

Super Compact Laser Bar Code Readers

BL-600 Series

Features

- World's smallest laser bar code reader in its class
- Twice the reading area
- Scans bars as narrow as 0.125 mm 0.005"
- Scan rate of 500 scans per second

Reading distance

Standard – 75 to 330 mm (2.95" to 12.99")

High-resolution – 55 to 190 mm (2.17" to 7.48")

High-resolution side-scanning – 45 to 175 mm (1.77" to 6.89")



Description

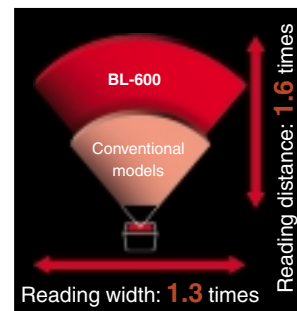
Ultra compact, half the size of standard bar code readers

With the BL-600 (31 x 40 x 21 mm 1.22" x 1.57" x 0.83") KEYENCE again breaks the world record for smallest bar code reader. Only 1/2 the size of the conventional bar code readers.

Twice the range with excellent reading performance

Built-in AGC* & SRC circuits

Using KEYENCE's original AGC circuits for advanced, high speed performance, the BL-600 offers excellent reading depth and angle characteristics. In addition, the reader includes built-in SRC circuits which greatly reduce the effects of extraneous reflected light for more reliable and stable reading.



* AGC=Auto Gain Control/SRC=Specular Reflection Cancel

The world's first built-in preventive maintenance

Built-in PMI* function (patent pending)

The BL-600 is the first bar code reader with a built-in PMI function for monitoring and reporting reading performance during operation. By referring to the PMI information, it is possible to quickly detect potential reading error problems. PMI offers a convenient tool for acquiring valuable maintenance information, and for investigating the causes of reading errors.

* Preventive Maintenance Information

Test switch for easy adjustment

Built-in test mode

The test mode allows you to confirm the optimal reading position at the point of installation by simply pressing a button. This valuable feature of the BL-600 results in faster installation and maintenance.

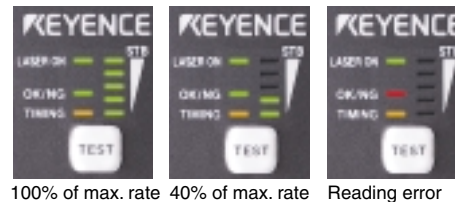


5-bar LED display

Indicates reading status to prevent errors

The BL-600 indicates the reading ratio* (decoding rate/100 scans) in real time using a five-bar LED display. Current reading status can be checked at a glance, helping to prevent reading errors before they occur.

5-bar LED reading status indicator



* Reading ratio can be output to computers.

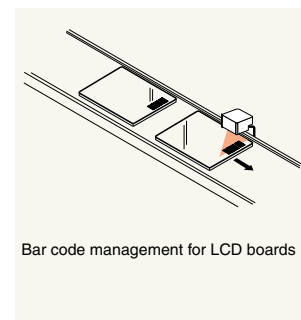
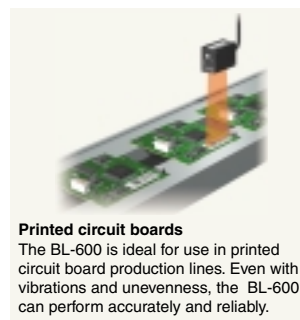
Ultra high speed of 500 scans/sec

Outstanding reading accuracy, even on high-speed lines

Using advanced KEYENCE control technology the BL-600 operates at 500 scans per second, making it the fastest laser bar code reader in its class.

