

---

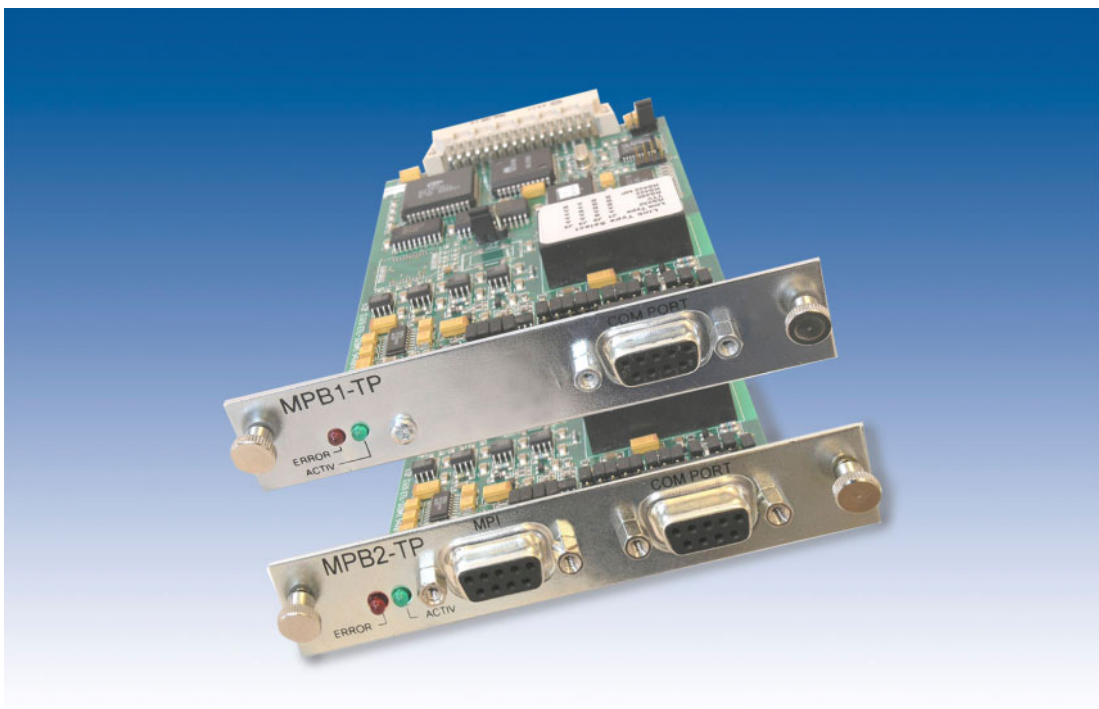
## Card Description

---

### Multi Protocol Board

---

#### MPB1-TP, MPB2-TP



Document M000871-03.doc  
Edition 09/2009

## Copyright

### Keep documentation for future use!

This documentation is the intellectual property of **Micro Innovation AG**, which also has the exclusive copyright. Any modification of the content, duplication or reprinting of this documentation, as well as distribution to third parties can only be made with the express permission of **Micro Innovation AG**.

**Micro Innovation AG** does not accept any liability for damages arising from the use of any incorrect or incomplete information contained in this documentation or any information missing therefrom.

**Micro Innovation AG** reserves the right to make complete or partial modification to this document.

All brand and product names are trademarks or registered trademarks of the owner concerned.

## Proper use

Hardware, software, operatingsystems and drivers must only be used for the applications specified in this description and only in conjunction with the components recommended by Micro Innovation AG.

## Warning !

No warranty claims will be recognized for faults arising from the improper handling of any device.

Devices and communication should not be used for the implementation of any safety functions relating to the protection of personnel and machinery.

No liability is accepted for claims for damages arising from a failure or functional defect.

All data specified in this document does not represent guaranteed specifications in the legal sense.

## Contents

<b>1</b>	<b>Introduction</b> .....	<b>6</b>
1.1	Interface connection MPB2-TP .....	6
<b>2</b>	<b>Configuration</b> .....	<b>7</b>
2.1	MPB1-TP .....	7
2.2	MPB2-TP .....	8
<b>3</b>	<b>Firmware</b> .....	<b>9</b>
3.1	MPBx-TP .....	9
3.2	MPBx-TP Loading Program .....	10
3.3	MPBx-TP Load Cable .....	11
<b>4</b>	<b>Preparing the communication cables</b> .....	<b>12</b>
4.1	Communications cable .....	12
4.2	Cable lengths .....	12
4.3	Shield connection .....	13
4.4	SIMATIC S7 - MPI .....	13
<b>5</b>	<b>Commissioning</b> .....	<b>14</b>
<b>6</b>	<b>Driver List</b> .....	<b>15</b>
<b>7</b>	<b>Driver Types</b> .....	<b>16</b>
7.1	BCI 1.0 .....	16
7.2	BCI 2.0 .....	16
7.3	Driver Selection Errors .....	16
<b>8</b>	<b>BCI 1.0 Drivers</b> .....	<b>17</b>
8.1	Mitsubishi .....	17
8.2	Siemens S5 .....	19
8.3	Siemens S7 .....	23
8.4	Klöckner Moeller .....	25
	Omron .....	26
8.5	Allen-Bradley .....	27
8.6	Matsushita .....	31
8.7	Texas Instruments .....	33
8.8	Elin Eldatic .....	34
8.9	Festo .....	35
8.10	AEG Modicon .....	36
8.11	Telemecanique .....	37
8.12	Honeywell .....	40
8.13	Jetter .....	41
8.14	ABB .....	43
8.15	Westinghouse .....	44
8.16	Micro Innovation .....	45
8.16.1	Data transfer protocol .....	46
8.16.2	Control characters .....	46
8.16.3	Data format .....	46
8.16.4	Troubleshooting .....	47
8.16.5	Send TP1 procedure command .....	47

8.16.6	Send TP2 procedure command .....	47
8.16.7	Notes .....	48
8.16.8	Receive TP1 procedure command.....	48
8.16.9	Receive TP2 procedure command.....	49
8.16.10	Special note.....	49
8.16.11	Implementation aids .....	49
8.17	Seitec .....	50
8.18	Selectron .....	51
8.19	Suconet K.....	52
8.19.1	Interpreter .....	53
<b>9</b>	<b>BCI 2.0 Drivers.....</b>	<b>54</b>
9.1	Siemens S7 .....	54
9.2	B&R.....	56
9.3	Hapa.....	58
9.4	Moeller PS40.....	59

## 1 INTRODUCTION

This document serves as a reference for the connection, commissioning and operation of the MPB1-TP and MPB2-TP communication cards.

These cards must only be used in MICRO PANEL devices (XV400) which provide the appropriate slot (destination hardware).

It must be ensured that the cards are only fitted or removed from the device when the power supply is switched off.

The MPB1-TP supports all drivers and physical interfaces for a wide range of PLC types which are described later in this documentation.

In addition to the MPB1-TP drivers, the MPB2-TP also supports the MPI interface for the SIMATIC S7. Apart from this, both cards are completely identical.

**The term MPBx-TP will be used in this documentation unless the functions of all cards are different. MPBx-TP means MPB1-TP and MPB2-TP.**

The firmware version determines the range of drivers that can be supported. The current driver list (document "Communication protocol list") can be downloaded from our home page ([www.microinnovation.com/en](http://www.microinnovation.com/en)).

If the current version does not provide a driver for the PLC type you require, please contact vendor and enquire about latest versions with a larger range of drivers.

**Remember that the MPB1-TP and the MPB2-TP card are factory set with RS485 default configuration.**

### 1.1 INTERFACE CONNECTION MPB2-TP

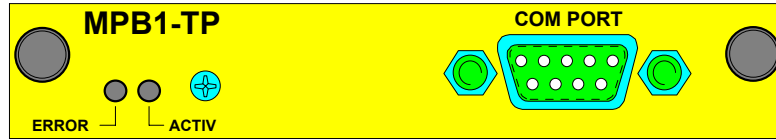
The MPB2-TP card is equipped with two interfaces. These interfaces cannot be linked (switched) at the same time. It would cause incalculable communication conflicts.

**Remark : Only one interface can be linked.**

## 2 CONFIGURATION

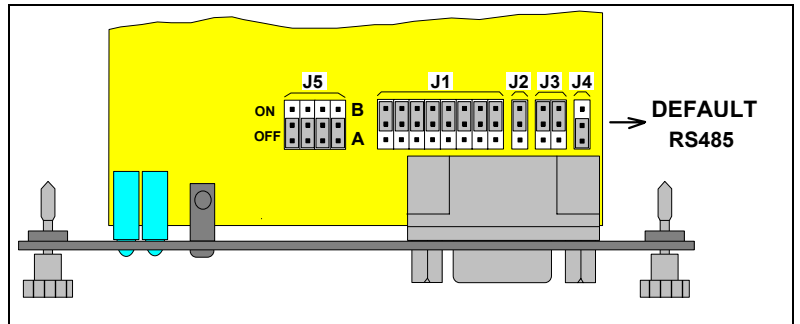
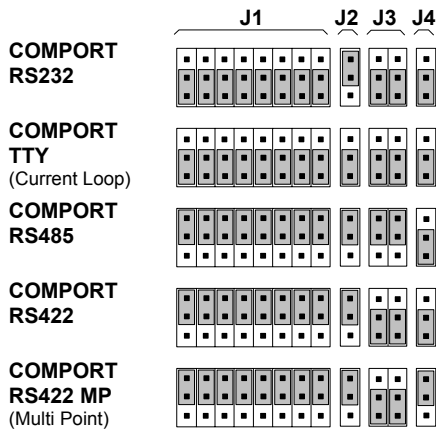
### 2.1 MPB1-TP

#### FRONT PANEL



COM PORT	The COM PORT interface can be configured via the jumpers for RS232, TTY RS422 and RS485 protocols. See also <b>Interface configuration</b> for information how to configure the interfaces.
ERROR	When lit, the ERROR LED (red) indicates that the last data transfer to the PLC was not executed correctly. The LED will not go out until the next data transmission to the PLC is executed correctly. This LED should never be lit in normal operation.
ACTIV	The green LED should be lit during an active data transfer between the MPB1-TP and the PLC. In normal operation this LED should flash <b>briefly (approx. 50 ms)</b> with every data transmission.

#### INTERFACE CONFIGURATION



PIN ASSIGNMENT				
COM BOARD MPB-TP (9 Pin female)				
PIN	RS232	TTY	RS485	RS422
1	-	IN <	-	DTR+>
2	RxD <	-	-	TxD+>
3	TxD >	-	A ∅	RxD+<
4	DTR >	-	-	DSR+<
5	GND	GND	GND	GND
6	DSR <	-	-	DTR->
7	-	-	B ∅	TxD->
8	-	-	-	RxD-<
9	-	OUT >	-	DSR-<
CASE	SHIELD	SHIELD	SHIELD	SHIELD

#### J5 - LINE TERM

Bus terminating resistors for RS485 and RS422.  
These must be switched on when the device is either the first or last station in the network.  
(ON = switched on).  
With point-to-point connections (only two stations), these resistors must always be switched on.

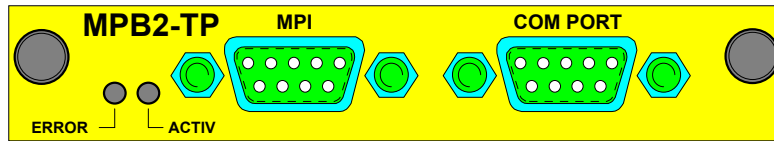
**Card Description MPB1-TP / MPB2-TP**

Communications

**Configuration**

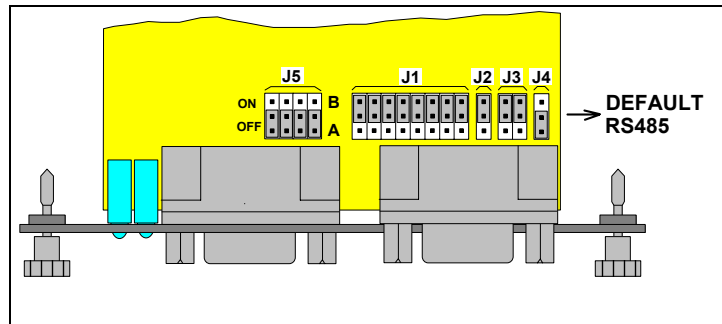
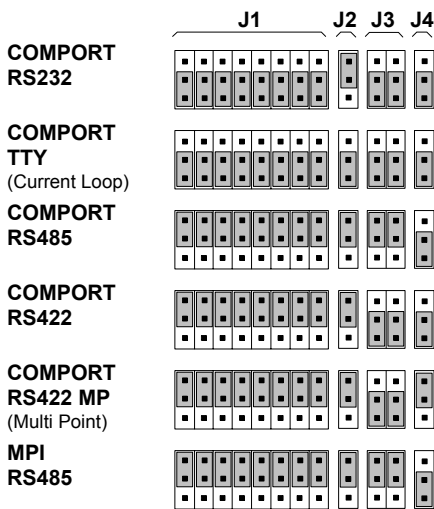
**2.2 MPB2-TP**

**FRONT PANEL**



COM PORT	The COM PORT interface can be configured via the jumpers for RS232, TTY RS422 and RS485 protocols. See also <b>Interface configuration</b> for information how to configure the interfaces.
MPI	The MPI interface must only be used for the SIMATIC S7 and <b>must be configured for RS485</b> . See also <b>Interface configuration</b> for information how to configure the interfaces.
ERROR	When lit, the ERROR LED (red) indicates that the last data transfer to the PLC was not executed correctly. The LED will not go out until the next data transmission to the PLC is executed correctly. This LED should never be lit in normal operation.
ACTIV	The green LED should be lit during an active data transfer between the MPB2-TP and the PLC. In normal operation this LED should flash <b>briefly (approx. 50 ms)</b> with every data transmission.

