

ABB INDUSTRIAL DRIVES

DCT880 thyristor power controller (20 A ... 4160 A) Manual



Control board SDCS-CON-H01 (T1 ... T6)

The control circuit terminals are common for all sizes T1 ... T6.

Location of the control circuit board SDCS-CON-H01

The SDCS-CON-H01 is mounted on an electronic tray. The electronic tray is attached in the housing by means of two hinges.

Watchdog function

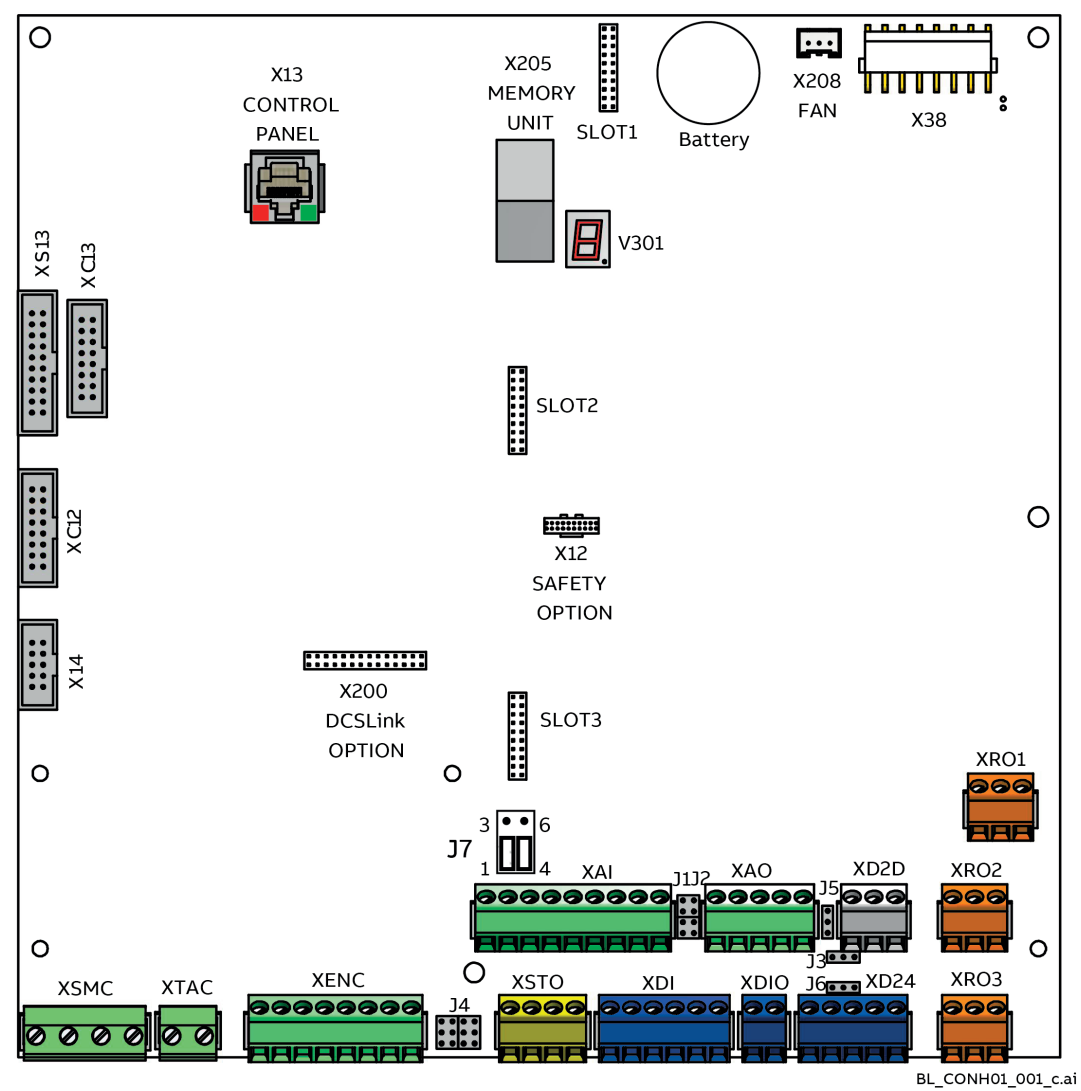
The SDCS-CON-H01 has an internal watchdog. The watchdog controls the proper function of the SDCS-CON-H01 and the firmware. If the watchdog trips, it has the following effects:

- The thyristor firing control is reset and disabled.
- All DI's will not be processed.
- All DO's are frozen in the actual state.
- All AI's will not be processed.
- All programmable AO's are frozen in the actual state.

