Littelfuse
STARTCO

3714 Kinnear Place Saskatoon, SK Canada S7P 0A6 Ph: (306) 373-5505 Fx: (306) 374-2245 www.littelfuse.com/protectionrelays

MPS PROFIBUS-DP INTERFACE

PRELIMINARY

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DISCLAIMER

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1. GENERAL

The Profibus-DP slave interface on the MPS-CTU is used to access meter data and provide starter control commands and reset functions. In order to stay within the 244-byte input and 244-byte output limitations of Profibus, only a select group of metering data is provided. Set-point access and Extended User Parameters are not implemented on the Profibus interface.

2. INTERFACE CONNECTOR

A D-SUB connector is used for the Profibus network.

PIN	FUNCTION
1	NC
2	NC
3	B-Line, RS-485
4	RTS
5	GND
6	+5
7	NC
8	A-Line, RS-485
9	NC

A network termination is required on both ends of the network as per the RS-484 specification. A 120- or 150-ohm resistor is used. Additional signals are provided on the D-SUB, however, in normal applications, only the A-line, B-line, and cable shield are used.

2.1 NETWORK SETTINGS

Automatic baud rate detection from 9.6 kilobits to 12 Megabits per second is provided. The MPS baud rate set point is not used.

The slave address is selected using the OPI *Setup* | *Hardware* | *Network Comms* menu. The address range is 1 to 125 and the default address is 125.

2.2 COMMUNICATION STATUS DISPLAY

The Profibus communication status can be viewed using the *Metering* | *Comm State* menu. This menu will indicate ON-LINE/OFF-LINE or an error code if there is an interface-module error. If the MPS indicates ON-LINE but the module LED is RED, verify that the slave address is correct. Module errors require the module to be reinitialized. The module is initialized on power up or can be initialized using the OPI. To initialize the module using the OPI, select *None* in the *Setup* | *Hardware* | *Network Type* menu, then select AnyBus. If the error persists, contact the factory.

The MPS can be configured to trip on network errors using the *Setup* | *Network Comms* | *Network Error* menu. If a module error occurs or if the module is OFF-LINE, the MPS will trip.

2.2.1 LED INDICATION

Module LED's can be viewed through access holes on the side of the MPS-CTU. Red indicates that the module is disabled, has an incorrect address, or not connected. Green indicates that the module is ON-LINE with a valid slave address and data exchange is possible.

2.3 GSD FILE

A configuration tool uses mps.gsd to configure the interface module on the MPS. The input and output area sizes defined by the MPS meter data and control commands must be setup within the configuration phase. The configuration tool must be set up with module byte sizes such that the total INPUT size is 228 bytes (meter data from the MPS into the network) and the total OUTPUT size is 4 bytes (commands out of the network to the MPS).

For the INPUT data, select METER module sizes of 128, 64, 32, and 4 for a total of 228 bytes. For the OUTPUT data, select the 4-byte COMMANDS modules.

2.4 METER DATA (INPUT)

The meter data consists of 228 bytes as defined by the Meter Data Table. Byte order is in MOTOROLA format where the high byte is followed by the low byte. Meter data starts at address offset 0.

