

| | | | | |
|-------------------------|------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | Telephone-Telefon-nr | | |
| Sven-Erik Karlsson | | 187050 | | |

**MFB-Modulbus converter PE1354B
Connect ACS600/DCS600 with MasterFieldbus**

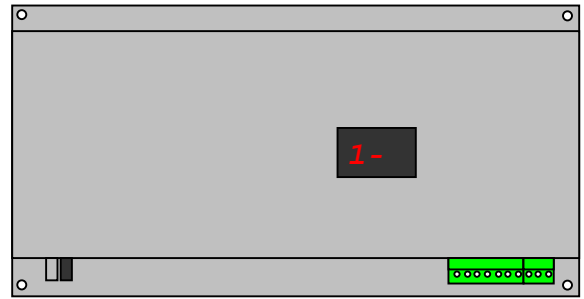
1. GENERAL

The **PE1354B** is a converter connected to ABB MasterFieldbus short distance bus (RS485) on one side and on **ABB DDCS** bus with optofibre communication on the other side. The converter is operating at High or Low communication speed on the MFB and 4 MBaud to DDCS units. DDCS units can be e.g. ACS600, DCS600. PE1354B operate as 1 to 16 Slaves on MFB and as Master on DDCS bus.
The PE1354B contains a 2-character display for status indication.

2. TECHNICAL DESCRIPTION

2.1 Dimension and mounting

To obtain the best immunity to electric noise the PE1354B must be electrically connected to cubicle through 4 M5 screws in each corner (M5 Screw pos 220mm x135mm).
Dimensions
Size: 240mm x 145mm (w x h)
Required mounting deep: 35mm



2.2 Technical data

Auxiliary Power
+24V DC (12-30V DC), typical 120mA(3W), at startup 1A 10ms, Max fuse: 4A

Communication MasterFieldbus

RS-485
Transmission speeds 375kbit/s or 2mbit/S selected with DIP switch
Max cable length :short dist. <=25m
Cable type FLFR 3x2x0.34
Occupies 1-16 nodes on MasterFieldBus, PE1354B can operate together with other MasterFieldbus units.
Connected systems can be AC450, AC410 or MP280 with MasterFieldbus.

Communication on ABB DDCS bus

PE1354B can be connected with 1.0mm plastic fiber POF or 200µm Hard Clad Silica HCS fiber.
Connected units can be e.g. ACS600, DCS600.
Enclosure class
IP00

Environmental data

Operation +5..+40 degrees C., Storage -40..+70 degrees C.

| | | | | |
|-------------------------|------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | Telephone-Telefon-nr | | 2 |
| Sven-Erik Karlsson | | 187050 | | |

| |
|---|
| MFB-Modulbus converter PE1354B Connect ACS600/DCS600 with MasterFieldbus |
|---|

2.3 Strapping

| DIPSW | POSITION | DEFAULT | FUNCTION |
|-------|-----------------------|---------|--|
| S1:1 | On=1 | ON | MFB bus number 0-7 |
| S1:2 | On=2 | OFF | MFB bus number 0-7 |
| S1:3 | On=4 | OFF | MFB bus number 0-7 |
| S1:4 | On=1 | OFF | DDCS Cluster number 0-7 (if NMFA MFB addr 0-15) |
| S1:5 | On=2 | OFF | DDCS Cluster number 0-7 (if NMFA MFB addr 0-15) |
| S1:6 | On=4 | OFF | DDCS Cluster number 0-7 (if NMFA MFB addr 0-15) |
| S1:7 | On=8 | OFF | (if NMFA MFB addr 0-15) |
| S1:8 | OFF=High | OFF | MFB low /high speed,Low=375 kbaud, High=2,0 MBaud |
| S1:9 | OFF=1 ON=10 | OFF | First Dataset number. Set OFF if Data set number on DDCS bus start from 1, Set ON if Dataset number start from 10. |
| S1:10 | OFF=Alt.1 ON=Alt.2 | OFF | Selection of Mapping table 1 or 2. Set on if PE1354B is used as an MasterFieldbus adapter Module NMFA-01 |
| S1:11 | | OFF | Max number of datasets transfered ON=4, OFF=8 |
| S1:12 | | OFF | DDCS Transmitter intensity OFF=Normal ON=High |

S1:1-3

This strapping must be set to MFB bus number 1-7. If bus number is wrong then PE1354B will not communicate on MasterFieldbus.

