of channels: 10 or 12
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μV (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 600 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 30 m long
- Recording pen: disposable felt-pen
- Pen gap: about 3.5 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 6 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC
- Option: remote control, 12 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive
- Dimension: Approx. 438 (W) × 266 (H) × 434 (D) mm
- Weight: Approx. 20 kg (for 12 pens)

CE*

LR8100E
Laboratory Recorder

- Four-, six-, or eight-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR8100E Specifications

- Operating method: digital servo
- Number of channels: 4, 6 or 8
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μV (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 30 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 8 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC or DC (optional)
- Option: remote control, 8 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive, computation, 10 to 32 V DC drive
- Dimension: Approx. 438 (W) × 266 (H) × 310 (D) mm
- Weight: Approx. 16 kg (for 8 pens)

CE*: Except the -/B model

Laboratory Recorders

LR4100E/LR4200E

http://www.yokogawa.com/ns/daq/daq-index_penrecorder.htm

Intelligent Pen Recorders

CE*

LR4100E
Laboratory Recorder

- One-, two-, three-, or four-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard), floppy disk drive (optional)

LR4100E Specifications

- Operating method: digital servo
- Number of channels: 1, 2, 3, or 4
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μV(for 1 mV or more voltage range)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 20 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 4 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard), floppy disk drive (optional)
- Power supply: AC or DC (optional)
- Option: remote control, 4 alarm point output, communication (via GP-IB or RS-232C), floppy disk drive, computation, 10 to 32 V DC drive
- Dimension: Approx. 438 (W) × 199 (H) × 323 (D) mm
- Weight: Approx. 14 kg (for 4 pens)

CE*: Except the -/B model

CE*

LR4200E
Flat-Bed Laboratory Recorder

- One-, two-, three-, or four-pen model
- Universal input of voltages, thermocouples, or RTDs
- Crisp, color recording and a wealth of printing functions
- High reliability owing to non-contact technologies
- IC memory card (standard)

LR4200E Specifications

- Operating method: digital servo
- Number of channels: 1, 2, 3, or 4
- Input mode: guarded floating input
- Measurement accuracy: 0.05% of reading + 0.03% of range + 1.0 μV (for 1 mV or more)
- Measuring range: 0.1 mV to 200 V FS (high sensitivity model), 12 types of thermocouples, and RTDs
- Measurement cycle: 135 Hz at fastest
- Chart speed: 10 to 1200 mm/h or mm/min
- Chart paper: effective recording width of 250 mm; fan-folded, 20 m long
- Recording pen: disposable felt-pen
- Pen gap: about 4 mm, provided with phase synchronization function as standard
- Printing: wire dot, ink-ribbon (monochromatic)
- Display: fluorescent display tube (5 by 7 dots); 4 lines with 20 characters each
- Display contents: digital values, bar graph and range
- Memory: IC card slot (standard)
- Power supply: AC
- Option: remote control, 4 alarm point output, communication (via GP-IB or RS-232C), computation, roll chart, re-roll function
- Dimension: Approx. 448 (W) × 455 (D) × 185 (H) mm
- Weight: Approx. 14 kg (with 4 pens)

CE*: Except the -/B model

Data Acquisition Unit

DA100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

PC-Based Data Acquisition Unit

DA100

Data Acquisition Unit

The DA100 data acquisition unit provides a data acquisition environment that is expandable and has a high level of design freedom, using a PC as the user interface.

- High level of design freedom
  The DA100 is available as a small standalone model capable of data acquisition on as many as 40 channels, and an expandable model that can be expanded up to 300 channels directly by the user.
- Networking capability
  The DA100 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- PC-friendly
  The included data logging software makes it easy to create a PC-based data acquisition environment.
- High-speed, high-precision measurements
  The DA100 is capable of high-speed, high-precision measurements with a scanning speed of 300 channels per 500 ms.
- Wide variety of I/O modules
  A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, distortion, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.
- An economically sensible choice
  Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.

DA100 Specifications (some specifications are for separately sold options)

Inputs:
  Expandable/changeable at the individual module level
  Standalone model: 10 to 40 channels
  Expandable model: 10 to 300 channels
Input types:
  DC voltage (±20 mV to ±50 V), thermocouples (R, S, B, K, E, J, T, N, W, L, U), RTD, mA, pulse, power monitor, strain, DI, etc.
Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
Remote measurement (expandable model):
  Maximum total distance using special cables: 500 meters
  Maximum number of connected subunits: 6
Measurement interval: 0.5–60 seconds
Integration time: 50 ms, 60 ms, 100 ms
Other: Alarm output
Options: Computation function, report computation function
PC software: DAQ 32Plus, DAQLOGGER
Dimension:
  Standalone: Approx. 422 (W) × 176 (H) × 100 (D) mm
  Expandable model: Approx. 336 (W) × 165 (H) × 100 (D) mm
  Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
Weight: Approx. 4 kg (with module attached)

Data Collector

DC100

http://www.yokogawa.com/ns/daq/daq-index_daq.htm

Data Collector

DC100

Data Collector

The DC100 is a data collector that lets you monitor various I/O signals using many different display functions on a large monitor, while saving the data to internal memory. With its large memory capacity, a single DC100 unit can meet a variety of user needs, such as mobility in terms of ease of handling in the field and portability; environmental durability with a PC-free, chart-free design; and economics in terms of effective use of measurement data and superior cost performance.

- Support for efficient data processing
  With its large memory capacity (specify 1 MB, 2 MB, or 4 MB of internal memory when placing your order), the DC100 enables efficient data acquisition. You can even transfer data to a PC while simultaneously backing up to internal memory. The DC100 comes standard with a 3.5-inch floppy drive, and an optional SCSI interface is available.
- Superior mobility
  With a lightweight (approximately 5 kg)*, compact (approximately 20 cm depth) design, the DC100 is ideal for vehicle installations or use as a portable data collector.
  (*With 40-channel input module attached to DC100 main unit.)
- Tremendous function expandability
  The DC100 gives you the flexibility to change and expand your configuration, from a small-scale 10-channel standalone unit up to a large-scale 300-channel data acquisition system. A variety of input types are available, including DC voltage, temperature (thermocouple, RTD), contacts, power monitor, pulse, strain, and DC current (mA).
- High-speed, high-precision measurements
  The DC100 is capable of high-speed, high-precision measurements with a maximum scanning speed of 500 ms for all channels.
- Networking capability
  The DC100 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.

DC100 Specifications (some specifications are for separately sold options)

Input channels:
  Standalone model: 10 to 40 channels
  Expandable model: 10 to 300 channels
Measurement interval: 0.5–60 seconds
A/D integration time: 20 ms (50 Hz), 16.7 ms (60 Hz), 100 ms (10 Hz)
Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, strain, DI
Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
Other: Alarm output, remote functions
Internal memory capacity:
  1 MB standard; 2 MB or 4 MB available as options (specify when ordering)
External storage media: 3.5-inch floppy drive (standard), optional SCSI interface
Remote measurement (expandable model):
  Maximum total distance using special cables: 500 meters
  Maximum number of connected subunits: 6
PC software: DAQ 32Plus, DAQLOGGER
Dimension:
  DC100 main unit: Approx. 338 (W) × 236 (H) × 157 (D) mm
  Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
Weight: Approx. 5.3 kg (with module attached)

Portable Hybrid Recorder

DR130

http://www.yokogawa.com/ns/daq/daq-index_darwin.htm

Portable Hybrid Recorder

DR130
Portable Hybrid Recorder

The DR130 portable hybrid recorder has superior mobility and functionality with advanced functions and high reliability packed into a compact body weighing less than 10 kg. The included floppy drive makes it easy to exchange data with a PC.

- Small, lightweight, and portable
  The DR130's overall size and weight have been reduced compared to older models. It can be used in building a simple network or connected to a LAN to support remote data acquisition and centralized data management.
- Networking capability
  The DR130 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- Floppy drive for saving data
  Settings and measurement data can be saved to the floppy drive. Measurement data is saved via the included 512 KB of SRAM for better reliability. The included 32Plus data acquisition software lets you convert measurements to Excel and Lotus 1-2-3 formats.
- PC-friendly
  Powerful PC software makes it easy to create a PC-based data acquisition environment.
- Universal input
  The input unit, which isolates each channel, has a built-in signal conditioner function that enables universal measurement of a variety of inputs (voltage, thermocouple, RTD, contacts).

DR130 Specifications (some specifications are for separately sold options)

Inputs: 10 or 20 channels (specify when ordering)
Input types: DC voltage, thermocouple, RTD, DI
Communication standards: GP-IB, RS-232, Ethernet
Measurement interval: 2–60 seconds
Recording interval: Minimum 2 seconds
Recording specifications: 10-color dot recording, 150 mm effective recording width
Display: VFD 5 × 7 dot matrix, 3-line display
Memory: 3.5-inch floppy drive with 512 KB SRAM
Options:
  Computation function, alarm output, remote function, power monitor, report computation function
PC software:
  DAQ 32Plus, DAQLOGGER
Dimension: Approx. 338 (W) × 221 (H) × 335 (D) mm
Weight: Approx. 9.3 kg

Hybrid Recorder

DR230

http://www.yokogawa.com/ns/daq/daq-index_darwin.htm

Hybrid Recorder

DR230
Hybrid Recorder

- The DR230 hybrid recorder provides excellent function expandability and design freedom as an R&D tool for all industries, for applications ranging from small-scale data logging up to multi-point data collection.

- Superior design freedom
  The DR230 provides flexibility to change or expand from small-scale data logging up to multi-point data collection. The DR230 is available as a simple 30-channel (maximum) standalone model and an expandable model that can be expanded from 10 to 300 channels directly by the user.
- Networking capability
  The DR230 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- An economically sensible choice
  Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.
- High-speed, high-precision measurements
  The DR230 is capable of high-speed, high-precision measurements with a scanning speed of 300 channels per 500 ms.
- PC-friendly
  You can easily create a PC-based data acquisition environment. In addition, a floppy drive can be added.
- Wide variety of I/O modules
  A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, strain, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.

DR230 Specifications (some specifications are for separately sold options)

Inputs:
  Standalone model: 10, 20, or 30 channels (specify when ordering)
  Expandable model: 10 to 300 channels (can be expanded or changed)
Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, distortion, DI
Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
Other: Alarm output, remote function
Remote measurement (expandable model):
  Maximum total distance using special cables: 500 meters
  Maximum number of connected subunits: 6
Measurement interval: 0.5 second (expandable model) to 60 seconds (measurement interval range for standalone model starts at 2 seconds)
Recording interval: Minimum 2 seconds
Recording specifications: 10-color dot recording, 250 mm effective recording width
Display: VFD 5 × 7 dot matrix, 3-line display
Memory: 3.5-inch floppy drive with 512 KB SRAM
Options: Computation function, report computation function
PC software: DAQ 32Plus, DAQLOGGER
Dimension:
  Standalone: Approx. 438 (W) × 291 (H) × 336 (D) mm
  Expandable model: Approx. 438 (W) × 291 (H) × 301 (D) mm
  Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
Weight: Approx. 13 kg (with module attached)

Introducing the New DX Series
(Data Acquisition Station)

DX1000/DX2000

http://www.daqstation.com

DXAdvanced R3

DAQSTATION reaches a new dimension

Basic Functions

- Up to 48 channels of input
- User can start/stop recording by batch, and create data files! NEW!
- Expandable to up to 348 channels with the MW100 automatic connection function

Display & Operation

- Arrange the display your way with a custom display function! NEW!
- Review historical data with date and time calendar search functions NEW!

Networking

- Standard Ethernet interface
- Supports the PROFIBUS-DP and EtherNet/IP protocols! NEW!
- Expanded Web and networking functions!

Reliability and Security

- Dust- and splash-proof front panel (IP65, NEMA4 compliant)
- Highly reliable internal memory with error-correction function
- Front panel door lock and login function

Application Software

- Software for a variety of tasks including analysis, settings, and acquisition

DAQSTANDARD:
Supports settings and data file analysis

DAQStudio:
Builder software for custom displays NEW!

DAQWORX:
Integrated Data Acquisition Software Suite

Large Memory

Max 200 MB of flash memory can be installed as internal memory
Max 2GB of CF card can be installed as removable memory

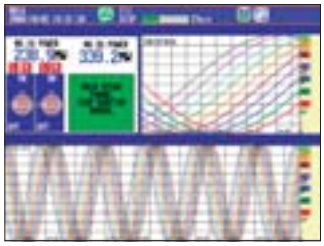
DX2000 (200MB)

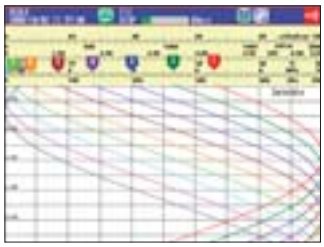
Display update (min/div)	30 min/div
Save interval (sec)	60 sec
Total sample time	Approx.1085 days

USB Interface

Front and Rear 1 port each
► Keyboard : 104 or 89 US Key board, USB Class Ver 1.1
► Memory : USB Flash Drive

Customizable Display Screens ! NEW!






DX1000/DX2000 Specifications

Inputs
Number of inputs:
DX1000: 2, 4, 6, 12 channels
DX2000: 4, 8, 10, 20, 30, 40, 48 channels
Measurement interval:
DX1002, DX1004, DX2004, DX2008:
125 ms, 250 ms, 25 ms (fast sampling mode)
DX1006, DX1012, DX2010, DX2020, DX2030, DX2040, DX2048:
1 s, 2 s, 5 s, 125 ms (fast sampling mode)
Inputs: Universal inputs
DCV (20, 60, 200 mV, 2, 6, 20, 50 V, 1-5 V)
TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
RTD (Pt100, JPt100)
DI (Contact input, TTL level)
DCA (With external shunt resister attached)

Display
Display unit:
DX1000: 5.5-inch TFT color LCD (320×240 pixels)
DX2000: 10.4-inch TFT color LCD (640×480 pixels)

Data saving function
External storage medium:
Medium: CompactFlash memory card (CF card)
Internal memory:
Medium: Flash memory
Capacity: Selectable from 80 MB or 200 MB

Alarm function
Number of alarm levels: Up to four levels for each channel
Alarm types: High and low limits, differential high and low limits, high and low rate-of-change limits and delay high and low

Ethernet communication function
Connection: Ethernet (10Base-T)
Protocols: TCP, UDP, IP, ICMP, ARP, DHCP, HTTP, FTP, SMTP, SNTP, Modbus, DX private

Construction
Front panel: Water and dust-proof (based of IEC529-IP65 and NEMA No.250 TYPE4*)
*Except external icing test.
Dimensions:
DX1000: 144(W)×144(H)×229(D)* mm *max.
DX2000: 288(W)×288(H)×226(D)* mm *max.

DAQSTATION Control and Measurement Station

CX1000/CX2000

http://www.yokogawa.com/ns/daq/daq-index_recorder.htm

All-in One Controller That Integrates Monitoring and Recording Functions

CE

CX1000/CX2000

Control and Measurement Station

DAQSTATION CX1000/CX2000 have up to 6 embedded loops. CX is a control and measurement station to collect/display control data of up to 16 external Green series controllers. CX standard control operation screens allow to monitor control data. With a program control (option), CX realizes functional program operation.

- Using DAQSTATION CX as a Data Collector
  DAQSTATION CX can record embedded loop data, measurement data, and external controller data. Control statuses and operation statuses can be recorded, It is easy to collect data for quality control and creating reports.
- Using DAQSTATION CX as a Control Terminal
  DAQSTATION CX lets you control, monitor, and collect data from controllers in various locations. The screens needed for controller operation and monitoring are included as standard features. The user-friendly display function lets you set operation parameters for Green series units.
- Fewer Cables
  Measurements from Green series units are transmitted to a DAQSTATION CX through an RS-485 interface. As all Green series controllers do not have to wire to CX, it can eliminate the need for individual twisted pair input wiring from the controller to CX.
- Network-Based Monitoring
  DAQSTATION CX can be set to transmit an E-mail when a controller outputs an alarm. This lets you monitor for alarms even if you are not on site. In addition, the DAQSTATION CX screen can be displayed on any PC Web browser.
- Internet Functions
  Standard Ethernet easily enables CX1000/CX2000 to be operated in existing LAN/WAN environment. The internet functions are E-mail notification, Web browser remote monitoring, and FTP file transfer.

CX1000/CX2000 Specifications

Display: 5.5-inch TFT color LCD (CX1000)
10.4-inch TFT color LCD (CX2000)
Control mode: Single loop, cascade control, and loop control with PV switching.
Control computation functions: Continuous PID control, relay ON/OFF control, time-proportionate PID control, overshoot control function (Super)
Control interval: 250, 500, 1000 ms
Number of control loop: 0, 2 (CX1000)
0, 2, 4, 6 (CX2000)
Measurement interval:1, 2 seconds
Measurement channels: 0, 6 (CX1000)
0, 10, 20 (CX2000)
Universal output type: 4-20 mA current output/Voltage pulse/Relay contact output
Contact input: 6 points per each 2 loops
Open collector transistor output: 4 points per each 2 loops
Make contact relay output: 2 points per each 2 loops
Ethernet: Standard feature
RS422A/485 or RS232: Only one can be specified
Program control function: Program patterns: 4 max (/PG1) or 30 max (/PG2)
Segments: Max 99 per pattern
Total segments: 300 max
External storage media: Floppy disks, Zip disks, CompactFlash memory card
Number of connecting Green series controllers: 4 (CX1000)
16 (CX2000)
Ladder communication: Available
Mathematical function: 12 channels (CX1000)
30 channels (CX2000)
Dimensions:
CX1000: 144 (W) × 144 (H) × 223 (D) mm
CX2000: 288 (W) × 288 (H) × 225.5 (D) mm
Weight: CX1000: Approx. 3.0 kg
CX2000: Approx. 6.3 to 7.7 kg

DAQSTATION

DX100/DX200

http://www.yokogawa.com/ns/daq/daq-index_recorder.htm

Data Acquisition Station with Networking Capabilities

CE

DX100/DX200

DAQSTATION

Yokogawa's DX Series of next-generation data acquisition stations go beyond conventional recorders to provide leading-edge networking functions and powerful information processing capabilities.

