

SD750

ACCESSORIES MANUAL

OPTICAL FIBER BOARD



LOW VOLTAGE VARIABLE SPEED DRIVE

SD750

— *LOW VOLTAGE VARIABLE SPEED DRIVE* —

Accessories Manual

Optical fiber board

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ABOUT THIS MANUAL

PURPOSE

This manual contains important instructions for the installation, configuration and use of the **optical fiber board** for Power Electronics SD750 variable speed drives.

The optical fiber board is optional for the SD750 variable speed drives frame 1 to 8. In the case of the SD750 frame 9 to 11, it is included on the standard equipment and it would be along with the module connection kit.

TARGET AUDIENCE

This manual is intended for qualified customers who will install, operate and maintain Power Electronics SD750 variable speed drives.

Only trained electricians may install and commission the drives.

REFERENCE MANUALS

The following reference documents are available for SD750 variable speed drives:

- Hardware and Installation Manual.
- Programming and Software Manual.
- Maintenance Manual.
- Pumps Application Manual.

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SAFETY SYMBOLS

Always follow safety instructions to prevent accidents and potential hazards from occurring.

In this manual, safety messages are classified as follows:

	WARNING	<p>Identifies potentially hazardous situations where dangerous voltage may be present, which if not avoided, could result in minor personal injury, serious injury or death.</p> <p>Be extremely careful and follow the instructions to avoid the risk of electrical shocks.</p>
	CAUTION	<p>Identifies potentially hazardous situations, which if not avoided, could result in product damage, or minor or moderate personal injury.</p> <p>Read the message and follow the instructions carefully.</p>
	NOTICE	<p>Identifies important measures to take in order to prevent damage equipment and warranty lost, as well as encouraging good use and environmental practices.</p>

Other symbols used in this manual for safety messages are the following:

	Hot surface. Be careful and follow the instructions to avoid burns and personal injuries.
	Risk of fire. Be careful and follow the instructions to prevent causing an unintentional fire.
	Caution, risk of electric shock. Energy storage timed discharge. Wait for the indicated time to avoid electrical hazards.
	Caution, risk of hearing damage. Wear hearing protection.

SAFETY INSTRUCTIONS

IMPORTANT!

Read carefully this manual to maximize the performance of the product and to ensure its safe installation and use.

In order to appropriately use the drive, please, follow all instructions described in the **Hardware and Installation Manual** which refer to transportation, installation, electrical connection and commissioning of the equipment.

For maintenance operations, follow the instructions from the **Maintenance Manual**.

Power Electronics accepts no responsibility for any damages resulting from incorrect use of equipment.



CAUTION

Read carefully the **Hardware and Installation Manual**, the **Maintenance Manual** and all documentation related to the drive to guarantee its safe use and avoid the risk of personal injuries and damages to the equipment.

Ensure compliance with local and national regulations of the installation site.

INTRODUCTION

1

SD750 drives are compatible with several optional boards:

- Communication boards (Ethernet/IP, Profinet, CANopen, Profibus...).
- Encoder board.
- Digital and analog I/O expansion boards.
- Optical fiber board

...among others. Up to three optional boards can be connected, maximum two of the same type.

This manual focuses on the optical fiber expansion board. This board is optional for the SD750 variable speed drives frame 1 to 8; in the case of the SD750 frame 9 to 11, is included on the standard equipment.

This board allows integrating the drives in optical fiber networks in a comfortable and simple way. Its practical design allows to know the board's operating status at all times.