Super Compact Laser Bar Code Readers **BL-600**

Applications



Specifications

Type	Standard type		High-resolution		High-resolution, side-scanning type		
	BL-600	BL-601	BL-600H	BL-601H	BL-650H	BL-651H	
Model							
Scanning direction	Front				Side		
Scan method	Single	Raster	Single	Raster	Single	Raster	
Light source ¹	Semiconductor laser (Wavelength: 650 nm)						
Maximum output	1.5 mW		1.5 mW		1.5 mW		
	99 μs		99 μs		82 μs		
	Class	FDA	Class II	Class II	Class II	Class II	
IEC		Class 2	Class 2	Class 2	Class 2		
Reading distance	75 to 330 mm 2.95" to 12.99" (When narrow width is 1.0 mm 0.04")		55 to 190 mm 2.17" to 7.48" (When narrow width is 0.5 mm 0.02")		45 to 175 mm 1.77" to 6.89" (When narrow width is 0.5 mm 0.02")		
Reading bar width ²	0.19 to 1.0 mm 0.007" to 0.04" * 0.25 to 1.0 mm 0.01" to 0.04" for CODE 93 and CODE 128		0.125 to 1.0 mm 0.005" to 0.04" * 0.15 to 1.0 mm 0.006" to 0.04" for CODE 93 and CODE 128				
Maximum reading label width ³	250 mm 9.84" (When reading distance is 280 mm 11.02")		156 mm 6.14" (When reading distance is 174 mm 6.85")		170 mm 6.69" (When reading distance is 155 mm 6.10")		
PCS	0.6 or more (white reflection rate 75% or more)						
Scan count	500 scans/second		500 scans/second		500 scans/second		
Supported codes	CODE39, ITF, Industrial 2 of 5, COOP 2 of 5, Coda bar, CODE128, EAN-128, CODE93, EAN/UPC(A•E)						
Reading digit	32 digits max. ⁴		32 digits max. ⁴		32 digits max. ⁴		
Trigger input	Non-voltage input (relay contact, solid state) * TTL input is also available.						
OK/NG output	Output type	NPN		NPN		NPN	
	Rating load	24 VDC, 30 mA		24 VDC, 30 mA		24 VDC, 30 mA	
	Leakage current at OFF	0.1 mA max.		0.1 mA max.		0.1 mA max.	
	Residual voltage at ON	0.5 V max.		0.5 V max.		0.5 V max.	
Serial Interface	Applied standard	In accordance with RS-232C		In accordance with RS-232C		In accordance with RS-232C	
	Synchronization	Start-stop synchronization		Start-stop synchronization		Start-stop synchronization	
	Transmission code	ASCII code		ASCII code		ASCII code	
	Baud rate	600, 1200, 2400, 4800, 9600, 19200, 31250, 38400 bit/s					
	Data length	7/8 bits		7/8 bits		7/8 bits	
	Parity check	None/even/odd		None/even/odd		None/even/odd	
Stop bit length	1/2 bits		1/2 bits		1/2 bits		
Enclosure rating	IP-65		IP-65		IP-65		
Ambient light	Sunlight: 10,000 lux, Incandescent lamp: 6,000 lux						
Ambient temperature	0 to +45°C		0 to +45°C		0 to +45°C		
Operating atmosphere	No dust or corrosive gas present						
Vibration	10 to 55 Hz, amplitude 1.5 mm, 2 hours each in X, Y and Z directions.						
Power supply voltage	5 VDC ±5%		5 VDC ±5%		5 VDC ±5%		
Power consumption	330 mA max.		330 mA max.		330 mA max.		
Weight	Approx. 115 g		Approx. 115 g		Approx. 130 g		

1. Raster width: BL-601: 7.1 mm±1.8 mm **0.30" ± 0.07"** (When reading distance is 120 mm **4.72"**), BL-601H: 5.5 mm± 1.4 mm **0.22" ± 0.06"** (When reading distance is 90 mm **3.54"**), BL-651H: 5.5 mm± 1.4 mm **0.22" ± 0.06"** (When reading distance is 65 mm **2.56"**)

2. Reading bar width indicates the range of readable narrow bar width when the bar code type is CODE39.

3. Maximum reading label width includes the bar code margin (quiet zone).

4. When start/stop character of CODE128 is CODE-C, up to 64 digits are allowed.

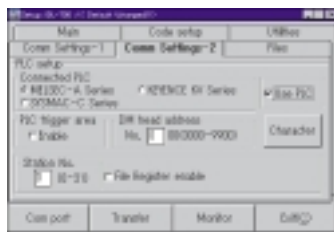
Note: The internal BL settings are written to the built-in EEPROM (erasable up to 100,000 times).

BL-600 Super Compact Laser Bar Code Readers

Software

A practical setup tool designed for easy operation (BL-H60WE)

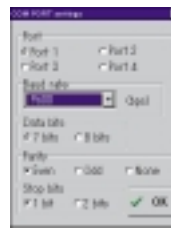
Simplify setup of your bar code reader's operating parameters with the Windows™-compatible setup program. Anyone can perform the initial setup with ease. What's more, the program allows you to easily manage data on a computer.