S1:4-7 if S1:10 is OFF

If S1:10 is OFF (NMFA mode is not selected) then PE1354B will loop trough 16 DDCS node addresses trying to get connection. First node addr to connect is CLUSTERNUMBER*16 +1, and last node addr is CLUSTERNUMBER*16 +16.

If CLUSTERNUMBER is set to 0 then PE1354B will try to connect DDCS node addr 1-16.

S1:4-7 if S1:10 is ON

If S1:10 is set to ON PE1354B will act almost like an NMFA-01.

Number of transfered datasets is limited to 4 regardless of S1.11 setting.

Set S1:4-7 to the MFB addr 0-15 to be connected to DDCS addr 1.

PE1354B will try to connect node addr 1 on the DDCS bus. In this mode PE1354B will only connect to DDCS addr 1 and the selected MFB addr.

S1:10

S1:10 select Normal mode or NMFA-01 mode. NMFA-01 mode has an own mapping table.

| | | | | |
|---|------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | Telephone-Telefon-nr | | 3 |
| Sven-Erik Karlsson | | 187050 | | |
| MFB-Modulbus converter PE1354B Connect ACS600/DCS600 with MasterFieldbus | | | | |

TERMINATION of MFB bus

MasterFieldBus has 9 strapping in 3 groups for termination of the signal lines RTS, CLOCK, DATA.

Two alternatives are possible.

1. PE1354B is the last unit connected on MasterFieldBus. Then the middle strapping in all 3 groups is inserted.
2. If MasterFieldBus continue to more units after PE1354B then no strapping is inserted for termination.

| STRAPPING | FUNCTION |
|-----------|--|
| B2:1 | RTS-N Not used on PE1354B (Only for active termination) |
| B2:2 | RST Inserted if PE1354B is last unit on MasterFieldBus |
| B2:3 | RTS Not used on PE1354B (Only for active termination) |
| B3:1 | CLK -N Not used on PE1354B (Only for active termination) |
| B3:2 | CLK Inserted if PE1354B is last unit on MasterFieldBus |
| B3:3 | CLK Not used on PE1354B (Only for active termination) |
| B4:1 | DATA-N Not used on PE1354B (Only for active termination) |
| B4:2 | DATA Inserted if PE1354B is last unit on MasterFieldBus |
| B4:3 | DATA Not used on PE1354B (Only for active termination) |

2.4 Status display 2 digits

First digit shows actual MasterFieldBus node addr 0-F.

| SECOND DIGIT | STATUS |
|--------------|---|
| 0 | No contact on Modulebus protocol |
| 1 | Contact on modulebus DDCS but no contact on MFB |
| - | Communication is OK |

2.5 Connections

| TERMINAL | FUNCTION |
|-------------|------------------------------|
| P1 | R-N MasterFieldbus RS485 |
| P2 | R MasterFieldbus RS485 |
| P3 | CLOCK-N MasterFieldbus RS485 |
| P4 | CLOCK MasterFieldbus RS485 |
| P5 | DATA-N MasterFieldbus RS485 |
| P6 | DATA MasterFieldbus RS485 |
| P7 | Cable screen |
| P11 | Chassi |
| P12 | +24V |
| P13 | 0V |
| P14 | CABLE SCREEN |
| 9 pole Dsub | Service aid |
| 2 | Txd RS232 |
| 3 | Rxd RS232 |
| 5 | 0V |
| OPT1 | RxD Modulebus DDCS |
| OPT2 | TxD Modulebus DDCS |

| | | | | |
|---------|-------------------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | | 2002-05-16 | | |
| | Dealt with by-Utfärdare | Telephone-Telefon-nr | | 4 |
| | Sven-Erik Karlsson | 187050 | | |

