

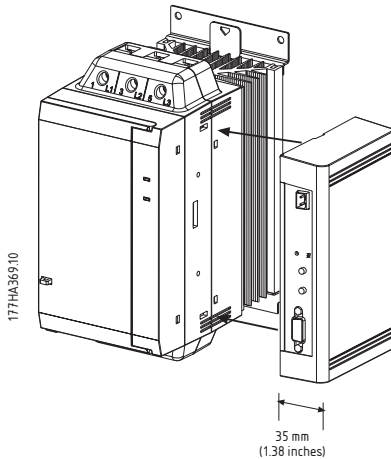
INSTALLATION INSTRUCTIONS MCD PROFIBUS MODULE

Order Code: 175G9001

■ Installation

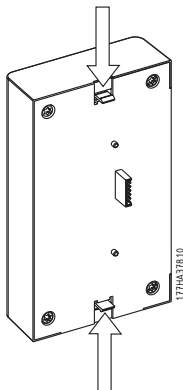
Install the Profibus Module using the following procedure:

1. Remove control power and mains supply from the soft starter.
2. Attach the module to the soft starter as illustrated below.
3. Set the module address to match the address set in the Master configuration tool.
4. Apply control power to the soft starter.
5. Insert the network connector and power up the module.



Remove the Profibus Module using the following procedure:

1. Remove power from the module.
2. Remove control power and mains supply from the soft starter.
3. Push a small flat-bladed screwdriver into the slots at the top and bottom of the module and depress the retaining clips.
4. Pull the module away from the soft starter.



Remove control power and mains supply from the soft starter before attaching or removing accessories. Failure to do so may damage the equipment.

■ Configuration

Import the file "SSPM08A8.gsd" into your Master configuration tool. This file is available on the supplied disk or can be downloaded from the website www.danfoss.com/drives. The GSD file contains three operating modules – see *Data Structures* to select the appropriate module for your application.

If your Master uses on-screen icons, there are two graphic bitmap files available from disk or can be downloaded from the website www.danfoss.com/drives. SSPM_N.bmp indicates normal mode. SSPM_D.bmp indicates diagnostic mode.



N.B.!

The Profibus Module has a slave address range of 0 to 99.

If the Profibus network fails, the module will leave data exchange mode after the network watchdog timeout period has expired. This timeout period is set at the Master configuration tool.

A Communication Timeout parameter in the GSD file sets how long after this event it takes for the soft starter to be forced into a trip state.

The user can adjust the Communication Timeout parameter in the GSD file to any setting between 0 and 100 seconds. The default setting is 10 seconds.



N.B.!

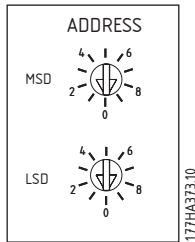
If the Communication Timeout parameter is set to 0, the current state of the soft starter will remain unchanged on a network failure. This gives the user the option of operating the soft starter via local control, but is NOT failsafe.

MCD Profibus Module

■ Adjustment

Before powering up the Profibus Module, set the two rotary switches so that the module address matches the address set in your Master configuration tool (the diagram below shows the factory default setting for the rotary switches).

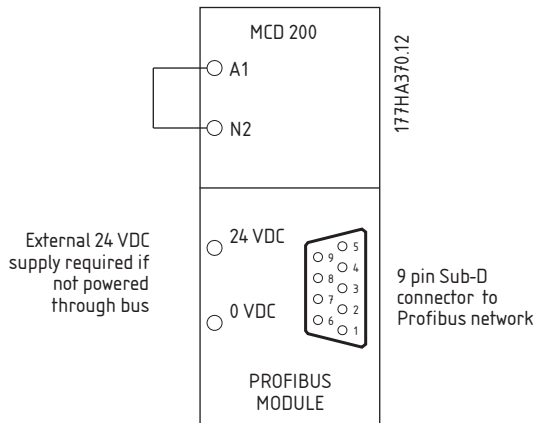
The module automatically detects the data rate.



