

## SIMATIC

### S7 S7-200 SMART V3

#### System Manual

|                                             |    |
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### A.10.3 EM DP01 PROFIBUS DP module wiring diagram

Table A-127 Wiring diagram for the EM DP01 PROFIBUS DP module (6ES7288-7DP01-0AA0)

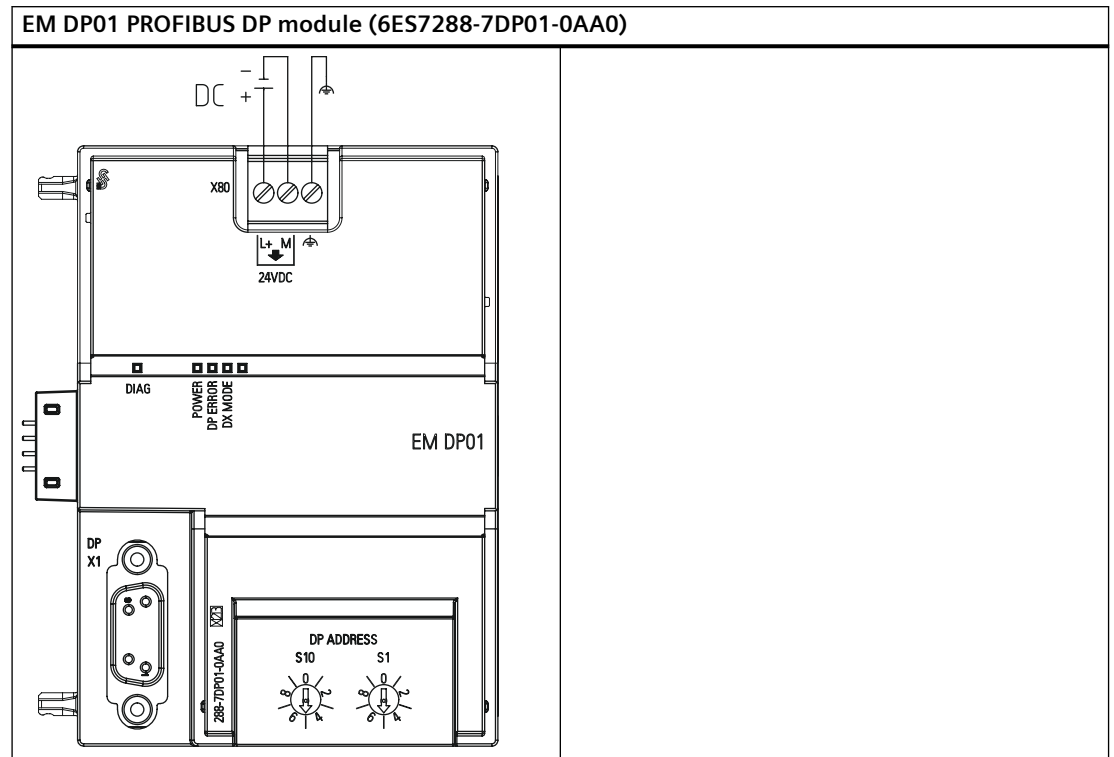


Table A-128 Connector pin locations for EM DP01 PROFIBUS DP module (6ES7288-7DP01-0AA0)

| Pin | X80              |
|-----|------------------|
| 1   | L+ / 24 V DC     |
| 2   | M / 24 V DC      |
| 3   | Functional Earth |

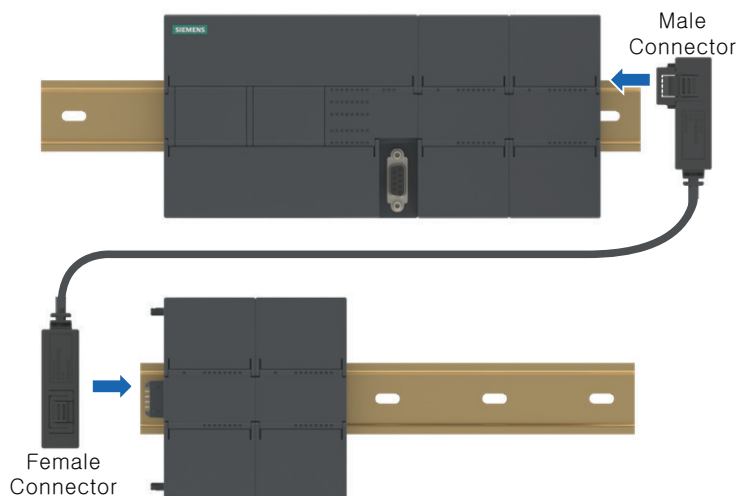
## A.11 S7-200 SMART cables

### A.11.1 S7-200 SMART I/O expansion cable

Table A-129 S7-200 SMART Expansion cable

| Technical Data |                    |
|----------------|--------------------|
| Article number | 6ES7288-6EC01-0AA0 |
| Cable length   | 1 m                |
| Weight         | 80 g               |

Refer to the installation section (Page 99) for information about installing and removing the S7-200 SMART expansion cable.