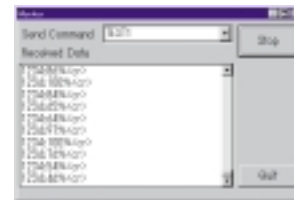
The standard Windows™-style interface makes setting up the bar code reader's operating parameters easier than ever.



Included with the software are preset values for 8 common types of bar codes. Detailed settings let you adjust the parameters to suit your application.



The software's versatility lets you fine-tune communications settings for compatibility with a wide range of equipment.



When in test mode, the BL Series performance rate (% of maximum) and reading frequency (scans per second) are clearly displayed, using built-in monitor screen.

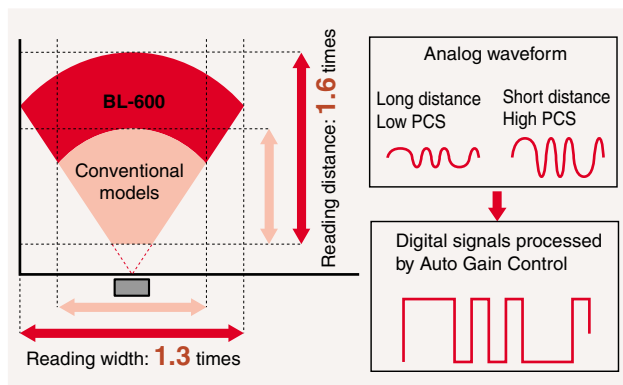
Functions

Best in its class, with amazing reading performance

AGC* & SRC circuits

Auto Gain Control automatically controls the amount of light received by the bar code reader by adjusting gain to the optimal level according to reading distance and PCS changes. Through this AGC function, the BL 600 can operate over long and wide reading distances and angles, despite its ultra compact size. Since the AGC circuits can amplify the signals received by the reader, even bar codes with low PCS can be read accurately. In addition to automatic gain control, the BL-600 features built-in SRC circuits that cancel out the influence of light reflected from sources other than the bar codes. For example, under conditions where laser light bounces off polished metal or mirror surfaces, the BL-600 delivers much more stable reading performance than current models.

* AGC=Auto Gain Control/ SRC=Specular Reflection Cancel

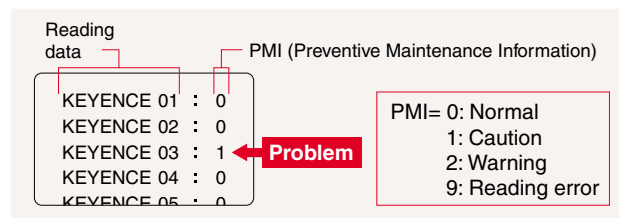


Preventive Maintenance Information (PMI) prevents reading errors before they occur

The world's first PMI function (patent pending)

This function adds preventive maintenance information (PMI), relating to the reliability and stability of bar code reading performance, to the bar code data that is output by the reader. The PMI function allows performance to be monitored so that possible causes of reading errors, such as deterioration in bar code printing quality or the presence of dirt on the lens of the bar code reader, can be detected at an early stage. These kinds of errors are often difficult to identify with conventional bar code readers. This function is especially convenient when using several bar code readers together.

* Reading stability tolerance settings are freely adjustable.



Enhanced stability reading with 8 scan lines

Raster scan type

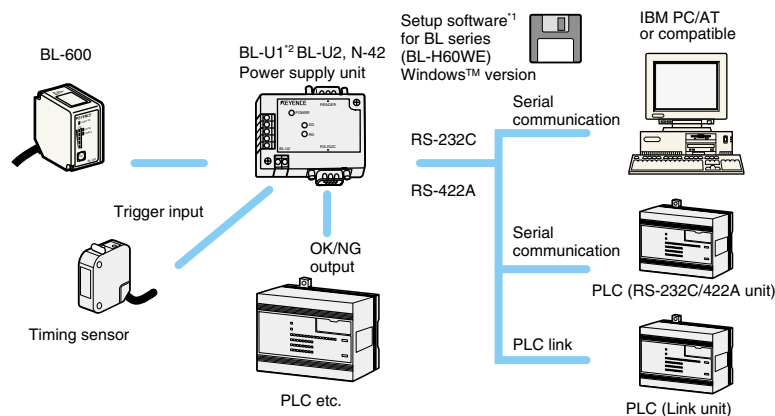
The BL-600 is available in a raster scan unit that reads bar codes using eight scan lines. Raster scan offers reliable, accurate bar code reading even with bar codes containing flaws such as chips, voids, or stains.