Recommended wire size - Tightening torques

Control cables:

Wire sizes:	Tightening torques:
0.5 ... 2.5 mm ² (24 ... 12 AWG)	0.5 Nm (5 lbf-in) for both stranded and solid wiring



	35. Temperature Measurement	
	4	Temp 1 Source XENC:5-6-7
	5	Temp 1 Conversion mode XENC:5-6-7
	This function is released for: – Firmware 1.08 and higher. – SDCS-CON-H01 REV E and higher.	
	Parameter settings see Group 35 Temperature Measurement	

XTAC: Analog tachometer

AITACH+	Not in use for DCT880
AITACH-	

XSMC: Mains contactor

MCCOM	Fixed output for the mains contactor
MCNO	250 V _{AC} /30 V _{DC} , 2 A Maximum wire size 2.5 mm ² Varistor protected Note: It is also possible to use one of the relay outputs. Examples see chapter Wiring
STOCOM	Not in use for DCT880
STONO	WARNING! The XSTO terminals must not be used for thyristor power controllers. They are not offering any certified safety functionality.
	Mains contactor ON command: E.g., 06.14 Leg 1 Status Word bit 11 = high.

XSTO: Safe torque off

OUT1	For the thyristor power controller to start, both connections (OUT1 to IN1 and IN2) must be closed. By default, the terminal block has wires to close the circuit. Removing the wires will block the firing pulses. WARNING! The XSTO terminals must not be used for thyristor power controllers. They are not offering any certified safety functionality. Maximum wire size 2.5 mm ² Current consumption per channel: 55 mA (continuous)
IN1	
IN2	

X205 Memory unit connection

The thyristor power controller is equipped with a memory unit that is plugged into X205 on the SDCS-CON-H01. The memory unit contains the firmware, the parameters, and the application program (as option). It is possible to handle the parameters by control panel, PC tool or overriding control. Changed parameters are stored immediately in the memory unit.

In addition, the fault logger entries are stored in the memory unit during de-energizing the auxiliary power.

When a thyristor power controller is replaced, the parameter settings can be retained by transferring the memory unit from the defective thyristor power controller to the new thyristor power controller.



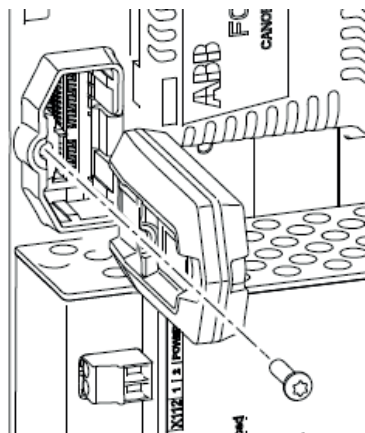
WARNING!

Do not remove or insert a memory unit when the thyristor power controller is powered.

After power-up, the thyristor power controller will scan the memory unit. If different parameter settings are detected, they are copied to the thyristor power controller. This may take several minutes.

Replacing the memory unit

Make sure, that the auxiliary power is off. Unscrew the memory unit and pull it out. Replace the memory unit in reverse order.



Screw is M3*5.

Additional terminals

- Use connectors Slot1 ... Slot3 for F-type I/O extension modules and F-type fieldbus adapters.
- Connectors XC12, XS13, X14 and X38 connect the SDCS-CON-H01 to the SDCS-PIN-H11 for voltage, current, temperature measurement and safety.
- Use connector X13 to connect the control panel either directly via a jack plug or via a CAT 1:1 cable (< 3 m) with RJ-45 plugs.

Switch on/off delays (reaction times)

Via FEA-03	Hardware	Type	Delay		DIP switch
-	SDCS-CON-H01	DI, DIO	Switch on delay	2 ms	-
			Switch off delay	1 ms	-
No	FDIO-01	DI	Switch on delay	15 ms	1 ms
				26 ms	10 ms
			Switch off delay	13 ms	1 ms
				21 ms	10 ms
	FIO-01	DIO	Switch on delay	3 ms	-
			Switch off delay	1 ms	-
	FIO-11	DIO	Switch on delay	5 ms	-
			Switch off delay	3 ms	-
Yes	FDIO-01	DI	Switch on delay	16 ms	1 ms
				26 ms	10 ms
			Switch off delay	15 ms	1 ms
				21 ms	10 ms
	FIO-01	DIO	Switch on delay	3 ms	-
			Switch off delay	1 ms	-
	FIO-11	DIO	Switch on delay	5 ms	-
			Switch off delay	3 ms	-

The given values are approximate values which were measured using a unit. Please consider, that for some operations e.g., starting and stopping, thyristor-based units cannot react before a full mains cycle has passed (worst-case scenario).