## A.11.2 RS-232/PPI Multi-Master Cable and USB/PPI Multi-Master Cable

### A.11.2.1 Overview

#### RS-232/PPI Multi-Master Cable and USB/PPI Multi-Master Cable Specifications

Table A-130 General Specifications

| Technical Data                        | RS-232/PPI Multi-Master cable | USB/PPI Multi-Master cable |
|---------------------------------------|-------------------------------|----------------------------|
| Article number                        | 6ES7901-3CB30-0XA0            | 6ES7901-3DB30-0XA0         |
| Supply voltage                        | 14.4 to 28.8 VDC              | 14.4 to 28.8 VDC           |
| Supply current at 24 V nominal supply | 60 mA RMS max.                | 50 mA RMS max.             |
| Isolation                             | RS-485 to RS-232: 500 VDC     | RS-485 to USB: 500 VDC     |

| RS-485 Side Electrical Characteristics  |                                                                                         |                                                                                         |
|-----------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Common mode voltage range               | -7 V to +12 V, 1 second, 3 V RMS continuous                                             | -7 V to +12 V, 1 second, 3 V RMS continuous                                             |
| Receiver input impedance                | 5.4 k $\Omega$ min. including termination                                               | 5.4 k $\Omega$ min. including termination                                               |
| Termination/bias                        | 10 k $\Omega$ to +5 V on B, PROFIBUS pin 3<br>10 k $\Omega$ to GND on A, PROFIBUS pin 8 | 10 k $\Omega$ to +5 V on B, PROFIBUS pin 3<br>10 k $\Omega$ to GND on A, PROFIBUS pin 8 |
| Receiver threshold/sensitivity          | $\pm 0.2$ V, 60 mV typical hysteresis                                                   | $\pm 0.2$ V, 60 mV typical hysteresis                                                   |
| Transmitter differential output voltage | 2 V min. at $R_L = 100 \Omega$ ,<br>1.5 V min. at $R_L = 54 \Omega$                     | 2 V min. at $R_L = 100 \Omega$ ,<br>1.5 V min. at $R_L = 54 \Omega$                     |

| RS-232 Side Electrical Characteristics |                                                             |   |
|----------------------------------------|-------------------------------------------------------------|---|
| Receiver input impedance               | 3 k $\Omega$ min.                                           | - |
| Receiver threshold/sensitivity         | 0.8 V min. low, 2.4 V max. high<br>0.5 V typical hysteresis | - |
| Transmitter output voltage             | $\pm 5$ V min. at $R_L = 3$ k $\Omega$                      | - |

| USB Side Electrical Characteristics                |   |                  |
|----------------------------------------------------|---|------------------|
| Full speed (12 MB/s), Human Interface Device (HID) |   |                  |
| Supply current at 5 V                              | - | 50 mA max.       |
| Power down current                                 | - | 400 $\mu$ A max. |

## Features

You can use the RS232/PPI Multi-Master cable with the S7-200 SMART CPUs in Freeport mode. See the Freeport mode for more information.

The USB cable requires the STEP 7-Micro/WIN SMART V2.3 (or later) programming software for operation.

### A.11.2.2 RS-232/PPI Multi-Master Cable

Table A-131 RS-232/PPI Multi-Master Cable - Pin-outs for RS-485 to RS-232 Local Mode Connector

| RS-485 Connector Pin-out |                                   | RS-232 Local Connector Pin-out |                                              |
|--------------------------|-----------------------------------|--------------------------------|----------------------------------------------|
| Pin Number               | Signal description                | Pin number                     | Signal Description                           |
| 1                        | No connect                        | 1                              | Data Carrier Detect (DCD) (not used)         |
| 2                        | 24 V Return (RS-485 logic ground) | 2                              | Receive Data (RD) (output from PC/PPI cable) |
| 3                        | Signal B (Rx/D/TxD+)              | 3                              | Transmit Data (TD) (input to PC/PPI cable)   |
| 4                        | RTS (TTL level)                   | 4                              | Data Terminal Ready (DTR) <sup>1</sup>       |
| 5                        | No connect                        | 5                              | Ground (RS-232 logic ground)                 |
| 6                        | No connect                        | 6                              | Data Set Ready (DSR) <sup>1</sup>            |
| 7                        | 24 V Supply                       | 7                              | Request To Send (RTS) (not used)             |
| 8                        | Signal A (Rx/D/TxD-)              | 8                              | Clear To Send (CTS) (not used)               |
| 9                        | Protocol select                   | 9                              | Ring Indicator (RI) (not used)               |

<sup>1</sup> Pins 4 and 6 are connected internally.