Below is the front of the optical fiber expansion board:

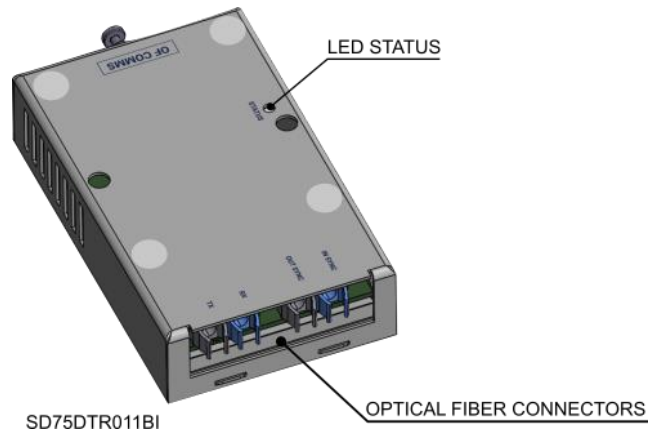


Optical fiber board specifications

- Compatibility: SD750.
- Baud rate: Speed is fixed and not configurable.
- Type of communication: Multimode fiber optics with Dasy Chain and Ring configuration.
- Status LED.

LED indicator and optical fiber connectors

The optical fiber expansion board has four optical fiber connectors and one led indicator (status) that provides information about the board's power supply. It is green and its frequency changes according to the operating state of the system.



LED	COLOR / FREQUENCY	DESCRIPTION
STATUS	On	The fiber board is supplied.
	Off	The fiber board is off.

CONNECTOR	DESCRIPTION
TX	Data transmission for synchronization.
RX	Data reception for synchronization.
OUT SYNC	Pulse transmission for synchronization.
IN SYNC	Pulse reception for synchronization.

Module connection kit (SD750 frames 9 to 11)

As mentioned previously, the optical fiber board is sent by default with SD750 drives frames 9 to 11, and in this case a module connection kit will be provided as well.

The module connection kit includes all cables necessary to perform the wiring between modules. Its contents are shown in the table below:

FRAME	WIRE FUNCTION	DESCRIPTION	UNITS	LENGTH (M)
2 x T6	OPTICAL FIBER SYNCHRO	Transmission	1	4,9
		Reception	1	4,9
	OPTICAL FIBER COMMS	Transmission	1	4,9
		Reception	1	4,9
	WIRE RS232/RS485	-	2	4,9
3 x T6	OPTICAL FIBER SYNCHRO	Transmission	2	4,9
		Reception	1	5,7
	OPTICAL FIBER COMMS	Transmission	2	4,9
		Reception	1	5,7
	WIRE RS232/RS485	-	2	4,9
4 x T6	OPTICAL FIBER SYNCHRO	Transmission	3	4,9
		Reception	1	6,5
	OPTICAL FIBER COMMS	Transmission	3	4,9
		Reception	1	6,5
	WIRE RS232/RS485	-	3	4,9
2 x T7	OPTICAL FIBER SYNCHRO	Transmission	1	5,95
		Reception	1	5,95
	OPTICAL FIBER COMMS	Transmission	1	5,95
		Reception	1	5,95
	WIRE RS232/RS485	-	1	5,95
3 x T7	OPTICAL FIBER SYNCHRO	Transmission	2	5,95
		Reception	1	7,1
	OPTICAL FIBER COMMS	Transmission	2	5,95
		Reception	1	7,1
	WIRE RS232/RS485	-	2	5,95
4 x T7	OPTICAL FIBER SYNCHRO	Transmission	3	5,95
		Reception	1	8,25
	OPTICAL FIBER COMMS	Transmission	3	5,95
		Reception	1	8,25
	WIRE RS232/RS485	-	3	5,95