Index	Name						
	Text						
	Range	Default	Unit	Scale FbEq16	Volatile	Change running	Type
	1020: FIO-11 ; 1021: FEN-31 ; 1024: FAIO-01 ; 1025: FDIO-01 ; 1026: FSE-31 ;						
	0 ... 65535	-	-	1 = 1	y	n	Signal
07.52	Slot 2 option module						
	Slot 2 option module. Displays the option module plugged into slot 2. For values, see 07.51 Slot 1 option module.						
	0 ... 65535	-	-	1 = 1	y	n	Signal
07.53	Slot 3 option module						
	Slot 3 option module. Displays the option module plugged into slot 3. For values, see 07.51 Slot 1 option module.						
	0 ... 65535	-	-	1 = 1	y	n	Signal
07.80	Control unit logic version						
	Version number of the control unit logic in the FPGA on the SDCS-CON-H01. Example: 10.10.0.0 = Firmware version 10.10.						
	0.000.0.0 ... 255.255.255.255	-	-	1 = 1	y	n	Signal
07.81	Ch1 power unit logic version						
	Version number of the power unit logic in the FPGA on the SDCS-OPL-H01 connected to channel1 of the SDCS-DSL-H1x. Example: 10.10.0.0 = Firmware version 10.10.						
	0.000.0.0 ... 255.255.255.255	-	-	1 = 1	y	n	Signal
07.86	FPGA logic version name						
	Used FPGA type. 0: VIFO ; SDCS-CON-H01. 1: VLFO ; SDCS-CON-H01L.						
	0 ... 1	-	0 ... 1	1 = 1	0 ... 1	n	0 ... 1
07.91	Control board type						
	Used Control board type. 0: CON-H01 ; SDCS-CON-H01. 2: CON-H01L ; SDCS-CON-H01L.						
	0 ... 2	-	-	1 = 1	y	n	Signal

Before proceeding with troubleshooting

Follow the procedure below to solve problems:

- First, check that the power controller is correctly wired, see chapter [Wiring](#).
- Check, whether a warning- or fault code is displayed on the PC tool, control panel or 7-segment display.
- If a warning code appears, go to the warning description, see [Warnings and AUX codes](#).
- If a fault code appears, go to the fault description, see [Faults and AUX codes](#).
- If any problems persist after the above recovery procedure, contact your ABB representative.

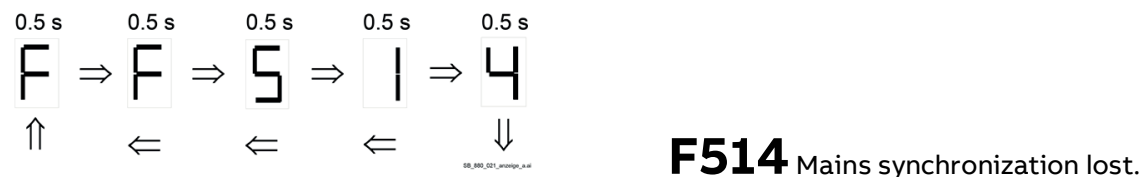
Messages

Display of status messages, fault, and warning signals

A seven-segment display (V301) is located on the control board SDCS-CON-H01, and it shows the state of the unit:

	Power up, firmware is not yet running.
	Dot is slowly flashing (1 s), firmware is running. No warnings, no faults.
	Indication while loading firmware into the SDCS-CON-H01.
	Warning.
	Fault

The seven-segment display shows the event in code. The letters and numbers of multi-character codes are displayed one after the other for 0.5 seconds at a time. Plain text messages are available on the control panel and in the fault logger of Drive composer.



Status messages

Status messages will only be indicated on the seven-segment display of the SDCS-CON-H01.

7-segment display	Text on control panel, and Drive composer	Definition
P. then b.	Not available.	Power up, firmware is yet not running.
.	Not available.	Dot is slowly flashing (1 s), firmware is running. No warnings, no faults.
L	Not available.	Indication while loading firmware into the SDCS-CON-H01.