**MFB-Modulbus converter PE1354B
Connect ACS600/DCS600 with MasterFieldbus**

2.6 Mapping of nodes MasterFieldbus to DDCS bus

| MasterFieldbus | DDCS bus |
|-----------------------|------------------------|
| Bus+Node addr | Node addr |
| Bus no DIP S1.1-3 | CLUSTER on DIP S1.4- 6 |
| 0 + BUS*100 | 1 + CLUSTER*16 |
| 1 + BUS*100 | 2 + CLUSTER*16 |
| 2 + BUS*100 | 3 + CLUSTER*16 |
| 3 + BUS*100 | 4 + CLUSTER*16 |
| 4 + BUS*100 | 5 + CLUSTER*16 |
| 5 + BUS*100 | 6 + CLUSTER*16 |
| 6 + BUS*100 | 7 + CLUSTER*16 |
| 7 + BUS*100 | 8 + CLUSTER*16 |
| 8 + BUS*100 | 9 + CLUSTER*16 |
| 9 + BUS*100 | 10 + CLUSTER*16 |
| 10 + BUS*100 | 11 + CLUSTER*16 |
| 11 + BUS*100 | 12 + CLUSTER*16 |
| 12 + BUS*100 | 13 + CLUSTER*16 |
| 13 + BUS*100 | 14 + CLUSTER*16 |
| 14 + BUS*100 | 15 + CLUSTER*16 |
| 15 + BUS*100 | 16 + CLUSTER*16 |

| | | | | |
|---|------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | Telephone-Telefon-nr | | 5 |
| Sven-Erik Karlsson | | 187050 | | |
| MFB-Modulbus converter PE1354B Connect ACS600/DCS600 with MasterFieldbus | | | | |

2.7 Mapping of Signals from MP280 to DDCS bus

| Name COM-CVO1 | Mapping Alt. 1 S1.10=OFF | | Mapping Alt. 2 (NMFA) S1.10=ON | |
|---------------|-----------------------------|-----------------------------|--------------------------------|-----------------------------|
| | First dataset=1 S1.9=OFF | First dataset=10 S1.9=ON | First dataset=1 S1.9=OFF | First dataset=10 S1.9=ON |
| PBOARD1 | DS1.1 | DS10.1 | DS1.1 | DS10.1 |
| PBOARD2 | DS11.1 | DS20.1 | Unused | Unused |
| I4ORD1 | DS11.2-3 | DS20.2-3 | Unused | Unused |
| RORD1 | DS1.2 | DS10.2 | DS1.2 | DS10.2 |
| RORD2 | DS1.3 | DS10.3 | DS3.1 | DS12.1 |
| RORD3 | DS3.1 | DS12.1 | DS5.1 | DS14.1 |
| RORD4 | DS3.2 | DS12.2 | DS1.3 | DS10.3 |
| RORD5 | DS3.3 | DS12.3 | DS5.2 | DS14.2 |
| RORD6 | DS5.1 | DS14.1 | DS3.2 | DS12.2 |
| RORD7 | DS5.2 | DS14.2 | DS3.3 | DS12.3 |
| RORD8 | DS5.3 | DS14.3 | DS5.3 | DS14.3 |
| RORD9 | DS7.1 | DS16.1 | Unused | Unused |
| RORD10 | DS7.2 | DS16.2 | Unused | Unused |
| RORD11 | DS7.3 | DS16.3 | Unused | Unused |
| RORD12 | DS9.1 | DS18.1 | Unused | Unused |
| RORD13 | DS9.2 | DS18.2 | Unused | Unused |
| RORD14 | DS9.3 | DS18.3 | Unused | Unused |
| I4ORD2 | DS13.1 -2 | DS22.1 -2 | Unused | Unused |

2.8 Mapping of Signals from DDCS bus to MP280

| Name COM-CVI1 | Mapping Alt. 1 S1.10=OFF | | Mapping Alt. 2 (NMFA) S1.10=ON | |
|---------------|-----------------------------|-----------------------------|--------------------------------|-----------------------------|
| | First dataset=1 S1.9=OFF | First dataset=10 S1.9=ON | First dataset=1 S1.9=OFF | First dataset=10 S1.9=ON |
| RIND1 | DS2.2 | DS11.2 | DS2.2 | DS11.2 |
| RIND2 | DS2.3 | DS11.3 | DS2.3 | DS11.3 |
| RIND3 | DS4.1 | DS13.1 | DS4.1 | DS13.1 |
| RIND4 | DS4.2 | DS13.2 | DS4.2 | DS13.2 |
| RIND5 | DS4.3 | DS13.3 | DS4.3 | DS13.3 |
| RIND6 | DS6.1 | DS15.1 | DS8.1 | DS17.1 |
| RIND7 | DS6.2 | DS15.2 | DS8.2 | DS17.2 |
| RIND8 | DS6.3 | DS15.3 | DS8.3 | DS17.3 |
| RIND9 | DS8.1 | DS17.1 | Unused | Unused |
| I4IND1 | DS12.1-2 | DS21.1-2 | Unused | Unused |
| PBIND2 | DS2.1 | DS11.1 | Unused | Unused |
| PBIND3 | DS8.3 | DS17.3 | DS6.1 | DS15.1 |
| PBIND4 | DS10.1 | DS19.1 | DS6.2 | DS15.2 |
| PBIND5 | DS10.2 | DS19.2 | DS6.3 | DS15.3 |
| PBIND1 | DS8.2 | DS17.2 | DS2.1 | DS11.1 |

| | | | | |
|---|------------|------------|----------------------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | | Telephone-Telefon-nr | 6 |
| Sven-Erik Karlsson | | | 187050 | |
| MFB-Modulbus converter PE1354B Connect ACS600/DCS600 with MasterFieldbus | | | | |

