Welcome to the DCS800 Hardware Options training module for ABB DC drives.

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Objectives

This training module covers:

- DDCS options for DCS800
- Branching unit NDBU-95
- AIMA-01 Module adapter
- Finger protection
- Extension lug bars
- EMC filters
- NETA-01 Remote Monitoring
Options for DDCS communication

- If the SDCS-COM-8 board is connected to SDCS-CON-4 board, DDCS communication is possible
- This board provides 4 channels for connection of external devices
- Here are some examples:
  - NDBU-95 Branching Unit
  - AIMA-01 Module Adapter
  - Advant Controller
- Which communication channel is required depends on the devices

In the ABB fiber optic world, there are many options for DDCS communication. For the DCS800, the communication interface is the SDCS-COM-8 board which provides DDCS communication channels.

This board provides 4 channels for connection of external devices for DDCS.

Here are some examples:
- NDBU-95, branching unit,
- AIMA-01, module adapter,
- Advant controller, the ABB PLC system

Which communication channel is required, depends on the devices.
- NDBU-95 is located outside of the drive and can thus be used for all D1 – D7 modules sizes.

- NDBU-95 is used to provide the star topology for communication to ABB overriding control systems and for the DriveWindow fiber optic network.

- NDBU-95 provides 9 output channels thus it is possible to serve up to 9 drives.

The NDBU-95 is located outside of the drive and can thus be used for all D1 to D7 modules sizes.

The DDCS branching unit NDBU-95 is used to provide the star topology for communication to ABB overriding control systems and for the DriveWindow fiber optic network. Star topology allows connected drives to become unpowered without disabling the communication of the other connected drives.

The NDBU-95 provides nine output channels thus it is possible to serve up to nine drives. If the number of drives must be increased, it is possible to connect several NDBU-95 in parallel, in series or in any combination to build up a network.
Here is an example for DDCS wiring of channel 0 data transfer.

Several drives are connected to the NDBU-95 via fiber optic cables.

On the master input there is an ABB overriding control system connected.
Another example for DDCS topology is shown in the picture.

Each NDBU-95 is connected to 8 drives. If more drives should be connected, NDBUs can be connected in series to multiply output connections.
AIMA-01 Module Adapter

- AIMA-01 is used to expand I/Os via extension modules
- Each AIMA-01 board can be equipped with up to 3 extension modules
- Typically each extension module gets its own ID node because of serial communication

• AIMA-01 is used to expand I/Os via extension modules. All types of R-modules can be plugged into connectors.
• Each AIMA-01 board can be equipped with up to 3 extension modules.
• Typically, each extension module gets its own ID node because of a serial communication.
The AIMA-01 board must be connected to the COM-8 board. The COM-8 board provides channel 1 communication for this purpose.

Note that the optical connection is limited to 200 meters.

Do not forget that this is a serial communication. Therefore, node IDs must be set according to description.
If more than one AIMA-01 board is used, all boards will be connected in series. One fiber cable from the first AIMA-01 board and one fiber cable from the last AIMA-01 board is connected to the COM-8 board of the DCS800.
Extension modules from the R-series fit to connectors on the AIMA-01 board

Fix the modules in addition with two screws to get proper grounding

After that, the extension module is ready for operation if the power is switched-on

Note that incorrect mounting of the extension module on the AIMA-01 board can damage electronic boards!
AIMA-01 Module Adapter

Example: Settings on the extension module

- On each extension module there are switches and selectors to specify communication.
- Node ID selector (S1) is used to set-up the node ID of the extension module. Read the DCS800 documentation to find out the required settings!
- Some modules have DIP-switches for some additional settings like filter settings, voltage- or current scaling.
Terminal options, part 1
Finger protections

- Typical DCS800 converter modules have IP00 protection.
- Therefore hot parts (AC and DC) are exposed and could cause accidents.
- To avoid this, finger protection is available as an option for D1 to D4 sizes.
- Finger protection comes in three sizes,
  - one for units D1 and D2,
  - one for unit D3,
  - one for unit D4.
Here are some examples of finger protection.
Terminal options, part 3
Extension lug bars

- Size D4 modules can deliver DC current up to 1000A.
- In some cases, the standard DC terminals are not large enough for needed DC power cables.
- In these cases, it is beneficial to use the extension lug bars.
- In general, the extension lug bars provide more space to connect the DC cables.

- Size D4 modules can deliver DC-currents up to 1000 A.
- In some cases the standard DC-terminals are not large enough for the needed DC-power cables.
- In these cases it is beneficial to use the extension lug bars for easier connection of the DC-cables.
- The extension lug bars provide more space to connect the DC-cables.
Auxiliary transformer T2
For module sizes D1 to D7:

- The auxiliary transformer (T2) is located outside of the drive
- All converter units require various auxiliary voltages, e.g. 115 or 230 VAC
  - Electronics or power supply
  - Cooling fans (115 or 230 VAC)
- Auxiliary transformer (T2) is especially designed to supply the drives electronics and the cooling fan
- This transformer can be connected to incoming voltages up to 690 VAC
- Maximum power is 1400 VA

- The auxiliary transformer T2 is located outside of the drive and can thus be used for all D1 to D7 module sizes.
- All Converter units require various auxiliary voltages, e.g., 115 or 230 VAC are needed for the electronics of D1 to D7 unit sizes, the cooling fans of D1 to D5 unit sizes also need 115 or 230 VAC as supply.
- The auxiliary transformer T2 is especially designed to supply the drives electronics and the cooling fan.
- The auxiliary transformer T2 can be connected to incoming voltages up to 690 VAC and provides either 115 or 230 VAC at its secondary winding. The power is 1400 Volt-Ampere and the current on the secondary side is 6 Amps for 230 VAC and 12 A for 115 VAC.
EMC filters, part 1
Connection diagram

- EMC filters are needed to reduce harmonics in the AC supply network.
- When using an EMC filter, correct mounting order with line reactors and fuses has to be taken into account.
- Line reactors and fuses have to be connected directly to the drive.
- EMC filter has to be connected ‘upstream’ of the line reactors.

- EMC filters are needed to reduce harmonics in the AC supply network.
- When using an EMC filter, correct mounting order with line reactors and fuses has to be taken into account.
- The line reactors and the fuses have to be connected directly to the drive.
- The EMC filter has to be connected ‘upstream’ of the line reactors.
EMC filters, part 2
For module sizes D1 to D6

The EMC filters are located outside of the drive. EMC filters are available for D1 to D6 modules sizes of up to 3000 ADC.

EMC filters are necessary to fulfill the standard for emitted interference. For more information about the necessity of an EMF filter, please see the DCS800 Hardware Manual chapter entitled EMC filters.

The table shows the type of drive with its rated DC-current and the D1 to D6 unit sizes.

Here are the types of EMF filters listed according to converter type and incoming voltage.
The NETA-01 Ethernet Adapter module is an optional device for browser-based remote monitoring of ABB drives via Ethernet.

**Monitor the drive**
- Read and adjust drive parameter values / actual signals
- Read and clear the contents of the fault log and save it to a file

**Control the drive**
- Give control commands
- Feed a motor speed or torque reference to the drive
- Reset a drive fault
Summary

Key points of this module are:

- DDCS options for DCS800
- Branching unit NDBU-95
- AIMA-01 Module adapter
- Finger protection
- Extension lug bars
- EMC filters
- NETA-01 Remote Monitoring
Additional information

- Hardware Manual (3ADW000194)