- Leading-edge networking functions
  The DX100/DX200 are standard-equipped with an Ethernet port so you can immediately connect to an existing LAN or WAN. Networking functions such as email notifications, remote monitoring through a Web browser, and FTP file transfers are supported.
- A variety of display functions
  The DX100/DX200 have wide-viewing-angle, high-resolution TFT color liquid crystal displays. The display size is 5.5 inches on the DX100 and 10.4 inches on the DX200. In addition to trend displays, the DX100/DX200 have a variety of other display functions, such as bar graph display, digital display, overview display, and past trend display.
- Flexible storage options
  The DX100/DX200 support the following external storage media: 3.5-inch floppy drive (1.44 MB), CompactFlash memory card, Zip disk.
- Robust design for maximum reliability
  Internal memory is flash memory, which does not require a battery backup. The case front has a dust-proof, drip-proof design, and conforms to the IEC529-IP65 standard and NEMA No. 250 TYPE4 (excluding icing test).
- Integration through application software
  The application software can be used to enter settings whether the DX Series is online or offline, and to easily build networked systems for data monitoring, file transfer, data logging, etc. The DAQOPC (OPC server) interface package lets you interface your DX Series with other equipment and build network systems in a timely manner.

DX100/DX200 Specifications

Inputs: 2, 4, 6, or 12 channels (DX100)
4, 8, 10, 20, or 30 channels (DX200)
Input types: DC voltage ±20 mV to ±50 V
Thermocouples: R, S, B, K, E, J, T, N, W, L, and U
RTD: Pt100, JPt100
Operation recording
DC current (externally attached shunt resistor)
* Any mix of inputs
Display: 5.5-inch TFT color liquid crystal display (DX100)
10.4-inch TFT color liquid crystal display (DX200)
External storage media: Specify any of the following when placing your order:
3.5-inch floppy drive (1.44 MB)
CompactFlash memory card
Zip disk
Recording capacity:
Approximately 1 month on 6 channels (with no computation channel, at 60-second sampling interval)
A variety of sampling intervals can be set.
Alarm types:
Upper and lower limits, delay upper and lower limits, difference upper and lower limits, change rate upper and lower limits
Option specifications:
Alarm output, RS-422A, RS-232, FOUNDATION™ Fieldbus communication function, remote control, FAIL/memory end output, computation/report function, batch function, 24 V DC transmitter power output, 24 V DC/AC power driving, VGA output (DX200), etc.
Dimensions: DX100: 144 (W) × 144 (H) × 218 (D) mm
DX200: 288 (W) × 288 (H) × 220 (D) mm
Weight: DX100: Approx. 3.0 kg
DX200: Approx. 6.6 to 7.3 kg

DAQSTATION
Pharmaceutical Models

DX100P/DX200P

http://www.yokogawa.com/ns/daq/daq-index_recorder.htm

Data Acquisition Station of 21 CFR Part 11 Compliant

DX100P/DX200P

DAQSTATION

■ Comply with the requirements of FDA reguration 21 CFR Part 11
- Electronic recording standards are supported through the following capabilities: binary data saving, batch function, login function, and operation history saving.
- Electronic signature standards are supported by the sign-in function and login function.

■ Application software
- Sign-in through DX100P/DX200P and through PC software.
- Sign-in information is stored as attachments to measurement files to protect the security of the original data.

■ Leading-edge networking functions
The DX100P/DX200P are standard-equipped with an Ethernet port so you can immediately connect to an existing LAN or WAN. Networking functions such as email notifications, remote monitoring through a Web browser, and FTP file transfers are supported.

■ A variety of display functions
The DX100P/DX200P have wide-viewing-angle, high-resolution TFT color liquid crystal displays for superior screen clarity. In addition, they have a variety of display functions, including trend, bar graph, digital, and overview displays.

■ Flexible storage options
The following storage media options can be selected according to your applications: CompactFlash memory card, Zip disk. In addition, a variety of file formats are supported, so you can efficiently save just the data you need. Because the DX Series do not use paper or ink for recording, efficiency is improved and total cost of ownership is reduced.

■ Maximum reliability
Internal memory is flash memory, which does not require a battery backup. You can also back up data to multiple destinations through your network.

DX100P/DX200P Specifications

Inputs: 2, 4, 6, or 12 channels (DX100P)
4, 8, 10, 20, or 30 channels (DX200P)
Input types:
DC voltage (20 mV to 50 V), thermocouple, RTD, operation recording, DC current (externally attached shunt resistor)
* Any mix of inputs
Contacts
Display: 5.5-inch TFT color liquid crystal display (DX100P)
10.4-inch TFT color liquid crystal display (DX200P)
External storage media: Specify any of the following when placing your order:
CompactFlash memory card
Zip disk
Recording capacity:
Approximately 100 days on 6 channels (with no computation channel, at 60-second sampling interval)
A variety of sampling intervals can be set.
Alarm types:
Upper and lower limits, delay upper and lower limits, difference upper and lower limits, change rate upper and lower limits
Option specifications:
Alarm output, RS-422A, RS-232, FAIL/memory end output, computation/report function, remote control, 24 V DC transmitter power output, 24 V DC/AC power driving, VGA output (DX200P), etc.
Dimensions: DX100P: 144 (W) × 144 (H) × 218 (D) mm
DX200P: 288 (W) × 288 (H) × 220 (D) mm
Weight: DX100P: Approx. 3.0 kg
DX200P: Approx. 6.6 to 7.3 kg

Hybrid Recorder

DR240

http://www.yokogawa.com/ns/daq/daq-index_darwin.htm

Hybrid Recorder

DR240

Hybrid Recorder

The DR240 hybrid recorder is a panel-mounted industrial recorder equipped with a highly reliable, high breakdown solid-state relay developed by Yokogawa. This recorder has excellent environmental durability and is ideal for process monitor applications.

- Environmental durability you can rely on
The DR240 provides the environmental durability and reliability you need for applications in harsh field environments. The input scanner unit contains a surface-mounted high breakdown solid-state relay developed by Yokogawa. This feature helps significantly reduce the unit's size while improving reliability.
- Superior design freedom
The DR240 is available as a simple 30-channel (maximum) standalone model and an expandable model that can be expanded from 10 to 300 channels in the field.
- Networking capability
The DR240 can be equipped with an Ethernet (10BASE-T) port so you can build a simple network or connect to an on-premises LAN for remote data acquisition and centralized data management.
- An economically sensible choice
Remote measurement at distances up to 500 meters reduces wiring requirements, and the unit's small size helps you save space.
- PC-friendly
You can easily create a PC-based data acquisition environment. In addition, a floppy drive can be added.
- Wide variety of I/O modules
A wide variety of input modules are available, including voltage, temperature (thermocouple, RTD), contact, strain, pulse, power monitor, and mA (DC current). The large array of modules also includes a communication module and alarm output module.

DR240 Specifications (some specifications are for separately sold options)

Inputs:
Standalone model: 10, 20, or 30 channels (specify when ordering)
Expandable model: 10 to 300 channels (can be expanded or changed)
Input types: DC voltage, thermocouples, RTD, mA, pulse, power monitor, strain, DI
Communication standards: GP-IB, RS-232-C, RS422A/485, Ethernet
Other: Alarm output, remote function
Remote measurement (expandable model):
Maximum total distance using special cables: 500 meters
Maximum number of connected subunits: 6
Measurement interval:
0.5 second (expandable model) to 60 seconds (measurement interval range for standalone model starts at 2 seconds)
Recording interval: Minimum 2 seconds
Recording specifications: 10-color dot recording, 250 mm effective recording width
Display: VFD 5 × 7 dot matrix, 3-line display
Memory: 3.5-inch floppy drive with 512 KB SRAM
Options: Computation function, report computation function
PC software: DAQ 32Plus, DAQLOGGER
Dimension:
Standalone: Approx. 444 (W) × 288 (H) × 343 (D) mm
Expandable model: Approx. 444 (W) × 288 (H) × 308 (D) mm
Subunit: Approx. 422 (W) × 176 (H) × 100 (D) mm
Weight: Approx. 16 kg (with module attached)

Industrial Recorders

μR10000/μR20000

http://www.yokogawa.com/ns/daq/daq-index_mr.htm

Leading Edge Chart Recorder "Easier to Acquire, Easier to Read"

μR10000

Intelligent Industrial Recorder (100 mm recording chart)

μR10000 has carried over μR series high reliability and basic functions. The 101 × 16 full-dot matrix display allows it to monitor various on-site data.

- High reliability and high quality
  - Fully contact-less technology
  - High degree of integration using custom IC
  - Light weight (2.5 kg for 6 dot-model)
  - Dust and splash proof front door
- Variety of line-up
  - 1 to 4 pen model, 6 dot model
- Variety of input types
  - Universal inputs
  - Many input sensors available (35 input types such as Pt50, PR20-40 etc)
- Superior ease-of-operation
  - VFD 101 × 16 full dot matrix display
  - Versatile operation display
  - Easily navigable interactive setting
  - New chart cassette
  - White LED
- Analog record of computed result (with the computation option: /M1)
- Network function
  - Ethernet, RS422A/485 communication option

μR10000 Specifications

Recording width: 100 mm
Chart length: 16 m
Number of inputs
- Pen model: 1-4 pens
- Dot model: 6 dot model

Input type: ±20 mV to ±50 V, 1-5 V range
- TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
- RTD (Pt100, Jpt100)
- DC current (with external shunt register)

Measurement interval
- Pen model: 125 ms/channel
- Dot model: 1 s/6 dot or 2.5 s/6 dot

Recording method
- Pen model: Disposable fel + pen, plotter pen
- Dot model: 6 color wire dot

Recording period
- Pen model: consecutive recording
- Dot model: max. 6 channel/10 sec

Display: VFD 101 × 16 full dot matrix display
Display types
- Multiple displays
- digital, bar, flag, DI/DO display etc can be displayed.
- 15 display types can be selected from approx. 80 display types.

Alarm levels: Up to 4 levels for each channel
Alarm type:
- High and low limit, differential high and low limit,
- high and low rate-of-change, delay high and low

Optional specification:
- Alarm output, RS422A/485 communication,
- Ethernet communication, Computation function,
- Expansion inputs, Remote input Calibration Correction,
- Header printout, Portable Type, 24 V DC/AC Power Supply etc.

Dimension:Approx. 144 (W) × 144 (H) × 220 (D) mm
Weight: 2.1 to 2.5 kg

μR20000

Intelligent Industrial Recorder (180 mm recording chart)

μR20000 has carried over μR series high reliability and basic functions. The 181 × 16 fulldot matrix display allows it to monitor various on-site data.

- High reliability and high quality
  - Fully contact-less technology
  - High degree of integration using custom IC
  - Light weight (8.4 kg for 6 dot-model)
  - Dust and splash proof front door
- Variety of line-up
  - 1, 2, 3, 4 pen models, 6, 12, 18, 24 dot models
- Variety of input types
  - Universal inputs
  - Many input sensors available (35 input types such as Pt50, PR20-40 etc)
- Superior ease-of-operation
  - VFD 181 × 16 full dot matrix display
  - Versatile operation display
  - Easily navigable interactive setting
  - White LED
- Analog record of computed result (with the computation option: /M1)
- Network function
  - Ethernet, RS422A/485 communication option

μR20000 Specifications

Recording width: 180 mm
Chart length: 20 m
Number of inputs
- Pen model: 1, 2, 3, 4 pens
- Dot model: 6, 12, 18, 24 dots

Input type: ±20 mV to ±50 V, 1-5 V range
- TC (R, S, B, K, E, J, T, N, W, L, U, WRe)
- RTD (Pt100, Jpt100)
- DC current (with external shunt register)

Measurement interval
- Pen model: 125 ms/channel
- Dot model: 1 s/6 dot, 2.5 s/12 to 24 dot or 2.5 s/6 dot, 5 s/12 dot, 10 s/18 to 24 dot

Recording method
- Pen model: Disposable felt pens, plotter pen
- Dot model: 6 color wire dot

Recording period
- Pen model: Consecutive recording
- Dot model: Max. 6 ch/10 s, 7 to 12 ch/15 s. 13 to 18 ch/20 s, 19 to 24/30 s

Display: VFD 181 × 16 full dot matrix display
Display types
- Multiple displays
- digital, bar, flag, DI/DO display etc can be displayed.
- 15 display types can be selected from approx. 80 display types.

Alarm levels: Up to 4 levels for each channel
Alarm type:
- High and low limit, differential high and low limit,
- high and low rate-of-change, delay high and low

Optional specification:
- Alarm output, RS422A/485 communication,
- Ethernet communication, Computation function,
- Expansion inputs, Remote input Calibration Correction,
- Header printout, Portable Type, 24 V DC/AC Power Supply etc.

Dimension: Approx. 288 (W) × 288 (H) × 220 (D) mm
Weight: Pen model: 7.5 to 7.6 kg
Dot model: 8.4 to 9.0 kg

Power and Energy Meter

PR300

http://www.yokogawa.com/ns/pr300/

A Meter for Power Facility and a Monitor for Monitoring Energy Consumption

PR300
Power and Energy Meter

- Saves on cost, wiring, and space
  - Integrates a wide selection of functions for measuring things like energy (active, regenerative, reactive, and apparent), power (active, regenerative, reactive, and apparent), voltage, current, frequency, and power factor into a single unit.
- Universal design
  - Converts the phase and wire system of an AC power system and an input voltage circuit to a universal format.
    The PR300 can select the phase and wire system from among single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire systems. Also it can select the input voltage up to 600 V AC.
  - Compatible with ANSI 4-inch round form size, DIN 96-square instrument size, and JIS 110-square instrument size.
- Employs a large, three-row LED display
  - Capable of confirming three-phase voltage and current on the three-row display simultaneously.
  - Three desired measurement items such as power, current, and energy assigned to the three-row display can be confirmed by changing up to 8 patterns.
  - Equipped with a phase switch key. Phase indication format A, B, and C provided for overseas use, in addition to R, S, and T.
- Equipped with a multitude of functions
  - Measures the maximum and minimum values of power, voltage, frequency, and power factor and the maximum value of current.
  - Transducer function: Transmits power, voltage, current, power factor, and frequency to the external instrument at 4 to 20 mA DC.
  - Demand measuring function: Demand current and demand power with alarm output prevents excess of contract power.
  - Pulse output function: Transmits pulses proportional to energy (active, regenerative, reactive, and apparent)
  - Optional integrating function: Measures energy at arbitrary times. Also measures energy of each process of productive facility.
  - Standard equipped with an RS-485 communication and capable of Ethernet communication.

PR300 Specifications

Phase and wire system: Universal phase and wire system (single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire systems)
Three-phase four-wire system (2.5 element)
Input frequency: 45 to 65 Hz
Input voltage: Universal voltage (150 V AC, 300 V AC, 600 V AC)
Input current: 1 A AC, 5 A AC
Accuracy rating:
Voltage and current: ±0.25% of F.S.
Active power: ±0.5% of F.S.
Active energy: ±0.5% (EN60687 accuracy: class 0.5 or equivalent)
Analog output: Measurement accuracy of measurement item for output + (±0.5% of F.S.) (optional)
Control signal for optional integration or demand alarm release (optional): Voltage 1 point
Analog output: 4 to 20 mA DC 1 point (optional)
Allowable load resistance: 0 to 600 Ω
Electric energy pulse output: Open collector 1 point (optional)
Output capacity: 30 V DC at 200 mA DC
Demand alarm output: Open collector 1 point (optional)
Output capacity: 30 V DC at 200 mA DC
Communication
Communication specifications: RS-485 interface (standard equipment)
Ethernet communication (optional)
Communication protocol: [RS 485] PC link, MODBUS, and PR201 protocol
[Ethernet] MODBUS/TCP
Measured Value display: 3-row, 5-digit, 7-segment red LED display
Power supply: 100-240 V AC ± 10% (50/60 Hz) or 130-300 V DC ±15%
External dimensions: 110 (W) × 110 (H) × 126.5 (D) mm (ANSI 4-inch round form size)
96 (W) × 96 (H) × 124.5 (D) mm (DIN 96-square instrument size)

UT100 Series Temperature Controllers

UT130/UT150/UT152/UT155

Easy-to-operate Simple Controller

UT130/UT150/UT152/UT155
Temperature Controller

- Easy-to-read displays
- Dynamic self-tuning function for easy start up
- Heating/cooling control is available
- Various alarm functions (optional)

UT130/150/152/155 Specifications

- Input accuracy:
  ±0.3%, control cycle 500 ms
- Universal input:
  TC, RTD, DCV (except UT130)
- Control output:
  4 to 20 mA (except UT130), voltage pulse, and relay
- Digital input:
  Max. 2 points (UT130: Not available)
- Communication fanction via RS485 interface compatibility:
  Simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol)
  Coordinated operation available
- High reliability:
  conforms to UL, CSA, and CE-mark certification
- Front panel conforms to
  UT130/150: IP65
  UT152/155 or equivalent (dust-and drip-proof): IP55
- Dimensions:
  UT130/150: 48 (W) × 48 (H) × 100 (D) mm
  UT152: 48 (W) × 96 (H) × 100 (D) mm
  UT155: 96 (W) × 96 (H) × 100 (D) mm
- Weight:
  UT130/150: approx. 0.2 kg
  UT152: approx. 0.3 kg
  UT155: approx. 0.4 kg

GREEN Series Digital Indicating Controllers

UT351/UT321

Economical, High-performance Type

UT351/UT321
Digital Indicating Controller

- Easy-to-operate general-purpose controllers
- Large clear PV display (with Active Color PV Display)
- A/M mode switching key (standard)
- Heating/cooling control included
- Retransmission output (standard)
  (also usable as the power supply for the sensor)
- Number of combination of setpoints and PID parameters: 4
- 24 VDC loop power supply (optional)

UT351/UT321 Specifications

- Input accuracy:
  ±0.1%, control cycle 250 ms
- Dimensions
  UT351: 96 (W) × 96 (H) × 100 (D) mm
  UT321: 48 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output:
  voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Alarm output: 3 points (standard)
- Heater burnout alarm specifiable
- Communication function via RS485 interface compatibility:
  simple communication with graphic panel/PLC/PC
  (PC link/ladder communication/Modbus protocol)
  Coordinated operation available
- High reliability:
  conforms to UL, CSA, and CE-mark certification
  Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: approx. 0.7 kg (for both the UT351 and UT321)
- Parameter settings on a PC is available with the LL100 parameters setting tool.