■ Connection

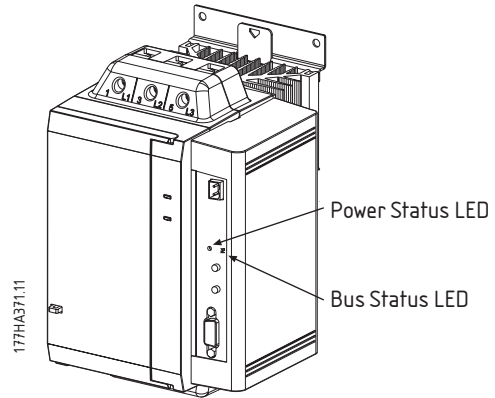
The module connects to the Profibus network via a standard 9 pin Sub-D connector.

The Profibus Module can be powered through the network cable or externally (24 VDC).



9 pin Sub-D connector	
Pin No.	Assignment
1	Shield
2	24 VDC negative (optional)
3	RxD/TxD-P
4	not used
5	DGND
6	VP (end of bus slave only)
7	24 VDC positive (optional)
8	RxD/TxD/-N
9	DGND

■ Power Status and Bus Status LEDs



Power Status LED (Red)	
Off	On
Module not powered up	Module powered up and ready to go online

Bus Status LED (Green)	
Off	On
No connection, offline or data exchange failure	Module online and in data exchange state



N.B.!

If communication fails between the module and the network, the Bus Status LED will go off. When communication is restored, the Bus Status LED will come back on.



N.B.!

When a communications failure occurs, the soft starter will trip if the Communication Timeout parameter for the network is set greater than zero. When communication is restored, the soft starter will require an independent Reset.

■ Data Structures

The GSD file contains two operating modules, supporting data I/O structures as follows:

Data Structure	Basic Module	Extended Module
Soft Starter Control I/O	✓	✓
Soft Starter Monitoring I/O	✗	✓

The Basic Module allows the user to start and stop the soft starter and read limited information on operating status.

The Extended Module defines additional bytes allowing the user to read soft starter operating data such as actual motor current and motor temperature.

■ Soft Starter Control I/O Data Structure

Master > Slave Control Word is structured as follows:

Byte 0	
Bit 7	<i>Reserved</i>
Bit 6	<i>Reserved</i>
Bit 5	<i>Reserved</i>
Bit 4	Quick Stop
Bit 3	<i>Reserved</i>
Bit 2	<i>Reserved</i>
Bit 1	<i>Reserved</i>
Bit 0	<i>Reserved</i>
Byte 1	
Bit 7	<i>Reserved</i>
Bit 6	<i>Reserved</i>
Bit 5	<i>Reserved</i>
Bit 4	<i>Reserved</i>
Bit 3	Reset
Bit 2	<i>Reserved</i>
Bit 1	<i>Reserved</i>
Bit 0	Fwd Run

Quick stop

When Fwd run bit changes from 1 to 0:

0 = stop action will be a soft stop (as selected on the soft starter).

1 = stop action will be a quick stop (i.e. coast to stop).



N.B.!:

The Quick stop bit must be set to 0 before the soft starter can perform a start.

Slave > Master Status Word is structured as follows:

Byte 0	
Bit 7	Ramping
Bit 6	<i>Reserved</i>
Bit 5	Motor Current (%FLC) *
Bit 4	
Bit 3	
Bit 2	
Bit 1	
Bit 0	
Byte 1	
Bit 7	<i>Reserved</i>
Bit 6	<i>Reserved</i>
Bit 5	<i>Reserved</i>
Bit 4	<i>Reserved</i>
Bit 3	<i>Reserved</i>
Bit 2	Fault
Bit 1	On
Bit 0	Ready

* Motor Current (% FLC) represents current as a percentage of the set motor FLC. A maximum value of 63 represents 200% FLC. To render this value as a readable percentage, divide by 0.315. This feature is only available on MCD 202 closed loop soft starters.

Ready is set when the soft starter is ready to start the motor.

On is set when the soft starter is starting, running or soft stopping the motor.

Fault is set when the soft starter has tripped.

Ramping is set when the soft starter is starting or soft stopping the motor.