METER DATA TABLE

BYTE (High to Low)	DESCRIPTION	MPS TYPE
0, 1	Trip and Alarm Status	T30
2, 3	Motor Status	T28
4, 5	Starter Status	T29
6, 7	Digital Inputs	T35
8, 9	Relay Outputs	T36
10, 11	Message 0	T27
12, 13	Message 1	T27
14, 15	Message 2	T27
16, 17	Message 3	T27
18, 19	Message 4	T27
20, 21, 22, 23	Phase A Current (A)	T1
24, 25, 26, 27	Phase B Current (A)	T1
28, 29, 30, 31	Phase C Current (A)	T1
32, 33, 34, 35	Ground-Fault Current (A)	T1
36, 37, 38, 39	Vab (V)	T1
40, 41, 42, 43	Vbc (V)	T1
44, 45, 46, 47	Vca (V)	T1
48, 49, 50, 51	Apparent Power (S) (kVA)	T1
52, 53, 54, 55	Reactive Power (Q) (kVAR)	T1
56, 57, 58, 59	Real Power (P) (kW)	T1
60, 61, 62, 63	Power Factor (±1)	T1
64, 65, 66, 67	Used Thermal Capacity (%)	T1
68, 69, 70, 71	Analog Input (mA)	T1
72, 73, 74, 75	Thermal Trend (%)	T1
76, 77, 78, 79	Positive Sequence Current (pu)	T1
80, 81, 82, 83	Negative Sequence Current (pu)	T1
84, 85, 86, 87	Unbalance Current (pu)	T1
88, 89, 90, 91	Positive Sequence Voltage (pu)	T1
92, 93, 94, 95	Negative Sequence Voltage (pu)	T1
96, 97, 98, 99	Unbalance Voltage (pu)	T1
100, 101, 102, 103	Motor Speed From Tach (RPM)	T1
104, 105, 106, 107	Running Time (Seconds)	T2
108 to 115	kW Seconds	T4
116 to 123	kVA Seconds	T4
124 to 131	kVAR Seconds	T4
132, 133, 134, 135	Module 1 #1 Temperature (°C)	T1
136, 137, 138, 139	Module 1 #2 Temperature (°C)	T1
140, 141, 142, 143	Module 1 #3 Temperature (°C)	T1
144, 145, 146, 147	Module 1 #4 Temperature (°C)	T1
148, 149, 150, 151	Module 1 #5 Temperature (°C)	T1
152, 153, 154, 155	Module 1 #6 Temperature (°C)	T1
156, 157, 158, 159	Module 1 #7 Temperature (°C)	T1
160, 161, 162, 163	Module 1 #8 Temperature (°C)	T1
164, 165, 166, 167	Module 2 #1 Temperature (°C)	T1
168, 169, 170, 171	Module 2 #2 Temperature (°C)	T1
172, 173, 174, 175	Module 2 #3 Temperature (°C)	T1
176, 177, 178, 179	Module 2 #4 Temperature (°C)	T1
180, 181, 182, 183	Module 2 #5 Temperature (°C)	T1
184, 185, 186, 187	Module 2 #6 Temperature (°C)	T1
188, 189, 190, 191	Module 2 #7 Temperature (°C)	T1
192, 193, 194, 195	Module 2 #8 Temperature (°C)	T1
196, 197, 198, 199	Module 3 #1 Temperature (°C)	T1
200, 201, 202, 203	Module 3 #2 Temperature (°C)	T1
204, 205, 206, 207	Module 3 #3 Temperature (°C)	T1
208, 209, 210, 211	Module 3 #4 Temperature (°C)	T1
212, 213, 214, 215	Module 3 #5 Temperature (°C)	T1
216, 217, 218, 219	Module 3 #6 Temperature (°C)	T1
220, 221, 222, 223	Module 3 #7 Temperature (°C)	T1
224, 225, 226, 227	Module 3 #8 Temperature (°C)	T1

2.5 STARTER CONTROL AND RESET (OUTPUT)

Control commands are issued to the MPS using a 2-word command sequence. The first word is the Command Request Header. The second word is the MPS Command. The Command Request Header (word 1) must be zero except when the MPS Command action is to be taken. The Command Request Header must transition from 0 to 3 for the command sequence to be accepted. Once a valid command has been sent, the Command Request Header should be set to zero.

Byte order is in MOTOROLA format where the high byte is followed by the low byte.

MPS COMMAND TABLE

COMMAND CODE	ACTION
0x0000	STOP
0x0001	START1
0x0002	START2
0x0003	Reset Trips
0x0004	Set Real-Time Clock
0x0005	Clear Data-Logging Records
0x0006	Clear Trip Counters
0x0007	Clear Energy Totals
0x0008	Clear Running Hours
0x0009	Emergency I^2t and Trip Reset
0x000A	Select Local Control
0x000B	De-select Local Control
0x000C	Re-enable Temperature Protection

MPS REQUEST MESSAGE

BYTE NUMBER	DESCRIPTION
0	Command Request Header (High)
1	Command Request Header (Low)
2	MPS Command (High)
3	MPS Command (Low)