Super Compact Laser Bar Code Readers BL-600

System Configuration

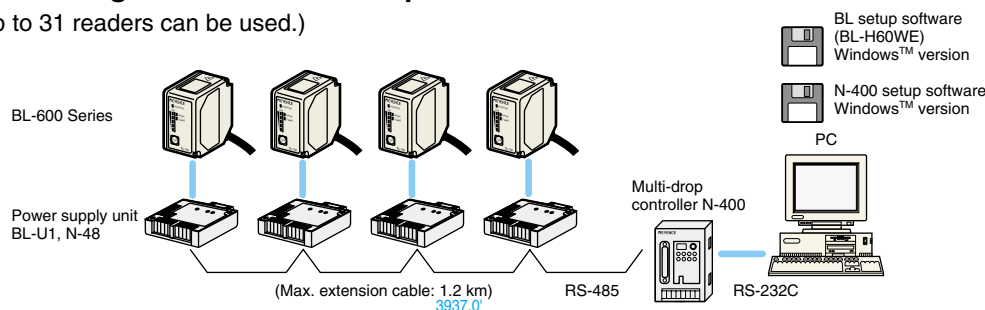
When using an RS-232C or RS-422A connection



*1 The BL-H60WE setup software is not included in the product and should be ordered separately (free of charge).
 * "MS-windows" and "Windows" are registered trademarks of Microsoft. Any other company name is a registered trademark of that company.
 *2 This product does not comply with EMC directives.

When using an RS-485 multidrop link connection

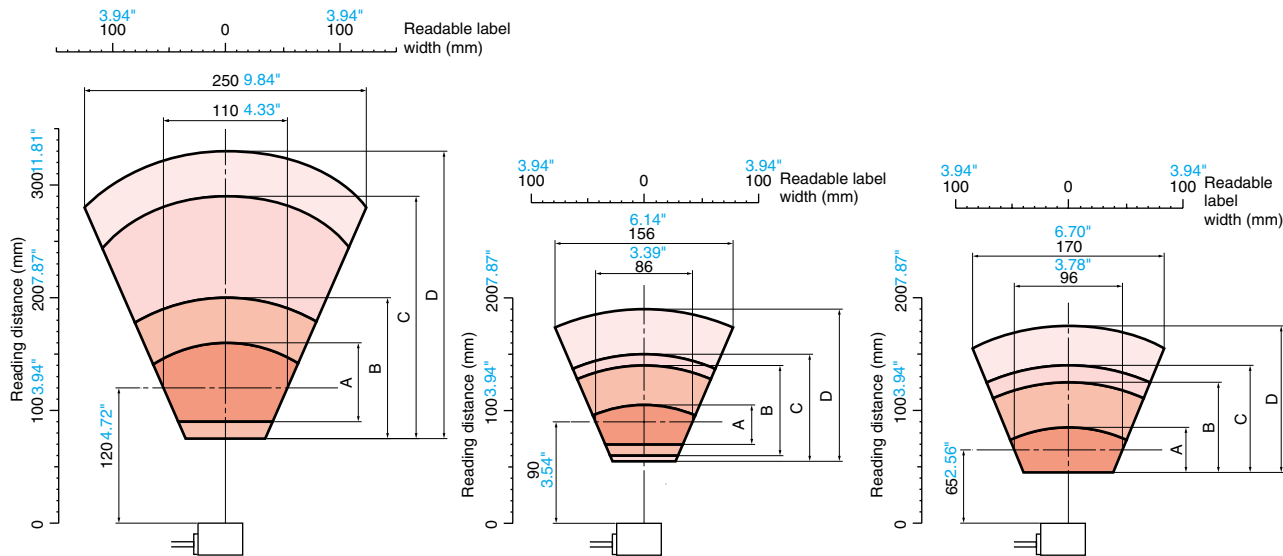
(Up to 31 readers can be used.)