**INTERFACE CONFIGURATION**



PIN ASSIGNMENT					
	COM BOARD MPB-TP (9 Pin female)				MPI
PIN	RS232	TTY	RS485	RS422	RS485
1	-	IN <	-	DTR+>	-
2	RxD <	-	-	TxD+>	-
3	TxD >	-	A ◊	RxD+<	Line-B
4	DTR >	-	-	DSR+<	RTS >
5	GND	GND	GND	GND	GND
6	DSR <	-	-	DTR->	VCC
7	-	-	B ◊	TxD->	-
8	-	-	-	RxD-<	Line-A
9	-	OUT >	-	DSR-<	-
CASE	SHIELD	SHIELD	SHIELD	SHIELD	SHIELD

**J5 - LINE TERM**

Bus terminating resistors for RS485 and RS422. These must be switched on when the device is either the first or last station in the network. (ON = switched on).

With point-to-point connections (only two stations), these resistors must always be switched on.

**These terminating resistors must not be used for the MPI.**

### 3 FIRMWARE

#### 3.1 MPBx-TP

The MPBx-TP firmware is stored on a retentive flash memory for standard and alternative drivers.

The following drivers are factory set:

- the latest MPBx-TP compatible **standard drivers (MPB.BIN)**
- and as **alternative drivers**:
  - on MPB1-TP the latest Moeller PS40 PLC driver (PS40.BIN)
  - on MPB2-TP the latest SIMATIC S7 driver (MPI.BIN).

The drivers can be updated at any time via the serial interface (see section 3.3) or in a MICRO PANEL (see appropriate documentation for MICRO PANEL).

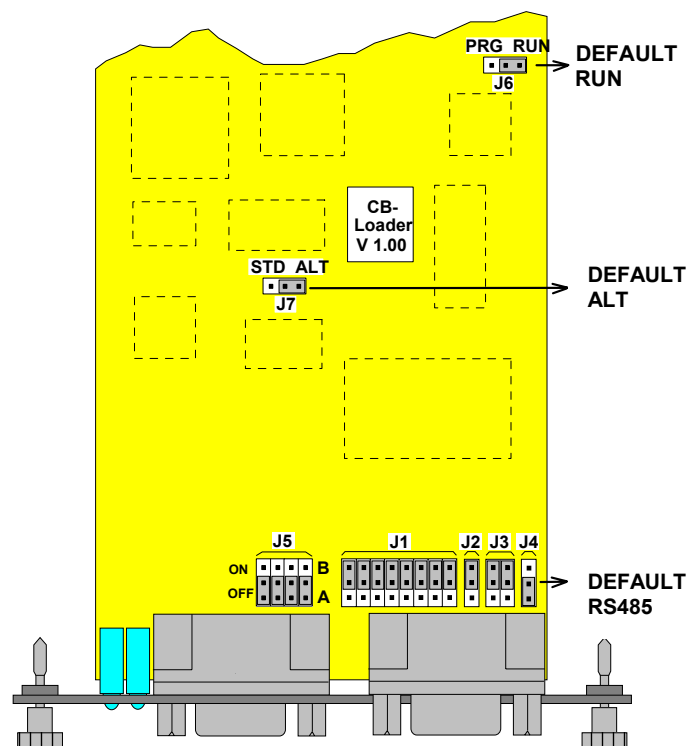
##### J6 - PRG RUN

- "RUN" position:  
Depending on the jumper position of J7, the standard drivers or the alternative drivers are activated.
- "PRG" position:  
New drivers can be loaded (see section 3.3).  
The setting of J7 does not have any effect in PRG mode.

##### J7 - STD ALT

- "STD" position:  
All MPBx-TP compatible drivers are activated.
- "ALT" position:  
On MPB1-TP, the PS40 driver for Moeller PLC is activated.  
On MPB2-TP, the MPI driver for the SIMATIC S7 is activated.  
On special types, the corresponding special driver is activated.

The currently loaded drivers or their versions are displayed in the system masks of the MICRO PANEL.



The driver settings ("STD" or "ALT") are not specified here.

All information in this documentation assumes that the MPBx-TP compatible drivers have been loaded as "STD" drivers and the MPI driver as "ALT".

### 3.2 MPBx-TP LOADING PROGRAM

This document describes how to load the firmware for the MPBx-TP using the COM PORT provided on the card.

Simple load features are also provided on the MICRO PANEL. These are described in the relevant device descriptions.

#### **ACCESSORIES**

- Load cable (see section 3.4)
- Load program (COMLOAD.EXE) at least version 2.00
- PC with serial interface (COM1 or COM2)
- Firmware files (MPB.BIN, MPI.BIN, PS40.BIN...)

#### **PROCEDURE**

1. Remove the card from the MICRO PANEL (**with the power supply switched off, i.e. de-energized**).
2. Configure the COM PORT of the MPBx-TP for RS232 (section 2.2)
3. Set jumper J6 on the MPBx-TP to PRG.
4. Fit the card back into the slot of the MICRO PANEL.
5. Connect the load cable to the serial interface of the PC (COM1 or COM2) and the COM PORT of the MPBx-TP.
6. Switch on the power supply.  
The ERROR LED on the MPBx-TP must light up and the ACTIV LED should flash 4 times at a rate of one pulse a second. Both LEDs should then go out and the MPBx-TP should then be ready for programming.
7. Start the COMLOAD.EXE (loading via COM1) program or COMLOAD.EXE2 (loading via COM2) on the PC.
8. Enter at least one standard firmware (enter "S") or an alternative firmware ("A").  
If the firmware could be loaded, the program will output the message FILE DETECTED together with the file size and the driver version.
9. Then start the data transfer (enter "T").  
The green ACTIV LED in the MPBx-TP should flash with every transferred data block that was received.
10. Once the data transmission has been completed correctly, the red ERROR LED on the MPBx-TP should no longer be lit (this would mean programming error).
11. Switch off the power supply and remove the card from the MICRO PANEL.
12. Reset jumper J6 on the MPBx-TP to RUN position and set jumper J7 to STD or ALT depending on the driver selected.
13. Configure the COM PORT according to the physical interface required.
14. Re-insert the card into the MICRO PANEL slot.
15. Connect the COM PORT or MPI (MPB2-TP only) to the PLC via the communication cable and switch on the power supply again.
16. The new driver is now active.  
Check in the system masks of the MICRO PANEL whether the correct version of the driver is displayed.

### 3.3 MPBx-TP LOAD CABLE

#### WIRING LIST for PC with 9-POLE DSUB on COM1 or COM2

RS232 Variant A			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
DTR	4	8	CTS
SG	5	5	SG
DSR	6	7	RTS
MPBx-TP COM PORT (9 pole male)		PC COM 1/2 (9 pole female)	

RS232 Variant B			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
DTR	4	6	DSR
SG	5	5	SG
DSR	6	4	DTR
MPBx-TP COM PORT (9 pole male)		PC COM 1/2 (9 pole female)	

#### WIRING LIST for PC with 25-POLE DSUB on COM1 and COM2

RS232 Variant A			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
DTR	4	5	CTS
SG	5	7	SG
DSR	6	4	RTS
MPBx-TP COM PORT (9 pole male)		PC COM 1/2 (25 pole female)	

RS232 Variant B			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
DTR	4	6	DSR
SG	5	7	SG
DSR	6	20	DTR
MPBx-TP COM PORT (9 pole male)		PC COM 1/2 (25 pole female)	

With both types (PC 9 pole or 25 pole) the hardware handshake according to variant A or B can be implemented.

## 4 PREPARING THE COMMUNICATION CABLES

The preparation of the cables for the serial interface „COM PORT“ and „MPI“ is an important factor in the electromagnetic compatibility (EMC) of the target hardware, both in terms of interference immunity and emission.

**The EMC values stated in the technical data can only be guaranteed if the cables are prepared according to the following specifications.**

### 4.1 COMMUNICATIONS CABLE

The communications cable must be shielded. The cable shield must be made from copper braid. Use a metal or metallised connector casing. Connect the cable shield directly to the connector casing for the MPBx-TP. This ensures that the cable shield is properly connected to the housing of the target hardware via the screws and the protective metal shroud of the plug connector.

Refer to the relevant operating instructions of the PLC manufacturer for the correct connection procedure for the cable shield to the PLC. Unless otherwise stated, connect the cable shield to the connector casing of the PLC.

Provide a potential equalisation cable with a suitable cross-section between control cabinets if the target hardware and PLC (or another communications partner) are installed in different control cabinets and the cable shield is directly or indirectly connected to the protective earth at the PLC end. This will prevent the occurrence of excessive compensation currents on the shield and shield connections, as may occur in the event of a possible shorting of a device on the protective earth system.

### 4.2 CABLE LENGTHS

The possible cable length and wire recommendations depend on the physical interface used.

Transmission errors may occur if these limits are not observed.

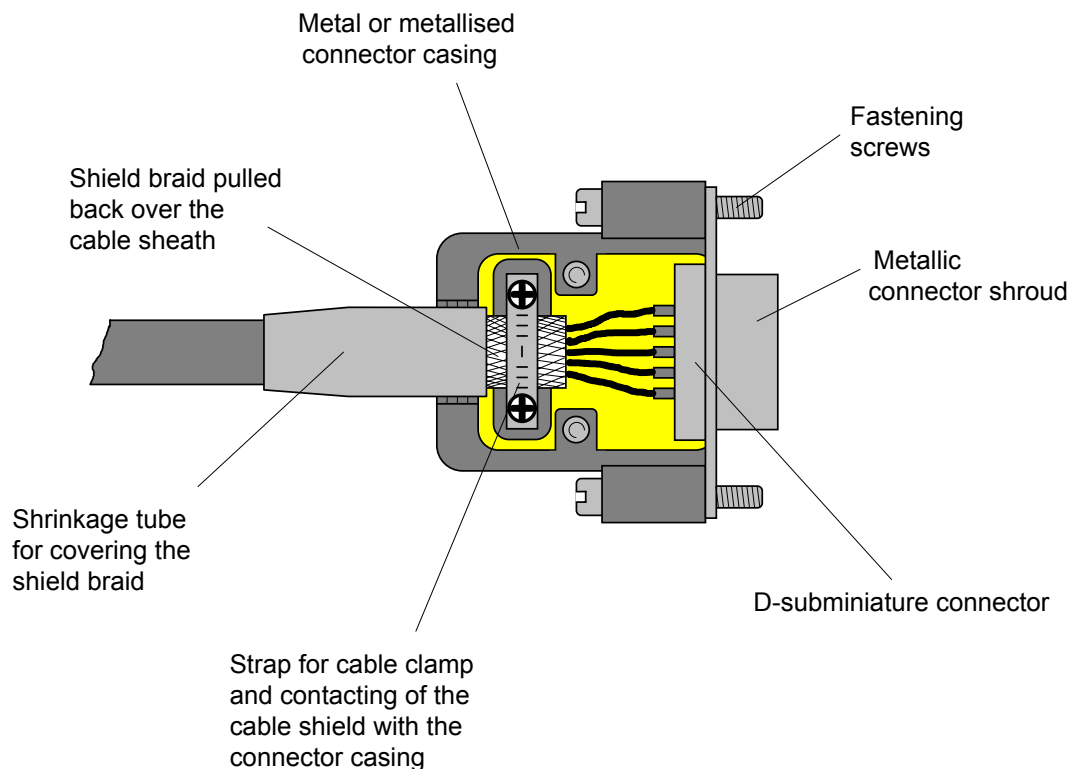
Interface	Baud rate	Length	Comments
RS232	19200	15 m	Only suitable for point-to-point connections
	9600	30 m	
	4800	60 m	
RS422/ 485	< 100000	1200 m	Using twisted pair communication cables can increase reliability of the data line concerned.
	< 500000	600 m	The line terminating resistors must be switched on between the first and last data terminals
	<1000000	120 m	
TTY	< 20000	1000 m	

### 4.3 SHIELD CONNECTION

Only use metal or metallised connector casings with a cable clamp for cable anchoring fastened on one side of the connector. This ensures an optimum contact area and low impedance connection with the connector casing.