2.9 Function

Normal mode S1:10=OFF

First will PE1354B try to connect the units on the DDCS bus.
 Before PE1354B will answer on MasterFieldbus the corresponding node on DDCS bus must have connection.
 DDCS Addr 1-16 will be connected to MasterFieldBus node 0-15.
 Parameter 70.1 (or 98.4) CH0 Node addr is set to: 1-16 + cluster number *16.
 Parameter 98.2 Com module is set to "ADVANT"

NMFA-01 Emulation mode S1:10=ON

First will PE1354B try to connect node addr 1 on the DDCS bus.
 When connection is ok on DDCS side PE1354B will answer on MasterFieldbus address strapped on DIP S1:4-7. In this mode PE1354B will only connect one MFB node with DDCS node number 1.
 Parameter 70.1 (or 98.4) CH0 Node addr is set to 1.
 Parameter 98.2 Com module is set to FieldBus
 Group 51 parameters are not used because DIPswitches on PE1354B set MFB addr and speed.
 Parameter 51.1 will now show "Not defined". This is Ok.

Data sets

DDCS communication will Write and Read total of 8 datasets.
 Dataset 1 and 3 is transferred every communication cycle.
 The next 6 Data Sets are transferred every third cycle.
 First cycle: DS1,3,5,7
 Second cycle: DS1,3,9,11
 Third cycle: DS1,3,13,15
 One cycle takes approx 1,0ms + 1,5ms x number of nodes.

One MasterFieldbus cycle takes approx 17ms when 16 nodes are connected.

PE1354B is continually trying to connect the unconnected DDCS nodes. To reduce the time for testing connection of nodes only one unconnected node is tested for every whole communication cycle. Next cycle then the next unconnected node is tested for communication.

Error handling

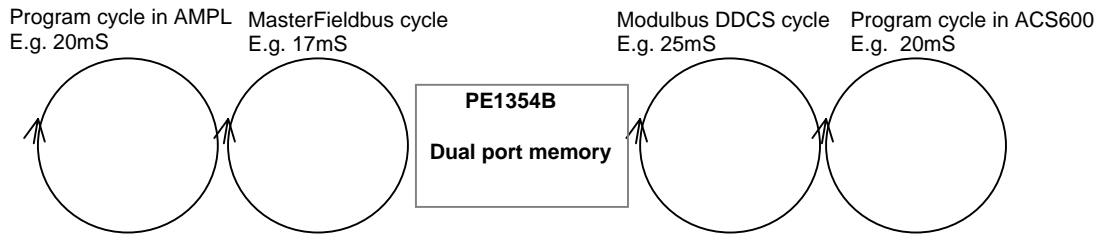
When DDCS communication for one node failure then the MFB communication for corresponding node are stopped. The PE1354B display will indicate 0 for the actual node.

When MFB communication for one node failure then DDCS communication for corresponding node are stopped. The PE1354B display will indicate 0 for the actual node.

| | | | | |
|--|------------|----------------------|------|------------|
| To-Till | From-Från | Date-Datum | Reg. | Page-Sidan |
| | 2002-05-16 | | | |
| Dealt with by-Utfärdare | | Telephone-Telefon-nr | | 7 |
| Sven-Erik Karlsson | | 187050 | | |
| MFB-Modulbus converter PE1354B | | | | |
| Connect ACS600/DCS600 with MasterFieldbus | | | | |

Signal delay

Calculation of signal delay time MP200 / ACS600



Cycle times in MPXXX AMPL and ACS600 are not included in following example.

$$\text{Max delay 16DDCS nodes} = 16 \times 1 + 1 + 16 \times 1,5 + 1,0 = \mathbf{42ms}$$

$$\text{Max delay 4 DDCSnodes} = 16 \times 1 + 1 + 4 \times 1,5 + 1,0 = \mathbf{24ms}$$