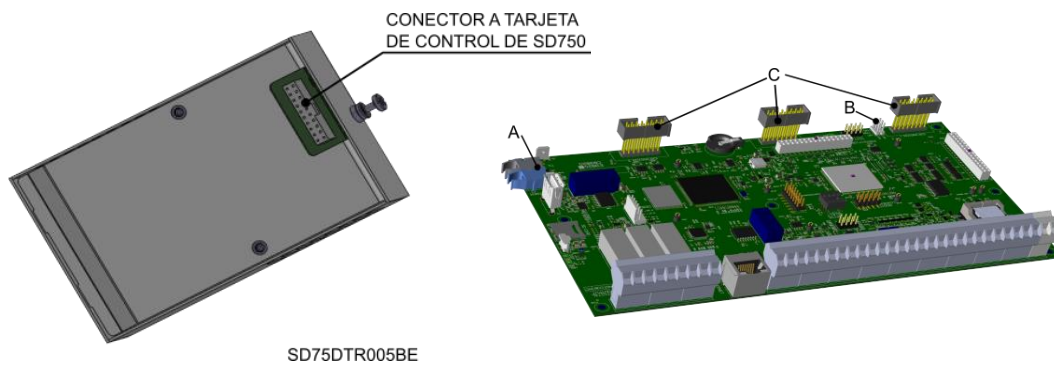
FRAME	WIRE FUNCTION	DESCRIPTION	UNITS	LENGTH
2 x T8	OPTICAL FIBER SYNCHRO	Transmission	1	6,3
		Reception	1	6,3
	OPTICAL FIBER COMMS	Transmission	1	6,3
		Reception	1	6,3
	WIRE RS232/RS485		1	6,3
3 x T8	OPTICAL FIBER SYNCHRO	Transmission	2	6,3
		Reception	1	7,8
	OPTICAL FIBER COMMS	Transmission	2	6,3
		Reception	1	7,8
	WIRE RS232/RS485		2	6,3
4 x T8	OPTICAL FIBER SYNCHRO	Transmission	3	6,3
		Reception	1	9,3
	OPTICAL FIBER COMMS	Transmission	3	6,3
			1	9,3
	WIRE RS232/RS485		3	6,3

CONNECTIONS

2

Connection to the drive

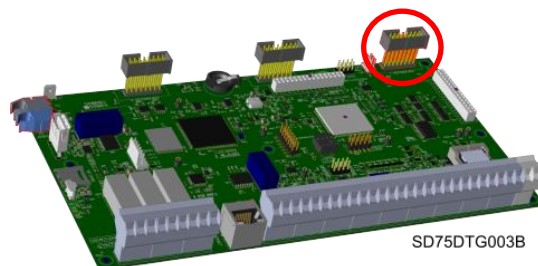
For the variable speed drives frame 1 to 8, the optical fiber must be connected directly, via the sixteen-pin ID connector on the back, to any of the three expansion connectors on the central control board of the SD750 drive.



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COMPONENTS OF THE CONTROL BOARD	DESCRIPTION
A	Fiber communication terminals.
B	Synchronism selector.
C	Connectors for the expansion boards.

In the case of the variable speed drives frame 9 to 11, the optical fiber board must be connected to the specific connector of the expansion board shown below.





CAUTION

Power Electronics' SD750 drives operate with a high electric energy.

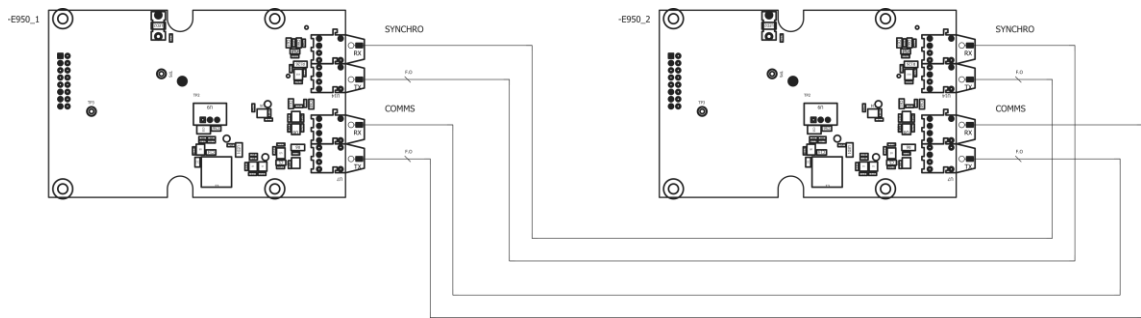
Make sure the power has been turned off and wait at least 10 minutes to ensure that the DC bus has been discharged, make sure with a multimeter that there is no input, output or DC bus voltage before installing the expansion board. Otherwise, there is a risk of personal injury or accident.

