

# ABB DC Drives

DCS800

The next Generation



**ABB**

# DCS800 – the next Generation



Flying Shears · Centrifuges · Battery Charging · Winders · Casting Cranes · Mud Pumps · Roller Tables · Filling machines · Test Rigs · Cutters · Printing machines · Extruders · Mixers

The practical requirements for modern DC drives are extremely diverse. On the one hand operation and handling should be easy while on the other hand almost perfect functionality and performance for all different applications is expected. The challenge is to find an innovative solution which copes with both of them - the solution is DCS800.

The combination of best-in-class user friendliness, high performance and almost unlimited scalability allows You to configure Your drives to get flexible, cost effective solutions. Thus the DCS800 helps You to save Your investment for the future.

## DCS800 – The key Advantages

- Unique power spectrum 20 A ... 20,000 A, up to 5,200 A in one module
- Supply voltage 230 ... 1,200 V<sub>AC</sub> (0 ... 1,500 V<sub>DC</sub>)
- Intuitive, easy programming and commissioning
- Modular expandable in hardware and software
- Adaptive programming
- PLC integrated (IEC 61131-3)
- Backwards compatible with DCS500/600
- Same tools and options as ABB AC drives
- Compact - highest power/size ratio in its class



# ABB DC drive technology - Innovation driven by tradition



on Drives · Material transport · Electrolysis · Cranes · Lifts · Open Pit Mining · Galvanization · Rolling Mills · Oil Rigs · Conveyor belts · Drilling Drives · Kilns · Tube mills · Mine Hoists

## A DC drive from ABB is more than just a drive.

Due to...

- our advanced technical Know How,
- our experience over decades in every imaginable application,
- highest quality and reliability of our products, as well as,
- our worldwide presence

...we can help you to be more competitive within the global marketplace of the future. During the development of the DCS800 we focused on the user's needs. By means of innovations, which save money. By means of functions, which make DC technology easier than ever before.

With the innovative DCS800 technology our customers are well armed for the challenges of the future. And with ABB they have the certainty of a reliable and fair partner- especially in the field of DC drives.

### Decision makers ask themselves:

- Which DC drive manufacturer today invests millions of Euros in a new DC product series?
- Which DC drive manufacturer today still offers complete support for old DC installations as well as for new customer requirements?
- Which DC drive manufacturer delivers DC drives with the latest state of the art technology, even in the future?

**ABB - The reliable partner**

### Saving money with DCS800

- Highest reliability and availability
- Fast installation and commissioning
- Less components, thus less spare parts needed
- PC Tool included in the standard scope of delivery
- PLC included in the drive without additional hardware
- Remote maintenance and diagnosis via internet
- Field supply, encoder and tachometer interfaces always included
- Reduced installation work due to integrated field supply

# DCS800 – Simplicity as a principle



Many users -like machine builders- have more important issues to do than wasting much time with drives in their applications. Therefore, the drives must work well and be simple to operate – just like the DCS800. The innovative DC drive from ABB sets all new standards in simple operation and smooth handling.

## Extremely flexible

Adaptive programming allows simple adaptation of every drive without using additional hardware or other options. Preconfigured function blocks (e.g. free PI controller, filters, logic blocks) are included off-the-shelf in every drive. The DCS800 control panel or the commissioning tool DriveWindow Light serve as programming tools. Hence, unexpected changes on site are easy to handle.



## One world - one drive

- Standard supply voltage up to 525 V
- Applicable for 50/60 Hz networks
- Multi-lingual control panel and PC tool
- Documentation available in 8 languages, even Russian and Chinese
- Support by ABB's worldwide drive network in more than 140 countries
- Approvals:



## DCS800 – designed to ease Your life

- Intuitive assistants make the commissioning a mere child's play
- Context sensitive user guidance and help functions
- High resolution control panel included in the standard delivery
- Simplified fault diagnosis by means of fault assistants
- Predefined macros for most applications
- Optimized auto tuning for all internal controllers
- Automatic phase sequence detection
- Automatic tacho adjustment

# DCS800 – Due to scalability open to all



Due to its large function range, the DCS800 is the first DC drive which increases its functionality according to the requirements of the user. Hardware extensions are quickly plugged on without using tools. Due to the standard integrated PLC and the Peer-to-Peer communication, even complex control tasks are realised directly in the drive.

## DCS800 – one drive fits all

The DCS800 allows cost-efficient drive systems, which are accurately adjusted to the respective application. Thus it is the first choice in various applications – in metals, in pulp and paper as well as in cranes, in mine hoist or in non-motric applications like battery chargers or magnets.