GREEN Series
Digital Indicating Controllers

UT450/UT420/UT550/UT520/UT750/US1000

http://www.yokogawa.com/ns/cis/utup/ut/ns-index_ut.htm

Multi-function, High-performance Type

UT450/UT420

Digital Indicating Controller

- Simple operation
- Large clear PV display
- Heating/cooling control and position proportional control (UT450) included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- 24 VDC loop power supply (option for UT450)

UT450/UT420 Specifications

- Input accuracy: ±0.1%, control cycle 200 ms
- Dimensions
  UT450: 96 (W) × 96 (H) × 100 (D) mm
  UT420: 48 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super 2" function, and auto-tuning (standard)
- Alarm output: 4 points
- Communication function via RS485 interface compatibility:
  simple communication with graphic panel/PLC/PC
  (PC link/ladder communication/Modbus protocol)
  Coordinated operation available
- High reliability:
  conforms to UL, CSA and CE-mark certification
  Front panel conforms to IP55 or equivalent (dust - and drip-proof)
- Security function using password
- Parameters settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less (for both the UT450 and UT420)

Broad-ranging, High-performance Type

UT550/UT520

Digital Indicating Controller

- High performance controllers with lots of functions
- Large clear PV display
- Heating/cooling control and position proportional control (UT550) included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- Easily applied to cascade control or input switching control by selecting function modes
- 24 VDC loop power supply (option for UT550)

UT550/UT520 Specifications

- Input accuracy: ±0.1%, control cycle 50 ms (fastest)
- Dimensions
  UT550: 96 (W) × 96 (H) × 100 (D) mm
  UT520: 48 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Extended DI/O (UT550: alarm output up to 8 points available)
- Communication function via RS485 interface compatibility:
  simple communication with graphic panel/PLC/PC
  (PC link/ladder communication/Modbus protocol)
  Coordinated operation available
- High reliability:
  conforms to UL, CSA and CE-mark certification
  Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less (for both the UT550 and UT520)

Excellent Control, Multifunction Type

UT750

Digital Indicating Controller

- Advanced highly functional indicating controller
- Large clear PV display
- Legible LCD indication
- Applicable to dual-loop control
- Easy selection of functions
  Control functions, such as temperature and humidity control or cascade control, are easily set up by selecting control function modes prepared in advance
- Easily applied to cascade control or input switching control by selecting function modes
- Customized computation function

UT750 Specifications

- Input accuracy: ±0.1%, control cycle 50 ms (fastest)
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- DI/O increase available (using I/O extension modules): up to 23 points
- Communication function via RS485 interface compatibility (2 ports):
  simple communication with graphic panel/PLC/PC
  (PC link/ladder communication/Modbus protocol)
  DI/O increase and coordinated operation available
- High reliability:
  conforms to UL, CSA, and CE-mark certification
  Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 Parameters Setting Tool
- User preferable and definable I/O computation using the LL200 Custom Computation Building Tool
- Weight: Approx. 1 kg

Programmable Controller with Bar Graph Displays

US1000

Digital Indicating Controller

- 30-segment LED PV bar graph
- Comes standard with a universal input that can directly accept sensor input
- Powerful dual-loop control function
- Custom computation function that covers a wide range of applications and is created by users combining controls and computations. (This is easily created using the LL1200 PC-Based Custom Computation Building Tool.)

US1000 Specifications

- Input accuracy: ±0.1%, control cycle 50 ms (fastest)
- Universal input: TC, DCV, RTD
- Control output: voltage pulse, 4 to 20 mA, and relay
- Digital input/output: Max. 7 points for each
- Communication function via RS485 interface compatibility:
  simple communication with graphic panel/PLC/PC
  (PC link/Modbus protocol)
  Coordinated operation available
- High reliability:
  conforms to FM, CSA, and CE-mark certification
  Front panel conforms to IP65 or equivalent (dust-and drip proof)
- Option Software
  LL1100 Parameters Setting Tool
  LL1200 Custom Computation & Parameter Setting Tool
- Dimension: 72(W) × 144 (H) × 149 (D) mm
- Weight: Approx. 0.8 kg

GREEN Series
Program Controllers

UP351/UP550

http://www.yokogawa.com/ns/cis/utup/up/ns-index_up.htm

Simple, General Purpose-program Type

UP351
Program Controller

- Practical general-purpose program controller
- Large clear PV display (with Active Color PV Display)
- Program capacity: 2 patterns (10 segments/pattern)
- PV event 2 points: time event one point
- Retransmission output (standard) (also usable as the power supply for the sensor)

UP351 Specifications

- Input accuracy: ±0.1%, control cycle 250 ms
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 0.7 kg

Complete, High-performance Program Type

UP550
Program Controller

- Function-completed high performance program controller
- Large clear PV display and legible LCD pattern display
- Capacity: 30 patterns/300 segments
- Heating/cooling control and position proportional control included
- Event setting: settable for up to 16 time events and 8 PV events (output up to 8 points)
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Easily applied to cascade control or input switching control by selecting function modes

UP550 Specifications

- Input accuracy: ±0.1%, control cycle 100 ms (fastest)
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- DI/O extendable (up to 8 points for both DI and DO)
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) Coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less

GREEN Series Program Controller

UP750

Large Capacity, Multifunction Program Type

UP750
Program Controller

- Advanced highly functional program controller
- Large clear 5-digit PV display and LCD display
- Large capacity: 300 patterns/3000 segments
- Applicable to dual-loop control
- Easy selection of functions (UP mode) Difficult control functions, such as temperature and humidity control or cascade control, are easily set up by selecting control function modes prepared in advance
- Customized computation function

UP750 Specifications

- Input accuracy: ±0.1%, control cycle 100 ms (fastest)
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- DI/O extendable (I/O extension modules used)
- Communication function via RS485 interface compatibility (2 ports): simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol) DI/O increase and coordinated operation available
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- User preferable and definable I/O computation using the LL200 custom computation building tool
- Weight: Approx. 1 kg

GREEN Series Digital Indicator with Alarms

UM351/UM331

Exceptionally Clear and Large Display, General Purpose Indicator

UM351/UM331
Digital Indicator with Alarms

- Easy-to-use general-purpose indicating alarm meters
- Large clear PV display (with Active Color PV Display)
- Alarm output available for up to 4 points
- Retransmission output (standard) (also usable as the power supply for the sensor)
- 24 VDC loop power supply (optional)

UM351/UM331 Specifications

- Input accuracy: ±0.1%, sampling cycle of 250 ms
- Dimensions UM351: 96 (W) × 96 (H) × 100 (D) mm UM331: 96 (W) × 48 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Alarm output: 3 points (standard), the addition of one more point available
- Communication function via RS485 interface compatibility: simple communication with graphic panel/PLC/PC (PC link/ladder communication/Modbus protocol)
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: Approx. 0.7 kg (for both the UM351 and UM331)

GREEN Series Digital Indicating Controller with Industrial Ethernet

UT351- ⋆A/UT551- ⋆A to ⋆D

http://www.yokogawa.com/ns/cis/utup/ut/ns-index_ut.htm

Simple, High-performance Type

UT351- ⋆A

Digital Indicating Controller with Industrial Ethernet [1, 2]

- Easy-to-operate general-purpose controllers
- Large clear PV display (with Active Color PV Display)
- A/M mode switching key (standard)
- Heating/cooling control included
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of combination of setpoints and PID parameters: 4

UT351- ⋆A Specifications

- Input accuracy: ±0.1%, control cycle 250 ms
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Alarm output: 3 points (standard)
- Heater burnout alarm specifiable
- Ethernet communication function 10BASE-T/100BASE-TX Modbus/TCP protocol
- Gate way communication function
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Weight: Approx. 0.7 kg
- Parameter settings on a PC is available with the LL100 parameters setting tool.

1: Ethernet is the trademark of XEROX Corporation.
2: Please prepare Ethernet cable individually.

Broad-ranging, High-performance Type

UT551- ⋆A to ⋆D

Digital Indicating Controller with Industrial Ethernet [1, 2]

- High performance controllers with lots of functions
- Large clear PV display (with Active Color PV Display)
- Position proportional control included
- Remote setpoint input available
- Retransmission output (standard) (also usable as the power supply for the sensor)
- Number of setpoint and PID parameter combinations: up to 8
- Easily applied to cascade control or input switching control by selecting function modes

UT551 Specifications

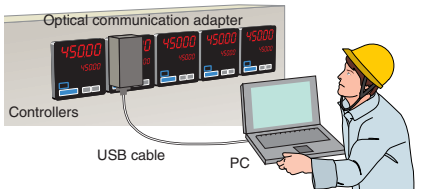
- Input accuracy: ±0.1%, control cycle 100 ms/200 ms/500 ms
- Dimension: 96 (W) × 96 (H) × 100 (D) mm
- Universal input: TC, DCV, RTD
- Universal output: voltage pulse, 4 to 20 mA, and relay
- Overshoot suppression "super" function, hunting suppression "super2" function and auto-tuning (standard)
- Extended DI/O (alarm output up to 8 points available)
- Ethernet communication function 10BASE-T/100BASE-TX Modbus/TCP protocol
- Gate way communication function
- High reliability: conforms to UL, CSA, and CE-mark certification Front panel conforms to IP55 or equivalent (dust- and drip-proof)
- Security function using password
- Parameter settings on a PC is available with the LL100 parameters setting tool
- Weight: Approx. 1 kg or less

1: Ethernet is the trademark of XEROX Corporation.
2: Please prepare Ethernet cable individually.

PC-Based Parameters Setting Tools

LL100/LL200, LL1100/LL1200 (for US1000)

http://www.yokogawa.com/ns/cis/utup/ll/ns-index_ll.htm



LL100/LL200, LL1100/LL1200 (for US1000)

Light Loader

LL100/LL1100 and LL200/LL1200 are software package that enables you to set the controllers configuration parameters.
The optical communication adapter will connect and communicate through the drip- and dust-proof panel of the controller.
It can easily be set via Ethernet. (for UT351-⋆A, UT551)

LL100/LL1100 Parameters Setting Tool

- Applicable Controllers: UT320, UT321, UT350,UT351, UT420, UT450, UT520, UT550, UT551, UT750, US1000, UP350, UP351, UP550, UP750

The LL100/LL1100[*1] PC-based Parameters Setting Tool is a software package used to set the setup parameters, operating parameters, and program patterns[*2] of the GREEN Series controllers from a personal computer. This tool allows users to download, upload, print out parameters, and display PV trend data during PID tuning etc.
*1: The LL1100 is for US1000 controller only.
*2: For program controllers only.

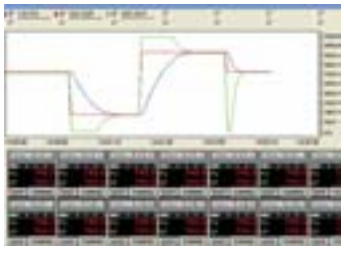
LL200/LL1200 Custom Computation Building Tool

- Applicable Controllers: US1000, UT750, UP750

The LL200/LL1200[*1] PC-based Custom Computation Building Tool is a software package used to create custom computation and custom display functions. This tool also covers the functions of the LL100/LL1100 PC-based Parameters Setting Tool. The custom computation building function, the main function of this package, enables users to formulate computations graphically. This tool has an online help function that provides explanations of the computation modules.
*1: The LL1200 is for US1000 controller only.

Tuning screen

Program pattern setting up screen



Multi-monitor display

Signal Conditioner

VJ Series/M Series

http://www.yokogawa.com/ns/cis/juxta/ns-index_juxta.htm

Compact, High Performance

VJ Series

Compact, Plug-in Signal Conditioners

VJ Series signal conditioners have a compact, space-saving plug-in style design. The lineup includes a universal input type, versatile I/O specifications, wide-range of power supply, isolated two outputs and field configurable models. Optional 2 relay alarm outputs or RS-485 communication function can be equipped for multi-function models.

Features

- Compact design for space saving
  The dimension is 76 (H) × 29.5 (W) × 124.5 (D) mm.
- Two isolated outputs
  Second isolated current or voltage (pulse) output is available as optional feature.
- Communication function
  Optional MODBUS (RS-485) communication function can be obtained simultaneously with analog output signal from one VJ unit.
- Alarm outputs
  Optional Hi/Low relay alarm outputs can be output simultaneously with analog (pulse) output signal from one VJ unit.
- Field configuration
  A field configuration of the microprocessor based VJ is possible from your PC (with VJ77 PC-based parameters setting tool) or using our Handy Terminal (JHT200).
- Compliance with international safety standards; CE, CSA and UL.

Specifications (Isolator VJH7)

Accuracy rating: ±0.1% of Span
Response speed: 200 ms, 63% (10 to 90%)
Power supply: 100-240 AC/DC (-15, +10%), 50/60 Hz or 15-30 VDC (±20%)
Alarm output (optional 2nd output)
  N.O.relay contact, 2 points, COM common
Communication output (optional 2nd output)
  Protocol: Modbus ASCII,Modbus RTU,
  number of connectable instruments: up to 31 units
  communication distance: up to 1200 m
  communication rate: 1200, 2400, 4800, 9600 bps

Lineup

Isolator	VJH7
Distributor	VJA7
Universal Temperature Converter	VJU7
Potentiometer Converter	VJS7
Pulse to Analog Converter	VJP7
Analog to Pulse Converter	VJQ7
Pulse Rate Converter	VJP8
Universal Computing Unit	VJX7

PC-based Parameters Setting Tool: VJ77

Field configuration tools to set, change and monitor the range, zero/span, burnout, parameters, computation program, etc. of the microprocessor based JUXTA signal conditioners and computing units.

Standard, Quantity Stability, Easy Adjustment

M Series

Standard, Plug-in Signal Conditioner

The JUXTA M Series, 8 models of free range type, is signal converters that offers good maintainability. It enables easy and reliable adjustment on site using a screwdriver. On site configuration of JUXTA, such as for input/output range, type of the sensors, burnout operation etc., is possible by using the setting tools from your PC.

Feature

- Easy for settings of the input/output range by using VJ77, Parameter Setting Tool, or JHT200, Handy Terminal. (All 8 models of M series)
- Adjustment can be made easily by using a screwdriver. (All 8 models of M series)
- Output testing is possible by setting arbitrary percentage values via JHT200 or VJ77. (All 8 models of M series)
- Universal Temperature Converter can change the type of its input sensors via JHT200 or VJ77.
- Also the wiring resistance can be easily adjusted using a screw driver.
- Input range of the Potentiometer Converter can be set easily by using a screwdriver

Lineup

Distributor (Free Range Type)	MA5
Distributor (2-output, Free Range Type)	MA5D
Isolator (Free Range Type)	MH5
Isolator (2-output, Free Range Type)	MH5D
Universal Temperature Converter (Free Range Type)	MU5
Universal Temperature Converter (2-output, Free Range Type)	MU5D
Potentiometer Converter (Free Range Type)	MS5
Potentiometer Converter (2-output, Free Range Type)	MS5D

Universal Temperature Converter MU5, MU5D

Input signal: Selection of input type (Thermocouple, RTD or mV signal)

Output signal: It can set up the following specification.
A: 0 to 20 mA DC Span is 5 mA or more
B: 0 to 5 mA DC Span is 1 mA or more
1: ±10 V DC Span is 0.1 V or more
2: ±100 mV DC Span is 10 mV or more

Power supply: 85-264 V AC/DC or 12-48 V DC
Accuracy rating: ±0.1% of span
Accuracy of reference junction compensation (RJC):
  Other than Type R and S: ±1ºC (0 to 50ºC)
  Type R and S: ±2ºC (0 to 50ºC)
External dimensions:
  86.5 (H) × 51 (W) × 123 (D) mm (including a socket)
Weight: Main unit: Approx. 200 g Socket: approx. 60 g

Signal Conditioner

VJET

http://www.yokogawa.com/ns/cis/juxta/ns-index_juxta.htm

Support for a Variety of Applications

VJET

Ethernet/RS-485 Converter

The VJET Ethernet/RS-485 converter is a compact, plug-in type communication converter that uses the Modbus/TCP protocol for connecting to host devices with Ethernet capability, and uses the Modbus/RTU protocol for connecting to devices with RS-485 communication function.

Features

- Enables monitoring of multiple widely separated sensor signals from a single location via Ethernet. Up to 31 sources can be monitored per VJET unit.
- Monitoring systems can be set up quickly using DAQWORX* software (recommended).
  *DAQWORX Data Acquisition Software Suite
- Installs in your existing LAN with a minimum of additional wiring.
- 29.5 mm wide (installed) space-saving design. Mounts easily on the wall or on DIN rails. Can be rack-mounted when installed in the VJCE-01A mounting base for communication.
- Choose 24 VDC or 100-240 VAC/DC power supply specifications.
- Supports CSA, CE, and UL safety standards.