For drives frame 9 to 11, the modules connection kit provided with the drive must be installed.

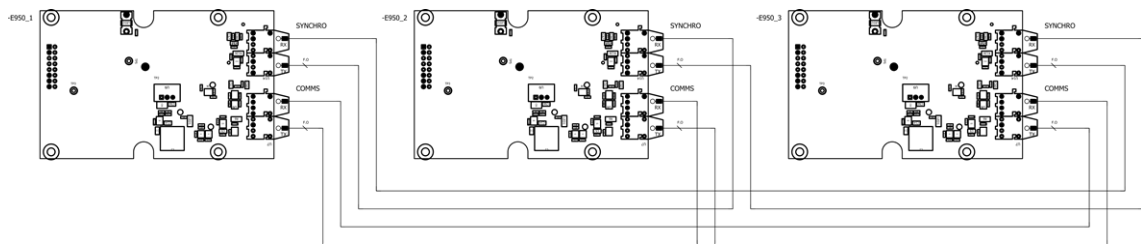
Connection between modules

Follow the next electrical schemes to connect up to 4 modules of Power Electronics SD750 variable speed drives.

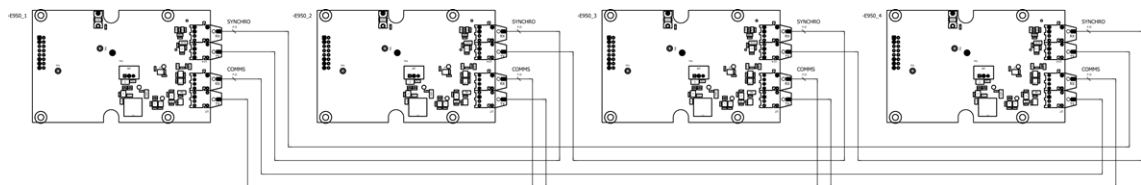
Connection of 2 modules



Connection of 3 modules

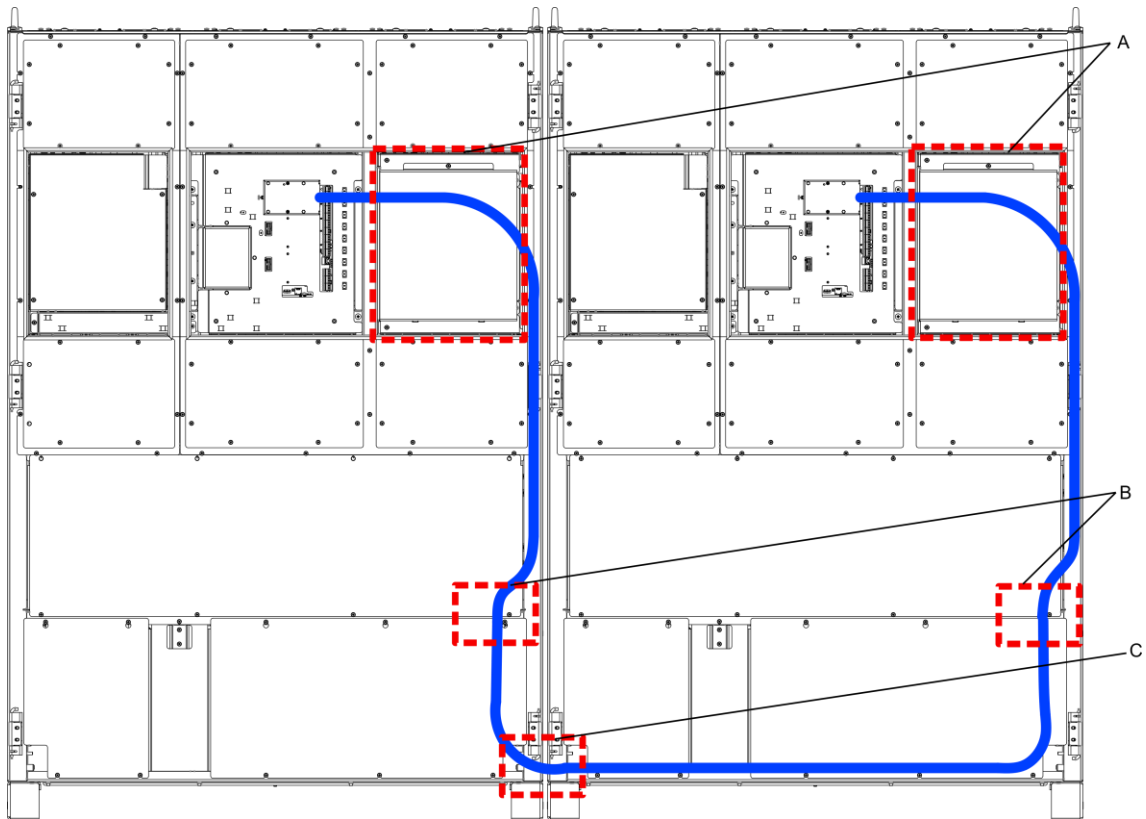


Connection of 4 modules



Wire routing

The image below shows how wiring should be routed for connecting the different modules.



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POINTS OF REFERENCE	DESCRIPTION
A	Fix with flanges the optical fiber wires to the notches located behind the cover. Then, lead the wires through the right pipe.
B	Pass the cables through the plastic bushing.
C	Use the right hole at the bottom to bring the optical fiber wires to the next variable speed drive.

COMMISSIONING

3

An example of the fiber optical board commissioning is described below.

1. Set in G1.9 Master/Slave = "Enable", to activate this functionality.
2. Once parameter G1.9 has been configured, group G25 is activated for configuration.
3. Set in G25.1 if the team role is Master or Slave.
4. Configure the G25.2 Run fiber: Set it to YES if it is desired that the slave takes the run command sent by the Master when it receives it. When configured as NO, the slave will also need a start command (normally simultaneous to the one that comes to the Master to start at the same time; only in small exceptions will not need to start at the same time).
5. Configure the G19.1.1 Type of control based on the chosen control.

Parameters setting

The parameters that are activated once the board is connected are summarized below:

NOTICE

For more details about the Modbus address and value range, see the *SD750 Drive Programming and Software Manual*.

Group 1: Options

Screen	Range	Function	Set on run
G1.9-Master/slave config = Disable	Disable Enable	Allows the activation (G1.9 = Enable) or the deactivation (G1.9 = Disable) of the synchronization between different equipment in the same application. There must necessarily always be a MASTER (there can only be one), and a SLAVE (there can be several). The connection between the equipment by optical fiber is needed. Note: To enable [G25.1-Role], it is necessary to enable this parameter.	NO

Group 25: Master/Slave

This group will appear when parameter [G1.9] is enabled.