The following procedure is recommended for connecting the cable shield:

1. Strip the cable.
2. Shorten the exposed shield braid by approx. 3 cm.
3. Turn back the braid over the cable sheath.
4. Use a heat shrinkable tube or insulation tape to cover the exposed cable sheath with the folded back shield braid so that 5 to 8 mm of exposed cable shield is left at the sheath end and is cleanly covered at the back.
5. Fit the connector.
6. The cable is then fastened at the exposed shield braid and the cable sheath below it directly underneath the cable clamp strap of the connector casing.



### 4.4 SIMATIC S7 - MPI

For this observe in particular the installation instructions with regard to line length or stub line in SIEMENS MPI specifications.

**The use of original Profibus cable and plug connector is generally recommended.**

## 5 COMMISSIONING

1. Connect the COM PORT of the MPBx-TP or MPI in the case of the MPB2-TP to the appropriate communications port on the PLC.  
For this use the special communications cable of the PLC (see wiring diagram from section 8).
2. Switch on the power supply. Active communication is started as soon as the first operating mask of the loaded project is displayed.
3. When communication with the PLC is active, the green ACTIV LED on the MPBx-TP will be lit. Once communication has ended, the ACTIV LED will go out.  
The red ERROR LED will be lit if **no** correct data exchange with the PLC was possible.

**Additional points on commissioning refer only to errors; none of the LEDs are lit or the red ERROR LED lights up.**

**Otherwise commissioning at this point has ended directly.**

4. If none of the two LEDs light up, this is probably because a driver was selected that is not supported by the current firmware of the MPBx-TP.  
In this case ask our customer support about newer versions of the MPBx-TP and note the error messages in the destination hardware.  
On the MPBx-TP also check whether the jumper J7 (STD/ALT) is set correctly for the required driver.

**Other points on commissioning only refer to errors (red ERROR LED)**

5. First check whether the physical interface of the MPBx-TP is compatible with that of the PLC (RS232, TTY, RS485, RS422). This represents 30 % of all commissioning errors.  
  
Have you connected the MPB2-TP to the correct port (MPI or COM PORT)?
6. Check the communications cable used (wiring test) by means of the diagram for the PLC in use (approx. 60% of all commissioning errors).
7. If the red ERROR LED is lit only intermittently, check whether the cable shields have been connected as described.
8. Wire **only one** of the connectors at MPB2-TP !
9. Furthermore pay particular attention to the PLC notes given in the section 8. All the interfaces described in this section have been tested and are used in real applications.  
If the interface you require is not listed, try an alternative interface for the PLC and contact our support centre.
10. Further information on particular devices is given in the section Commissioning the target hardware.

## 6 DRIVER LIST

The installed firmware version determines which drivers can be supported.

The current driver list (document "Communication protocol list") can be downloaded from our home page ([www.microinnovation.com/en](http://www.microinnovation.com/en)).

Requirements for the communication:

- The required driver file (table column „Kommunikation Treiber“) is installed on the MICRO PANEL.
- The jumper J7 of the MPBx-TP is set as follows:
  - For activating the driver file „MPB.BIN“ on position „STD“
  - For activating another driver file on position „ALT“

If the current version does not provide a driver for the PLC type you require, please contact vendor and enquire about latest versions with a larger range of drivers.

## 7 DRIVER TYPES

The next section describes the drivers for different PLC types that have been tested and that are used in practise.

The connection to all PLCs is always made on the MPBx-TP via the "COM PORT" 9-pole D-Sub interface, unless MPI is explicitly specified (only SIEMENS S7).

Connection types on existing PLC types that are not listed can theoretically be derived.

Contact our customer support in case of problems.

Drivers for new PLC types can only be implemented by the manufacturer of the MPBx-TP. In this case ask about newer versions of the MPBx-TP or for possibilities to implement your PLC type.

### 7.1 BCI 1.0

BCI stands for Basic Communication Interface and describes the generally applicable definition for the data exchange with the PLC.

The following definition is possible for BCI 1.0 standard drivers:

- 1) PLC or MPBx-TP station number (1 byte)
- 2) Data type (1 byte)
- 3) Start address (2 byte)
- 4) Number of data bytes

### 7.2 BCI 2.0

The BCI 2.0 allows a considerably more flexible definition of the data for the data exchange with one or several PLCs and is used with all new driver types.

The following definition is possible for BCI 2.0 standard drivers:

- 1) MPBx-TP station number (1 byte)
- 2) MPBx-TP slot number (1 byte)
- 3) PLC station number (1 byte)
- 4) PLC slot number (1 byte)
- 5) Data format (1 byte)
- 6) Data type (1 byte)
- 7) Module address (2 byte)
- 8) Start address (2 byte)

### 7.3 DRIVER SELECTION ERRORS

Error message : **GROUP NOT AVAILABLE / DRIVER NOT AVAILABLE !**

The required BCI 1.0 driver is not available in the current firmware.

Error message : **BCI 2.0 DRIVER NEEDED!**

The required BCI 2.0 driver is not available in the current firmware.

Error message : **ONLY BCI 1.0**

The required driver is only available in the current firmware as BCI 1.0 driver

Error message : **ONLY BCI2.0**

The required driver is only available in the current firmware as BCI2.0 driver.

These error messages indicate that your current firmware does not yet support the latest drivers. Contact your customer support.

## 8 BCI 1.0 DRIVERS

### 8.1 MITSUBISHI

#### MITSUBISHI

PLC Type	Protocol	PLC Port	Parameters
A series	Computer Link	AJ71C24 Format 1 (Mode 1)	9600 baud, 8 data bits, 1 stop bit, No parity Checksum on

**DRIVER DESIGNATION (2, 1) : MITSUBISHI > AJ71C24 (MPB.BIN)**

**SUPPORTED DATA TYPES : M, D**

#### WIRING LIST

RS232				RS422				
Signal	Pin		Pin	Signal	Pin		Pin	Signal
RxD	2	—————	2	TxD				
TxD	3	—————	3	RxD				
DTR	4	—————	6	DSR				
SG	5	—————	7	SG				
DSR	6	—————	20	DTR				
			8	DCD				
			4	RTS				
			5	CTS				
MPBx-TP (9 pole male)				AJ71C24 (25 pole male)				

RS422				RS422				
Signal	Pin		Pin	Signal	Pin		Pin	Signal
TxD+	2	—————		RxD+				
RxD+	3	—————		TxD+				
SG	5	—————		SG				
TxD-	7	—————		RxD-				
RxD-	8	—————		TxD-				
MPBx-TP (9 pole male)				AJ71C24				

#### NOTES

- Check in accordance with the manual for the Computer Link Module AJ71xx whether the mentioned parameters and interface (RS232 or RS422) are correctly set.  
  
Note: the switch assignment is not identical for all AJ71xx!
- Select protocol format 1 for the AJ71xx and station number 0 (fixed for MPBx-TP).
- Remember that changes to settings on the AJ71xx are not effective until the PLC has been restarted.
- Correct data transmission on the AJ71xx using RS232 is indicated by the flashing of LEDs 2SD and 2RD, and LEDs 4SD and 4RD when using RS 422.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**mitsubishi**

PLC Type	Protocol	PLC Port	Parameters
<b>AX series</b>	Port Communication	PG-Port	9600 baud, 8 data bits, 1 stop bit, Parity Odd Checksum on
<b>FX series</b>	Direct Access	PG-Port	9600 baud, 7 data bits, 2 stop bit, Parity Even Checksum on

**DRIVER DESIGNATION (2, 2) : MITSUBISHI > PG-AX (MPB.BIN)****(2, 3) : MITSUBISHI > PG-FX (MPB.BIN)****SUPPORTED DATA TYPES : M, D****WIRING LIST**

<b>RS422</b>			
Signal	Pin	Pin	Signal
DTR+	1	4	DSR+
TxD+	2	2	RxD+
RxD+	3	3	TxD+
DSR+	4	5	DTR+
DTR-	6	17	DSR-
TxD-	7	15	RxD-
RxD-	8	16	TxD-
DSR-	9	18	DTR-
SG	5	7	SG
		21	Pres
MPBx-TP (9 pole male)		PG AX/FX (25 pole male)	

**NOTES**

- No special notes;

The connection is the same as for the programming device provided that all parameters are fitted and no other driver or configuration is required in the PLC.

## 8.2 SIEMENS S5

**SIEMENS S5**

PLC Type	Protocol	PLC Port	Parameters
<b>S5</b>	DK512 (R3964R)	CP524/525/135 or compatible	9600 baud, 8 data bits, 1 stop bit, Parity Even low priority

DRIVER DESIGNATION (3, 1) : SIEMENS &gt; DK512 (MPB.BIN)

SUPPORTED DATA TYPES : DW

## WIRING LIST

RS232			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
SG	5	7	SG
MPBx-TP (9 pole male)		CP524/525 (25 pole male)	

TTY			
Signal	Pin	Pin	Signal
IN	1	10	OUT+
SG	5	19	OUT-
OUT	9	13	IN+
		14	IN-
MPBx-TP (9 pole male)		CP524/525/135 (25 pole male)	

PLC Type	Protocol	PLC Port	Parameters
<b>S5-928B</b>	DK512 (R3964R)	CP	9600 baud, 8 data bits, 1 stop bit, Parity Even low priority

## WIRING LIST

RS422			
Signal	Pin	Pin	Signal
TxD+	2	11	RxD+
RxD+	3	9	TxD+
SG	5	8	SG
TxD-	7	4	RxD-
RxD-	8	2	TxD-
DTR+	1		
DSR+	4		
DTR-	6		
DSR-	9		
MPBx-TP (9 pole male)		928B-CP (15 pole male)	

**NOTES**

- Configure the communications processor used for the specified parameters and select the low priority for the PLC.
- Do not program any jobs for your CP but simply use the standard function blocks (RECEIVE\_ALL and FETCH\_ALL). The MPBx-TP cannot accept jobs that are initiated by the CP.
- For active data exchange with the CP the function blocks mentioned must be called up in the main program of the PLC (OB1).
- Remember that this interface is not only for the R3964R protocol but also requires the DK512 (= RK512) data interpreter.

## Example:

The CPU944 can run the R3963R protocol on the second interface using the 6ES5-816-1BB21 module.

This only enables data transport, however, the interpreter would have to be implemented in the control program of the PLC (not recommended).

Note: this CPU can also process the AS511 protocol on the second interface.

- PLC and CP must both be in Run status.
- If data blocks or data words are addressed that are not available in the PLC, this will cause errors in the communication.

**SIEMENS S5**

PLC Type	Protocol	PLC Port	Parameters
<b>S5</b>	AS511	PG-Port	9600 baud, 8 data bits, 1 stop bit, Parity Even

**DRIVER DESIGNATION (3, 2) : SIEMENS > AS511 (MPB.BIN)**

**SUPPORTED DATA TYPES : DW**

**WIRING LIST**

<b>TTY</b>				
Signal	Pin		Pin	Signal
IN	1	—————	6	OUT+
SG	5	—————	7	OUT-
		└──┬──┘	9	IN+
OUT	9	—————	2	IN-
MPBx-TP (9 pole male)			S5 PG (15 pole male)	

**NOTES**

- The interface to the PG-Port of the S5 is the same as for the programming device. No parameter settings or function blocks are required.
- With CPUs that have two interfaces it is best to use the second one since usually not all PG functions are available on this. All the functions of the MPBx-TP can be implemented with this port.
- The PLC must be in Run status for active communication.
- If both data blocks or data words are addressed that are not available in the PLC, this will cause errors in the communication.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**SIEMENS S5**

PLC Type	Protocol	PLC Port	Parameters
<b>S5-103</b>	R3964R	CP521-SI	9600 baud, 8 data bits, 1 stop bit, Parity Even

**DRIVER DESIGNATION (3, 4) : SIEMENS > CP521-SI (MPB.BIN)****SUPPORTED DATA TYPES : DW****WIRING LIST**

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
SG	5	7	SG
MPBx-TP (9 pole male)		CP521-SI (25 pole male)	

<b>TTY</b>			
Signal	Pin	Pin	Signal
IN	1	18	OUT+
SG	5	21	OUT-
		9	IN+
OUT	9	10	IN-
MPBx-TP (9 pole male)		CP521-SI (25 pole male)	

**NOTES**

- The AG103 with the CP521-SI supports the R3964R protocol.
- An interpreter with a scaled-down version of DK512 (max 4 data byte) can be obtained for this PLC from your MPBx-TP dealer.
- If the interpreter is implemented in the PLC (see appropriate documentation), the MPBx-TP is capable of implementing RECEIVE and FETCH jobs as with the CP524.
- The PLC must be in Run status for active communication.
- If both data blocks or data words are addressed that are not available in the PLC, this will cause errors in the communication.