# Ordering information

## F.1 CPU modules

| CPU models            | Article number     |
|-----------------------|--------------------|
| CPU ST40, DC/DC/DC    | 6ES7288-1ST40-0AA2 |
| CPU SR40, AC/DC/Relay | 6ES7288-1SR40-0AA2 |
| CPU SR60, AC/DC/Relay | 6ES7288-1SR60-0AA2 |
| CPU ST60, DC/DC/DC    | 6ES7288-1ST60-0AA2 |

## F.2 Expansion modules (EMs) and signal boards (SBs)

| Expansion modules and signal boards                                | Article number     |
|--------------------------------------------------------------------|--------------------|
| EM Digital 8 x Inputs (EM DE08)                                    | 6ES7288-2DE08-0AA0 |
| EM Digital 16 x Inputs (EM DE16)                                   | 6ES7288-2DE16-0AA0 |
| EM Digital 8 x Outputs Transistor (EM DT08)                        | 6ES7288-2DT08-0AA0 |
| EM Digital 8 x Outputs Relay (EM DR08)                             | 6ES7288-2DR08-0AA0 |
| EM Digital 16 x Outputs Relay (EM QR16)                            | 6ES7288-2QR16-0AA0 |
| EM Digital 16 x Outputs Transistor (EM QT16)                       | 6ES7288-2QT16-0AA0 |
| EM Digital 8 x Inputs / Digital 8 x Outputs Transistor (EM DT16)   | 6ES7288-2DT16-0AA0 |
| EM Digital 8 x Inputs/ Relay 8 x Outputs (EM DR16)                 | 6ES7288-2DR16-0AA0 |
| EM Digital 16 x Inputs / Digital 16 x Outputs Transistor (EM DT32) | 6ES7288-2DT32-0AA0 |
| EM Digital 16 x Inputs / Relay 16 x Outputs (EM DR32)              | 6ES7288-2DR32-0AA0 |
| EM Analog 4 x Inputs (EM AE04)                                     | 6ES7288-3AE04-0AA0 |
| EM Analog 2 x Outputs (EM AQ02)                                    | 6ES7288-3AQ02-0AA0 |
| EM Analog 4 x Outputs (EM AQ04)                                    | 6ES7288-3AQ04-0AA0 |
| EM Analog 8 x Inputs (EM AE08)                                     | 6ES7288-3AE08-0AA0 |
| EM Analog 2 x Inputs / Analog 1 x Outputs (EM AM03)                | 6ES7288-3AM03-0AA0 |
| EM Analog 4 x Inputs / Analog 2 x Outputs (EM AM06)                | 6ES7288-3AM06-0AA0 |
| EM RTD 2 x 16 bit (EM AR02)                                        | 6ES 288-3AR02-0AA0 |
| EM RTD 4 x 16 bit (EM AR04)                                        | 6ES7288-3AR04-0AA0 |
| EM TC 4 x 16 bit (EM AT04)                                         | 6ES7288-3AT04-0AA0 |
| EM DP01 PROFIBUS DP SMART (EM DP01)                                | 6ES7288-7DP01-0AA0 |
| SB Digital 2 x Inputs / Digital 2 x Outputs (SB DT04)              | 6ES7288-5DT04-0AA0 |
| SB Analog 1 x Output (SB AQ01)                                     | 6ES7288-5AQ01-0AA0 |
| SB Analog 1 x Input (SB AE01)                                      | 6ES7288-5AE01-0AA0 |

| Expansion modules and signal boards | Article number     |
|-------------------------------------|--------------------|
| SB RS485/RS232 (SB CM01)            | 6ES7288-5CM01-0AA0 |
| SB Battery (SB BA01)                | 6ES7288-5BA01-0AA0 |

### F.3 Programming software

| Programming software                                  | Article number     |
|-------------------------------------------------------|--------------------|
| STEP 7-Micro/WIN SMART V3 Individual License (CD-ROM) | 6ES7288-8SW01-0AA1 |