Screen	Range	Function	Set on run										
G25.1-Role = Local Slave	Local Master Local Slave Global Master Global Slave	Defines the roll which the drive is going to take in the network.	NO										
		<table border="1"> <thead> <tr> <th>FUNC.</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>Local Master</td> <td>The drive assumes the Master role within the local module (parallel equipment) – a subgroup within the system that supports a motor.</td> </tr> <tr> <td>Local Slave</td> <td>The drive assumes the Slave role within the local module (parallel equipment) – a subgroup within the system that supports a motor.</td> </tr> <tr> <td>Global Master</td> <td>The drive assumes the Master role within the global module (complete system) – Several drives with several motors working in load sharing.</td> </tr> <tr> <td>Global Slave</td> <td>The drive assumes the Slave role within the global module (complete system) – Several drives with several motors working in load sharing.</td> </tr> </tbody> </table>		FUNC.	DESCRIPTION	Local Master	The drive assumes the Master role within the local module (parallel equipment) – a subgroup within the system that supports a motor.	Local Slave	The drive assumes the Slave role within the local module (parallel equipment) – a subgroup within the system that supports a motor.	Global Master	The drive assumes the Master role within the global module (complete system) – Several drives with several motors working in load sharing.	Global Slave	The drive assumes the Slave role within the global module (complete system) – Several drives with several motors working in load sharing.
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Global Slave	The drive assumes the Slave role within the global module (complete system) – Several drives with several motors working in load sharing.												
G25.2-Run fiber = No	No Yes	If the drive is configured in slave mode and fiber optics communication, equipment will be able to start directly with command from the master or not, depending on the setting of this parameter.	YES										
		<table border="1"> <thead> <tr> <th>FUNC.</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>No</td> <td>The slave needs an additional start command to the master's command.</td> </tr> <tr> <td>Yes</td> <td>The slave will start with the master's command.</td> </tr> </tbody> </table>		FUNC.	DESCRIPTION	No	The slave needs an additional start command to the master's command.	Yes	The slave will start with the master's command.				
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No	The slave needs an additional start command to the master's command.												
Yes	The slave will start with the master's command.												
G25.7-Paral. Drives Number = 1 ^[1]	1 to 4	Allows to select the number of drives included in the local parallel network.	YES										
G25.8a-Torque slave ID 1 = Off ^[1]	Off = 0 1 to 50	Sets the torque slave Modbus ID to 1.	YES										
G25.8b-Torque slave run 1 = Start ^[1]	Start Run	Sets the torque slave number 1 in run mode.	YES										
G25.9a-Torque slave ID 2 = Off ^[1]	Off = 0 1 to 50	Sets the torque slave Modbus ID to 2.	YES										
G25.9b-Torque slave run 2 = Start ^[1]	Start Run	Sets the torque slave number 2 in run mode.	YES										
G25.10a-Torque slave ID 3 = Off ^[1]	Off = 0 1 to 50	Sets the torque slave Modbus ID to 3.	YES										
G25.10b-Torque slave run 3 = Start ^[1]	Start Run	Sets the torque slave number 3 in run mode.	YES										
G25.11a-Torque slave ID 4 = Off ^[1]	Off = 0 1 to 50	Sets the torque slave Modbus ID to 4.	YES										
G25.11b-Torque slave run 4 = Start ^[1]	Start Run	Sets the torque slave number 4 in run mode.	YES										
G25.12a-Torque slave ID 5 = Off ^[1]	Off = 0 1 to 50	Sets the torque slave Modbus ID to 5.	YES										
G25.12b-Torque slave run 5 = Start ^[1]	Start Run	Sets the torque slave number 5 in run mode.	YES										
G25.13-Reset fiber = Yes	No Yes	Allows the master to reset the faults which occur in the slaves.	YES										



¹ Available if [G25.1 = Global Master].

List of Modbus addresses

Configuration parameters

The configuration parameters for the Profibus board are summarized below:

Parameter	Screen	Address	Range	Modbus Range	Access [2]
G1.9	Master/slave config = Disable	40021	Disable Enable	0 1	RW
G25.1	Role = Local Slave	41186	Local Master Local Slave Global Master Global Slave	0 1 2 3	RW
G25.2	Run fiber = No	41187	No Yes	0 1	RW
G25.7	Paral. Drives Number = 1	41325	1 to 4	1 to 4	RW
G25.8a	Torque slave ID 1 = Off	40822	Off = 0 1 to 50	0 to 50	RW
G25.8b	Torque slave run 1 = Start	40952	Start Run	0 1	RW
G25.9a	Torque slave ID 2 = Off	40823	Off = 0 1 to 50	0 to 50	RW
G25.9b	Torque slave run 2 = Start	40953	Start Run	0 1	RW
G25.10a	Torque slave ID 3 = Off	40824	Off = 0 1 to 50	0 to 50	RW
G25.10b	Torque slave run 3 = Start	40954	Start Run	0 1	RW
G25.11a	Torque slave ID 4 = Off	40825	Off = 0 1 to 50	0 to 50	RW
G25.11b	Torque slave run 4 = Start	40955	Start Run	0 1	RW
G25.12a	Torque slave ID 5 = Off	40826	Off = 0 1 to 50	0 to 50	RW
G25.12b	Torque slave run 5 = Start	40956	Start Run	0 1	RW
G25.13	Reset fiber = Yes	41326	No Yes	0 1	RW

[2] **Access:** **RW:** Read and write. **RO:** Read only.