## 8.3 SIEMENS S7

## SIEMENS S7

PLC Type	Protocol	PLC Port	Parameter
S7-31x S7-41x	MPI	PG-Port (MPI)	187,5 kBaud

DRIVER DESIGNATION (3, 6) : SIEMENS > MPI-PREREL (MPI.BIN)

SUPPORTED DATA TYPES : DB:DBW

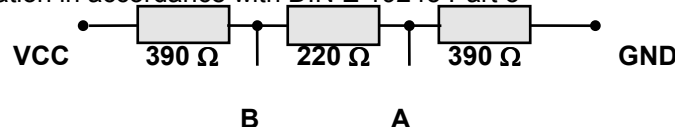
## WIRING LIST

MPI (RS485)			
Signal	Pin	Pin	Signal
LINE-B	3	3	LINE-B
LINE-A	8	8	LINE-A
RTS	4		
SG	5		
VCC	6		
MPB2-TP (MPI 9 pole male)		S7-MPI (9 pole male)	

## NOTES

- The interface to the SIMATIC S7 is connected directly via the PG Port (MPI). The connection therefore does not require any parameter setting or the activation of any function blocks.
- Standard Profibus cables and connectors (MPI corresponds physically to Profibus) are required for connecting the individual stations in the MPI network. Please note, for installation of link cable, refer to the specification of SIEMENS Section MPI, regards length of cables and installation.
- The MPB2-TP card must be set to "ALT" and the current MPI driver (MPI.BIN) must be loaded (see also section 3.2 and 3.3).
- The bus terminating resistors must be switched on at the cable ends (last stations), with at least one of the stations being energised so that the terminations are supplied with power. With the standard Profibus cables this can be switched on using the slide switches in the connector housing.

Line termination in accordance with DIN E 19245 Part 3



**The bus terminating resistors on the MPB2-TP board MUST NOT be switched on !**

**NOTES ON SIMATIC 7 (Continuation)**

- The MPB2-TP is **permanently** assigned station number 1.  
Ensure, however, that no other station in the MPI network is assigned this station number (no double assignments).  
Check with the PG under "Who's online", whether station 1 is already assigned.
- Station number 0 is reserved for the PG.  
Station number 2 is the default setting for the PLC**
- The HSA (Highest System Address) must be the same for all stations in the network (15, 31, 63 or 126).  
If declaration is wrong or missing (use „Param1“ in Configuration Software), the MPB2-TP will use 126.
  - As soon as the MPB2-TP is connected with the parameterized PLC in the MPI network, you will see this under station number 1 in the PG under "Who's online".
- The PG cannot, however, be used to establish a connection to this station. If, however, this is attempted, the MPB2-TP will refuse this connection. The PG will then output the message "Station refuses connection establishment".
- The MPB2-TP can only establish active connection with **one** parameterized MPI station (SIMATIC S7 PLC).
- The individual data blocks can be assigned as follows:
    - 1 char Data type ("D" = DB:DBW)
    - 1 byte Module address (corresponds to the DB number)
    - 1 byte Data address
- Note in particular here that word values are generally transferred. When transferring data bytes, the High and Low word in the PLC is opposite to that of the display.
- With PLC byte processing, the start addresses of data words are generally doubled.  
This means that, for example, DB5:DW5 is DB5:DW10 in the PLC.
  - An error message will be output, if the parameterized destination station (PLC) is not available or if the network is not connected.  
The number after ST# corresponds to the missing MPI station number in hexadecimal format.  
MPI 1.52 ST#02 CONNECT?
  - If the module address or data address is not available, the following message is output:  
MPI 1.52 ST#02 ADDRESS!
- Since the MPB2-TP always transfers data blocks of at least 2 bytes, only the access to the data address is checked and not the subsequent addresses.  
Following addresses that are not present are ignored and do not initiate error messages.
- If no errors occur with the data transfer, the following message will be output:  
MPI 1.51 ST#02 READY !
- The messages and error messages are generated by the MPB2-TP after every data transfer. These, however, are only displayed in the MMI in the event of a change (error after Ready) or sporadically if the error stays the same.

## 8.4 KLÖCKNER MOELLER

**KLÖCKNER MOELLER**

PLC Type	Protocol	PLC Port	Parameters
<b>PS3, PS3x6, PS4-200</b>	Suconet K1	Suconet	187.5 Kbaud

**DRIVER DESIGNATION (1, 2) : KL.MOELLER > Suconet K1 (MPB.BIN)**

**SUPPORTED DATA TYPES : MB, MW, TP (Array/Word)**

## WIRING LIST

<b>RS485</b>				
Signal	Pin		Pin	Signal
A	3	=====	4	A
SG	5	=====	3	SG
B	7	=====	1	B
MPBx-TP (9 pol male)			PSxxx (5 pol DIN-male)	

## NOTES

- The MPBx-TP interface via Suconet K1 requires the use of a driver for interpreting incoming data and copying it to the appropriate markers.
- The driver is available in two versions for the PLC type concerned and can be obtained from KM with the appropriate documentation:
  - a) for only one device with MPBx-TP
  - b) for several devices with MPBx-TP
- The station number via which the MPBx-TP must report within the network, must match the number in the driver.
- The PLC must be in Run state for active communication.
- The appropriate driver must also be correctly integrated in the PLC program.
- Also ensure when using RS485 that the first and the last station in the network have their bus terminating resistors switched on.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

OMRON

**OMRON**

PLC Type	Protocol	PLC Port	Parameters
C-/H-/K series	Host Link	Host Link Unit	9600 baud, 7 data bits, 2 stop bit, Parity Even

**DRIVER DESIGNATION (6, 1) : OMRON > CHK series****SUPPORTED DATA TYPES : HR, IR, DM****WIRING LIST**

<b>RS422</b>			
Signal	Pin	Pin	Signal
TxD+	2	1	RxD+
RxD+	3	5	TxD+
SG	5	3	SG
TxD-	7	6	RxD-
RxD-	8	9	TxD-
DTR+	1		
DSR+	4		
DTR-	6		
DSR-	9		
MPBx-TP (9 pole male)		Host Link (9 pole male)	

**NOTES**

- For connecting this PLC you have to use the „Host Link Unit“ for the Omron PLC, which supports by minimum the following commands : „RR“ „RH“ „RD“ „WR“ „WH“ „WD“ und „SC“  
Normally this commands are given by command level 1.  
If you try to communicate with ungiven registers (HR, IR, DM) a communication error will occur !
- For activ communication the station number given for each message must match the station entered on the „Host Link Unit“.
- The physical interface on the MPBx-TP must be configured for RS422 (**not** MP) and parameters must match.
- IMPORTANT** : „Link Type Selector“ on „Host Link Unit“ must stay on „Multiple-Link“.
- On activ communication LED „RCV“ and „XMT“ on „Host Link Unit“ must flicker. If only LED „RCV“ flicker, station number is wrong or „Link Type Selector“ stay on „Single Link“.
- Also ensure that the first and the last station in the network have their bus terminating resistors switched on.
- Shield connections are given in the OMRON manual and chapter 4 in this manual.

## 8.5 ALLEN-BRADLEY

## ALLEN-BRADLEY

PLC Type	Protocol	PLC Port	Parameters
PLC5	DF1	Channel 0	9600 baud, 8 data bits, 1 stop bit, Parity Even Full Duplex, BCC checksum

DRIVER DESIGNATION (7, 1) : A.-BRADLEY &gt; PLC-5 (MPB.BIN)

SUPPORTED DATA TYPES : N, B

## WIRING LIST

RS232			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
SG	5	7	SG
		4	RTS
		5	CTS
		6	DSR
		8	DCD
		20	DTR
MPBx-TP (9 pole male)		Channel 0 (25 pole male)	

RS422			
Signal	Pin	Pin	Signal
		13	CTS+
		19	RTS+
RDA	2	14	TxD+
SDA	3	16	RxD+
SG	5	7	SG
SDB	7	3	RxD-
RDB	8	2	TxD-
		4	RTS-
		5	CTS-
MPBx-TP (9 pole male)		Channel 0 (25 pole male)	

## NOTES

- Configure the transmission parameters in the PLC5 for channel 0 according to the parameters specified.

The parameters are set in the "MENU ONLINE CONFIGURATION" in the "GENERAL UTILITY" of the Allen-Bradley programming software:

Channel 0 SYSTEM (Point To Point).

**NAK receive 0**

**DF1 ENQS 0**

- The "NODE ADDRESS" must match the address set for the MPBx-TP. The MPBx-TP itself reports itself as station number 0.
- Ensure that all files to be addressed (N and B) are available in the PLC and are large enough.
- Addressing files or data words that are not available in the PLC will lead to faulty communication (red LED "ERROR" lit).

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**ALLEN-BRADLEY**

PLC Type	Protocol	PLC Port	Parameters
<b>SLC500</b>	DF1	1747-KE	9600 baud, 8 data bits, 1 stop bit, Parity Even Full Duplex, BCC checksum

**DRIVER DESIGNATION (7, 2) : A.-BRADLEY > SLC-500 (MPB.BIN)****SUPPORTED DATA TYPES : N, B****WIRING LIST**

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		DF1-Port (9 pole female)	

**NOTES**

- The 1747-KE communications module from Allen-Bradley is required in order to link the MPBx-TP to the SLC500.
- Configure the DF1 port of 1747-KE using any VT100 terminal (or Windows terminal) for the interface parameters and type (RS232) mentioned.
- The parameter setting of the 1747-KE is described in chapter 4 of the manual. The interfaces are set as standard for RS232 so that only JW4 for configuring the 1747-KE needs to be set to the required position.
- Connect the cable with the CONFIG port of the 1747-KE and their VT100 terminal (1200 baud). After the PLC is switched on, the module responds by activating the menu described in chapter 5. Set the parameters mentioned for the DF1 port.
- The following parameters are required for the DF1 protocol in addition to the ones mentioned:
 **FULL-DUPLEX**
  - Duplicate Packet Detection : Disable
  - Checksum : BCC
  - Constant Carrier Detect : Disable
  - Modem Init String :
  - Embedded Response Detect : ADER
  - ACK Timeout : 200 x 5ms
  - ENquiry Retries : 0
  - NAK Received Retries : 0
- The "NODE ADDRESS" must correspond with the one to be addressed by the MPBx-TP. This is the address of the SLC500 and not that of the 1747-KE.  
The MPBx-TP reports itself as station number 0.

**NOTES (Continuation SLC-500)**

- Switch off the PLC after the configuration and set JW4 to OPERATION.
- The MPBx-TP can only exchange data with the 1747-KE via the CIF file (Common Interface File = fix no. #9). Only open this file in the required size.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**ALLEN-BRADLEY**

PLC Typ	Protocol	PLC Port	Parameter
SLC503 SLC504	DF1	PROG.TERM	9600 baud, 8 data bits, 1 stop bit, Parity Even Full Duplex, BCC checksum

**DRIVER DESIGNATION (7, 3) : A.-BRADLEY > SLC503/504 (MPB.BIN)****SUPPORTED DATA TYPES : N, B****WIRING LIST**

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		PROG.TERM (9 pole female)	

**NOTES**

- Configure the transmission parameters in the SLC503/4 the interface PROG.TERM (Channel 0) according to the parameters specified.  
  
The parameters are set in the „MENU ONLINE CONFIGURATION“ in the „GENERAL UTILITY“ of the Allen-Bradley programming software :
- System Channel 0 : FULL DUPLEX  
**NAK receive 0**  
**DF1 ENQS 0**
- The „DESTINATION ADRESS“ (=PLC) must match the address set for the MPBx-TP. The „SOURCE ADRESS“ reports to the MPBx-TP is fixed as 0 .
  - Ensure that all files to be addressed (N and B) are available in the PLC are large enough. Addressing files that are not available, will lead to faulty communication (red Led „ERROR“ lit).
  - If you are also using the same interface „PROG.TERM“ for the programming, the parameter are change always only in the menu „ONLINE“ and after in the "ONLINE CONFIG" menu.
- In this case the programming cable is identically with the described communications cable.

## 8.6 MATSUSHITA

**MATSUSHITA**

PLC Type	Protocol	PLC Port	Parameters
FP1	PG-Port	PG-Port	9600 baud, 8 data bits, 1 stop bit, Parity Odd

**DRIVER DESIGNATION (8, 1) : MATSUSHITA > FP1/3/5 (MPB.BIN)**

**SUPPORTED DATA TYPES : DT, R, SV, EV, X, Y**

**WIRING LIST**

<b>RS422</b>			
Signal	Pin	Pin	Signal
DTR+	1	4	DSR+
TxD+	2	15	RxD+
RxD+	3	14	TxD+
DSR+	4	5	DTR+
SG	5	2	SG
DTR-	6	13	DSR-
TxD-	7	7	RxD-
RxD-	8	6	TxD-
DSR-	9	12	DTR-
MPBx-TP (9 pole male)		AFP15205 (15 pole male)	

**NOTES**

- The MPBx-TP is linked to the FP1 via the AFP15205 converter directly on the PG port of the PLC (converter = round 15 pole D-sub connector).
- The connection to the PG port of the FP1 is the same as for a programming device and active communication should be possible without any further steps.
- The PLC must be switched on and in Run status.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**MATSUSHITA**

PLC Type	Protocol	PLC Port	Parameters
FP3 / FP5	PG-Port	PG-Port	9600 baud, 8 data bits, 1 stop bit, Parity Odd

**DRIVER DESIGNATION (8, 1) : MATSUSHITA > FP1/3/5 (MPB.BIN)****SUPPORTED DATA TYPES : DT, R, SV, EV, X, Y****WIRING LIST**

<b>RS422</b>			
Signal	Pin	Pin	Signal
TxD+	2	10	RxD+
RxD+	3	9	TxD+
SG	5	7	SG
TxD-	7	3	RxD-
RxD-	8	2	TxD-
DTR+	1	4	DSR+
DSR+	4	5	DTR+
DTR-	6	12	DSR-
DSR-	9	11	DTR-
MPBx-TP (9 pole male)		FP3/5 PG (15 pole male)	

**NOTES**

- The connection to the PG port of the FP3 and FP5 is the same as for a programming device. Active communication should be possible without any further steps.
- The PLC must be switched on and in Run status.
- An additional possibility of connecting to the FP1, FP3, and FP5 is via the AFP850 RS 232 <-> RS422 converter (see below).
- Remember that the physical interface of the MPBx-TP must be adapted for this (RS232).