### DCSLink – the direct connection

- Simple and cost-efficient connection of several devices
- Peer-to-Peer communication directly from drive to drive
- Cycle times < 1.5 ms
- Standard support of demanding drive configurations, e.g. Master Follower, drives with multiple field exciters, winder / unwinder, roller tables and 12-pulse operation.

### DCS800 - PLC included

- Programming environment ControlBuilder, based on the common standard tool CoDeSys
- Support for all IEC 61131 programming languages
- Numerous preconfigured functions e.g.:
  - Free PID controller
  - Winder for diverse applications
  - Ramp and function generator
- Direct configuration in the drive without any needs for additional hardware like technology boards
- Memory Card for saving the source code in the drive
- Wide and comfortable standard function block library



# DCS800 – Far away and still at Your fingertips



The DCS800 is „Internet enabled“. Remote service from every internet PC guarantees the reliable use of the DCS800 in an easy and cost effective way - if necessary from thousands of miles away. In addition, our intuitive PC tools provide easy access to all DCS800 functions. Thanks to guided commissioning, adaptive programming and intelligent diagnostics its operation will be like a mere child's play.

## DCS800 – powerful PC tools

### DriveWindow Light

- Free of charge
- Standard connection to PC and laptop
- Assistants for fast commissioning, diagnosis and maintenance
- Adaptive Programming

### DriveWindow

- Fast optical connection with up to 2000 drives at the same time
- Real time monitoring

### DriveSize

- Fast and individual dimensioning of DC drives and motors
- Load cycles freely definable
- Configuration from individual modules to complex line-ups



**ControlBuilder**

**Trending**

**DriveSize**

**Commissioning assistant**

# DCS800 – Technical Data

## Technical data DCS800

Mains supply voltage	230...1,200 V +/-10%, 3~
Frequency	50...60 Hz +/-5 Hz
Electronics supply	115...230 V
	-15% / +10%, 1~
DC Output current	20...5,200 A
Overload capability	200%

## Ambient conditions

Ambient temperature	0° ... +40° C
	40° ... 55° C with reduction
Storage temperature	-40° ... +55° C
Transport temperature	-40° ... +70° C
Relative humidity	5 ... 95%, not condensing (max. 50% betw. 0°...5° C)
Pollution degree	Class 2
Protection class	IP 00
	finger protection I <sub>nom</sub> < 1,000 A
Altitude	< 1,000 m height above sea level: nominal Current
	> 1,000 m height above sea level: with reduction

## Field current

Up to 25A integrated (not D6 / D7)  
Up to 60 A, external 1~  
Up to 520 A, external 3~

## I/O

Digital inputs	8 standard up to 14 optional
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## Digital outputs

8 standard  
up to 12 optional

## Analog inputs

+/-10 V; 0/2...10 V  
up to 6 optional

+/-2 0mA; 0/4...20 mA

## Analog outputs

3 standard (1x I<sub>acc</sub>)  
up to 5 optional  
(+/-20 mA; 0/4...20 mA, with RAIO optional)

## Accuracy

Speed resolution with encoder	0.005%, of nominal Speed
with analog tacho	0.1% (16 Bit)
Cycle time speed controller	3.3 / 2.77 ms (50 / 60 Hz), synchronous with mains frequency
Step response curr. contr.	5 ms
Cycle time curr. contr.	3.3 / 2.77 ms (50 / 60 Hz), synchr. with mains frequency
Analog inputs	16 Bit

## PC-Tools

DriveWindow Light	free of charge with every converter Standard RS232 PC-connection
DriveWindow	Real-time optical connection
ControlBuilder	IEC61131 programming tool
DriveSize	Converter- and motor dimensioning

## Maintenance / Diagnosis

Remote diagnosis with any Internet-PC worldwide

- with internet browser / internet explorer
- or with DriveWindow full drive control via OPC

## Approvals



## Adaptive Programming

pre-defined drive-specific function blocks, e.g.

- Free process controller (PI-Controller)
- I/O- and digital Operations

With control panel or PC-Tool, no need for additional hardware

## Speed Feedback

EMF  
Analog tacho  
Encoder  
2nd Encoder possible (RTAC)

## Communication

Serial communication

- Ethernet
- Profibus
- CANopen
- DeviceNet
- ControlNet
- Modbus
- Modbus Plus
- CS31 (Procontic)
- Masterpiece (Asea)
- Selma2 (Strömberg)
- DDCS (AC800 M)

Industrial IT<sup>®</sup> enabled

## DCSLink Peer-to-Peer

- up to 800 kBaud, < 2.5 ms
- Master-Follower
- Armature-fieldconverter
- Free selectable data

## High Current Solutions

- 12-pulse up to 20,000 A, serial and parallel
- Hard parallel and sequential
- up to 1,500 V