Custom Modbus

Custom Modbus directions (G20.2.x) come by default as detailed in the tables below. **For more information on Modbus addresses, see the *Software and Programming Manual* for the SD750 drive.**

Master input (G20.2.1)

Position	Parameter	Modbus Address	Modbus Range
1	Status Comms	43585	Real Value = Modbus Value
2	Motor speed (%)	42003	Real Value = (Modbus Value / 100)
3	Motor current	42007	Real Value = (Modbus Value / 10)
4	Motor power	42010	Real Value = Modbus Value
5	Motor torque	42008	Real Value = (Modbus Value / 100)
6	Motor frequency	42005	Real Value = (Modbus Value / 10)
7	Motor voltage	42006	Real Value = Modbus Value
8	Motor phi cosine	42009	Real Value = (Modbus Value / 100)
9	DC bus voltage	42035	Real Value = Modbus Value
10	Speed reference	42001	Real Value = (Modbus Value / 100)
11	Drive temperature	42039	Real Value = Modbus Value
12	IGBT temperature	42040	Real Value = Modbus Value
13	L1-L2 supply voltage	42031	Real Value = Modbus Value
14	L2-L3 supply voltage	42032	Real Value = Modbus Value
15	AI1 percentage (%)	42062	Real Value = (Modbus Value / 100)
16	AI2 percentage (%)	42065	Real Value = (Modbus Value / 100)

Master output (G20.2.2)

Position	Parameter	Modbus Address	Modbus Range
1	Host Start Control	43586	Real Value = Modbus Value
2	Host Comms Control (Ref)	43570	Real Value = Modbus Value
3	Host Reset Control	43588	Real Value = Modbus Value
4	Host Trip Control	43589	Real Value = Modbus Value
5	Acceleration rate 1	40181	Real Value = (Modbus Value / 100)
6	Deceleration rate 1	40182	Real Value = (Modbus Value / 100)
7	Main start mode	40224	Real Value = Modbus Value
8	Main stop mode	40221	Real Value = Modbus Value
9	Minimum limit speed 1min	40401	Real Value = (Modbus Value / 100)
10	Maximum limit speed 1min	40402	Real Value = (Modbus Value / 100)
11	Speed ref 1 source	40051	Real Value = Modbus Value
12	Torque ref 1 source	40054	Real Value = Modbus Value
13	Main control mode	40071	Real Value = Modbus Value
14	Current limit	40405	Real Value = (Modbus Value / 10000)
15	Torque limit	40409	Real Value = (Modbus Value / 100)
16	Regeneration I limit	40417	Real Value = (Modbus Value / 10000)

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FAULTS AND WARNINGS MAPPING

4

This section displays new faults that will only be available if optical fiber expansion board is connected.

Please refer to the full list of faults and warnings in the SD750 drives *Software and Programming Manual*.

Description of fault list

DISPLAY	DESCRIPTION
F93:Time out optical fiber	Timeout of the optical fiber has been exceeded.
F95:Slave	When working in the Master / Slave system (G1.9 = Enable), the slave reports this fault because the master has failed.
F96:Master	When working in the Master / Slave system (G1.9 = Enable), the Master reports this fault because a slave has failed.

Troubleshooting

DISPLAY	POSSIBLE CAUSE	ACTIONS
F93:Time out optical fiber	The fiber has been broken.	Check the wiring.
	One of the computers in the network has been turned off.	Check the status of the equipment.
	Incorrect connection	-
F95:Slave	One of the slaves has failed.	Check the fault produced in the slave.
F96:Master	The master has failed.	Check the fault produced in the master.



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