Code	Fault/Notice	Cause and what to do
5213	External fault 3. (Editable message text) Programmable, see 28.05 External event 3 source and 28.06 External event 3 type.	There is no problem with the unit itself! Fault generated by external device 3. See group 28 Unit Faults. Check: – External device 3. – 31.05 External event 3 source.
5214	External fault 4. (Editable message text) Programmable, see 28.07 External event 4 source and 28.08 External event 4 type.	There is no problem with the unit itself! Fault generated by external device 4. See group 28 Unit Faults. Check: – External device 4. – 31.07 External event 4 source.
5215	External fault 5. (Editable message text) Programmable, see 28.09 External event 5 source and 28.10 External event 5 type.	There is no problem with the unit itself! Fault generated by external device 5. See group 28 Unit Faults. Check: – External device 5. – 31.09 External event 5 source.
5091	STO active. Programmable, see 28.72 STO indication run/stop.	Safe torque off active, no unit problem. Check: – 31.22 STO indication run/stop. – The safe torque off circuit. WARNING! The XSTO terminals must not be used for thyristor power controllers. They are not offering any certified safety functionality.
5221	Rating ID mismatch.	The hardware of the thyristor power converter/SDCS-CON-H01 does not match the information stored in the memory unit. This may occur e.g., after a firmware update, memory unit replacement or replacement of the SDCS-CON-H01. To reset, cycle the auxiliary power of the unit. Check: – The settings of 95.14 Set: Power unit (if shown and available), 95.16 Set: Unit type code, 95.17 Set: Unit legs, 95.18 Set: Unit output current scaling and 95.19 Set: Unit input voltage scaling. – The AUX code (format ZZ). ZZ indicates the AUX code category. – 06 = Power unit rating ID invalid. – 07 = Reading power unit rating ID or power unit type failed on power unit connection. – 08 = Power unit not supported (illegal rating ID). – 09: = Power unit type mismatch. See 95.14 Set: Power unit = Unsupported power unit type. – 10 = Type code out of range. For module sizes H1 ... H5 the current and voltage range of the type code setting is limited to max 1190 ADC and max 600 V_{AC}. – 20 = Saving of 95.25 Set: Type code failed. – 21 = Saving of 95.14 Set: Power unit failed.

Code	Fault/Notice	Cause and what to do	
		Reload firmware or replace the unit.	
5238	EFB invalid parameterization.	Embedded fieldbus (EFB) parameter settings are inconsistent or not compatible with the selected protocol. Check the settings of group 58 Embedded fieldbus and verify they are consistent with the configured protocol.	
5239	EFB load fault.	Embedded fieldbus (EFB) protocol firmware could not be loaded.	Reload firmware or replace the unit.
		Version mismatch between embedded fieldbus (EFB) protocol firmware and unit firmware.	
5242	Text data overflow.	Internal fault. Reset the fault. Contact your local ABB representative if the fault persists.	
5243	Text 32-bit table overflow.		
5245	Text 64-bit table overflow.		
5245	Text file overflow.		
5249	Internal task overload.	Internal fault. Cycle the power of the unit or use 96.08 Control board boot. If the problem persists, contact your local ABB representative stating the AUX code.	
5250	Internal stack overflow.	Internal fault. Cycle the power of the unit or use 96.08 Control board boot. If the problem persists, contact your local ABB representative stating the AUX code.	
5251	Internal file load.	File read error. Cycle the power of the unit or use 96.08 Control board boot. Check: – The memory unit. – Re-load the firmware. – Exchange the memory unit. – Exchange the SDCS-CON-H01. If the problem persists, contact your local ABB representative.	
5252	Internal record load.	Internal record load error. Contact your local ABB representative.	
5254	Memory unit detached.	The memory unit was detached while the unit is powered. Switch off the power to the unit and reinstall the memory unit. In case the memory unit was not actually removed when the fault occurred, check that the memory unit is properly inserted into its connector and its mounting screw is tight. Then cycle the power of the unit or use 96.08 Control board boot. If the problem persists, contact your local ABB representative.	
5255	Internal firmware.	Internal firmware fault. Cycle the power of the unit or use 96.08 Control board boot. If the problem persists, contact your local ABB representative.	
5256	User set fault.	Loading of user parameter set failed. Ensure that a valid user parameter set exists. Reload if uncertain. Check: – That the requested set does exists. See 96.04 Macro select. – That the set is compatible with the control program. – If the unit was switched off during loading.	