Specifications

Ethernet communication

Interface	Conforms to IEEE802.3 (10BASE-T/100BASE-TX)
Protocol	Modbus/TCP
Access control	CSMA/CD
Transfer rate	10/100 Mbps
Maximum segment length	100 m (the length between Hub and converter)
Maximum connecting configuration	Up to 4 cascade connection per hub (10BASE-T) Up to 2 cascade connection per hub (100BASE-TX)

RS-485 communication

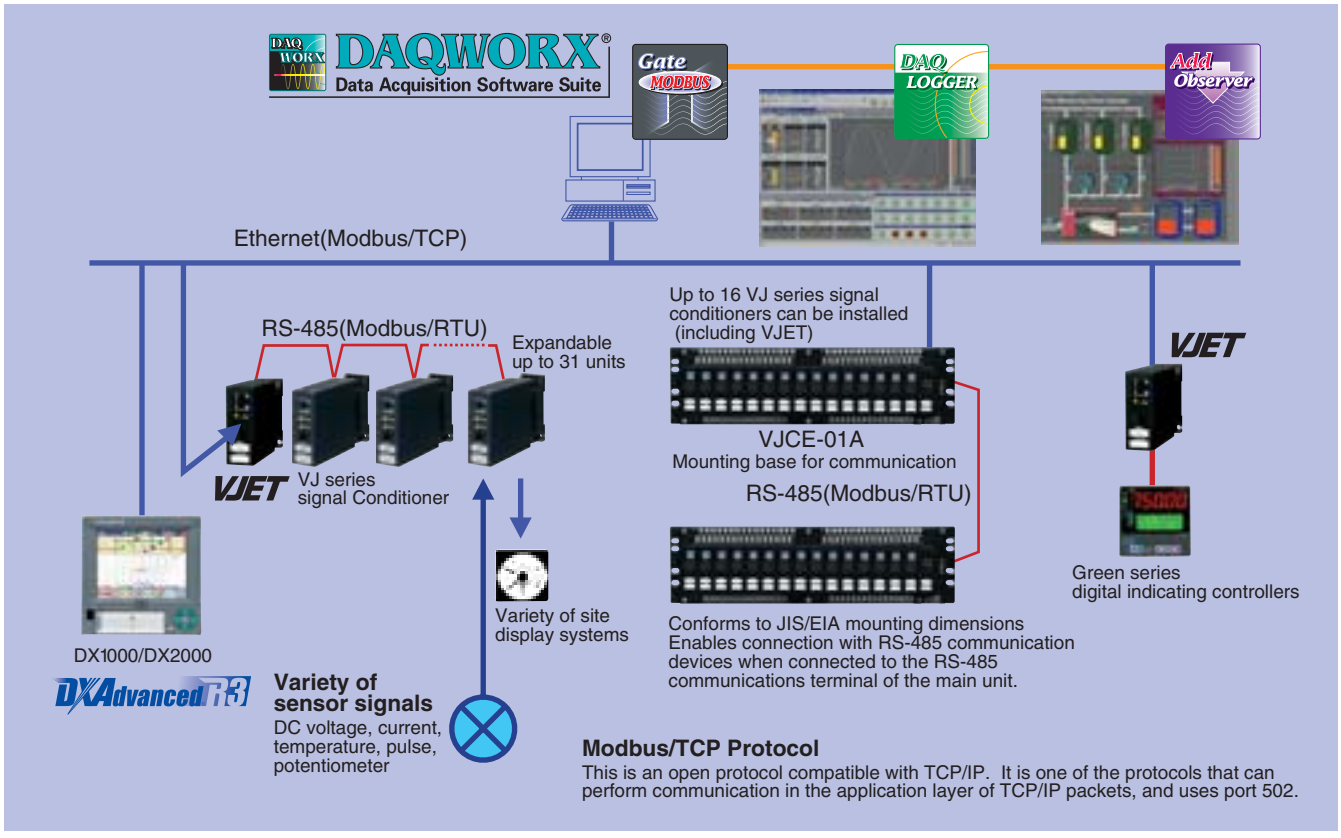
Interface	Conforms to EIA RS-485
Protocol	Modbus/RTU
Transfer system	Half-duplex communication
Synchronous system	Start-stop synchronization
Transfer rate	9600 bps
Data length	8
Stop bit	1
Parity	Even, odd or none

Power supply

Power supply rated voltage	24 VDC ±10% or 100-240 VAC/DC (-15, +10%), (50/60 Hz)
Power consumption	1.8 W at 24 VDC; 1.5 W at 110 VDC 2.6 VA at 100 VAC, 4.0 VA at 200 VAC

■VJET Setting Tool version 1.02

VJET communication parameter can easily be set via Ethernet. High-speed response mode, parity, IP address, subnet musk, TCP/IP port, default gateway.
Visit our web site and download this software
http://www.yokogawa.com/ns/cis/field/ns-vjet_01.htm
See the VJET user's manual (IM 77J01E11-01E) for the detailed specifications.



DAQWORX

DAQWORX

http://www.yokogawa.com/ns/daqworx/

Data Acquisition Software Suite

DAQWORX

Our integrated data acquisition software package responds to changeable market conditions with a high degree of scalability.

By combining YOKOGAWA recorders and data acquisition stations and instruments, you can create data acquisition systems without the need for special programming. You can easily increase the measurement bandwidth and range of applications by including our high-value–added software.

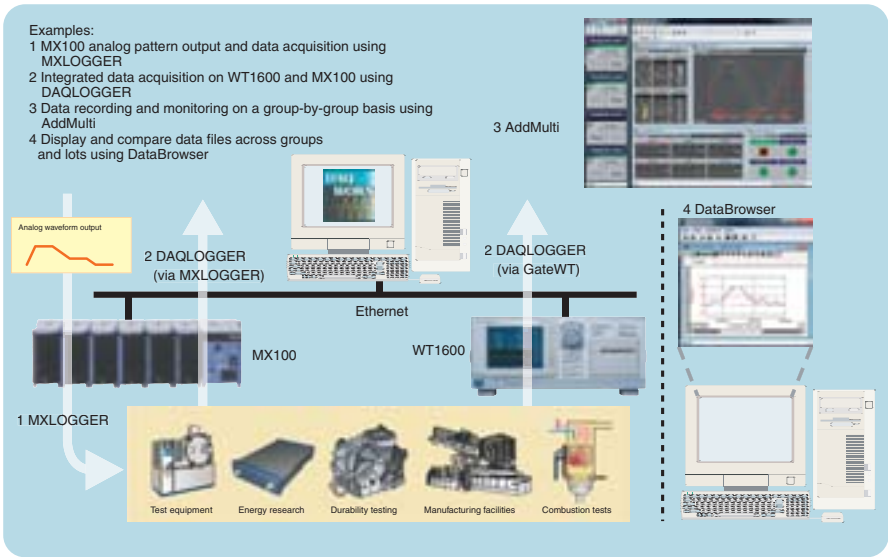
Features

DAQWORX comprises four data acquisition "Base" software programs, six "Add-on" programs with high-value–added functions, eight "Gate" interface programs, and a common Viewer program for a total of nineteen software components. These can be combined as desired to build a data acquisition and monitoring system that is ideal for the user's application. DAQWORX can be categorized into two packages depending on the data acquisition software selected.

- Integrated Package
  Centered around DAQLOGGER data acquisition software, this package allows you to build a data acquisition and monitoring system with not only recorders and data acquisition equipment, but also by integrating a wide variety of other measuring instruments and devices through interface programs. Furthermore incorporating various high-value–added software programs will enable you to record on a group-by-group basis, set up triggered recording, monitor on user-created screens, and perform many other specialized functions.
- Product Specific Packages
  These are data acquisition software programs designed to maximize hardware performance; DAQ32Plus for DARWIN, MXLOGGER for DAQMASTER MX, and DAQEXPLORER for DAQSTATION DX/CX and MVAdvanced/MobileCorder MV. High-value-added software can be combined, and acquired data can be integrated with DAQLOGGER.

List of Software

- Integrated Package
  - DAQLOGGER: General purpose data acquisition on a maximum of 32 units/1600 ch, shortest measurement interval of 1 second. <Supported Instruments> Daqstation DX/CX, MVAdvanced/MobileCorder MV, DA/DC/DR, VR, and the μR1000/1800.
  - GateDX-P: Interface for DX100P/DX200P
  - GateμR: Interface for μR10000/μR20000
  - GateMX/MW: Interface for MX100/MW100
  - GateCONTROL: Interface for small-scale measurement instruments (controllers, signal conditioners, etc.)
  - GateWT: Interface for WT series power measuring instruments
  - GateOPC: Interface for OPC DA server
  - GateMODBUS: Interface for MODBUS (TCP/RTU)
  - GateEye: Real time image transfer from Web cameras to AddObserver monitoring panels.
  - DAQLOGGER Client: Remote monitor for DAQLOGGER
  - AddObserver: Real time monitoring on user-created screens (with "Builder" screen editor)
  - AddObserver Runtime: Real time monitoring on user-created screens (runtime version)
  - AddMulti: Acquisition on a group-by-group basis (32 ch × 50 groups)
  - AddTrigger: Acquisition using a wide array of trigger conditions
- Product Specific Package
  - DAQ32Plus: For DARWIN, shortest acquisition interval of 0.5 seconds
  - MXLOGGER: For the MX100, shortest acquisition interval of 10 ms
  - DAQEXPLORER: For DXAdvanced/DX/CX/MV, automatic data file transfer
  - DAQ32Plus Client: Remote monitor for DAQ32Plus
  - AddObserver(Runtime)/AddMulti/AddTrigger: see the integrated package.
- Viewer (Common to All)
  - DataBrowser: File searching and multi-waveform display

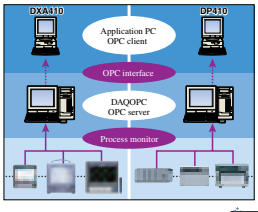


DAQOPC

DXA410 for DX/DX-P/CX/MV, DP410 for DARWIN

http://www.yokogawa.com/ns/daq/daq-index_software.htm

OPC Interface Package



DXA410 for DX/DX-P/CX/MV, DP410 for DARWIN

OPC Interface Package

OPC (OLE for Process Control) is a comprehensive interface standard for communication between applications. Established by the OPC Foundation in the US, OPC is recognized as an international standard. DAQOPC allows DARWIN Series (DP410), DX/DX-P/CX/MV Series (DXA410) units to connect with a wide variety of client applications (SCADA software and user application software).

DAQOPC Features

- DAQOPC is an OPC server which supports OPC Data Access Version 2.0.
- DAQOPC provides OPC clients with custom interfaces and automation interfaces.
- DAQOPC supports the browser function, enabling OPC clients to browse information on OPC servers

Function Specifications

DAQOPC provides the following OPC specification interfaces.

- Data Access (DA) server function
  The DA server reads process data using item IDs as identifiers, and writes process data through communication input channels (C01 through C60).

System configuration

- Server/client configuration
  DAQOPC users (OPC clients) can be configured in the following two ways:
  - OPC client coexisting on the same PC as DAQOPC
  - OPC client present on host computer (Windows 2000/XP)
- Multiple-client configurations
  Multiple OPC clients can access a single DAQOPC.
- Multiple-server configurations
  A single OPC client can access multiple DAQOPC server.

Compatible Equipment

- DXA410: DX100/DX200/DX100L/DX200C/DX100P/DX200P/CX1000/CX2000/MV100/MV200
- DP410: DA100/DC100/DR130/DR230/DR240
- Communication standards:
  Ethernet: All models listed above
  RS-232/RS-422A/RS-485: All models listed above except DX100P/DX200P
- Operating systems: Windows 2000 or XP Professional

Application capacity

A number of connected clients: Up to 100
A number of group objects: Up to 1000
A number of registered item IDs: Up to 10,000/group
A number of cache updated item IDs: Up to 100,000
Cache updating interval: 1 to 3600 sec
A number of connected units (DXA410): Up to 24
A number of connected units (DP410): Up to 16

Data Logger

Datum-Y, Datum-LOGGER

http://www.yokogawa.com/gmi/datum-y

Compact Data Logger Offering Best-in-class Noise Resistance and Communication Function

CE

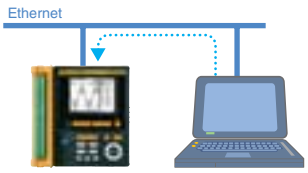
Datum-Y (XL120 Series)

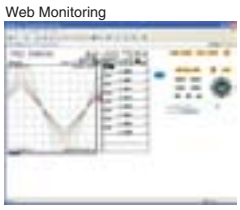
Portable Data Station (Data Logger)

- All channels adopt universal insulated inputs
  : The temperature and voltage can be set independently for each channel.
- Easy-to-read screen display
  : A wide view color TFT LCD makes it easy to read even outdoors
- Data can be saved at the maximum speed of 100 ms
  : Reliably measures temperature changes
- Large amounts of data can be acquired
  : Employs compact flash and SD cards.
  USB memory enables support for a data copy function.
- Comes standard with a LAN port
  : Also supports remote data acquisition.

Web Server Function

You can easily monitor the Datum-Y screens with the Internet Explorer*1 Web browser (Screen display can be updated every 5, 10, or 30 seconds automatically, or manually). You can use Operator Page to remotely operate Datum-Y, except for turning the power on and off and key locking. You can use Monitor Page just to check and switch the Datum-Y screens. You can set access authentication for each screen to enhance security.
*1: Internet Explorer is a registered trademark of Microsoft Corporation.



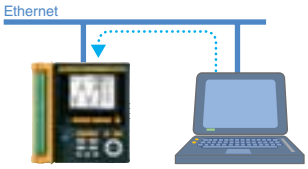


Specification

Number of inputs : 8 channels (XL121), 16 channels (XL122, XL124)
Floating unbalanced input, insulated between channels
Measurement interval : 100 ms (only when the 8-channel terminal block is used), 200 ms, 500 ms, 1 sec, 2 sec, 5 sec, 10 sec, 20 sec, 30 sec, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, 1 hr
Input type : TC, RTD, DCV
* RTD for XL121 and XL122 only
Digital Pulse (1ch), DI (2ch)
Fuctions : Trigger Functions (Pre-trigger/trigger delay), Four arithmetic operation, Linear scaling, Statistical operation (MAX, MIN, AVE, P-P, RMS)
Communication Fuctions: Ethernet, USB, RS-232, RS-485
• Network Functions : Web server, FTP server, FTP client, E-mail delivery, Time synchronization
Serial communication Modbus protocol:
Transmission medium: RS-232 or RS-485
Transmission mode: RTU mode, ASCII mode
Data saving : Internal memory : 16 MB
External storage medium :
Compact flash memory card (Type II), SD card, USB memory
(Only the copy function is supported by USB memory. Only those USB memories that have been verified by Yokogawa are recommended.)
Display unit : 3.5-inch TFT color LCD (320 × 240 pixels)
External dimensions : Approx. 155 (W) × 155 (H) × 55 (D) mm
Weight : Approx. 800 g (Without battery and rubber boot)

FTP Server Function

You can output a list of files stored in Datum-Y's internal memory and connected external storage media, and you can transfer and delete files.