Reading Range Characteristics

Typical

Unit: mm Inch



BL-600/601

Name	Narrow bar width	Readable label width
A CODE39	0.19 0.007"	90 to 160 3.54" to 6.30"
B CODE39	0.25 0.010"	75 to 200 2.95" to 7.87"
C CODE39	0.5 0.02"	75 to 290 2.95" to 11.42"
D CODE39	1.0 0.04"	75 to 330 2.95" to 12.99"

(Measuring conditions)
 Using the KEYENCE standard bar code.
 Ratio of thin bar to thick bar = 1: 2.5
 Skew: 15°
 Pitch: 0°
 Tilt: 0°

BL-600H/601H

Name	Narrow bar width	Readable label width
A CODE39	0.125 0.049"	70 to 105 2.76" to 4.13"
B CODE39	0.19 0.007"	60 to 140 2.36" to 5.51"
C CODE39	0.25 0.010"	55 to 150 2.17" to 5.91"
D CODE39	0.5 0.02"	55 to 190 2.17" to 7.48"

(Measuring conditions)
 Using the KEYENCE standard bar code.
 Ratio of thin bar to thick bar = 1: 2.5
 Skew: 15°
 Pitch: 0°
 Tilt: 0°

BL-650H/651H

Name	Narrow bar width	Readable label width
A CODE39	0.125 0.0049"	45 to 85 1.77" to 3.35"
B CODE39	0.19 0.007"	45 to 125 1.77" to 3.35"
C CODE39	0.25 0.010"	45 to 140 1.77" to 5.51"
D CODE39	0.5 0.02"	45 to 175 1.77" to 6.89"

(Measuring conditions)
 Using the KEYENCE standard bar code.
 Ratio of thin bar to thick bar = 1: 2.5
 Skew: 15°
 Pitch: 0°
 Tilt: 0°

BL-600 Super Compact Laser Bar Code Readers

Connections

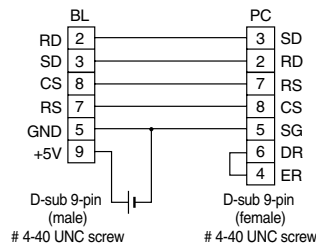
Connector pin assignments

Pin No.	Cable color	Symbol	Description	Signal direction
Connector case	Shield	FG	Frame ground	—
1	Yellow	TIM	Trigger input	Input
2	Brown	RD (RXD)	Receives RS-232C data	Input
3	Purple	SD (TXD)	Sends RS-232C data	Output
4	White	OK	OK output	Output
5	Black	GND (SG)	Ground 9 (common ground for respective signals)	—
6	Gray	NG	NG output	Output
7	Pink	RS (RTS)	Request to send RS-232C data (always ON)	Output
8	Blue	CS (CTS)	Enable to send data through RS-232C	Input
9	Red	+5 V	+5 V DC power supply	Input

RS-232C connections

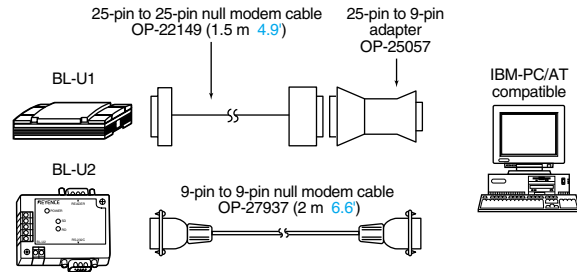
[When using a D-sub 9-pin connector]

Use a metallic connector housing for the D-sub 9-pin connector. Connect the shielded cable with the connector housing.



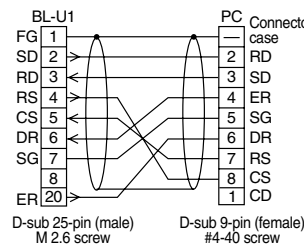
Options

The optional null modem cable is available from KEYENCE.

