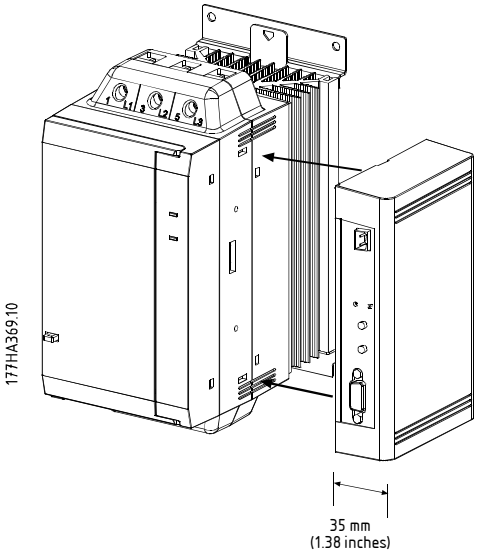
OPERATING INSTRUCTIONS
MCD 200 PROFIBUS Module

Order Code: 175G9001

Installation



Control power and mains supply must be removed from the MCD 200 before attachment or removal of an accessory module. Failure to do so may result in equipment damage.

Configuration

Import the “SSPM08A8.GSD” file from disk or on the internet at www.danfoss.com/drives into your Master configuration tool. Select the Basic module if you require strict adherence to the Low Voltage Switchgear (LVSG) Motor Starter format 1 profile, or the Extended module if you require access to the full range of MCD 200 operating parameters.

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

ATTENTION
The PROFIBUS module has a slave address range of 0 – 99.

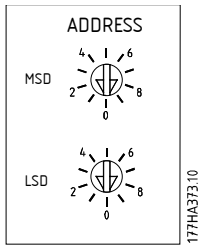
If the PROFIBUS network fails, the module will leave data exchange mode after the network watchdog time out period has expired. The Master configuration tool sets this time out period. A Comms Timeout parameter in the GSD file sets how long after this event it takes for the MCD 200 to be forced into a trip state (ie, Ready LED flashing x 8).

The user can adjust the Comms Timeout parameter in the GSD file from 0 to 100 seconds. Default setting is 10 seconds.

ATTENTION
If the Comms Timeout parameter is set to 0, the current state of the starter will remain unchanged on a network failure. This gives the user the option of operating the MCD 200 via local control, but is NOT failsafe.

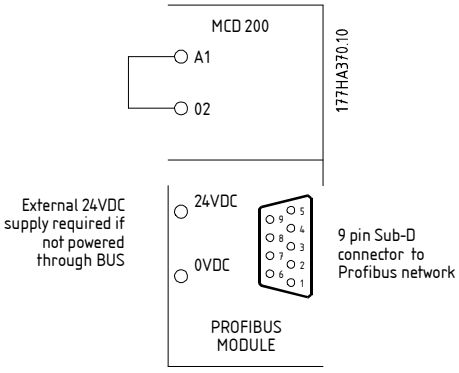
Adjustment

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. Diagram (below) shows factory default setting for rotary switches.



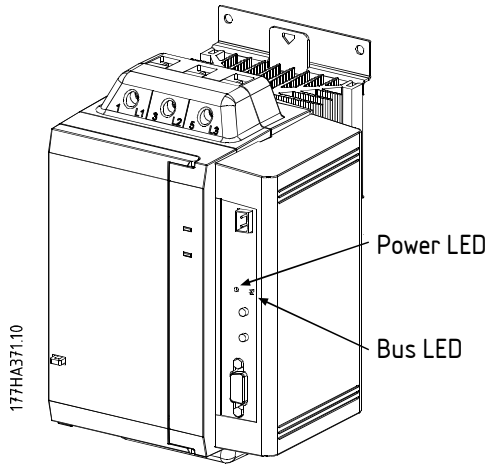
The module has data rate auto-detection so no adjustment is required for this.

Connection



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

■ Power Status (Red) and Bus Status (Green) LEDs



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

Bus Status LED (Green)	
Off	On
No connection, Off-line or data exchange failure	Module on-line and in data exchange state

ATTENTION
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.

When a communications failure occurs, the MCD 200 may trip if the Comms Timeout parameter (refer to Configuration) is set greater than zero. When communication is restored, the MCD 200 will require an independent reset.

■ PROFIBUS

Diagnostic

The PROFIBUS module uses the data structure defined in the Low Voltage Switchgear (LVSG) Motor Starter format 1 profile. Additional bytes have been defined which allow the user to access MCD 200 operating parameters such as actual motor current and motor temperature.

The PROFIBUS module is defined in the GSD file as a Modular Slave. The MCD 200 is supported by a choice of two Modules in the GSD file.

The Basic Module allows the MCD 200 to be configured in a network with strict adherence to the Low Voltage Switchgear (LVSG) Motor Starter format 1 profile. This Module provides Start/Stop, Quick Stop and Reset control, as well as starter status and % FLC current feedback.

The Extended Module provides the same access as the Basic Module, with the addition of extensions allowing extra operating parameter requests.

The Extended Module has two I/O areas.

- The first I/O area supports the bytes defined in the Low Voltage Switchgear (LVSG) Motor Starter format 1 profile.
- The second I/O area is an extension providing read only access to extra operating parameters.

Low Voltage Switchgear (LVSG)

Motor Starter Format 1 Profile

Data Structure

Master > Slave Control Word is structured as follows. Reserved bits may be defined in the profile but are not relevant to the MCD 200 series.