Model Number and Suffix Code

Model	Suffix code	Specification
XL121		8ch, with Screw in type terminal block unit
XL122		16ch, wth Screw in type terminal block unit
XL124		16ch, with M3 screws type terminal block unit
	-D	Power cord(UL/CSA Standard)
	-F	Power cord(VDE Standard)
	-H	Power cord(GB Standard)
	-R	Power cord(AS Standard)
	-S	Power cord(BS Standard)

Optional Accessories

Application Software "Datum-LOGGER"

Datum-LOGGER allows you to connect up to ten Datum-Ys to analyze and process data after you perform real-time measurement and acquire data with a PC.
- Real-time measurement at the maximum speed of 1 second
- Zooming to analyze acquired data in the waveform view
- A variety of data saving functions available (selective and partial saving)

Model Number

	Name	Model No.	Description
Optional accessories	Type-K TC	90060	5 meter × 4 sets
	Carrying case	93037	To store the main unit and accessories
	Lithium ion battery	94009	2,400 mAh, 7.4 V
	Stand	93039	Supports tilted installation on the desktop, wall mounting, and DIN rail mounting
	Digital I/O cable	91029	For pulse/logic inputs and alarm outputs, 3 m
	Application Software (Datum-LOGGER)	XL900	For Datum-Y
	Communication cable	91011	RS-232 communication cable for PC (9 pin)
	Printer cable	91010	RS-232 cable for printer
	Printer	97010	Includes 1 roll thermal paper and 1 battery pack
	Printer thermal paper	97080	10 rolls/set
	AC adapter for printer	94006	Power supply 200-240 V
	AC adapter for printer	94007	Power supply 100-120 V

Printer (97010)

Carrying case (93037)

Lithium ion battery (94009)

Digital I/O cable (91029)

Stand (93039)

Clamp-on Power Meters

CW240, CW120/CW121, AP240E

http://www.yokogawa.com/gmi/cw

Electric Power Analysis & Power Supply Quality Control

CW240

Clamp-on Power Meter

- Simultaneous measurement of power, harmonics, voltage fluctuation, and waveform
- Supports a range of connections
- Wide measurement range
- Leakage current measurement
- External memory
- Large LCD

CW240 Specifications

Measuring Mode:
All items can be measured at the same time
Instantaneous value (Wave form)/Electric Energy/Demand/Harmonics/Voltage Fluctuation
Wiring:
1P2W, 1P3W, 1P3W3i, 3P3W2i, 3P3W3i, 3P4W, 3P4W4i
Multipul system Load Measurement:
1P2W × 2/× 3/× 4, 1P3W × 2, 3P3W × 2, SCOTT Wiring (1P3W + 3P3W)
Range:
Voltage: 150/300/600/1000 V
Current: 200.0 mA (96036) to 3000 A (96034/35)
Accuracy:
Voltage: ±(0.2% rdg. + 0.1% rng.)
Current/active power: ±(0.6% rdg. + 0.4% rng.) when using clamps 96030, 96031,96033 and 96036
: ±(1.0% rdg. + 0.8% rng.) when using clamps 96032, 96034 and 96035
General Specifications
- External dimensions: 206 (W) × 184 (H) × 65 (D) mm
- Weight: Approx. 1.2 kg (without batteries)
- Power: AC adaptor, AA size alkaline battery × 6

Low-cost Tools to Support Your Energy Conservation

CW120 Series

Clamp-on Power Meter

Input system: Single-phase 2 wire to 3-phase 3-wire (CW120), 3-phase 4-wire (CW121)
Measurement Functions: Voltage, Current, Frequency, Active power, Reactive power, Power factor, Active power, Regenerative power
Features: Large capacity of memory (ATA flash memory card), Wiring error check function, Support variety of network communication protocols

CW120 Series Specifications

Measurement Item:
Voltage rms (V), Current rms (A), Active Power (W) and Frequency (Hz)
Wiring:
CW120: 1P2W, 1P3W and 3P3W and 1P2W × 2
CW121: 1P2W, 1P3W, 3P3W, 3P4W, 1P2W × 2 and 1P2W × 3
Range:
Voltage: 150/300/450 V
Current: 5/10/20/50/100/200/500/1000 A
Basic Accuracy:
Voltage: ±(0.3% rdg. + 0.2% rng.)
Current/active power: ±(0.8% rdg. + 0.4% rng.) when using clamps 96030,96031 and 96033
: ±(1.2% rdg. + 0.8% rng.) when using clamp 96032
General Specifications
- External dimensions: 117 (W) × 161 (H) × 51 (D) mm
- Weight: Approx. 600 g
- Power: AC 100 to 240 V ±10%, 50/60 Hz

Effective power supply quality and power saving management for PCs

AP240E

Data Analysic Program for CW series

- Data Management
- Data Display Selection
- Graph Display
- Daily Report Display, Weekly / Monthly Report Display
- Harmonic Graph Display
- Harmonics Instant Value Display
- Waveform Data Display
- Voltage Change Display

Clamp Probes for CW240/CW120 series

Model	96036	96033	96030	96031	96032	96034	96035
Clamp Probes							 * Need AC adapter
Diameter of measurable conductor	ϕ 40 mm	ϕ 18 mm	ϕ 30 mm	ϕ 30 mm	ϕ 65 mm	65 × 100 mm	ϕ 170 mm
Measuring Range	AC 2 A	AC 50 A	AC 200 A	AC 500 A	AC 700 A (1000 A 5 min)	AC 1000/2000/3000 A	AC 300/3000 A
Output Voltage	AC 50 mV	AC 500 mV	AC 500 mV	AC 500 mV	AC 250 mV	AC 500 mV	AC 500 mV
Frequency Range	20 Hz to 5 kHz	20 Hz to 20 kHz	20 Hz to 20 kHz	20 Hz to 5 kHz	45 Hz to 66 Hz	30 Hz to 1.5 kHz	10 Hz to 20 kHz
External dimensions	70 × 120 × 25 mm	52 × 106 × 25 mm	73 × 130 × 30 mm	73 × 130 × 30 mm	100 × 172.5 × 32 mm	120 × 310 × 48 mm	140 × 64 × 28 mm
Weight	Approx. 300 g	Approx. 220 g	Approx. 300 g	Approx. 300 g	Approx. 500 g	Approx. 1,390 g	Approx. 470 g

* Need to purchase AC adapter separately

Handy Calibrators

CA150

http://www.yokogawa.com/gmi/ca

High accuracy and compact design

CA150
Handy Calibrator

Features

- Highly accurate within 0.02% of the DC voltage range for source and measure
- Source and measurement can be performed simultaneously
- Vertical body with large-screen display
- Loop power supply function (24 VDC at a load of max 22 mA)
  It is possible to measure current in the mA range while supplying power
- Sink function
- Sweep functions that allow 3 types of continuous outputs:
  Step sweep function
  Linear sweep function
  Program sweep function

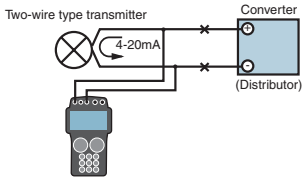
Applications

● Two-wire Type Transmitter Applications

■Two-wire type transmitter (measurement function) application

○Loop check function

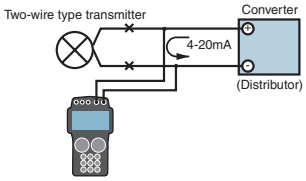
Measures mADC signals output while supplying transmitter power at 24 VDC.



■Two-wire type transmitter (source function) application

○Sink function

Receives current (Sink) from the power supply at voltages of up to 28 VDC and transmits mADC signals to the loop.



Specifications

Source Unit

	Range	Resolution
DC voltage	100mV	1uV
	1V	10uV
	10V	0.1mV
	30V	10mV
DC current mA SINK	20mA	1uA
	20mASINK	1uA
OHM	500Ω	0.01Ω
	5kΩ	0.1Ω
	50kΩ	1Ω
RTD	PT100 JPT100	0.1˚C
Thermocouple	K E J T N L U	0.1˚C
	R S B	1˚C
Frequency /pulse	100Hz	0.01Hz
	1000Hz	0.1Hz
	10kHz	0.1kHz
	50kHz	1kHz
	CPM	0.1CPM

Measurement Unit

	Range	Resolution
DC voltage	500mV	10uV
	5V	0.1mV
	35V	1mV
DC current	20mA	1uA
	100mA	10uA
OHM	500Ω	0.01Ω
	5kΩ	0.1Ω
	50kΩ	1Ω
RTD	PT100 JPT100	0.1˚C
Thermocouple	K E J T N L U	0.1˚C
	R S B	1˚C
Pulse	100Hz	0.01Hz
	1000Hz	0.1Hz
	10kHz	0.001kHz
	CPM	1CPM
	CPH	1CPH
Loop power supply	24V LOOP	

General Specifications

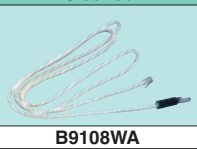
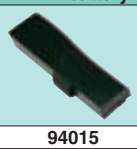
Specifications common to source and measurement

- Communication functions: Serial interface
  RS232 D-Sub 9-pin connector
- Memory functions: Data can be stored and loaded in setting memory (setting data) and data memory (source/measurement)

Common source specifications

- Power supply: 6 AA size alkaline batteries
  AC adapter (sold separately) or dedicated NiMH battery (sold separately)
- Battery life Conditions: Simultaneous Source/measurement
  When 6 batteries are used: Approx. 8 hours
  When NiMH battery is used: Approx. 10 hours
- Auto power-off: Approx. 10 minutes
- Insulation resistance: Between input terminal and output terminal: 500 VDC, 50 MΩ or more
- Withstand voltage: Between measurement terminal and generation terminal: 350 VAC, 1 minute
- Operating temperature/humidity range: 0 to 40°C, 20 to 80%RH (no condensation)
- Storage temperature range: -20 to 60°C 90%RH or less (no condensation)
- External dimensions: Approx. 251 × 124 × 70 mm
- Weight: Approx. 1000 g (with Batteries)
- Accessories:
  Lead cable for generation: 1 set
  Lead cable for measurement: 1 set
  Carrying case: 1
  Terminal adapter: 1
  Size AA battery: 6
  Instruction Manual: 1
  Fuse for measurement: 1 (spare)
- Conforming Standards:
  Safety: EN61010-1
  EMC: EN 61326 Class B;EN 55011 Class B Group1
  EN 61000-3-2; EN 61000-3-3, EN61326

Optional Accessories (sold separately)

Product name	AC adapter		RJ sensor	Accessory storage case	NiMH battery	Main body case
						
Model name	94010		B9108WA	B9108XA	94015	93027
Remark	-D	For UL/CSA Standard	For reference junction compensation	Lead cables, RJ sensor, etc. can be stored.	NiMH battery Dedicated	With strap and accessory storage case
	-F	For VDE Standard				
	-H	For GB Standard				
	-R	For AS Standard				
	-S	For BS Standard				

Handy Calibrators

CA51/CA71, CA11E, CA12E

http://www.yokogawa.com/gmi/ca

Simultaneous Signal Source and Measurement Capability

CA51/CA71

Handy Calibrators

Features

- Source and measure operations can be performed at the same time.
  (Select from the following source signal and measurement signal options: voltage, current, resistance, thermocouple (TC), resistance temperature detector (RTD), frequency, pulse).
- AC voltages, including supply voltage, can be measured.
- Easy operation.
- Compact size and Lightweight
- Includes a wide array of additional functions.
  - Source
    Values set in steps of 4-20 mA
    24V DC Power Supply to Transmitter
  - Divided output (n/m) function
    Output settings are divided, eliminating the need for bothersome calculations for percentage output.
  - Autostep function
    Changes the output value in step form based on the setting from the divided output (n/m) function. Changes can be sourced automatically every 10% or 25%.
  - Online communication (CA71 only)
    RS-232C-compliant optically isolated interface
  - Sweep function
    Linearly increases or decrease the output. The increasing/decreasing time can be set to either 16 or 32 seconds.
  - Memory function
    Source values and measurements forming individual value sets can be saved to or read from the Handy Calibrator's internal memory (maximum 50 value sets).
  - Temperature monitor function

General Specifications

Parameter	Specifications
Power supply	Four AA alkaline batteries, or special AC adapter (sold separately)
Battery life	Measurement off, output 5 V DC/10 kΩ or greater: Approximately 40 hours Simultaneous signal generation/measurement, output 5 V DC/10 kΩ or greater: Approximately 20 hours Simultaneous signal generation/measurement, output 20 mA/5 V: Approximately 12 hours (using alkaline batteries, with backlight off)
Auto-power-off function	Approximately 10 minutes (auto-power-off can be disabled through a DIP switch setting)
Applicable standards	IEC61010-1, IEC61010-2-31 EN61326-1 EN55011, Class B, Group 1
Operating temperature and humidity ranges	0–50°C, 20–80% RH (no condensation)
External dimensions (WHD)	Approximately 190 × 120 × 55 mm
Weight	Approximately 730 g (including batteries)

Specifications

Source Unit

Parameter	Reference	Range	Accuracy (23±5°C per year)	Resolution
DC voltage	100 mV	-10.00–110.00 mV	±(0.02% + 15 µV)	10 µV
	1 V	0–1.1000 V	±(0.02% + 0.1 mV)	0.1 mV
	10 V	0–11.000 V	±(0.02% + 1 mV)	1 mV
	30 V	0–30.00 V	±(0.02% + 10 mV)	10 mV
DC current	20 mA	0–24.000 mA	±(0.025% + 3 µA)	1 µA
	4–20 mA	4/8/12/16/20 mA		4 mA
mA SINK	20 mA	0.1–24.000 mA	±(0.05% + 3 µA)	1 µA
Resistance	400 Ω	0–400.00 Ω	±(0.025% + 0.1 Ω)	0.01 Ω
RTD	Pt100	-200.0–850.0°C	±(0.025% + 0.3°C)	0.1°C
	JPt100	-200.0–500.0°C		
TC	K	-200.0–1372.0°C	±(0.02% + 0.5°C) (-100°C or greater) ±(0.02% + 1°C) (-100°C or less)	0.1°C
	E	-200.0–1000.0°C		
	J	-200.0–1200.0°C		
	T	-200.0–400.0°C	±(0.02% + 0.5°C) (0°C or greater) ±(0.02% + 1°C) (0°C or less)	
	N	-200.0–1300.0°C		
	L	-200.0–900.0°C		
	U	-200.0–400.0°C		
	R	0–1768°C	±(0.02% + 2.5°C) (100°C or less) ±(0.02% + 1.5°C) (100°C or greater)	1°C
	S			
	B	600–1800°C	±(0.02% + 2°C) (1000°C or less) ±(0.02% + 1.5°C) (1000°C or greater)	
Frequency, pulse	500 Hz	1.0–500.0 Hz	±0.2 Hz	0.1 Hz
	1000 Hz	90–1100 Hz	±1 Hz	1 Hz
	10 kHz	0.9 kHz–11.0 kHz	±0.1 kHz	0.1 kHz
	Pulse cycle	1–99,999 cycles	–	1 cycle

Measurement Unit

• Both CA51 and CA71

Parameter	Reference	Accuracy (23±5°C per year)	Resolution
DC voltage	100 mV	±(0.025% + 20 µV)	10 µV
	1 V	±(0.025% + 0.2 mV)	0.1 mV
	10 V	±(0.025% + 2 mV)	1 mV
	100 V	±(0.05% + 20 mV)	0.01 V
DC current	20 mA	±(0.025% + 4 µA)	1 µA
	100 mA	±(0.04% + 30 µA)	10 µA
Resistance	400 Ω	±(0.05% + 0.1 Ω)	0.01 Ω
AC voltage	1 V	±(0.5% + 5 dgt)	1 mV
	10 V		0.01 V
	100 V		0.1 V
	300 V	±(0.5% + 2 dgt)	1 V
Frequency, pulse	100 Hz	±2 dgt	0.01 Hz
	1000 Hz		0.1 Hz
	10 kHz		0.001 kHz
	CPM		1 CPM
	CPH		1 CPH

• CA71 only

Parameter	Reference	Accuracy (23±5°C per year)	Resolution
TC	K	±(0.05% + 1.5°C) (-100°C or greater) ±(0.05% + 2°C) (-100°C or less)	0.1°C
	E		
	J		
	T		
	N		
	L		
	U		
	R	±(0.05% + 2°C) (100°C or greater) ±(0.05% + 3°C) (100°C or less)	1°C
	S		
	B		
RTD	Pt100	±(0.05% + 0.6°C)	0.1°C
	JPt100		

Source and Measuring of Voltage and Current

CA11E

Voltage/Current Calibrator

Signal source:
DCV (Max. 30 V), DCA (Max. 24 mA)
Measurement:
DCV (Max. 30 V), DCA (Max. 24 mA)
Features:
Auto step (4 to 20 mA), 20 mA SINK, Sweep function, 24V (20 mA) / Loop check function

CA11E Specifications

Source
DCV: 30/10/1-5/1 V/100 mV
DCA: 20/4-20 mA SINK
Measurement
DCA: 30/10/1 V/100 mV
DCA: 20 mA
Genetal Specifications
- External dimensions:
  192 (W) × 90 (H) × 42 (D) mm
- Weight: Approx. 440 g
- Power Supply:
  Four AA (R6) dry cells or AC adaptor

Simulator of Common Thermocouples and RTD Sensors

CA12E

Temperature Calibrator

Signal source:
TC, RTD PT100, 100 mV, 400Ω
Measurement:
TC, RTD PT100, 100 mV, 400Ω

CA12E Specifications

Source
TC: K/E/J/T/N/R/S/B/L/U
RTD: PT100/JPT100
100 mV, 400Ω
Measurement
TC: K/E/J/T/N/R/S/B/L/U
RTD: PT100/JPT100
100 mV, 400Ω
Genetal Specifications
- External dimensions:
  192 (W) × 90 (H) × 42 (D) mm
- Weight: Approx. 440 g
- Power Supply:
  Four AA (R6) dry cells or AC adaptor

Digital Multimeters

Selection Guide, TY700 series

Model	Type	Max. Value	Display: Dual	Display: Bar Graph	Display: Back-lit	Measurement Items: AC RMS	Measurement Items: Voltage	Measurement Items: AC + DC	Measurement Items: Current	Measurement Items: AC + DC A	Measurement Items: Resistance	Measurement Items: Continuity Check	Measurement Items: Diode Test	Measurement Items: Frequency	Measurement Items: Temperature	Measurement Items: Capacitance	Additional Functions: Communication	Additional Functions: Data Memory	Additional Functions: Max./Min. Value Memory	Additional Functions: Relative Value Computation	Additional Functions: Logarithm Computation	Additional Functions: Data Hold	Additional Functions: Auto Hold	Additional Functions: Peak Hold	Additional Functions: Overvoltage Input Warning	Additional Functions: Comparator	Additional Functions: Auto Power Off
TY710	Handheld	50000	●	●	●	○	●	○	●	○	●	●	●	○	○	●	●	●	●	●	●	●	●	●	○	●	●
TY720	Handheld	50000	●	●	●	○	●	○	●	○	●	●	●	○	○	●	●	●	●	●	●	●	●	●	○	●	●
TY520	Handheld	6000		●	●	○	●		●		●	●	●	●	○	●				●		●	●		●		●
TY530	Handheld	6000		●	●	○	●		●		●	●	●	●	○	●	●	●	●	●		●	●		●		●
73201	Handheld	4300					●		●		●	●	●										●		◎		●
73202	Handheld	4300					●		●		●	●	●			●							●		◎		●
73203	Handheld	4300					●		●		●	●	●			●							●		◎		●
73204	Handheld	4300					●				●	●	●										●		◎		●
73101	Pocket-sized	4300					●				●	●	●										●				●

◎ : Also functions as excessive current input warning.