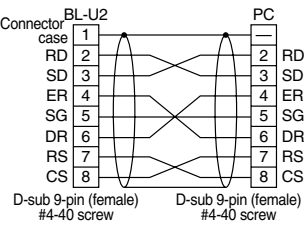


[When using the BL-U1/U2]

BL-U1



BL-U2



Options



BL-U1 AC power supply unit (with RS-232C, 422A, 485 interface)



BL-U2 DC power supply unit (with RS-232C interface)



N-42 DC power supply unit (with RS-422A interface)



N-48 DC power supply unit (with RS-485 interface)



N-400 Multidrop link controller

Super Compact Laser Bar Code Readers **BL-600****Power supply unit**

Model		BL-U1	BL-U2	N-42	N-48
Power supply for bar code reader		5 V \pm 5% (1.5 A)	5 V \pm 5% (630 mA)		
Power supply for sensor		12 V \pm 10% (300 mA)	—	—	—
Interface		RS-232C, RS-422A, RS-485 (Up to 31 units can be connected. Max. cable extension: 1.2 km 3,937')	RS-232C	RS-422A (Max. cable extension: 1.2 km 3,937')	RS-485 (Up to 31 units can be connected. Max. cable extension: 1.2 km 3,937')
Trigger input	Input rating	8.5 to 30 VDC, 10 mA max.			
	Max. OFF current	0.5 mA	0.5 mA	0.5 mA	0.5 mA
OK/NG output	Output type	NPN	NPN	NPN	NPN
	Rated load	30 VDC, 100 mA	30 VDC, 100 mA	30 VDC, 100 mA	30 VDC, 100 mA
	Leakage current	0.1 mA max.	0.1 mA max.	0.1 mA max.	0.1 mA max.
	Residual voltage	1 V max.	1 V max.	1 V max.	1 V max.
Ambient temperature		0 to +50°C	0 to +50°C	0 to +50°C	0 to +50°C
Power supply voltage		100 to 240 VAC (50/60 Hz)	24 VDC +10%/-20%	24 VDC +10%/-20%	24 VDC +10%/-20%
Current consumption		40 VA (100 VAC), 50 VA (240 VAC)	250 mA	260 mA	260 mA
Weight (including cable)		Approx. 615 g	Approx. 80 g	Approx. 100 g	Approx. 100 g

Multi-drop link controller

Model		N-400
Trigger input	Input rating	15 to 26 VDC, 10 mA max.
	Maximum OFF current	1.0 mA
RS-232C	Standard	Conforms to RS-232C
	Synchronization	Start-Stop (full duplex)
	Transmission code	ASCII
	Baud rate	600, 1,200, 2,400, 9,600, 19,200, 31,250, 38,400 bps
	Data length	7 bits/8 bits
	Parity check	None/Even/Odd
	Stop bit length	1 bit/2 bits
RS-485	Standard: conform to RS-485	RS-485
	Synchronization	Start-Stop (full duplex)
	Transmission code	ASCII
	Baud rate	600, 1,200, 2,400, 9,600, 19,200, 31,250, 38,400 bps
	Data length	7 bits/8 bits
	Parity check	None/Even/Odd
	Stop bit length	7 bits/8 bits
Maximum connectable units	31 units	
Maximum extension length	1.2 km 3,937'	
Ambient temperature		0 to +50°C
Power supply voltage		24 VDC +10%/-20%
Current consumption		140 mA max.
Weight		Approx. 180 g

Warning

The BL-600 Series conforms to FDA and IEC standards as follows:

Model	BL-600/601/600H/601H/650H/651H
FDA	Class II
IEC	Class 2

Protective housing labels**FDA**

CAUTION—LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM.

IEC

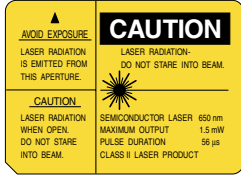
CAUTION
Laser radiation when open. Do not stare into beam.