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

ATTENTION
Quick Stop is a manufacturer defined bit and functions as follows, when Fwd Run bit changes from 1 to 0 ;
Byte 2, Bit 4 = 0 = stop action will be a Soft Stop if set on the MCD 200.
Byte 2, Bit 4 = 1 = stop action will be a Quick Stop (ie, Coast to Stop).

Slave > Master Status Word is structured as follows. Reserved bits may be defined in the profile but are not relevant to the MCD 200 series.

Byte 1	
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Reserved
Bit 4	Reserved
Bit 3	Reserved
Bit 2	Fault
Bit 1	On
Bit 0	Ready

Byte 2	
Bit 7	Ramping
Bit 6	Reserved
Bit 5	Motor Current (% FLC) [See Attention 1]
Bit 4	
Bit 3	
Bit 2	
Bit 1	
Bit 0	

ATTENTION
Ready is set when the MCD 200 is ready to start the motor.
On is set when the MCD 200 is starting, running or soft stopping the motor.
Fault is set when the MCD 200 has tripped.
Ramping is set when the MCD 200 is starting or soft stopping the motor.

ATTENTION: 1
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 not available on any MCD 201 open loop soft starter or any MCD 202 closed loop soft starter with serial number format xxxx03-xxx or less.

Low Voltage Switchgear (LVSG)

Motor Starter Format 1 Profile with Extended Data Structure

Master > Slave output byte is structured as follows;

Byte 3
Operating Parameter request (Parameter number 1 – 4)

Slave > Master input bytes, in response to an Operating Parameter request, are structured as follows;

Byte 3	
Bits 7 to 1 Reserved	Bit 0 = 1 = Invalid Parameter Number
Byte 4	
Echo Parameter Number	
Byte 5	
High Byte Operating Parameter value read from MCD 200	
Byte 6	
Low Byte Operating Parameter value read from MCD 200	

ATTENTION
An invalid Operating Parameter Number will result in the Invalid Parameter Number Byte 3, Bit 0 being set to = 1.

Parameter Numbers are defined as follows;

Parameter number	Parameter value (high byte)	Parameter value (low byte)
0	Reserved	Reserved
1	Soft Starter product type code (= 4) Bits 7 – 3 only	MCD 200 software version number
2	Trip number	MCD 200 state
3 (1)	Average current (high byte)	Average current (low byte)
4 (1)	Reserved	Motor temperature
5 to 15	Reserved	Reserved

ATTENTION: 1
All MCD 201 open loop soft starter models will read back average current as '2222' decimal and motor temperature as '111' decimal.

MCD 200 Parameter Number 2 Low Byte is structured so that Bits 0 – 3 indicate MCD 200 status and Bits 4 – 7 function as follows;

Value (decimal) Bits 0 to 3	MCD 200 Status
0	Unknown (communication error between module and MCD 200)
1	Ready to start (waiting)
2	Starting (MCD 200 soft starting)
3	Running (MCD 200 running and bypass contactors closed)
4	Stopping (MCD 200 soft stopping)
5	Not Ready (Restart delay)
6	Fault (MCD 200 tripped)
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 validated
Bit 7	Set if comms failure occurs between module and MCD 200

MCD 200 Parameter Number 2 High Byte indicates the MCD 200 trip number. Details are as follows;

Trip number (decimal)	MCD 200 trip state
1	Excess Start Time (1)
2	Motor Overload (1)
3	Motor Thermistor (1)
4	Phase Imbalance (1)
5	Supply Frequency
6	Phase Rotation (1)
8	Power Circuit
15	Communication failure between module and MCD 200
16	Communication failure on PROFIBUS network
255	No trip

ATTENTION: 1
These trip states only apply to the MCD 202 closed loop soft starter models.

PROFIBUS

Diagnostic

The PROFIBUS module supports external diagnostics. If the MCD 200 trips, the trip number will be automatically returned in a Diagnostic Telegram consisting of the following 3 bytes.

Diagnostic Telegram Data Structure	
Byte 1	= User diagnostic length (always set = 3)
Byte 2	= MCD 200 trip number
Byte 3	= Reserved

MCD 200 trip numbers are detailed in the following table (ie, Byte 2 of the diagnostic telegram)

Trip number (decimal)	MCD 200 trip state
1	Excess Start Time (1)
2	Motor Overload (1)
3	Motor Thermistor (1)
4	Phase Imbalance (1)
5	Supply Frequency
6	Phase Rotation (1)
8	Power Circuit
15	Communication failure between module and MCD 200
16	Communication failure on PROFIBUS network
255	No trip

ATTENTION: 1
These trip states only apply to the MCD 202 closed loop soft starter models.

■ PROFIBUS

Freeze mode

The Profibus module supports Freeze Mode.

In Freeze Mode, the input buffers are not updated with new data from the MCD 200 until a Un-Freeze command is received from the Master.

■ PROFIBUS

Synch mode

The Profibus module supports Sync Mode.

In Sync Mode, commands to the MCD 200 are not processed with new data from the Master until the module receives a Un-Sync command.

■ PROFIBUS

Clear mode

If the Master sends a global Clear command, the Profibus module will send a Quick Stop command to the MCD 200 soft starter. The Profibus module will inhibit any start commands until the Master exits Clear Mode.

ATTENTION

When Clear mode is entered, the MCD 200 will Quick Stop the motor. If the Fwd Run bit is set (ie, Fwd Run bit = 1) before leaving Clear mode, the motor will restart. If the Fwd Run bit is cleared (ie, Fwd Run bit = 0) before leaving Clear mode, the motor will not start.