MCD Profibus Module

■ Soft Starter Monitoring I/O Data Structure

Master > Slave output byte is structured as follows:

Byte 2

Operating data request (Data request numbers 1 to 14)

Slave > Master input bytes, in response to an operating data request, are structured as follows:

Byte 2

Echo data request number

Byte 3

Bits 7 to 1 <i>Reserved</i>	Bit 0 = 1: Invalid data request number
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Byte 4

High byte operating data value read from the soft starter

Byte 5

Low byte operating data value read from the soft starter



N.B.!

An invalid data request number will result in the Invalid data request number bit being set = 1.

Data values are defined as follows:

Data Request Number	Data Value (high byte)	Data Value (low byte)
0	<i>Reserved</i>	<i>Reserved</i>
1	Soft starter product type code: 4 = MCD 200 Series	Soft starter software version number
2	Trip code	Soft starter status
3 *	Average current (high byte)	Average current (low byte)
4 *	<i>Reserved</i>	Motor temperature
5 to 15	<i>Reserved</i>	

* MCD 201 and MCD 203 soft starters will read back average current as "2222" and motor temperature as "111" decimal.

Soft starter status

The low byte data value of data request number 2 reports soft starter status.

Bits 0 to 3 function as follows:

Value (decimal) Bits 0 to 3	Soft Starter Status
0	Unknown (communication error between module and soft starter)
1	Ready to start (waiting)
2	Starting (soft starting)
3	Running (running – full voltage at the motor)
4	Stopping (soft stopping)
5	Not ready (restart or thermal delay)
6	Fault (tripped)

Bits 4 to 7 function as follows:

Bit Number	Function
Bit 4	Set if positive phase rotation detected (Bit 6 must = 1)
Bit 5	Set if average current exceeds FLC setting
Bit 6	Set after first start once phase rotation has been confirmed
Bit 7	Set if a communication failure occurs between module and soft starter

Trip Codes

Data request number 2 high byte indicates the soft starter trip or warning code. Details are as follows:

Trip Code	Trip Type	MCD 201	MCD 202	MCD 203
1	Excess start time		■	
2	Motor overload		■	
3	Motor thermistor		■	
4	Phase imbalance		■	
5	Supply frequency	■	■	■
6	Phase rotation		■	
8	Power circuit	■	■	■
15	Starter communication failure (between module and soft starter)	■	■	■
16	Network communication failure (between module and network)	■	■	■
33	Bypass overload		■	
255	No trip	■	■	■

■ **Profibus Diagnostic Telegram and Flag**

The Profibus Module supports external diagnostics. The following telegram will be sent to the Master if the soft starter trips:

Diagnostic Telegram Data Structure	
Byte 0	User diagnostic length (always = 3)
Byte 1	Trip code
Byte 2	Reserved

See the table above for trip codes.

■ **Profibus Freeze Mode**

The Profibus Module supports Freeze Mode.

In Freeze Mode, inputs are only updated with new data from the soft starter when another Freeze action is carried out. An Un-Freeze action returns the Profibus Module to normal operation.

■ **Profibus Sync Mode**

The Profibus Module supports Sync Mode.

In Sync Mode, commands to the soft starter are not processed until an Un-Sync action is carried out at the Master.

■ **Profibus Clear Mode**

If the Master sends a global Clear command, the Profibus Module will send a Quick Stop command to the soft starter.

MCD Profibus Module

■ Specifications
Enclosure

Dimensions 35 mm (W) x 157 mm (H) x 90 mm (D)
 Weight 250 g
 Protection IP20

Mounting

Spring-action plastic mounting clips (x 2)

Connections

Soft starter 6-way pin assembly
 Contacts Gold flash
 Network DB9 female
 External power supply 2-way removable screw type²
 Maximum cable size 2.5 mm²

Settings

Network address
 Setting MSD and LSD rotary switches
 Range 0 to 99
 Data rate
 Setting Auto-detect
 Range 9.6 kb/s ~ 12.0 Mb/s

Power

Consumption (steady state, maximum) 35 mA at 24 VDC
 Reverse polarity protected
 Galvanically isolated

Certification

C✓ IEC 60947-4-2
 CE IEC 60947-4-2
 Profibus International