BL-600 Super Compact Laser Bar Code Readers

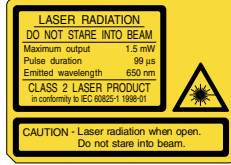
Warning labels

BL-600/601/600H/601H

FDA Class II

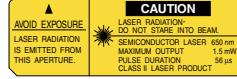


IEC Class 2

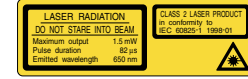


BL-650H/651H

FDA Class II



IEC Class 2

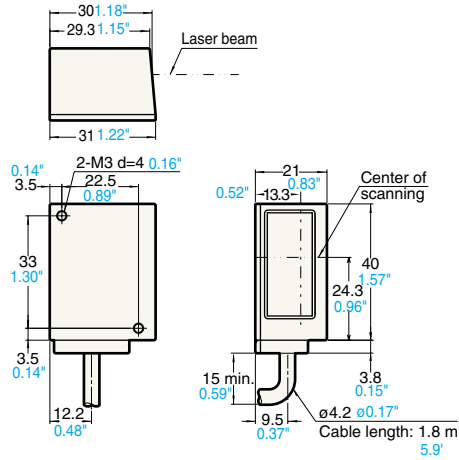


Dimensions

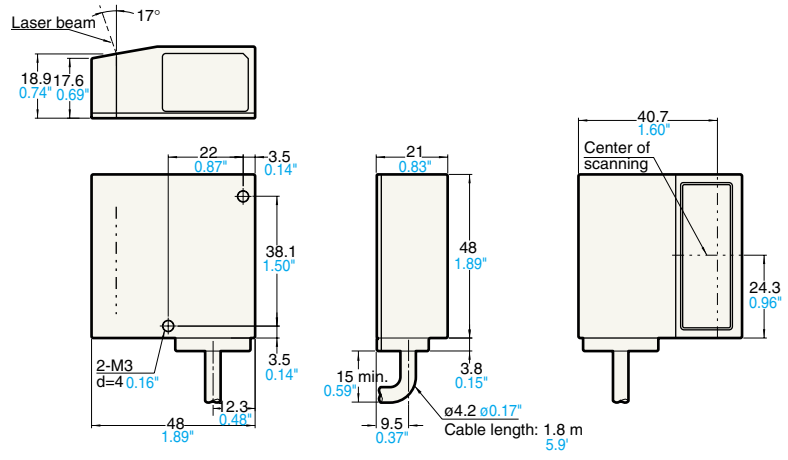
Bar code readers

Unit: mm Inch

BL-600/601/600H/601H

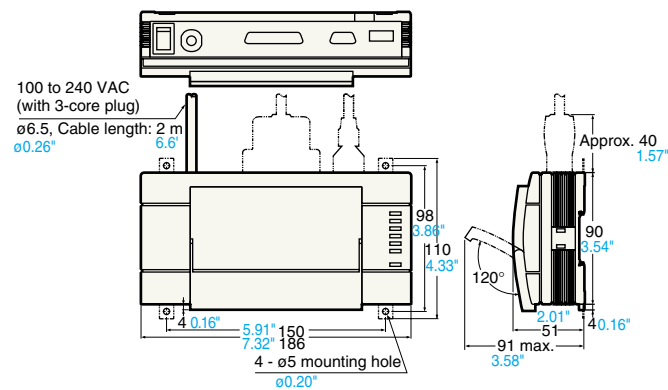


BL-650H/651H

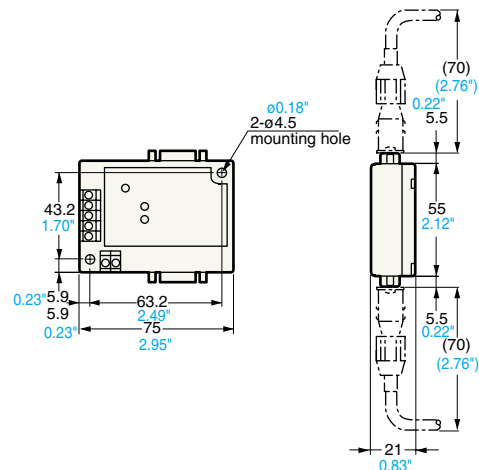


Power supply units

BL-U1

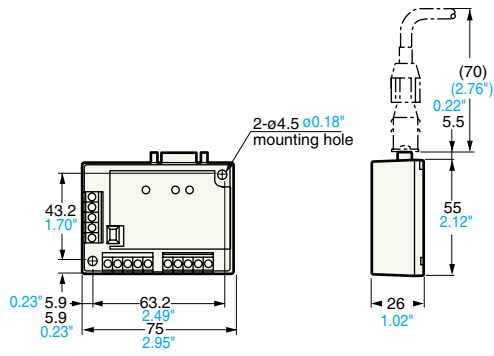


BL-U2



Super Compact Laser Bar Code Readers **BL-600**

N-42/N-48



N-400

Unit: mm Inch