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
DTR	4	6	DSR
SG	5	7	SG
DSR	6	20	DTR
		4	RTS
		5	CTS
MPBx-TP (9 pole male)		AFP8550 (25 pole male)	

## 8.7 TEXAS INSTRUMENTS

## TEXAS INSTRUMENTS

PLC Type	Protocol	PLC Port	Parameters
TI500	PG-Port	PG-Port	9600 baud, 7 data bits, 1 stop bit, Parity Odd

DRIVER DESIGNATION (3, 5) : SIEMENS > TI-500 (MPB.BIN)

SUPPORTED DATA TYPES : V

## WIRING LIST

RS422			
Signal	Pin	Pin	Signal
TxD+	2	5	RxD+
RxD+	3	1	TxD+
SG	5	6	SG
TxD-	7	8	RxD-
RxD-	8	7	TxD-
MPBx-TP (9 pole male)		TI5xx (9 pole male)	

## NOTES

- The MPBx-TP is connected to the TI-500 via the PG port. Active communication should be possible without any further steps.
- Check whether the setting of SW1..12 (in the battery compartment) matches the parameters listed.

SW1 = ON; SW2 = X; SW3..5 = ON; SW6 = OFF; SW7..12 = ON

For switch positions see the cover of the battery compartment or PLC manual.

- The PLC must be switched on and in Run status.

**8.8 ELIN ELDATIC****ELIN ELDATIC**

PLC Type	Protocol	PLC Port	Parameters
MC1	ECS2000	PG-Port	9600 baud, 8 data bits, 2 stop bit, No parity

**DRIVER DESIGNATION (10, 1) : OTHERS > ELIN-MC1 (MPB.BIN)**

**SUPPORTED DATA TYPES : V, X, Y, I, E, A**

**WIRING LIST**

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		Eldatic MC1 (9 pole female)	

**NOTES**

- The MPBx-TP is connected to the Eldatic MC1 directly via the PG port. Active communication should be possible without any further steps.
- The MPBx-TP has the status of a charging device with the station number 253.
- Data can only be exchanged with the PLC connected (point-to-point) and the number of the connected stations to be addressed must match.
- Is the data to be exchanged (V, X, Y, I, E, A) actually present in the PLC?
- Are the transmission parameters correctly set?  
9600 baud in the "ORG" menu under "Communication" (check via "LAD" menu)
- The PLC must be switched on and must be in Run status.

**8.9 FESTO****FESTO**

PLC Type	Protocol	PLC Port	Parameters
<b>FPC405</b>	Commando Interpreter	DIAG-Port	9600 baud, 8 data bits, 1 Stop bit, No parity

**DRIVER DESIGNATION (10, 2) : OTHERS > FPC405 (MPB.BIN)**  
**SUPPORTED DATA TYPES : R, MW**

**WIRING LIST**

<b>RS232</b>				
Signal	Pin		Pin	Signal
RxD	2	—————	3	TxD
TxD	3	—————	2	RxD
SG	5	—————	5	SG
MPBx-TP (9 pole male)			DIAG-Port (9 pole male)	

**NOTES**

- The MPBx-TP is connected to the FPC405 directly via the DIAG port. Active communication should be possible without any further steps.
- The PLC must be switched on and in Run status.

**8.10 AEG MODICON****AEG MODICON**

PLC Type	Protocol	PLC Port	Parameters
<b>984 Series</b>	Modbus RTU	MB-Port 1 or 2	9600 baud, 8 data bits, 1 Stop bit, Parity Even

**DRIVER DESIGNATION (11, 1) : BUS > MB RTU1 (MPB.BIN)**

**SUPPORTED DATA TYPES : R, M**

**WIRING LIST**

<b>RS232</b>			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
		4	DTR
		6	DSR
		7	RTS
		8	CTS
MPBx-TP (9 pole male)		MBx-Port (9 pole male)	

**NOTES**

- The MPBx-TP is connected to the Modicon 984 via one of the two MB ports (1 or 2).
- Two different data types are available. "R" are word registers and correspond to 4x registers (40001...). "M" are markers or bit registers and correspond to 0x registers (00001...).
- Ensure that the connected station and the station to be addressed (number) match, and that the PLC is in RUN mode.
- The MPBx-TP uses the standard parameters for the MB port which are the factory settings when the PLC is delivered. Active communication should therefore be possible immediately.
- If this is not the case, try to address the appropriate MB port using the programming software and the same parameters and address (e.g.: Online Editor).
- If the MB port cannot be addressed via the programming software either, check the setting of the port address. This can be set either via the software or via the hardware (see PLC manual, "Configuration of the MB port").
- If access via the programming software with the same parameters, address and protocol type (Modbus RTU) is possible, the MPBx-TP can be connected again to the MB port.
- The PLC requires a long time after startup before it is in RUN mode. The target device may therefore temporarily report an error after being switched on.

**Remedy: Switch on target device with PLC!**

## 8.11 TELEMECANIQUE

## TELEMECANIQUE

PLC Type	Protocol	PLC Port	Parameters
TSX17	UNI-Telway	TSX-SCG116	9600 baud, 8 data bits, 1 Stop bit, Parity Odd

**DRIVER DESIGNATION (11, 3) : BUS > TELWAY-S (MPB.BIN)**  
**SUPPORTED DATA TYPES : W**

## WIRING LIST

RS485			
Signal	Pin	Pin	Signal
A	3	14	A
SG	5	8	SG
B	7	7	B
		5	Earth
		12	UTW
Coding example :		4	Parity
		11	N4 (16)
SCG116 as Master		3	N3 (8)
(Station number 0)		10	N2 (4)
		2	N1 (2)
		9	N0 (1)
MPBx-TP		TSX-SCG116	
(9 pole male)		(15 pole male)	

„Parity“ also be connected to „Earth“ if the number of the „Nx“ connected to earth is even.

Detailed notes on the address coding are given in the manual on the UNI-Telway Bus (TSX D24 004G).

## NOTES

- With this connection the MPBx-TP is run as a slave and the SCG116 acts as master.
- Configure the communication module using the dialogue block as described in the manual on the TSX SCG116 (section 3.1-2), using the following parameters :
 

UTW Master (exact number of slave), 9600 baud, Timeout 100ms
- The station number of the master is always 0.  
The number of slaves defined must be as high as the last address in the network. The station number of the MPBx-TP in this case must be higher than 0 and corresponds to the station number via which the MPBx-TP has logged on.
- The "NET" and "ADR" LEDs of the TSX SCG116 must not be lit.  
If the "ADR" LED is lit, this means that the wired address is not correct. If "NET" is lit, this means that one or several configured stations are not responding.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**TELEMECANIQUE**

PLC Type	Protocol	PLC Port	Parameters
TSX17	UNI-Telway	TSX-ACC5	9600 baud, 8 data bits, 1 Stop bit, Parity Odd

**DRIVER DESIGNATION (11, 4) : BUS > TELWAY-M (MPB.BIN)****SUPPORTED DATA TYPES : W****WIRING LIST**

RS485			
Signal	Pin	Pin	Signal
A	3	14	A
SG	5	8	SG
B	7	7	B
		5	Earth
		12	UTW
		4	Parity
		11	N4 (16)
		3	N3 (8)
		10	N2 (4)
		2	N1 (2)
		9	N0 (1)
Coding example :			
ACC5 as Slave 1 (Station number 1)			
MPBx-TP (9 pole male)		TSX-ACC5 (15 pole male)	

„Parity“ also be connected to „Earth“ if the number of the „Nx“ connected to earth is even.

Detailed notes on the address coding are given in the manual on the UNI-Telway Bus (TSX D24 004G).

**NOTES**

- With this connection the MPBx-TP acts as master. However, only one slave can be run with this (point-to-point).
- Configure the communication module using a dialogue block, as described in the manual on the TSX ACC5 (section 2.1-1). Use the following parameters:  
  
UTW : 9600 baud, ODD Parity, 8 data bits, 1 stop bit
- In this case the station number of the MPBx-TP is 0 (Master).  
The set station number on the ACC5 must correspond to the station number to be addressed via the MPBx-TP.

**WIRING NOTES**

- The connections described are made directly on the communications card without the use of a two-way branch (e.g.: TSX SCA62).
- In this case, however no BUS terminating resistors are provided at the PLC end. This is permissible for a point-to-point connection.  
In this case switch on the bus terminating resistors of the RS485 on the MPBx-TP.
- If several stations are connected to the same BUS, a two-way branch with bus terminating resistors switched on must be used for at least the first and last PLC. If the MPBx-TP is at the end of the link, its bus terminating resistors must be switched on (see configuration of the MPBx-TP).

<b>TELEMECANIQUE</b>
----------------------

PLC Type	Protocol	PLC Port	Parameter
<b>TSX37</b>	UNI-Telway	AUX AUX (TSX ACC01)	9600 Baud, 8 data bits, 1 stop bit, odd parity

**DRIVER DESIGNATION (11, 3) : BUS > TELWAY-S (MPB.BIN)**

**SUPPORTED DATA TYPES : W**

#### WIRING LIST

<b>RS485</b>			
Signal	Pin	Pin	Signal
A	3	1	A
SG	5	7	SG
B	7	2	B
MPBx-TP (9 pole male)		AUX (8 pole MiniDin male)	

#### NOTES

- When the MPBx-TP is connected it is run as a slave and the TSX37 operates as master.
- The MPBx-TP can run parallel to the PG in this connection and also with other MMIs. Observe the more detailed wiring specifications given in the TSX37 manual.
- Configure the communication interface of the PLC of CHANNEL0 with the following parameters:  
UTW Master, maximum number of slaves (>3), 9600 baud, Timeout 30 ms
- The station number of the TSX27 is always 0 (master).
- The stations 1 to 3 are reserved for the PG.
- The number of slaves specified must be the same size as the last address in the network.
- The station number of the MPBx-TP must always be greater than 3 and smaller or equal to 8, and is the station number the MPBx-TP reports.
- When using the TSX ACC01 ensure that the operating mode selector switch (S1) is set for master mode.
- Also ensure that the bus terminating resistors of the first and last stations are switched on.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

## 8.12 HONEYWELL

**HONEYWELL**

PLC Type	Protocol	PLC Port	Parameters
IPC620	ABC	Comm-Port	9600 baud, 8 data bits, 1 Stop bit, No parity Full duplex

**DRIVER DESIGNATION (4, 5) : HONEYWELL > ABC (MPB.BIN)****SUPPORTED DATA TYPES : RG, M****WIRING LIST**

<b>RS422</b>			
Signal	Pin	Pin	Signal
TxD+	2	21	RxD+
RxD+	3	14	TxD+
TxD-	7	22	RxD-
RxD-	8	15	TxD-
		12	RTS+
		17	CTS+
		13	RTS-
		16	CTS-
MPBx-TP (9 pole male)		Comm-Port (25 pole male)	

**NOTES**

- The MBP-TP is connected to the IPC620 directly on the Comm port or alternatively via a DCM module with the ABC protocol.
- This interface must be configured with the IPC software beforehand. For this set the Ser. Port to "Permitted" under "Edit Proc. Conf." and under "Serial Port Parameters":  
  
FULL DUPLEX, 9600 baud, No Parity, 1 Stop bit, Nodal Address > 0; Protocol ABC
- The station number set (Nodal address) must correspond to the station number to be addressed via the MPBx-TP.