Code	Fault/Notice	Cause and what to do
		– 001: Internal error [invalid call parameter]. – 002: Internal error [configuration not supported]. – 003: Transmission buffer full. – 000: Broadcast. – 001: Power unit connected to channel1 on SDCS-DSL-H1x. – 01: Transmitter side [link error] from power unit to control unit. – 02: Transmitter side [no communication] from power unit to control unit. – 03: Receiver side [link error] from control unit to power unit. – 04: Receiver side [no communication] from control unit to power unit. – 05: Transmitter FIFO error, see XXX. – 06: SDCS-OPL-H01 not found.
5501	Aux undervoltage	Aux voltage < 21.2 V_{DC}. Recovery at 21.9 V_{DC} (0.7 V hysteresis). Check: – 24 V_{DC} auxiliary voltage at XAUX. – Chapter XAUX: Auxiliary voltage input (X99).
5508	Ext I/O comm loss. Programmable, see 28.14 Ext I/O comm loss event. See also warning A799.	The I/O extension module types and locations specified by parameters do not match the detected configuration or do not communicate with the unit. Check: – The type and location settings of the modules. See parameters 14.01, 14.02, 15.01, 15.02, 16.01 and 16.02. – That the module/board is properly seated in its slot. – That the module/board and the slot connector is not damaged. – Try installing the module into another slot. – Check the AUX code (format XYYYYYYY). XX specifies the number of the I/O extension module. – 01: Group 14 I/O extension module 1. – 02: Group 15 I/O extension module 2. – 03: Group 16 I/O extension module 3. YYYYYY indicates the problem. Actions see below.
	00 0001	Communication with module failed.
	00 0002	Module not found.
	00 0003	Configuration of module failed.
	00 0004	
5525	Type code.	The hardware of the unit/SDCS-CON-H01 does not match the information stored in the memory unit. This may occur e.g., after a firmware update, memory unit replacement or replacement of the SDCS-CON-H01. To reset, cycle the auxiliary power of the unit. Check: – The settings of 95.14 Set: Power unit (if shown and available), 95.16 Set: Unit type code, 95.17 Set: Unit legs, 95.18 Set: Unit output current scaling and 95.19 Set: Unit input voltage scaling. – The AUX code (format ZZ). ZZ indicates the AUX code category. – 06 = Power unit rating ID invalid. – 07 = Reading power unit rating ID or power unit type failed on power unit connection. – 08 = Power unit not supported (illegal rating ID).

Code	Fault/Notice	Cause and what to do
		– 09: = Power unit type mismatch. See 95.14 Set: Power unit = Unsupported power unit type. – 10 = Type code out of range. – 20 = Saving of 95.16 Set: Type code failed. – 21 = Saving of 95.14 Set: Power unit failed.
5545	Application loading.	Application file incompatible or corrupted. Check the AUX code. Actions see below.
	8006	Not enough memory for the application.
	8007	The application contains the wrong library version.
	800A	The application contains an unknown target (system) library function.
	800B ... XXXX	The application load failed.
5546	Control panel/PC tool link communication. Programmable, see 49.05 Communication loss action.	This fault occurs only when the unit is controlled from the control panel/PC tool (local mode). The control panel/PC tool connected via USB, or the PC tool connected via FENA-11/21 has stopped communicating. Check: – The setting of 49.04 Communication loss time. – If needed extend the time out to 2000 ms. Do not forget to verify the setting by means of 49.06 Refresh settings Refresh. – The setting of 49.05 Communication loss action. – If changed, do not forget to verify the setting by means of 49.06 Refresh settings Refresh. – The control panel/PC tool connection/cable. – The control panel connector. – The mounting platform if being used (e.g., DPMP-01). – Disconnect and reconnect the control panel/PC tool.
5547	Unit hardware.	Unit hardware failure. To reset, cycle the auxiliary power of the unit. If the problem persists, check the AUX code (format YYYY). YYYY indicates the problem. Actions see below.
	0050	Parameter flash memory faulty (erase).
	0051	Parameter flash memory faulty (program).
	0052	Check connector XC12 on SDCS-CON-H01 and connector XC12 on SDCS-PIN-H11.
5548	Internal firmware.	Internal firmware error. To reset, cycle the auxiliary power of the unit. If the problem persists, contact your local ABB representative, quoting the AUX code. Check the AUX code (format YYYY). YYYY indicates the problem. Actions see below.
	0001	Default setting of parameters wrong.
	0002	Parameter flash memory image too small for all parameters.
	0004	Illegal write attempt on a signal or write-protected parameter.
	0006	Wrong type code.
	0007	An un-initialized interrupt has occurred.
	0010	Wrong parameter value.
	0101 ... 9999	The read only parameter, which is being written to by means of a pointer parameter, e.g., 62.51 Data set 10 data 1 selection, Adaptive Program, or application program, can be identified by means of the last 4 digits.