A New De Facto Standard for Handheld DMM

- Maximum Measurement Accuracy: 0.020% rdg + 2 dgt
- Highly Reliable: Closed case calibration
- Full Support of Data Management: Measured data stored in internal memory
- Safe Design: Shutters prevent erroneous insertion of test leads into current measurement-terminals (terminal shutters)
- Shockproof elastomer casing

General Specifications

Additional Functions	USB communication (optional adapter & software), data memory (TY720: 10,000 data, TY710: 1,000 data), max/min value memory, relative/percentage value computation, logarithm computation, data/auto hold, peak hold (TY720), overvoltage warning, backlight
Power Supply	Four AA (R6) dry cells
Battery Life	Approx. 120 hours
Dimensions	90 (W) × 192 (H) × 49 (D) mm
Weight	Approximately 560 g (including batteries)
Safety Standards	1000 V CAT. Ⅲ, 600 V CAT. Ⅳ

TY700 Series

Digital Multimeters

TY700 Series Specifications

Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)

		TY710			TY720		
Detection		RMS			Switching detection (RMS or MEAN)		
Item	Range	Accuracy					
DCV	50mV	0.05+10					
	500mV/2400mV	0.02+2					
	5V	0.025+5					
	50V/500V/1000V	0.03+2					
ACV [RMS]		Upper: 10 to 20Hz Lower: 20Hz to 1kHz	Upper: 1kHz to 10kHz Lower: 10kHz to 20kHz	Upper: 20kHz to 50kHz Lower: 50kHz to 100kHz	Upper: 10 to 20Hz Lower: 20Hz to 1kHz	Upper: 1kHz to 10kHz Lower: 10kHz to 20kHz	Upper: 20kHz to 50kHz Lower: 50kHz to 100kHz
	50mV	— —	— —	— —	2+80 0.4+40	5+40 5.5+40	15+40 15+40
	50mV/5V/ 50V/500V	1.5+30	0.7+30 2+50	— —	1+30	0.4+30 1+40	2+70 5+200
	1000V	0.7+30	3+30 —	— —	0.4+30	3+30 —	— —
ACV [MEAN]					10 to 20Hz	20Hz to 500Hz	500Hz to 1kHz
	50mV	—			4+80	1.5+30	5+30
	50mV/5V/ 50V/500V/1000V	—			2+30	1+30	3+30
DCV+ACV		Upper: DC,10 to 20Hz Lower: DC,20Hz to 1kHz	Upper: DC,1kHz to 10kHz Lower: DC,10kHz to 20kHz	Upper: DC,20kHz to 50kHz Lower: DC,50kHz to 100kHz	Upper: DC,10 to 20Hz Lower: DC,20Hz to 1kHz	Upper: DC,1kHz to 10kHz Lower: DC,10kHz to 20kHz	Upper: DC,20kHz to 50kHz Lower: DC,50kHz to 100kHz
	5V/50V/500V	1.5+10 1+10	1+10 2+10	— —	1.5+10 0.5+10	0.5+10 1+10	2+10 5+20
	1000V	1.5+10 1+10	— —	— —	1.5+10 0.5+10	— —	— —
DCA	500μA/5000μA/ 50mA/500mA	0.2+5					
	5A	0.6+10					
	10A	0.6+5					
ACA [RMS]		10Hz to 20Hz	20Hz to 1kHz	1kHz to 5kHz	10Hz to 20Hz	20Hz to 1kHz	1kHz to 5kHz
	500μA/5000μA/ 50mA/500mA	1.5+20	1+20	—	1+20	0.75+20	1+30
	5A/10A				1.5+20	1+20	2+30
ACA [MEAN]					10Hz to 20Hz	20Hz to 1kHz	1kHz to 5kHz
	500μA/5000μA/ 50mA/500mA	—			2+20	1.5+20	2+30
	5A/10A	—			3+20	2+20	4+30
DCA+ACA		DC,10 to 20Hz	DC,20Hz to 1kHz	DC,1kHz to 5kHz	DC,10 to 20Hz	DC,20Hz to 1kHz	DC,1kHz to 5kHz
	500μA/5000μA/ 50mA/500mA	2+10	1.5+10	—	1.5+10	1+10	1.5+10
	5A/10A				2+10	1.5+10	3+10
Resistance	500Ω/5kΩ/50kΩ 500kΩ	0.1+2			0.05+2		
	5MΩ	0.5+2					
	50MΩ	1+2					
Low-power Resistance	5kΩ/50kΩ/500kΩ	—			0.2+3		
	5MΩ	—			1+3		
Frequency	2.0Hz to 99.99kHz	0.02+1					
Capacitance	5nF/50nF/500nF 5μF/50μF	1+5					
	500μF	2+5					
	5mF/50mF	3+5					
Continuity check	550Ω	Buzzer sounds at 100±50Ω or less					
Diode test	2.4V	1+2					
Temperature	-200 to 1372°C	1+1.5°C					

Digital Multimater

TY500 series, 732 series, 73101

Provides Safety Levels Demanded in Field Work

TY500 Series

Digital Multimeters

3.5 digits (6,000-count, 31-segment bar graph display), RMS type
Measurement Functions: Voltage, Current, Resistance, Continuity Check, Diode Test, Frequency, Capacitance, Temperature
Features: Closed case calibration, Hi-impact overmold case, USB communication (optional adapter & software) (TY530 only), data memory (1,600 data for TY530 only)
Safety Standards: 1000 V CAT. Ⅲ, 600 V CAT. Ⅳ

TY500 Series Specifications

Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)

		TY520		TY530
Detection		RMS		Switching detection
Item	Range	Accuracy		
DCV	600mV/6V/60V/600V	0.09 + 2		
	1000V	0.15 + 2		
ACV		50/60Hz	40 to 500Hz	500Hz to 1kHz
	600mV/6V/60V/600V 1000V	0.5 + 5	1 + 5	1.5 + 5
				—
DCA	600µA/6000µA/60mA	0.2 + 2		
	600mA/6A/10A	0.5 + 5		
ACA		50/60Hz		40Hz to 1kHz
	600µA/6000µA/60mA/ 600mA/6A/10A	0.75 + 5		1.5 + 5
Resistance	600Ω/6kΩ/60kΩ/600kΩ	0.4 + 1		
	6MΩ	0.5 + 1		
	60MΩ	1 + 2 (0 to 40MΩ) 2 + 2 (40 to 60MΩ)		
Frequency	10.0Hz to 99.99kHz	0.02 + 1		
Capacitance	10nF	2 + 10		
	100nF/1µF/10µF	2 + 5		
	100µF/1000µF	3 + 5		
Continuity check	600Ω	Buzzer sounds at 50±30Ω or less		
Diode test	2V	1 + 2		
Temperature	-50 to 600°C	2 + 2°C		

General Specifications
- External dimensions:
  90 (W) × 192 (H) × 49 (D) mm
- Weight: Approx. 570 g
- Power Supply: Four AA (R6) dry cells

Low-cost Handheld DMM

732 Series

Digital Multimeters

3.5 digits (4,300-count), Mean value type
Measurement Functions: Voltage, Current, Resistance, Continuity Check, Diode Test, Capacitance
Features: Auto hold, Auto power-off

732 Series Specifications

Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)

Model		73201	73202	73203	73204
Detection		Mean value			
Item	Range	Accuracy			
DCV	400.0 mV/4.000 V/ 40.00 V/400.0 V/600 V	0.5%+1 0.75%+1	0.5%+1	0.3%+1	0.5%+1
ACV	4.000 V/40.00 V/ 400.0 V/600 V	1.0%+5		0.75%+5	
DCA	400.0 µA/4000 µA/ 40.00 mA/400.0 mA/ 10.00 A	1.0%+2 2.0%+2			–
ACA (40 to 500 Hz)	400.0 µA/4000 µA/ 40.00 mA/400.0 mA/ 10.00 A	2.0%+20 2.0%+5 2.0%+20 2.0%+5 2.0%+20			–
Resistance	400.0 Ω/4.000 kΩ/ 40.00 kΩ/400.0 kΩ/ 4.000 MΩ/40.00 MΩ	0.75%+2 0.75%+1 2.0%+1 5.0%+2			

General Specifications
- External dimensions:
  74 (W) × 155 (H) × 31 (D) mm
- Weight: Approx. 240 g
- Power Supply:
  Two AAA (LR03 or R03) dry cells

Pocket DMM with Superb Portability

73101

Pocket Digital Multimeter

4300 count display
Continuity Check and Diode Test
Auto Hold
Auto Power Off

73101 Specifications

Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)

Item	Range	Accuracy	Input Resistance
DCV	400.0 mV 4.000 V 40.00/400.0/600 V	1.2%+2 0.7%+1 1.2%+1	>100 MΩ 11 MΩ 10 MΩ
ACV	4.000 V 40.00/400.0/600 V	2.0%+5	10 MΩ
Resistance	400.0 Ω 4.000 k/40.00 k/400.0 kΩ 4.000 MΩ 40.00 MΩ	1.2%+2 2.0%+3 5.0%+3	
Continuity check	400.0 Ω	–	
Diode test	2.00 V	1.5%+1	Open-circuit Voltage<3.4 V Testing Current<1.0 mA

Genetal Specifications
- External dimensions:
  76 (W) × 117 (H) × 18 (D) mm
- Weight: Approx. 110 g
- Power Supply: Two LR-44 dry cells

Clamp-on Testers

Selection Guide, CL120, CL130/CL135, CL150/CL155, CL220

Model	Diameter of measurable conductor	Range	Accuracy	AC current	DC current	Leak current	DC voltage	AC voltage	Resistance	Continuity check	Frequency	True RMS	Output	Data hold	Peak hold	Filter
CL120	ϕ24	20 to 200 A	2.0+7	●										●		
CL130	ϕ33	200 to 600 A	1.5+6	●			●		●	●				●		
CL135	ϕ33	200 to 600 A	1.5+4	●			●		●	●		●		●		
CL150	ϕ54	400 to 2000 A	1.0+3	●			●	●	●	●			●	●	●	
CL155	ϕ54	400 to 2000 A	1.0+3	●			●	●	●	●		●	●	●	●	
CL220	ϕ24	400 to 300 A	1.0+4	●	●									●		
CL235	ϕ33	400 to 600 A	1.0+5	●	●		●	●	●	●	●	●		●		
CL250	ϕ55	400 to 2000 A	1.5+2	●	●		●	●	●	●			●	●		
CL255	ϕ55	400 to 2000 A	1.5+2	●	●		●	●	●	●		●	●	●	●	
CL320	ϕ24	20 mA to 200 A	2.0+4	●		●								●		●
CL340	ϕ40	40 mA to 400 A	1.0+5	●		●								●	●	●
CL345	ϕ40	40 mA to 400 A	1.0+5	●		●						●		●	●	●
30031A	ϕ40	3 mA to 60 A	1.0+5	●		●								●		
30032A	ϕ40	3 mA to 60 A	1.0+5/1.5+5	●		●								●		●
CL360	ϕ68	200 mA to 1000 A	1.0+2	●		●							●	●	●	●

Light weight & compact design

CL120
Clamp-on Tester

- ACA
- ϕ 24
- AC/20 to 200A

CL120 Specifications

Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)

Item	Range	Accuracy
ACA	200A	2.0+7 (50 to 1kHz)
		2.0+5 (50/60Hz)
	20A	3.0+10 (40 to 1kHz)

Both AC/DC Current Measurement

CL130/135
Clamp-on Testers

- ACA
- ϕ 33
- AC/200 to 600A
- AC V/Ω
- RMS for CL135

CL130/CL135 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy (CL130/CL135)	
ACA	200A	1.5+6 (50/60Hz)	1.5+4 (50/60Hz)
		2.0+5 (40 to 1kHz)	2.0+5 (40 to 1kHz)
	600A	1.0+3 (50/60Hz)	1.5+4 (50/60Hz)
		2.0+5 (40 to 1kHz)	2.0+5 (40 to 1kHz)
ACV	200V/600V	1.0+2 (50/60Hz)	1.0+2 (50/60Hz)
		1.5+4 (40 to 1kHz)	1.5+4 (40 to 1kHz)
Resistance	200Ω	1.2+4, Beeps at below 30Ω (continuity check)	

Wide Range of Current Measurement

CL150/CL155
Clamp-on Testers

- ACA
- ϕ 54
- AC/400 to 2000 A
- AC V/DC V/Ω
- DC Output
- RMS for CL155

CL150/CL155 Specifications

Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)

Item	Range	Accuracy
ACA	400 A	1.0 + 3 (50/60 Hz)
		2.0 + 3 (40 to 1 kHz)
	2000 A (0 to 1500 A)	1.0 + 3 (50/60 Hz)
		3.0 + 3 (40 to 1 kHz)
	2000 A (1500 to 2000 A)	3.0 (50/60 Hz)
ACV	40/400/750 V	1.0 + 2 (50/60 Hz)
		1.5 + 3 (40 to 1 kHz)
DCV	40/400/1000 V	1.0 + 2
Resistance	400/4 k/40 k/400 kΩ	1.5 + 2, Beep sound at less than 50 ±35 Ω

Both AC/DC Current Measurement

CL220
Clamp-on Tester

- ACA/DCA
- ϕ 24
- AC/40 to 300 A
- DC/40 to 300 A

CL220 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy
ACA	40 A	1.0 + 4
	300 A (±20 to ±200 A)	1.5 + 4
	300 A (±200 to ±300 A)	3.0
DCA	40 A	1.0 + 4 (50/60 Hz)
		2.5 + 4 (20 to 1 kHz)
	300 A (20 to 200 A)	1.5 + 4 (50/60 Hz)
		2.5 + 4 (20 to 1 kHz)
	300 A (200 to 300 A)	3.5 (50/60 Hz)
		4.0 (20 to 1 kHz)

Clamp-on Testers

CL235, CL250/CL255, CL320, CL340/CL345, CL360, 30031

RMS ACA/DCA measurement

CL235
Clamp-on Tester

- ACA/DCA
- ϕ 33
- AC/400 to 600A, DC/400 to 1000A
- AC V/DC V/Ω/Hz
- RMS

CL235 Specifications

Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)

Item	Range	Accuracy
ACA	400/600A	1.5+5 (50/60Hz) 3.5+5 (40 to 1kHz)
DCA	400/1000A	1.0+5
ACV	40/400/600V	1.5+5 (50/60Hz) 3.5+5 (40 to 1kHz)
DCV	40/400/600V	1.0+5
Resistance	400/4000Ω	1.0+5, Beeps at below 20Ω (continuity check)
Frequensy	10 to 3000Hz	1.5+5

Wide Range of ACA/DCA measurement

CL250/CL255
Clamp-on Testers

- ACA/DCA
- ϕ 55
- AC/400 to 2000A, DC/400 to 2000A
- AC V/DC V/Ω
- DC Output
- Hz,RMS for CL255

CL250 Specifications

Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)

Item	Range	Accuracy
DCA	400/2000A	1.5+2
ACA	400A/2000A (0 to 1000A)	1.5+2 (50/60Hz) 3.0+4 (40 to 500Hz) 5.0+4 (500 to 1kHz)
	2000A (1001 to 2000A)	3.0+2 (50/60Hz)

CL255 Specifications

Accuracy: (23°C ±5°C, Less than 75% RH), ±(% rdg + dgt)

Item	Range	Accuracy
DCA	400/2000A	1.5+2
ACA	400A/2000A (150 to 1700A)	1.5+3 (50/60Hz) 3.0+4 (30 to 1kHz)
	2000A (1701 to 2000A)	3.5+3 (50/60Hz)

Compact design of Leakage current measurement

CL320
Leakage Clamp-on Tester

- ACA
- ϕ 24
- AC/20mA to 200A

CL320 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy	
		WIDE (40 to 400Hz)	50/60Hz
ACA	20mA/200mA	2.0+4 (50/60Hz)	3.0+5 (50/60Hz)
	200A (0 to 100A)	5.0+6 (40 to 400Hz)	
	200A (100.1 to 200A)	5.0+4 (50/60Hz)	5.0+5 (50/60Hz)

Leakage current measurement

CL340/CL345
Leakage Clamp-on Testers

- ACA
- ϕ 40
- AC/40mA to 400A
- RMS for CL345

CL340 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy	
		WIDE (20Hz)	50/60Hz
ACA	40mA/400mA	2.5+10 (20 to 1kHz)	1.0+5 (50/60Hz)
	400A (0 to 350A)	2.5+10 (40 to 1kHz)	1.0+5 (50/60Hz)
	400A (350 to 400A)	5.0 (40 to 1kHz)	2.0 (50/60Hz)

CL345 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy	
		WIDE (20Hz)	50/60Hz
ACA	40mA/400mA	2.5+10 (20 to 1kHz)	1.0+5 (50/60Hz)
	400A (0 to 300A)	2.5+10 (40 to 1kHz)	1.0+5 (50/60Hz)
	400A (300 to 400A)	5.0 (40 to 1kHz)	2.0 (50/60Hz)

Wide Range of Leakage current measurement

CL360
Leakage Clamp-on Tester

- ACA
- ϕ 68
- AC/200mA to 1000A
- DC/AC Output

CL360 Specifications

Accuracy: (23°C ±5°C, Less than 85% RH), ±(% rdg + dgt)

Item	Range	Accuracy	
		WIDE (40 to 1kHz)	50/60Hz
ACA	20mA/2A/20A	1.0+2 (50/60Hz) 3.0+2 (40 to 1kHz)	1.5+2
	200A	1.5+2 (50/60Hz) 3.5+2 (40 to 1kHz)	2.0+2
	1000A (0 to 500A)	1.5+2 (50/60Hz) 3.5+2 (40 to 1kHz)	2.0+2
	1000A (501 to 1000A)	5.0+2 (50/60Hz) 10.0+2 (40 to 1kHz)	5.5

Leakage Currents of 1 mA measurement

30031A/30032A
Leakage Clamp-on Tester

- ACA
- ϕ 40
- AC/3 mA to 60 A

30031A/30032A Specifications

Accuracy: (23°C ±5°C, Less than 80% RH), ±(% rdg + dgt)

Item	Range	Accuracy	
		30031A, 30032A Filter OFF	30032A Filter ON
ACA	0 to 30 mA	1.0+5 (50±1.0Hz/60±1.0Hz)	1.5+5 (50±1.0Hz/60±1.0Hz)
	0 to 50 A		
	50 to 60 A	5.0+5 (50±1.0Hz/60±1.0Hz)	5.5+5 (50±1.0Hz/60±1.0Hz)