## 8.13 JETTER

## JETTER

PLC Type	Protocol	PLC Port	Parameters
PASE	SYMPAS	Viadukt Port	9600 baud, 8 data bits, 1 Stop bit, No parity

DRIVER DESIGNATION (10, 5) : OTHERS > PASE (MPB.BIN)  
SUPPORTED DATA TYPES : R

## WIRING LIST

RS232			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
SG	5	7	SG
MPBx-TP (9 pole male)		Viaduct-port (9 pole male)	

**Note the poles since the two devices are connected with the same D-Sub connectors and the assignment is not identical.**

## NOTES

- The MPBx-TP is connected to the PASE via the Viaduct Port using the PG protocol and requires specific parameters to be set.
- The registers "R" are divided into 1):
  - 1R Range REG 00001..01996 / 16 Bit Access
  - 2R Range REG 00001..01996 / 24 Bit Access
  - 3R Range REG 50001..01996 / 16 Bit Access
  - 4R Range REG 50001..01996 / 24 Bit Access
- **1) Read next section SPECIAL NOTE (without fail!)**

**SPECIAL NOTE**

Data is normally transferred in word or double word format, e.g.:

1R0141	HI-BYTE LO-BYTE
1R0142	HI-BYTE LO-BYTE
1R0143	HI-BYTE LO-BYTE
1R0144	HI-BYTE LO-BYTE

All values in the PASE, however, are "24-Bit" (3 BYTE) in length.

In the range 1R and 3R the MPBx-TP sends a 00 for the most significant 8 bits:

This has the disadvantage that only bytes (range 0..255) and words (range 0..65535) can be sent, whilst ShortIntegers (range -128..+127) and Integers (range -32768..+32767) cannot.

If the most significant bit (in this case bit 7) of a ShortInteger is set the value is negative:

ShortInteger : -1 = FF<sub>h</sub>; -2 = FE<sub>h</sub>; -128 = 80<sub>h</sub>; 127 = 7F<sub>h</sub> ...

The value -5, for example, is represented in the PASE accordingly as 251 (0000FB<sub>h</sub>) instead of FFFF<sub>h</sub> and must be converted inside the PLC:

The same applies to the Integers (2 bytes).

The ranges 2R and 4R are reserved exclusively for LONG values since they are also transferred in a special way by the DRIVER.

BSP	2R0241	HI-BYTE LO-BYTE
	2R0242	HI-BYTE LO-BYTE
	2R0243	HI-BYTE LO-BYTE
	2R0244	HI-BYTE LO-BYTE
transferred	2R0241	MED-BYTE LO-BYTE
	2R0241	UNUSEDHI-BYTE
	2R0243	MED-BYTE LO-BYTE
	2R0243	UNUSEDLO-BYTE

The two registers 242 and 244 are therefore not written and can be used as required in the PLC program.

Long values are normally in the range of +/- 2,147 billion (32-bits). The min MIN / MAX for the PASE must not, however, exceed +/- 8,388 million (24-bit).

Higher values are shortened by the DRIVER to 24-bit and are therefore transferred incorrectly.

ShortIntegers and Integers are also not permissible in these ranges!

## 8.14 ABB

## ABB

PLC Type	Protocol	PLC Port	Parameters
Masterpiece 90	MODBUS	MMK Port	9600 baud, 8 data bits, 1 Stop bit, No parity

DRIVER DESIGNATION (11, 5) : BUS > ABB-MMK (MPB.BIN)  
 SUPPORTED DATA TYPES : R, M

## WIRING LIST

RS232			
Signal	Pin	Pin	Signal
RxD	2	2	TxD
TxD	3	3	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		MMK-Port (9 pole male)	

## NOTES

- The MPBx-TP is connected to the Masterpiece 90 via the serial interface 2 of the CPU unit.
- Two different data types are possible. "I" data types are word registers and correspond to "4x" registers, for ABB they are DAT(I). "B" data types are marker or bit registers and correspond to the "0x" registers, for ABB these are the DAT(B).
- The station number under which the PLC is to be addressed is **fixed at Station 1**.
- Your system software must also be provided with the Modbus functions, you therefore need the version QMP93 or QMP95.
- Also ensure that all data words that can be addressed via the MPBx-TP are also defined in the PLC.  
Refer for this to the ABB manual on how to define the data words and what effective Modbus addresses are accessed (COLA listing).
- If a value is generated, this will be given a Valid for the subsequent MODBUS address.
- Ensure particularly therefore that no data is written to this Valid or read from it.
- Normally you simply need to leave an address free (see also in the COLA list).

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**8.15 WESTINGHOUSE**

**WESTINGHOUSE**

PLC Type	Protocol	PLC Port	Parameters
PC1100/1200	Modbus RTU	„D“ Connector NL1075/NL1075B	9600 baud, 8 data bits, 1 Stop bit, Parity Even

**DRIVER DESIGNATION (11, 1) : BUS > MB RTU1 (MPB.BIN)**  
**SUPPORTED DATA TYPES : R, M**

**WIRING LIST**

RS485			
Signal	Pin	Pin	Signal
A	3	9	A
SG	5	18	SG
B	7	17	B
MPBx-TP (9 pole male)		„D“ Connector (25 pole female)	

RS485			
Signal	Pin	Pin	Signal
A	3	8	A
SG	5	6	SG
B	7	2	B
MPBx-TP (9 pole male)		NL1075/1075B (Screw Terminal)	

**NOTES**

- Two different data types are available. "R" are word registers and correspond to the "4x" registers. With Westinghouse these are "HR" registers. "M" are marker or bit registers and correspond to "0x" registers. With Westinghouse these are "Coils".
  - The station number under which the MPBx-TP is to address the PLC must be defined with the "UA" command in the PLC (see also in UA command in the PLC manual).
  - The port 3 (RS485) for the interface parameters must also be defined with the CP command.
  - The SW1 on the CPU board of the PC-1200 must be in the RS485 position (all closed = RS485 terminated/all open = RS485 not terminated).
- The first and last station in the line of a RS485 network must be terminated (bus terminating resistors). With a point-to-point connection on both devices in all cases (PLC and MPBx-TP).
- Note particularly that all data words to be exchanged with the MPBx-TP are also defined in the PLC. In the event of using HR registers, data can only be read or written that is also used in the PLC program.

## 8.16 MICRO INNOVATION

<b>Micro Innovation</b>
-------------------------

PLC Type	Protocol	PLC Port	Parameters
Universal	TP1 TP2	Variable	9600 baud, 8 data bits, 1 Stop bit, No parity

**DRIVER DESIGNATION (16, 2) : DIVERS > TP1 (MPB.BIN)**

**(16, 4) DIVERS > TP2 (MPB.BIN)**

**SUPPORTED DATA TYPES : DW**

## WIRING LIST

RS232			
Signal	Pin	Pin	Signal
RxD	2	—————	TxD
TxD	3	—————	RxD
SG	5	—————	SG
MPBx-TP (9 pole male)		Variabel	

RS422			
Signal	Pin	Pin	Signal
RDA	2	—————	TxD+
SDA	3	—————	RxD+
SG	5	—————	SG
SDB	7	—————	RxD-
RDB	8	—————	TxD-
MPBx-TP (9 pole male)		Variabel	

RS485			
Signal	Pin	Pin	Signal
A	3	—————	A
SG	5	—————	SG
B	7	—————	B
MPBx-TP (9 pole male)		Variabel	

## NOTES

- The TP protocols are open interfaces to the MPBx-TP and enable data exchange with any PLC provided with programmable interfaces.
- The major difference between the two protocols (TP1 and TP2) is that TP1 transfers individual values and TP2 data blocks.  
For this see the following sections.
- The protocol does not require a hardware handshake and can be used with any interface.  
The final wiring to your PLC must be made according to the physical interface (see WIRING LIST).

**8.16.1 DATA TRANSFER PROTOCOL**

The data exchange between the PLC and the MPBx-TP is carried out only on request.

Two different commands are provided for this. which are each initiated by an STX (02<sub>h</sub>).

- 40<sub>h</sub> : Send (MPBx-TP sends data to the PLC)**  
**44<sub>h</sub> : Receive (MPBx-TP expects data from the PLC)**

The Send command is only initiated by the MPBx-TP if new values are detected from the application for the PLC data.

The Receive command is processed normally by the MPBx-TP cyclically (approx. every 100 ms) each time data is polled by the PLC from the application.

**When using the TP1 protocol**, each data word is transferred individually of the TP2 protocol data blocks (n-bytes).

**8.16.2 CONTROL CHARACTERS**

- RECEIVE : 44<sub>h</sub> Data direction -> MPBx-TP  
 SEND : 40<sub>h</sub> Data direction MPBx-TP -> PLC  
 STX : 02<sub>h</sub> Start transmission  
 ETX : 03<sub>h</sub> End end transmission  
 NAK : 15<sub>h</sub> Command or data invalid  
 ACK : 06<sub>h</sub> Command or data valid  
 CR : 0D<sub>h</sub> String end (only for TP1 protocol)

**8.16.3 DATA FORMAT**

**When using the TP1 protocol**, all data words and addresses are transferred as ASCII hex strings.

- Addresses are fixed bytes 000<sub>h</sub>..800<sub>h</sub>  
 Values are 4 bytes 0000<sub>h</sub>..FFFF<sub>h</sub>  
 Each of these hex strings are completed with a CR (0dh).

Examples:

Decimal	Hexadecimal	Hexadecimal String
2368	0940 <sub>h</sub>	30 <sub>h</sub> 33 <sub>h</sub> 34 <sub>h</sub> 30 <sub>h</sub>
17238	4356 <sub>h</sub>	34 <sub>h</sub> 33 <sub>h</sub> 35 <sub>h</sub> 36 <sub>h</sub>
-15364	C3FC <sub>h</sub>	43 <sub>h</sub> 33 <sub>h</sub> 46 <sub>h</sub> 43 <sub>h</sub>

**When using the TP2 protocol**, all data words and addresses are transferred as 2 bytes with the HI byte being transferred before the LO byte.

The TP2 protocol is considerably more efficient than the TP1 protocol. However, it is more difficult to implement the TP2 protocol in some programmable controllers.

**8.16.4 TROUBLESHOOTING**

If the MPBx-TP receives no response from the PLC after a delay (VZ) of up to 500ms (Timeout) after STX the request (STX) is re-started.

If the command was not detected from the PLC (RECEIVE or SEND) or if another error is present in the data package, the PLC must send a NAK (15<sub>h</sub>) within a VZ.

If the MPBx-TP does not receive a NAK or another character as ACK (06<sub>h</sub>) within a VZ, the request is started.

**8.16.5 SEND TP1 PROCEDURE COMMAND**

MPBx-TP	PLC	REMARKS
STX (02h)		Start transfer
	ACK (06h)	PLC ready
SEND (40h)		Data direction MPBx-TP -> PLC
D_NR		Data word number (0..2048)
CR (0Dh)		String end
D_VAL		Value of the data word
CR (0Dh)		String end
ETX (03h)		End transfer
CHK		Checksum (Addition of all bytes from SEND to incl. ETX)
	ACK (06h)	Data received

**8.16.6 SEND TP2 PROCEDURE COMMAND**

MPBx-TP	PLC	REMARKS
STX (02h)		Start transfer
	ACK (06h)	PLC ready
SEND (40h)		Data direction MPBx-TP -> PLC
ADR_HI		HI byte start address
ADR_LO		LO byte start address
BYTE COUNT		Number of data bytes
DATA0_HI		HI byte 1st data word (1st byte)
DATA0_LO		LO byte 1st data word (2nd byte)
DATA1_HI		HI byte 2nd data word (3rd byte)
DATA1_LO		LO byte 2nd data word (4th byte)
...		(max.no "BYTE COUNT")
ETX (03h)		Transfer end
CHK		Checksum (addition of all bytes SEND to and incl. ETX)
	ACK (06h)	Data received

**8.16.7 NOTES**

The MPBx-TP awaits the first ACK (06<sub>h</sub>) within VZ in response to a send request to send data.

If this is the case, the data and checksum are then transferred. If not, the MPBx-TP repeats the request with STX (02<sub>h</sub>).

If the MPBx-TP receives the second ACK after sending the data, the data is considered as having been correctly transferred and the transfer is finished.

If the VZ has elapsed or a different character to ACK is received, the transfer is restarted.

**These notes also apply to the “RECEIVE” command.**

**8.16.8 RECEIVE TP1 PROCEDURE COMMAND**

Troubleshooting see also 6.16.4 and 6.16.7

MPBx-TP	PLC	REMARKS
STX (02h)		Start transfer
	ACK (06h)	PLC ready
RECEIVE (44h)		Data direction PLC -> MPBx-TP
D_NR		Data word number (0..2048)
CR (0Dh)		String end
ETX (03h)		Transfer end
CHK		Checksum (addition of all bytes from RECEIVE to and incl.ETX)
	STX (02h)	Header correct, transfer start
	D_VAL	Value of data word
	CR (0Dh)	String end
	ETX (03h)	Transfer end
	CHK	Checksum (Addition of all bytes from D_VAL to and incl. ETX)

**8.16.9 RECEIVE TP2 PROCEDURE COMMAND**

Troubleshooting see also 6.16.4 and 6.16.7

MPBx-TP	PLC	COMMENTS
STX (02h)		Start transfer
	ACK (06h)	PLC ready
RECEIVE (44h)		Data direction PLC-> MPBx-TP
ADR_HI		HI byte Start address
ADR_LO		LO byte Start address
BYTE COUNT		Number of data bytes
ETX (03h)		End transfer
CHK		Checksum (Addition of all bytes from RECEIVE to and incl. ETX)
	STX (02h)	Header correct, start transfer
	DATA0_HI	HI byte 1st Data word (1st Byte)
	DATA0_LO	LO byte 1st Data word (2nd Byte)
	DATA1_HI	HI byte 2nd Data word (3rd Byte)
	DATA1_LO	LO byte 2nd Data word (4th Byte)
	...	(max. number "BYTE COUNT")
	ETX (03h)	Transfer end
	CHK	Checksum (addition of all bytes from D_VAL to and incl. ETX)

**8.16.10 SPECIAL NOTE**

The PLC should not be processing any time consuming functions during the transfer operation (after ACK was sent) in order to ensure that data is not lost. The MPBx-TP sends in this phase 1 byte to the PLC every 1ms.