## Protections

Speed feedback monitoring	Temperature
Overload	Over speed
Motor stalled	Motor over current
Motor over voltage	Field over current
Field over voltage	Minimum field current
Zero speed	Armature current ripple
Mains over- and under voltage	

## Integrated IEC 61131-PLC

- Open standard programming tool ControlBuilder
- Support of all five IEC-languages
- Drive-specific function blocks
- Saving of program and source in Memory Card
- Online debugging and forcing



Unit size	2-Q rated Current DCS800-01 I <sub>DC</sub> [A]	4-Q rated Current DCS800-02 I <sub>DC</sub> [A]	Supply voltage [V <sub>AC</sub> ]							max. field current internal [A <sub>DC</sub> ]	Dimensions	
			400	525	600	690	800	990	1200		h x w x d [mm]	h x w x d [inch]
D1	20	25	●	●						6	310 x 270 x 200	12.50 x 10.75 x 8.00
	45	50	●	●								
	65	75	●	●								
	90	100	●	●								
	125	140	●	●								
D2	180	200	●	●					15	310 x 270 x 270	13.75 x 10.75 x 10.75	
	230	260	●	●								
D3	315	350	●	●	● <sup>3)</sup>				20	400 x 270 x 310	15,75 x 10,75 x 12,50	
	405	450	●	●								
	470	520	●	●								
D4	610	680	●	●	● <sup>3)</sup>				25	580 x 270 x 345	23.00 x 10.75 x 13.75	
	740	820	●	●								
	900	1000	●	●								
D5	900	900	●	●	●	●			25	1050 x 510 x 410	41.50 x 20.25 x 16.25	
	1200	1200	●	●								
	1500	1500	●	●	●	●						
	2000	2000	●	●	● <sup>1)</sup>	● <sup>1)</sup>						
D6	1900	1900					●		external field	1750 x 460 x 410	69.00 x 18.25 x 16.25	
	2050	2050		●	●	●						
	2500	2500	●	●	●	●						
	3000	3000	●	●	●	●						
D7	2050	2050						●	external field	1750 x 760 x 570	69.00 x 30.00 x 22.50	
	2600	2600						● <sup>2)</sup>				
	3300	3300	●	●	●	●		● <sup>2)</sup>				
	4000	4000	●	●	●	●						
	4800	4800	●	●	●	●						
	5200	5200	●	●	●	●						

●<sup>1)</sup> only available as 2-Q drive

●<sup>2)</sup> on request

●<sup>3)</sup> 600V

2-Q -> 290 A / 590 A  
4-Q -> 320 A / 650 A

# DCS800 family



## DCS800-S Modules

The versatile drive for any application

20 ... 5,200 A<sub>DC</sub>  
0 ... 1,160 V<sub>DC</sub>  
230 ... 1,000 V<sub>AC</sub>  
IP00

- Compact
- Highest power ability
- Simple operation
- Comfortable assistants, e.g. for commissioning or fault tracing
- Scalable to all applications
- Free programmable by means of integrated IEC61131-PLC



## DCS800-A Enclosed Converters

Complete drive solutions

20 ... 20,000 A<sub>DC</sub>  
0 ... 1,500 V<sub>DC</sub>  
230 ... 1,200 V<sub>AC</sub>  
IP21 – IP54

- Individually adaptable to customer requirements
- User-defined accessories like external PLC or automation systems can be included
- High power solutions in 6- und 12-pulse up to 20,000 A, 1,500 V
- In accordance to usual standards
- Individually factory load tested
- Detailed documentation



## DCS800-E Series

Pre-assembled drive-kits

20 ... 2,000 A<sub>DC</sub>  
0 ... 700 V<sub>DC</sub>  
230 ... 600 V<sub>AC</sub>  
IP00

- DCS800 Module with all necessary accessories mounted and fully cabled on a panel
- Very fast installation and commissioning
- Squeezes shut-down-times in revamp projects to a minimum
- Fits into Rittal cabinets
- Compact Version up to 450 A and Vario Version up to 2,000 A



## DCS800-R Rebuild Kit

Digital control-kit for existing powerstacks

20 ... 20,000 A<sub>DC</sub>  
0 ... 1,160 V<sub>DC</sub>  
230 ... 1,200 V<sub>AC</sub>  
IP00

- Proven long life components are re-used, such as power stacks, (main) contactors, cabinets and cabling / busbars, cooling systems
- Use of up-to-date communication facilities
- Increase of production and quality
- Very cost-effective solution
- Open Rebuild Kits for nearly all existing DC-drives
- tailor-made solutions for...
  - BBC PxD
  - BBC SZxD
  - ASEA Tyrak
  - other manufacturers



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