Insulaion Testers

Selection Guide, MY40

Type		Series/ Model	Suffix Code & Backlight	Rating	AC Voltage Measuring range	Display	Additional Function
Digital insulation testers	4 ranges	MY40 CE	01 (EL-illuminated)	125V/200MΩ 250V/200MΩ 500V/2000MΩ 1000V/2000MΩ	0–600V	3 1/2-digit LCD	Automatic discharge Conductor resistance measurement Comparator function Memory function
Analog insulation testers	2 & 3 ranges	2406E CE	31-E (N/A)	25V/5MΩ 50V/10MΩ 125V/20MΩ	0–300V	Analog	Automatic discharge Battery check
			41-E (EL-illuminated)				
			32-E (N/A)	125V/20MΩ 250V/50MΩ	0–300V		
			42-E (EL-illuminated)				
			33-E (N/A)	125V/20MΩ 250V/50MΩ 500V/100MΩ	0–600V		
			43-E (EL-illuminated)				
			34-E (N/A)	250V/50MΩ 500V/100MΩ 1000V/2000MΩ	0–600V		
			44-E (EL-illuminated)				
			35-E (N/A)	250V/500MΩ 500V/1000MΩ 1000V/2000MΩ	0–600V		
			45-E (EL-illuminated)				
	Single range	MY10 CE	01 (afterglow-illuminated)	125V/20MΩ	0–250V	Analog	Automatic discharge Battery check
			02 (afterglow-illuminated)	250V/50MΩ	0–300V		
			03 (afterglow-illuminated)	500V/100MΩ	0–500V		
			04 (afterglow-illuminated)	500V/1000MΩ	0–500V		
			05 (afterglow-illuminated)	1000V/2000MΩ	0–500V		
	Single range	3213A	41 (N/A)	100V/20MΩ	0–150V	Analog	Battery check
			42 (N/A)	250V/50MΩ	0–250V		
			43 (N/A)	500V/100MΩ	0–300V		
			44 (N/A)	500V/1000MΩ	0–300V		
			45 (N/A)	1000V/2000MΩ	0–300V		
			46 (N/A)	125V/20MΩ	0–250V		

Digital model with 4 voltage/resistance ratings

CE

MY40
Digital Insulation Tester

Features

- Multifunction
  Insulation resistance, AC voltage and conductor resistance measurement
  Insulation test mode: Comparator, memory, auto-hold and discharge functions
  All test modes: Live-line alarm (excluding AC voltage measurement), battery check and automatic power-off
- Easy-to-view, fluctuation-free display
- Double-action safety mechanism

General Specifications

Dimensions: 125 (W) × 103 (H) × 53 (D) (mm), excluding protrusions
Weight: 420 g (main unit and batteries only, excluding accessories)
Batteries: Four AA (R6P) batteries

Testing Performance Specifications

Model	Rating	Range Option	Resolution	Measuring Range	Tolerance	Lower Limit of measured Ω	Rated Current	Central Scale Value
MY40-01	125V/200MΩ	.4000	.1kΩ	0–.0199MΩ	± (5%of rdg+6dgt)	0.125MΩ	1mA	5MΩ
		4.000	1kΩ	.0200–10.00MΩ*	± (2%of rdg+6dgt)			
		40.00	10kΩ	10.01–200.0MΩ	± 5%of rdg			
		200.0	100kΩ					
	250V/200MΩ	.4000	.1kΩ	0–.0499MΩ	± (5%of rdg+6dgt)	0.25MΩ	1mA	5MΩ
		4.000	1kΩ	.0500–20.00MΩ*	± (2%of rdg+6dgt)			
		40.00	10kΩ	20.01–200.0MΩ	± 5%of rdg			
		200.0	100kΩ					
	500V/2000MΩ	4.000	1kΩ	0–0.999MΩ	± (5%of rdg+6dgt)	0.5MΩ	1mA	50MΩ
		40.00	10kΩ	1.000–500MΩ*	± (2%of rdg+6dgt)			
		400.0	100kΩ	501–2000MΩ	± 5%of rdg			
		2000	1MΩ					
	1000V/2000MΩ	4.000	1kΩ	0–1.999MΩ	± (5%of rdg+6dgt)	2MΩ	0.5mA	50MΩ
		40.00	10kΩ	2.000–1000MΩ*	± (2%of rdg+6dgt)			
		400.0	100kΩ	1001–2000MΩ	± 5%of rdg			
		2000	1MΩ					

* First effective measuring range; ** The minimum value at which the rated voltage can be maintained

Standard test conditions
Ambient temperature/humidity ranges: 23 ±5℃/45-75% RH
Tolerances under the above-mentioned conditions:
Deviation from zero scale value: 6 digits maximum
Indication of ∞ mark on bar graph: Approx. 4000 MΩ min. (500 V/1000 V)
Approx. 400 MΩ min. (125 V/250 V)
Open circuit voltage: 130% max. of rated voltage
Rated measuring current: 1 mA (0 to 20%) when in first effective measuring range
Short-circuit Current: 2 mA max.

AC voltage measurement (45-400 Hz)

Model	Range	Resolution	Accuracy	Input Impedance
MY40-01	600V	1V	±(2% of rdg + 6dgt)	Approx. 2 MΩ

Conductor resistance measurement

Model	Range	Resolution	Accuracy	Open-circuit Voltage
MY40-01	400Ω	0.1Ω	±(2% of rdg + 8dgt)	Buzzer sound resistance: <40Ω.

Insulaion Testers

2406E series, MY10 series, 3213A series

Analog models with two and three ratings

2406E Series

Analog Insulation Testers

Features

- AC voltage measurement
- Automatic discharge
- Sky blue EL backlight

General Specifications

Dimensions (main unit): Approx. 120 (W) × 110 (H) × 60 (D) (mm)
Weight: Approx. 500 g (including batteries)
Batteries: Six AA (R6P) batteries

Testing Performance Specifications

Model	Suffix code	Rating	Effective Measuring range	Central Scale Value	AC Voltage Measuring range	Lower limit of measured Ω	Rated Current
240631	-E	25V/5MΩ	0.001–5MΩ	0.1MΩ	0–300V	0.025MΩ	1mA
240641	-E	50V/10MΩ	0.005–10MΩ	0.2MΩ		0.05MΩ	1mA
		125V/20MΩ	0.01–20MΩ	0.5MΩ		0.125MΩ	1mA
240632	-E	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–300V	0.125MΩ	1mA
240642	-E	250V/50MΩ	0.01–50MΩ	1MΩ		0.25MΩ	1mA
240633	-E	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–600V	0.125MΩ	1mA
240643	-E	250V/50MΩ	0.01–50MΩ	1MΩ		0.25MΩ	1mA
		500V/100MΩ	0.05–100MΩ	2MΩ		0.5MΩ	1mA
240634	-E	250V/50MΩ	0.01–50MΩ	1MΩ	0–600V	0.25MΩ	1mA
240644	-E	500V/100MΩ	0.05–100MΩ	2MΩ		0.5MΩ	1mA
		1000V/2000MΩ	1–2000MΩ	50MΩ		1MΩ	1mA**
240635	-E	250V/500MΩ	0.1–500MΩ	10MΩ	0–600V	0.25MΩ	1mA**
240645	-E	500V/1000MΩ	0.5–1000MΩ	20MΩ		0.5MΩ	1mA**
		1000V/2000MΩ	1–2000MΩ	50MΩ		1MΩ	1mA**

EL-backlit Non-backlit

* The minimum value at which the rated voltage can be maintained;
** 0.55 mA in the case of the first effective measuring range

Analog models with single rating

MY10 Series

Analog Insulation Testers

Features

- AC voltage measurement
- Automatic discharge
- A wide choice of accessories
  –Designed for shared use with the MY40

General Specifications

Dimensions: Approx. 125 (W) × 103 (H) × 53 (D) (mm), excluding protrusions
Weight: Approx. 400 g (main unit and batteries only, excluding accessories)
Batteries: Four AA (R6P) batteries

Testing Performance Specifications

Model	Rating	Effective Measuring Range	Central Scale Value	AC Voltage Measuring Range	Lower Limit of Measured Ω*	Rated Current
MY10-01	125V/20MΩ	0.01–20MΩ	0.5MΩ	0–250V	0.125MΩ	1–1.2mA
MY10-02	250V/50MΩ	0.01–50MΩ	1MΩ	0–300V	0.25MΩ	1–1.2mA
MY10-03	500V/100MΩ	0.05–100MΩ	2MΩ	0–500V	0.5MΩ	1–1.2mA
MY10-04	500V/1000MΩ	0.5–1000MΩ	20MΩ	0–500V	1MΩ	0.5–0.6mA
MY10-05	1000V/2000MΩ	1–2000MΩ	50MΩ	0–500V	2MΩ	0.5–0.6mA

* The minimum value at which the rated voltage can be maintained

Analog models with single rating

3213A Series

Analog Insulation Testers

Features

- AC voltage measurement and check live lines such as motive power lines
- One-touch operation Press-and-lock switch for continuous measurement
- A wide choice of accessories to meet various testing requirements
- Vibration- and shock-resistant hand-held compact testers

General Specifications

Dimensions: Approx. 110 (W) × 180 (H) × 60 (D) (mm)
Weight: Approx. 700 g including batteries, or approx. 1.2 kg including hard case, handle, test leads and batteries
Batteries: Eight AA (R6P) batteries

Testing Performance Specifications

Model	Rating	Effective Measuring Range	Central Scale Value	AC Voltage Measuring Range	Lower Limit of measured Ω	Rated Current
321341	100V/20MΩ	0.02–20MΩ	0.5MΩ	0–150V	0.1MΩ	1mA
321342	250V/50MΩ	0.05–50MΩ	1MΩ	0–250V	0.25MΩ	1mA
321343	500V/100MΩ	0.1–100MΩ	2MΩ	0–300V	0.5MΩ	1mA
321344	500V/1000MΩ	1–1000MΩ	20MΩ	0–300V	0.5MΩ	1mA**
321345	1000V/2000MΩ	2–2000MΩ	50MΩ	0–300V	1MΩ	1mA**

* The minimum value at which the rated voltage can be maintained; ** 0.55 mA in the case of the first effective measuring range

Earth Tester 323511

Single Dial Measurement Without Range Change

323511
Earth Tester

- 3 terminal measurement of earth resistance
- Accurate, wide-range logarithmic scale
- AC potentiometer bridge, synchronous detector
- Portable yet rugged and shockproof

323511 Specifications

Measuring Range:
Earth Resistance: 0 to 10 to 100 to 1,000 Ω
Earth Voltage: 0 to 30 V
Scale:
Earth Resistance: 3-digit logarithmic continuous scale on measuring dial
Earth Voltage: Uniform scale on galvanometer
Accuracy:
Earth Resistance: ±5% of 2 Ω in the range of 0 to 2 Ω
±2.5% of 20 Ω in the range of 2 to 20 Ω
±2.5% of 200 Ω in the range of 20 to 200 Ω
±5% of 1,000 Ω in the range of 200 to 1,000 Ω
Earth Voltage: ±5% of full scale value
Measuring Frequency: 500 Hz
Ambient Temperature Influence: Variation in indication is within the corresponding one scale division for temperature change by 20±20°C.
Battery Voltage Influence: The accuracy is maintained wihtin the specified limit even if the voltage decreases down to approx. 4 V under operating condition.
Earth Voltage Influence: Variation in indication is within the corresponding one scale division for the earth voltages of up to 10 V at commercial frequency.
Power Source: Four 1.5 V batteries
Insulation Resistance: More than 20 MΩ at 500 V DC between terminals and case
Dimensions: Approx. 122 × 190 × 124 mm not including accessories.
Weight: Approx. 1.5 kg for Instrument only.
Approx. 3.5 kg including all accessories.

Leakage Current Tester 322610

Handy Universal Tester for Checking Electrical Appliances

322610
Leakage Current Tester

- Three input resistance ranges – 1, 1.5 and 2 kΩ
- Four functions – AC current, DC current, DC + AC current and AC voltage measurements
- ±2.5% full scale accuracy
- 100 µA full scale value
- Shockproof indicator using taut band movement
- Built-in overload protection circuit
- Handy and easy to carry
- Shielded case, resistant to high-frequency fields

322610 Specifications

Range: DC current ... 0.1, 1, 10 mA,
AC current .... 0.1, 1, 10 mA,
(DC + AC) current ... 0.1, 1, 10 mA,
AC Voltage ... 150, 300 V (50 and 60 Hz)
Accuracy: ±2.5% of full scale value on current and voltage ranges
Input Impedance: Current range; 1 kΩ, 1.5 kΩ, and 2 kΩ
Voltage range; More than 100 kΩ
Frequency Range: 20 Hz to 5 kHz
Power Source: Two 9 V dry cells,
Continuous Operating Time; Approx. 290 hours
Overload Protection: Up to 30 mA AC for one minute will not damage instrument on current ranges
Dimensions: Approx. 190 × 124 × 90 mm not including handle
Weight: Approx. 1.0 kg

Digital Illuminance Meters 510 series

Intensity of illumination can be adjusted at noon

510 Series
Digital Illuminance Meters

Measuring range: 9.99 (51002)/99.9/999/9,990/99,900/999,000 lx
Accuracy: +/-(4% rdg + 1 dgt) (51001), +/-(2% rdg + 1 dgt) (51002)
Features: Timer hold, Ripple measurement, Average illuminance computation function

510 Series Specifications

Photoelectric Element: Silicon Photodiode
Measuring Range:
0.0 to 99.9/999/9,990/99,900/999,000lX
Response Time: 5 sec. (Auto Range)
2 sec. (Manual Range)
Accuracy: ±4% rdg. ±1 dgt. (51001)
±2% rdg. ±1 dgt. (51002)
General Specifications
- External dimensions (main unit):
Approx. 67 (W) × 177 (H) × 38 (D) (mm)
- Weight: Approx. 260 g
- Batteries: One 9 V 6F22(S-006P)

Digital Thermometers TX10 series

1-channel Single-function to 2-channel Multifunction

TX10 Series
Digital Thermometers

TX1001:
1-channel Single-function with data hold function
TX1002:
1-channel Multifunction with data hold, internal memory, user-calibration and relative display function
TX1003:
2-channel Multifunction with data hold, internal memory, user-calibration and relative display function

TX10 Series Specifications

- Thermocouple measurement ranges
Type K: -200 to 1372 deg.C
Type J: -200 to 1000 deg.C
Type E: -200 to 700 deg.C
Type T: -200 to 400 deg.C
- Resolution
-200.0 to 199.9 deg.C: 0.1 deg.C, 200 deg.C: 1 deg.C (TX1001)
-200.0 to 199.9 deg.C: 0.1 deg.C or 1 deg.C (when resolution is set at 1 deg.C), 200deg.C: 1 deg.C (TX1002, 03)
- Accuracy
-200.0 to -100.1 deg.C: +/-(0.1% of rdg + 1.0deg.C);
-100.0 to 199.9 deg.C: +/-(0.1% of rdg + 0.7deg.C);
200deg.C and when resolution is set at 1deg.C:+/-(0.2% of rdg + 1 deg.deg.C)

General Specifications
- External dimensions:
56 (W) × 151 (H) × 33 (D) mm
- Weight: Approx. 180 g
- Power: Two AA size (LR6) dry batteries

Thermo-Collectors

TM10, TM20

Temperature measurement and management of temperature data records

TM10/TM20

Trermo-collectors

- Effective for HACCP program implementation.
- Collect up to 5000 data items with time-stamp, tag name and inspector name.
- Save 2 weeks continuous data logging with 1 minute interval, (up to 20000 data items, measuring interval is 1sec. to 24 houres.)
  Information on **when**, **by whom** and **what** is measured is saved along with the data.

TM10/TM20 Specifications

Product name (Model)	TM10 Thermo-collector Thermistor model (54051)	TM20 Thermo-collector Thermocouple model (54011)
Number of measuring channels	1	2
Measuring range (only the main unit)	External thermistor -30°C to 200°C Built-in thermistor -20°C to 50°C	Thermocouple Type K : -200°C to 1372°C Type J : -200°C to 1000°C Type E : -200°C to 700°C Type T : -200°C to 400°C Voltage input ±100 mV, ±1 V
Accuracy (only the main unit)	External thermistor ±0.3°C to ±1.0°C Built-in thermistor ±0.8°C to ±1.0°C	Thermocouple -200.0 to 100.1°C : ±(0.1% of rdg + 0.7°C) -100.0°C or above : ±(0.1% of rdg + 1.0°C) Voltage input ±(0.1% of rdg + 0.2% of range)
Measuring interval	Collector mode: 1 second or longer Logging mode: 1 second to 24 hours	Collector mode: 0.5 seconds or longer when 1 channel is used. Logging mode: 1 second to 24 hours when 1 channel is used.
Data capacity	5000 data items when used in collector mode only, 20000 data items when used in logging mode only.	
External dimensions	Approx. 133(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 170 g (including batteries)	Approx. 151(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 180 g (including batteries)
Supplied accessories	Software, two AA-size alkaline dry batteries (LR6), a waterproof cover, and an instruction manual	

Optional Accessories for TM10/TM20

Product name	Model
RS-232C cable for PC connection (9-pin)	91011
Printer	97010
AC adapter for printer (Europe)	94006
AC adapter for printer (USA)	94007
Thermal paper for printer (10 rolls)	97080
RS-232C cable for printer connection	91010

Probes for TM10

90010 Standard Needle Probe
90013 Rounded end Probe (for Liquid)

● Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy	
-30°C ≤ T < -20°C	±1.0°C	(Typical)
-20 ≤ °C ≤ 0	±0.5°C	(Typical)
0 < °C < 100	±0.5°C	
100 ≤ °C < 150	±1.0°C	(Typical)
150 ≤ °C ≤ 200	±2.0°C	(Typical)

● Response:Approx. 6 seconds for 90% of final value

90011 High-speed Needle Probe
90012 Surface Probe

● Measuring range: -30°C to 200°C

Temperature range (T)	Accuracy	
-30°C ≤ T < -20°C	±2.0°C	(Typical)
-20 ≤ °C ≤ 0	±1.5°C	(Typical)
0 < °C < 100	±1.5°C	(Typical)
100 ≤ °C < 150	±1.5°C	(Typical)
150 ≤ °C ≤ 200	±2.5°C	(Typical)

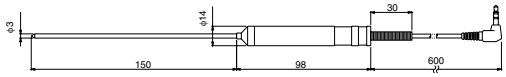
● Response:Approx. 2 seconds for 90% of final value (90011)
Approx. 6 seconds for 90% of final value (90012)

Note: The accuracy ratings above were obtained with the measurement of liquids being agitated.