Complex tasks should be processed before an ACK is sent in response to a transfer start (MPBx-TP sends STX).

This is necessary since no hardware handshake is activated and therefore data can be overwritten.

**8.16.11 IMPLEMENTATION AIDS**

In order to simplify implementation, we have written programs for IBM-PCs which simulate your PLC and the MPBx-TP itself.

TP.EXE / TP.PAS	Exec and Source Code, Simulation of a PLC with TP1 Protocol
TP2EXE / TP2PAS	Exec and Source Code, Simulation of a PLC with TP2 Protocol
TP2SIM.EXE	Simulates an MPBx-TP with TP2 Protocol; Can be very useful in order to test your own PLC driver with MPBx-TP.

Further information is provided in the README file on diskette.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**8.17 SEITEC****SEITEC**

PLC Typ	Protocol	PLC Port	Parameter
GLT	ISYGLT	GLT-Bus	9600 or 38400 Baud 8 data bits, 1 stop bit, Parity Programmed

**DRIVER DESIGNATION (9, 2) : USER > GLT 9600 (MPB.BIN)****(9, 4) : USER > GLT 38400 (MPB.BIN)****SUPPORTED DATA TYPES : DW****WIRING LIST**

<b>RS485</b>			
Signal	Pin	Pin	Signal
A	3	—————	A
SG	5	—————	SG
B	7	—————	B
MPBx-TP (9 pole male)		GLT-Bus (Screw Terminal)	

**NOTES**

- The MPBx-TP interface via GLT-Bus requires the use of a specific module for interpreting incoming data and copy it to the appropriate markers.  
Example : MODULE 1 MDP/B ; MPBx-TP is awaiting on station 1
- This module is a component of the PLC firmware and need no further programming.
- The station number via which the MPBx-TP must report within the network must match the module number in the PLC program.
- The PLC must be in Run state for active communication.
- If there are more than one MPBx-TP in the network, every MPBx-TP must have his own station number.
- There are two drivers available one for 9600 Baud and one for 38400 Baud. **Important : Take care that every module has the same baud rate !**
- Also ensure when using RS485 that the first and the last station in the network have their bus terminating resistors switched on.

## 8.18 SELECTRON

## SELECTRON

PLC Typ	Protocol	PLC Port	Parameter
<b>SELECONTROL MAS</b>	Modbus RTU	X2 / RS232	9600 Baud, 8 data bits, 1 stop bit, even parity

**DRIVER DESIGNATION (11, 1) : BUS > MB RTU1 (MPB.BIN)**  
**SUPPORTED DATA TYPES : R, M**

## WIRING LIST

RS232 (CPU751/752)			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		X2 RS232 (9 pole female)	

RS232 (CPU714/715)			
Signal	Pin	Pin	Signal
RxD	2		TxD
TxD	3		RxD
SG	5		SG
MPBx-TP (9 pole male)		RS232 (Screw Terminal)	

## NOTES

- The appropriate driver from the COM\_SIO\_ULib must be loaded into the SELECONTROL MAS in order to exchange data with it on the Modbus RTU protocol.  
Order no. of the COM\_SIO\_ULib : 421.0604
- Refer to the relevant documentation from the supplementary manual "CAP1131 User Library" for information on loading and configuring the driver.  
Ensure that interface parameters match those specified (**even parity**)
- The version of the Modbus RTU driver in the SELECONTROL MAS **must** be higher or equal to **2.01**.
- The MPBx-TP operates as master.  
The station number set on the MPBx-TP must match the one output for the driver in the PLC.
- Two different Read/Write data types are available:

"R" are word registers and correspond to the "wOR" data cells in the PLC  
"M" are bit registers and correspond to the "xOD" data cells in the PLC

**MPBx-TP                      SELECONTROL MAS**

R1..256                      wOR[0..255]

M1..256                      xOD[0..255]

All other data types supported by the Selecontrol driver are not used.

The MPBx-TP can process considerably larger data addresses (R1..R9996 and M1..M9996).  
This is also possible in the PLC with small modifications of the driver. If necessary ask the manufacturer of the PLC driver.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 1.0 Drivers

**8.19 SUCONET K****SUCONET K**

PLC Typ	Protocol	PLC Port	Parameter
<b>PS4-200 variable</b>	Suconet K	Suconet	375 and 187,5 kBaud

**DRIVER DESIGNATION (1, 7) : KL.MOELLER > Suconet K (MPB.BIN)**  
**SUPPORTED DATA TYPES : MB**

**WIRING LIST**

<b>RS485</b>			
Signal	Pin	Pin	Signal
A	3	4	A
SG	5	3	SG
B	7	1	B
MPBx-TP (9 pole male)		PS4-200 (5 pole DIN-male)	

**NOTES**

- A user module in the PLC is required in order to connect the MPBx-TP via Suconet K. This user module interprets incoming data and copies it to the appropriate data cells.
- The user modules can be implemented for any PLC with a Suconet connection. The PS 4 200 mentioned is currently the only known PLC for which an appropriate driver is available.  
  
Documentation on this is available from Support.
- The MPBx-TP can only be operated as a slave.  
The Suconet K master function must be set in the PLC.
- The MPBx-TP logs on with the set station number as an active station in the Suconet K network and controls the active data exchange.
- The user module must interpret the data of this station number and pass it on to the MPBx-TP or acknowledge (see Interpreter).
- Also note that the bus terminating resistors of the first and last station in the network must be switched on when using RS 485.

## 8.19.1 INTERPRETER

The data exchange between the MPBx-TP and the PLC requires 20 data bytes reserved for the Receive buffer (data from the MPBx-TP to the PLC) and 20 data bytes for the Send buffer (data from the PLC to the MPBx-TP).

The data of both buffers is interpreted in the same way as shown in the following table:

Address	Designation	Comment
000	Control	<p>Bit 7 <u>Validation bit</u></p> <p>Is toggled by the MPBx-TP with every <b>new data</b> package The user module always writes this bit 7 (or the entire byte) last to the Send buffer after the remaining data has been interpreted and copied. Data transfer is completed successfully when the valid bit of the Send buffer in the MPBx-TP is the same as the valid bit of the Receive buffer. If the bit in the Receive buffer of the PLC changes, a new data package has been sent from the MPBx-TP.</p> <p>Bit 6 <u>Data direction</u></p> <p>This bit indicates whether the data in the Receive buffer has to be copied to the data register of the PLC (Bit = 1) or whether the data from the PLC data register has to be copied to the Send buffer (Bit = 0).</p> <p>Bit 5..0 <u>Reserve</u></p>
001	Bytecounter	Number of data bytes to be copied Minimum 2 Maximum 16
002	AddressLO	Start address LO byte of the data register in the PLC
003	AddressHI	Start address HI byte of the data register in the PLC
004	Data[0]	1st data byte (with word data LO byte 1st data word)
005	Data[1]	2nd data byte (with word data HIbyte 1st data word)
006	Data[2]..	..
018	Data[14]	15th data byte (with word data LO byte 8th data word)
019	Data[15]	16th data byte (with word data HI byte 8th data word)

In the case of a **Receive job** (Control bit 6 = 1) first the data in the Receive buffer must be copied to the data register of the PLC. Only after this can the control byte of the Receive buffer be copied to the Send buffer (validation).

In the case of a **Send job** (Control bit = 0) first the data registers of the PLC must be copied to the Send buffer. Only after this can the control byte of the Receive buffer be copied to the Send buffer (validation).

**Detailed information on Suconet is provided in the Klöckner-Moeller documentation entitled "SUCONET IMPLEMENTATION SET".**

## 9 BCI 2.0 DRIVERS

### 9.1 SIEMENS S7

#### SIEMENS S7

PLC Type	Protocol	PLC Port	Parameter
S7-31x S7-41x	MPI	PG-Port (MPI)	187,5 kBaud

**DRIVER DESIGNATION (1, 1) : SIEMENS > MPI (MPI.BIN)**

**SUPPORTED DATA TYPES : DB, MB, EB, AB (Byte, Word, DWord)**

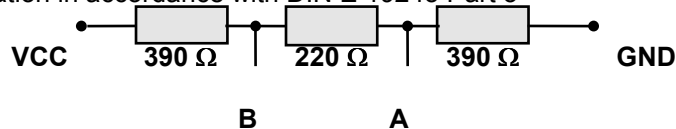
#### WIRING LIST

MPI (RS485)			
Signal	Pin	Pin	Signal
LINE-B	3	3	LINE-B
LINE-A	8	8	LINE-A
RTS	4		
SG	5		
VCC	6		
MPB2-TP (MPI 9 pole male)		S7-MPI (9 pole male)	

#### NOTES

- The interface to the SIMATIC S7 is connected directly via the PG Port (MPI). The connection therefore does not require any parameter setting or the activation of any function blocks.
- Standard Profibus cables and connectors (MPI corresponds physically to Profibus) are required for connecting the individual stations in the MPI network. Please note, for installation of link cable, refer to the specification of SIEMENS Section. MPI, regards length of cables and installation.
- The MPB2-TP card must be set to "ALT" and the current MPI driver (MPI.BIN) must be loaded (see also section 3.2 and 3.3).
- The bus terminating resistors must be switched on at the cable ends (last stations), with at least one of the stations being energised so that the terminations are supplied with power. With the standard Profibus cables this can be switched on using the slide switches in the connector housing.

Line termination in accordance with DIN E 19245 Part 3



**The bus terminating resistors on the MPB2-TP board MUST NOT be switched on !**

**NOTES ON SIMATIC 7 (Continuation)**

- The MPB2-TP station number must be set between 1..125 (influence HSA). Ensure, however, that each station in the MPI network is assigned a unique station number (no double assignments). Check with the PG under "Who's online", which stations are already assigned.

**Station number 0 is reserved for the PG.**

**Station number 2 is the default setting for the PLC**

- The HSA (Highest System Address) must be the same for all stations in the network (15, 31, 63 or 126). If declaration is wrong or missing (use „Param1“ in Configuration Software), the MPB2-TP will use 126.
- As soon as the MPB2-TP is connected with a PLC in the MPI network, you will see this under the set station number in the PG under "Who's online".

The PG cannot, however, be used to establish a connection to this station. If, however, this is attempted, the MPB2-TP will refuse this connection. The PG will then output the message "Station refuses connection establishment".

- The MPB2-TP can establish active connection with up to 42 MPI stations (SIMATIC S7 PLC) at the same time.
- The individual data blocks can be assigned as follows :
  - 1 Byte Destination station (MPI station number)
  - 1 Byte Data type (Byte, Word, Dword)
  - 1 char Data type ("D" = DB:DBB, "M"=MB, "E"=EB, "A"=AB)
  - 1 word Module address (Only with data type D corresponds to the DB number)
  - 1 word Data address

In the case of conflicting data types (byte, word, Dword), the data cannot be stored correctly in the PLC.

e.g. Word value as data type Byte ==> LO/HI byte reversed

- An error message will be output if the set destination station (PLC) is not available or if the network is not connected. The number after ST# corresponds to the missing MPI station number in hexadecimal format.  
MPI 1.52 ST#02 CONNECT?
- If the module address or data address is not available, the following message is output:  
MPI 1.51 ST#09 ADDRESS!

Since the MPB2-TP always transfers data blocks of at least 2 bytes, only the access to the data address is checked and not the subsequent addresses.

Following addresses that are not present are ignored and do not initiate error messages.

- If no errors occur with the data transfer, the following message will be output:  
MPI 1.51 ST#06 READY!

The messages and error messages are generated by the MPB2-TP after every data transfer. These, however, are only displayed in the MMI in the event of a change (error after Ready) or sporadically if the error stays the same.

**9.2 B&R****B&R**

PLC Type	Protocol	PLC Port	Parameter
CP60	Mininet	PP40 Mininet	19200 baud, 8 data bits, 1 stop bit, no parity

**DRIVER DESIGNATION ALT** : MININET > SPOIO Mode (MININET.BIN)

**DRIVER DESIGNATION ALT** : MININET > PLC Mode (MININET.BIN)

**SUPPORTED DATA TYPES** : R, F (only with SPOIO)

**WIRING LIST**

RS232			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	7	SG
MPBx-TP (9 pole male)		PP40-Mininet (25 pole male)	

**NOTES**

- The connection to the B&R CP60 is made via the additional module PP40.  
The firmware of the PP40 must be created with the appropriate drivers for PLC mode or SPOIO mode (see PP40 documentation) and must match the driver selected for the MMI.
  - The MPBx-TP card must be set to "ALT" and the current Mininet driver (MININET.BIN) must be loaded (see section 3.2 and 3.3).
  - The PLC program does not require any other drivers or interpreters and active communication is started immediately.  
As Mininet is a Master/Slave network, ensure that the destination address of the data block is the same as that of the PLC. The MMI has the permanently assigned address 0 and is always the master.
  - Only the register types "R" can be used with the driver for PLC mode. With the driver for SPOIO Mode type "F" markers can also be addressed.
  - Data is exchanged bitwise with the PLC. Words and double words are stored directly in Motorola format.
- Examples :  
 Byte1      R100  
 Word1      R101(HB)      R100 (LB)  
 Dword1    R103(HW/HB)    R102 (HW/LB)    R101 (LW/HB)    R100 (LW/LB)
- HB=Higher Byte, LB=Lower Byte, HW=Higher Word, LW=Lower Word

PLC Type	Protocol	PLC Port	Parameter
PLC-2005	Modbus RTU	IF2 RS-422/485	9600 Baud, 8 data bits, 1 stop bit, even parity

**DRIVER DESIGNATION (11, 1) : BUS > MB RTU1 (MPB.BIN)**  
**SUPPORTED DATA TYPES : R, M**

#### WIRING LIST

RS485			
Signal	Pin	Pin	Signal
A	3	3	A
SG	5	5	SG
B	7	8	B
MPBx-TP (9 pol male)		IF2-2005 (9 pol male)	

RS422			
Signal	Pin	Pin	Signal
TxD+	2	3	RxD+
RxD+	3	2	TxD+
SG	5	5	SG
TxD-	7	8	RxD-
RxD-	8	7	TxD-
MPBx-TP (9 pol male)		IF2-2005 (9 pol male)	

#### NOTES

- The appropriate driver dvframe, up V3.30 must be loaded into the B+R GDM and the Library dvframe.br and drv\_modbus.slb, up V T1.403 must be loaded into PLC Programm in order to exchange data with it on the Modbus RTU protocol.
- Two different data types are available. "R" are (word) registers and correspond to the "MB4" Holding registers. "M" are marker or (bit) registers and correspond to "MB0" "Coils" registers.
- Refer to the relevant documentation from the PG Onlinehelp under Lib-Help for information on loading and configuring the driver.

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 2.0 Drivers

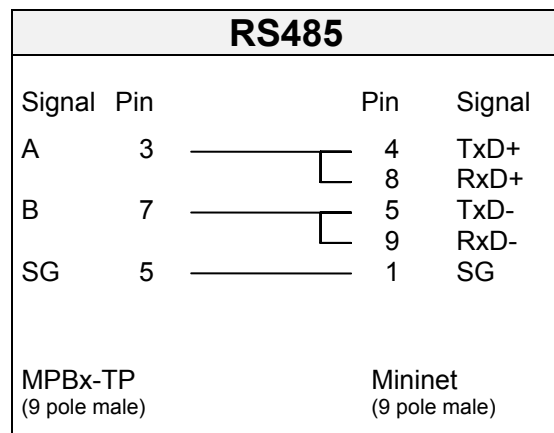
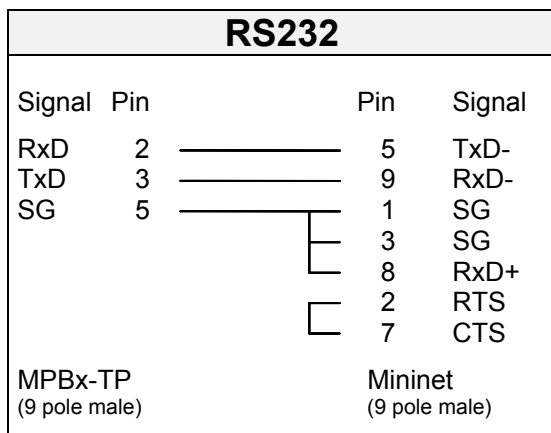
**9.3 HAPA**

**Hapa**

PLC Type	Protocol	PLC Port	Parameter
HAPA110	Mininet	Mininet	19200 Baud, 8 data bits, 1 stop bit, no parity

**DRIVER DESIGNATION ALT : HAPA110 > SPOIO Mode (MININET.BIN)**  
**DRIVER DESIGNATION ALT : HAPA110 > PLC Mode (MININET.BIN)**  
**SUPPORTED DATA TYPES : M**

**WIRING LIST**



**NOTES**

- The Hapa110 is connected via the integrated Mininet interface. The Hapa110 firmware must be created with the appropriate drivers for PLC and SPOIO Mode (see Hapa110 documentation). The MMI can then be run in one of the two modes.
- The MPBx-TP card must be set to "ALT" and the current Mininet driver (MININET.BIN) must be loaded (see section 3.2 and 3.3).
- The PLC program does not require any other drivers or interpreters and active communication is started immediately. As Mininet is a Master/Slave network, ensure that the destination address of the data block is the same as that of the PLC. The MMI has the permanently assigned address 0 and is always the master.
- Only marker type "M" can be used with the driver for PLC Mode and SPOIO Mode.
- Each address can either be assigned a byte, word or double word. All values for each address are always transferred as double words in Motorola format.  
Examples :  

Byte	5	00 00 00 05	Byte	-7	00 00 00 F9
Word	512	00 00 02 00	Word	-128	00 00 FF 80
Dword	160	00 00 00 A0	Dword	-5430	FF FF EA CA
- The address to be assigned in the MMI also corresponds to the same address in the PLC. For this the address is multiplied by 4 during data transfer (compatibility with B&R).
- When using the RS 485 variant switch on at least the bus terminating resistors of the MPBx-TP.

## 9.4 MOELLER PS40

## Moeller PS40

PLC Type	Protocol	PLC Port	Parameter
PS4-141 PS4-151 PS4-201 PS4-341 PS416	Suconet K	Suconet K SBI (PS416)	375 kBaud or 187.5 kBaud

DRIVER DESIGNATION ALT : PS4-141-MM1 > Suconet K (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-151-MM1 > Suconet K (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-201-MM1 > Suconet K (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-341-MM1 > Suconet K (PS40.BIN)

DRIVER DESIGNATION ALT : PS416 > Suconet K (PS40.BIN)

SUPPORTED DATA TYPES : MB

## WIRING LIST

RS485				
Signal	Pin		Pin	Signal
A	3	—————	4	A
SG	5	—————	3	SG
B	7	—————	1	B
MPBx-TP (9 pole male)			PS4-XXX (5 pole DIN male)	

RS485				
Signal	Pin		Pin	Signal
A	3	—————	3	A
SG	5	—————	5	SG
B	7	—————	7	B
MPBx-TP (9 pole male)			PS416 (9 pole male)	

## NOTES

- Devices with the MPBx-TP card are incorporated in the Suconet network configuration under the general name "MV4" (Suconet Identifier A060).
- The number of Suconet data bytes and the station number of these devices can be parameterised in the network configuration and must match the settings in the design software:

<u>Sucosoft Topology Configuration</u>	<u>Design software</u>
--	------------------------

Station number	=	MMI Station No.
Receive data	=	Send Buffer
Send data	=	Receive Buffer

Permissible values :

Receive data	13 21 37 69
Send data	10 18 34 66

= User data	8 16 32 64
-------------	------------

**NOTES (Continued)**

- The effective user data is less than the value specified as receive and send data. The first 5 bytes of receive data and the first 2 bytes of send data (from the point of view of the PLC) are header data and define the location of the user data, which in turn corresponds to the physical markers of the PLC.
- For this each device fitted with an MPBx-TP card requires an application module assigned to it in the Suconet master. This module interprets the incoming data and copies it to the markers or reads from them.
- The name of the application module is "MI4netK" and is a manufacturer-defined function block in the Sucasoft programming software from version 3.0. Refer to the relevant Sucasoft documentation "AWB-C 2700-1349" for the exact use of this function block.
- The MPBx-TP card must be set to "ALT" and the current PS40 driver (PS40.BIN) must be loaded (for this see also sections 3.2 and 3.3).
- The PLC must be in "RUN" status for active communication otherwise the "MI4netK" function block cannot generate a response.
- Remember also that the RS485 protocol requires the bus terminating resistors of the first and last station in the network to be switched on.
- The following messages can be generated:
 

Suconet K 1.00 CONNECT	Master not available or cable break
Suconet K 1.00 ADDRESS	Marker address outside of permissible range
Suconet K 1.00 PLCRUN	Master PLC not in "RUN"
Suconet K 1.00 TIMEOUT	General Suconet
Suconet K 1.00 PROTOCOL	Application module not active or cycle time > 2.5 seconds
Suconet K 1.00 READY	Active data exchange

<b>Moeller PS40</b>
---------------------

PLC Type	Protocol	PLC Port	Parameter
PS4-141 PS4-151 PS4-201 PS4-341	SUCOM-A	PRG	9600 Baud, 8 data bits , 1 start bit, 2 stop bits

DRIVER DESIGNATION ALT : PS4-141-MM1 > PRG (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-151-MM1 > PRG (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-201-MM1 > PRG (PS40.BIN)

DRIVER DESIGNATION ALT : PS4-341-MM1 > PRG (PS40.BIN)

SUPPORTED DATA TYPES : MB

#### WIRING LIST

RS232				
Signal	Pin		Pin	Signal
RxD	2	—————	5	TxD
TxD	3	—————	2	RxD
SG	5	—————	3	SG
MPBx-TP (9 pole male)			PS4-XXX (5 pole DIN male)	

#### NOTES

- The SUCOM-A protocol of the programming device is used when connecting the MPBx-TP to the PRG interface.  
This is part of the OS of the PLC and active communication must be possible directly afterwards.
- The MPBx-TP card must be set to "ALT" and the current PS40 driver (PS40.BIN) must be loaded (for this see also sections 3.2 and 3.3).
- The PLC must be in "RUN" status for active communication.
- The data exchange is only carried out with the physical markers of the PLC.
- The following messages can be generated:

SUCOM-A 2 1.00 CONNECT	PLC not switched on or cable break
SUCOM-A 2 1.00 ADDRESS	Marker address outside of permissible range
SUCOM-A 2 1.00 PLCRUN	Master PLC not in "RUN"
SUCOM-A 2 1.00 TIMEOUT	Cycle time > 2.5 seconds
SUCOM-A 2 1.00 PROTOCOL	General protocol error
SUCOM-A 2 1.00 READY	Active data exchange

**Card Description MPB1-TP / MPB2-TP**

Communications

BCI 2.0 Drivers

**Moeller PS40**

PLC Type	Protocol	PLC Port	Parameter
PS416	SUCOM-A	PRG	9600 Baud, 8 data bits, 1 Start bit, 2 Stop bit

**DRIVER DESIGNATION ALT : PS416 > PRG (PS40.BIN)****SUPPORTED DATA TYPES : MB****WIRING LIST**

RS232			
Signal	Pin	Pin	Signal
RxD	2	3	TxD
TxD	3	2	RxD
SG	5	5	SG
MPBx-TP (9 pole male)		PS416 (5 pole DIN male)	

RS485			
Signal	Pin	Pin	Signal
A	3	3	A
SG	5	5	SG
B	7	7	B
MPBx-TP (9 pole male)		PS416 (9 pole male)	

**NOTES**

- The SUCOM-A protocol of the programming device is used when connecting the MPBx-TP to the PRG interface.  
This is part of the OS of the PLC and active communication must be possible directly afterwards.
- The MPBx-TP card must be set to "ALT" and the current PS40 driver (PS40.BIN) must be loaded (for this see also sections 3.2 and 3.3).
- The PLC must be in "RUN" status for active communication.
- Ensure that the physical PRG interface matches that of the MPBx-TP (RS232 or RS485).
- Remember also that the RS485 protocol requires the bus terminating resistors of both stations to be switched on.
- The data exchange is only carried out with the physical markers of the PLC.
- The following messages can be generated:

SUCOM-A 1 1.00 CONNECT	PLC not switched on or cable break
SUCOM-A 1 1.00 ADDRESS	Marker address outside of permissible range
SUCOM-A 1 1.00 PLCRUN	Master PLC not in "RUN"
SUCOM-A 1 1.00 TIMEOUT	Cycle time > 2.5 seconds
SUCOM-A 1 1.00 PROTOCOL	General protocol error
SUCOM-A 1 1.00 READY	Active data exchange



**Micro Innovation AG  
Spinnereistr 8-14  
CH-9008 St. Gallen  
Switzerland**

**Tel : ++41- 71 243 24 24  
Fax : ++41- 71 243 24 90  
email : [info@microinnovation.com](mailto:info@microinnovation.com)  
homepage : <http://www.microinnovation.com>**