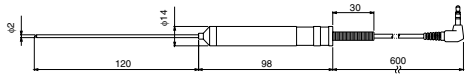
External Dimensions

TM10

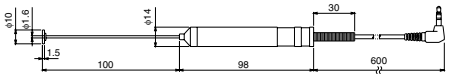
Standard needle probe (90010) / Rounded end probe (90013) / Material: SUS316



High-speed needle probe (90011) / Material: SUS316



Surface probe (90012) / Material: SUS316



Probes for TM20/TX10

Temperature Probe (for type K)

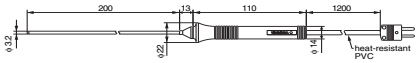
Model	Probe type	Measuring range	Accuracy	Response time (second)	Sensor Dimenter / Length (m/m)
90020	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	ϕ3.2 / 200
90021	rounded end	-50 to 600°C	0.4% or ±1.5°C	0.4	ϕ1.6 / 150
90022	rounded end	-50 to 600°C	0.4% or ±1.5°C	1.4	ϕ3.2 / 500
90023	needle	-50 to 500°C	0.4% or ±1.5°C	0.4	ϕ1.6 / 100
90024	needle	-50 to 500°C	0.4% or ±1.5°C	1	ϕ2.1 / 100
90030	Surface straight	-20 to 250°C	0.75% or ±2.5°C	2	ϕ15 (temp. sensing portion)
90031	Surface angled	-20 to 250°C	0.75% or ±2.5°C	2	ϕ15 (temp. sensing portion)
90032	Surface straight	-20 to 500°C	0.75% or ±2.5°C	2	ϕ15 (temp. sensing portion)
90033	Surface angled	-20 to 500°C	0.75% or ±2.5°C	2	ϕ15 (temp. sensing portion)
245907	Bead TC	-40 to 260°C	0.75% or ±2.5°C	(90% response)	1200 (included cord)

NOTE: 90030 is using polyimide to insulate from objects to be measured.
Manufacturers of polyimide are announcing not to apply polyimide directly for food, internal and body fluid.

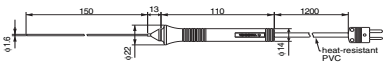
External Dimensions

TM20 TX10

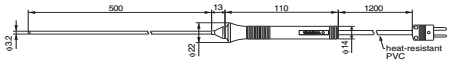
90020
Material:
SUS316



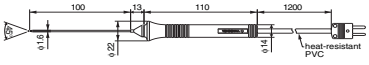
90021
Material:
SUS316



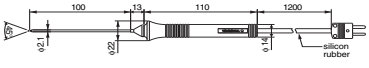
90022
Material:
SUS316



90023
Material:
SUS316

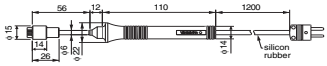


90024
Material:
SUS316

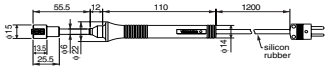


245907

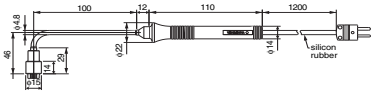
90030
Material:SUS316



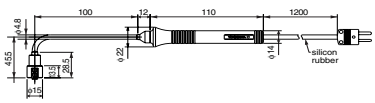
90032
Material:SUS316



90031
Material:SUS316



90033
Material:SUS316



Standard Resistors — 2792A series

Metal foil resistors

2792A series
Standard Resistors

- Traced to the national standard for high accuracy; test (calibrated) accuracy of ±5 ppm
- Resistance temperature coefficient
- A variety of models
  Eight models with nominal resistance values ranging between 0.001 Ω and 10 kΩ
- Precision temperature control equipment, such as an oil bath, not needed for calibration due to marked improvement in resistance temperature coefficient
- Included document: Test certificate

2792A series Specifications

Model	Nominal value	Accuracy 23˚C±2˚C
2792A01	0.001 Ω	±100ppm
2792A02	0.01 Ω	±75ppm
2792A03	0.1 Ω	±50ppm
2792A04	1 Ω	±30ppm
2792A05	10 Ω	±30ppm
2792A06	100 Ω	±30ppm
2792A07	1 kΩ	±30ppm
2792A08	10 kΩ	±30ppm

Operating temperature and humidity ranges: 0-50°C / 20-80% RH
Maximum allowable power: 3 W
Test (calibrated) accuracy: ±5 ppm
Power characteristics: ±100 ppm/W
Insulation resistance:
More than 1000 MΩ at 500 V DC
Withstand voltage: 1.5 kV for one minute between measurement terminal and casing
Terminal construction: 4 terminals
External dimensions: Approximately ϕ104 × 150 mm (current terminal width: approximately 174 mm)
Weight: Approximately 1.2 kg
Accessories: User'S Manual, One Test Certificate

Decade Resistance Boxes — 279301/279303

High-accuracy, DC variable resistor with 6 dials

279301/279303
Decade Resistance Boxes

279301
- High accuracy and stability
- High reproducibility
- 1 mΩ resolution

279303
- Up to 100 MΩ in 100 Ω step
- Low voltage coefficient
- Shock- and vibration-proof construction

279301 Specifications

Resistance Range: 0.100 to 1,111.210 Ω (Minimum resistance is 0.100 Ω).
Dial Composition: 0.001 × 10 + 0.01 Ω × 10 + 0.1 Ω × 11 + 1 Ω × 10 + 10 Ω × 10 + 100 Ω × 10
Resolution: 0.001 Ω
Accuracy: ± (0.01% + 2 mΩ) at temperature 23 ± 2°C, humidity 45 to 75%, and 0.1 W power application

279303 Specifications

Resistance Range: 0 to 111.1110 MΩ.
Dial Composition: 100 Ω × 10 + 1 kΩ × 10 + 10 kΩ × 10 + 100 kΩ × 10 + 1 MΩ × 10 + 10 MΩ × 10.
Accuracy: 100Ω, 1 kΩ, 10 kΩ and 100 kΩ steps ... ± (0.05% + 0.05Ω)
1 MΩ and 10 MΩ steps ... ±0.2%
(At temperature 23 ± 2°C, humidity below 75%, including residual resistance of approx. 0.05 Ω).

Decade Resistance Boxes — 278610/278620

Quick and easy setting

278610/278620
Decade Resistance Boxes

Models 278610 and 278620 six-dial decade resistance boxes allow quick and easy setting of a wide range of resistance. These resistance boxes are used in combination with voltage or current standards to adjust voltage or current, as dummy load resistances or as an arm of AC bridges.

278610/278620 Specifications

Available Models:

Model Number	Resistance Range
278610	0.1 to 111,111 Ω (six decade dials)
278620	1 to 1,111,110 Ω (six decade dials)

Residual Resistance: Less than 23 mΩ.
Power Rating: 0.3W/step, within 3W for overall instrument.
Maximum Allowable Input: 0.5W/step, 5W for overall instrument.
Maximum Circuit Voltage: 250 V.
Operating Temperature Range: 0 to 40°C
Storage Temperature Range: -10 to 50°C
Humidity Range: 25 to 85%, relative humidity.
Insulation Resistance: More than 500 MΩ at 500 V DC.
Dielectric Strength: 1,500 V AC for one minute.

Slide Resistors — 2791 series

Used in testing laboratory and industrial test

2791 Series
Slide Resistors

Model 2791 is composed of resistance wire with an insulating coating wound on a frame of special ceramic and a sliding brush that maintains contract with the wire. Resistance is continuously variable and can be increased or decreased as desired.

2791 series Specifications

Available Models:

Code	Nominal Value	Allowable Input Current
279101	4,800 Ω	0.18 A
279102	1,400 Ω	0.35 A
279103	600 Ω	0.5 A
279105	170 Ω	1.0 A
279108	39 Ω	2.0 A
279112	4.7 Ω	6.0 A

Allowable Deviation: ±20% of nominal value.
Insulation Resistance: More than 5 MΩ at 500 V DC between terminal and case.
Dielectric Strength: 1,000 V AC for one minute between terminal and case.

Portable Wheatstone Bridge — 2755

1Ω to 10MΩ by operation of dials and switches

2755
Portable Wheatstone Bridge

Model 2755 measures resistances from 1 Ω to 10 MΩ by operation of dials and switches. Batteries and a galvanometer are self-contained. The front control panel is provided with power and galvanometer circuit selectors, one ratio arm dial, and four measuring arm dials.

2755 Specifications

Measuring Range: 1,000 Ω to 10.00 Ω.
Measuring Arms: 1Ω × 10 + 10 Ω × 10 + 100 Ω × 10 + 1,000 Ω × 10 (min. one step: 1 Ω).
Ratio Arms (Multiplier): × 0.001, × 0.01, × 0.1, × 1, × 10, × 100, × 1,000 (M10, M100, M1000 ... Murray & Varley loop testing).
Accuracy: ±0.1% of reading on 100 Ω to 100 kΩ range, ±0.3% of reading on 10 Ω to 1 MΩ range, ±0.6% of reading on 1Ω to 10 MΩ range.
Temperature Coefficient of Resistance Elements:
$\pm 5 \times 10^{-5}$/°C at ambient temperature of 5 to 35°C, $\pm 2 \times 10^{-5}$/°C at ambient temperature 20 to 35°C.
Galvanometer: Sensitivity ... 0.9 μA/div., internal resistance ... Approx. 150 Ω, external critical damping resistance ... Approx. 800 Ω, period ... within 1.5 seconds.
Power Source: Three 1.5 V batteries (built-in).
Operating Temperature Range: 5 to 35°C.
Humidity Range: 85% max., relative humidity.
Outer Case: ABS resin.
Accessory supplied at no extra cost: Carrying case.

Portable Double Bridge — 2769

0.1mΩ to 110Ω with four plugs and one measuring dial

2769
Portable Double Bridge

Model 2769 is a compact, portable Kelvin double bridge designed for measuring low resistance from 0.1 mΩ to 110 Ω with four multiplication plugs and one measuring dial. It has built-in standard resistors, bridge power source and high-sensitivity taut-band suspension system electronic DC galvanometer.

2769 Specifications

Measuring Range: 0.1 mΩ* to 110 Ω.
Measuring Dial: 1.00 to 11.00 Ω at × 1.
Multipliers: × 0.0001*, × 0.001, × 0.01, × 0.1, × 1, × 10 (plug-in system).
Min. Division: 0.005 mΩ at × 0.0001*, 0.05 mΩ at ×0.001, 0.5 mΩ at × 0.01, 5 mΩ at × 0.1, 50 mΩ at × 1, 0.5 Ω at × 10.
Accuracy: ± (0.05 Ω × multiplier + 0.01 mΩ)
Current Rating: 10 A at × 0.0001* (0.01 Ω), 3A at × 0.001 (0.1 Ω), 1A at × 0.01 (1 Ω). 0.3A at × 0.1 (10 Ω), 0.1A at × 1 (100 Ω), 0.01A at × 10 (1,000 Ω).
Galvanometer: Built-in electronic DC galvanometer, voltage sensitivity ... approx. 20 μV/div.
sensitivity changeover;
G_0 ... (Input resistance: approx. 11 kΩ).
G_1 ... approx. 1/11 of G_0 sensitivity.
G_2 ... approx. 1/110 of G_0 sensitivity.
Operating Temperature Range: 5 to 35°C
Humidity Range: Less than 85%
Bridge Power Source: Tow 1.5 V batteries, External power source is also usable.
*Note: Standard Resistor (Model 2771) is required for measurement on 0.1 to 1.1 mΩ range at 0.0001 multiplier.

Meters Products

2011 to 2053, 2100A Series, Clearline Series, FS,FL Series and 2370A Series

Portable Instruments


201314


205206

Line-up

DC Ammeters and Voltmeters	2011, 2012
AC Ammeters and Voltmeters	2013, 2014
High-frequency AC Ammeters and Voltmeters	2016
Audio-frequency AC Voltmeters	2017
Frequency Meters	2038
Power Factor Meters	2039
Wattmeters	2041, 2042
Miniature DC Ammeters and Voltmeters	2051
Miniature AC Ammeters and Voltmeters	2052, 2053

2011 to 2053

Portable Instruments

- Taut-band suspension system eliminates friction and provides strong resistance to shock impact.
- Stable performance for long term use.
- Products have been widely used over many years as an industry standard at various customers such as industries, power plants, research laboratories and schools, etc.

Switchboard Instruments

Line-up

DC Ammeters and Voltmeters	2101A, 2181A
AC Ammeters and Voltmeters	2102A, 2182A
Wattmeters	2105A, 2185A
Varmeters	2106A, 2186A
Power Factor Meters	2107A, 2187A
Frequency Meters	2108A, 2188A
Synchroscope	2109

Front Cover Dimensions (Width × Height mm)

210□A	110×110
218□A	80×80

2100A Series

Switchboard Instruments

- Compliance with JIS C1102-2007

Panel Meters


Clearline Series


FS,FL Series
* Cover with set pointer

Line-up

- Clearline Series
  (2071 to 2076A, 2081 to 2086A, 2093A and 2094A)
  DC Ammeters and Voltmeters, AC Ammeters and Voltmeters and Frequency Meters
- FS,FL Series
  DC Ammeters and Voltmeters, AC Ammeters and Voltmeters,
  Frequency Meters, Wattmeters, Varmeters and Power Factor Meters

Front Cover Dimensions (Width × Height mm)

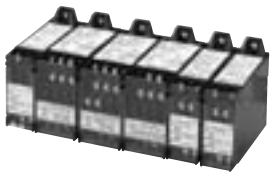
2071, 2081:	52×44
2072, 2082:	57×48
2073, 2083:	69×58
2074A, 2084A, FL80:	82×69 (FL80: 80×67)
2075A, 2085A, FL10:	102×85 (FL10: 100×83)
2076A, 2086A:	122×102
2093A, FS60:	60×60
2094A, FS80:	80×80
FS10:	100×100

Clearline Series and FS,FL Series

Panel Meters

- Compliance with JIS C1102-2007
- Clearline Series
  Two types of movement suspension systems, Taut-band and Pivot & Jewel, are available to fit to various applications.
- FS,FL Series
  High visibility by adopting clear front cover.

0.5 Class Transducer for Power Applications



Line-up

DC-DC isolator	2371A
AC Voltage, current (average rectified)	2372A
AC Voltage, current (RMS rectified)	2373A
AC Voltage, current (True RMS rectified)	2374A
Power	2375A
Reactive power	2376A
Phase	2377A
Power factor	2377A
Frequency	2378A

Dimensions (mm)

2371A, 2372A, 2373A, 2374A, 2378A:
127(H) × 40(W) × 130(D)
2375A, 2376A, 2377A:
127(H) × 55(W) × 130(D)

2370A Series

0.5 Class Transducer for Power Applications

- Available for DIN rail and panel mountings

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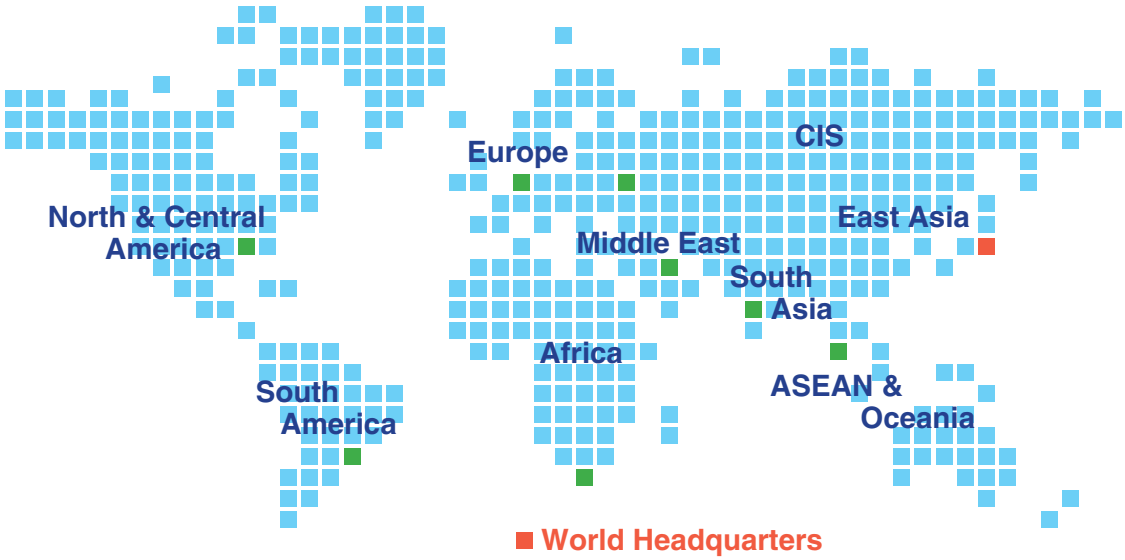

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Represented by :

[Ed : 11/b]
Printed in Japan, 904(KP)