### F.4 Spare parts and other hardware

| Cables, network connectors, repeaters, and end retainers                     | Article number     |
|------------------------------------------------------------------------------|--------------------|
| I/O Expansion cable, 1 m                                                     | 6ES7288-6EC01-0AA0 |
| MPI Cable                                                                    | 6ES7901-0BF00-0AA0 |
| RS-232/PPI Multi-Master cable                                                | 6ES7901-3CB30-0XA0 |
| USB/PPI Multi-Master cable                                                   | 6ES7901-3DB30-0XA0 |
| PROFIBUS Network cable                                                       | 6XV1830-0EH30      |
| Network Bus Connector with Programming Port Connector, Vertical Cable Outlet | 6ES7972-0BB12-0XA0 |
| Network Bus Connector (no programming port connector), Vertical Cable Outlet | 6ES7972-0BA12-0XA0 |
| RS485 Bus Connector with 35° Cable Outlet (no programming port connector)    | 6ES7972-0BA42-0XA0 |
| RS485 Bus Connector with 35° Cable Outlet (with programming port connector)  | 6ES7972-0BB42-0XA0 |
| RS485 IP 20 Repeater, Isolated                                               | 6ES7972-0AA02-0XA0 |
| TD/CPU Connecting cable                                                      | 6ES7901-3EB10-0XA0 |
| End Retainer Thermoplast, 10 MM                                              | 8WA1808            |
| End Retainer, Steel                                                          | 8WA1805            |

Table F-1 Terminal block spare kits

| If you have<br>S7-200 SMART module (article number) | Use this terminal block spare kit (4/pk) |                            |
|-----------------------------------------------------|------------------------------------------|----------------------------|
|                                                     | Terminal block article number            | Terminal block description |
| CPU ST40, DC/DC/DC (6ES7288-1ST40-0AA1)             | 6ES7292-1AH30-0XA0                       | 8 pin, tin-plated          |
|                                                     | 6ES7292-1AV30-0XA0                       | 20 pin, tin-plated         |
|                                                     | 6ES7 292-1AL30-0XA0                      | 11 pin, tin-plated         |
| CPU SR40, AC/DC/Relay (6ES7288-1SR40-0AA1)          | 6ES7292-1AV30-0XA0                       | 20 pin, tin-plated         |
|                                                     | 6ES7292-1AV40-0XA0                       | 20 pin, tin-plated         |
|                                                     | 6ES7292-1AV30-0XA0                       | 12 pin, tin-plated         |
| CPU ST60, DC/DC/DC (6ES7288-1ST60-0AA1)             | 6ES7292-1AV30-0XA0                       | 20 pin, tin-plated         |
|                                                     | 6ES7292-1AM30-0XA0                       | 12 pin, tin-plated         |

| If you have<br>S7-200 SMART module (article number)                             | Use this terminal block spare kit (4/pk) |                                |
|---------------------------------------------------------------------------------|------------------------------------------|--------------------------------|
|                                                                                 | Terminal block article number            | Terminal block description     |
| CPU SR60, AC/DC/Relay (6ES7288-1SR60-0AA1)                                      | 6ES7292-1AV30-0XA0                       | 20 pin, tin-plated             |
|                                                                                 | 6ES7292-1AV40-0XA0                       | 20 pin, tin-plated             |
|                                                                                 | 6ES7292-1AV30-0XA0                       | 12 pin, tin-plated             |
| EM Digital 8 x Inputs (EM DE08) (6ES7288-2DE08-0AA0)                            | 6ES7292-1AG30-0XA0                       | 7 pin, tin-plated              |
| EM Digital 8 x Outputs (EM DT08) (6ES7288-2DT08-0AA0)                           | 6ES7292-1AG30-0XA0                       | 7 pin, tin-plated              |
| EM Digital 8 x Outputs Relay (EM DR08)<br>(6ES7288-2DR08-0AA0)                  | 6ES7292-1AG30-0XA0                       | 7 pin, tin-plated              |
|                                                                                 | 6ES7292-1AG40-0XA0                       | 7 pin, tin-plated, keyed-right |
| EM Digital 8 x Inputs / Digital 8 x Outputs (EM DT16)<br>(6ES7288-2DT16-0AA0)   | 6ES7292-1AG30-0XA0                       | 7 pin, tin-plated              |
| EM Digital 8 x Inputs/ Relay 8 x Outputs (EM DR16)<br>(6ES7288-2DR16-0AA0)      | 6ES7292-1AG30-0XA0                       | 7 pin, tin-plated              |
|                                                                                 | 6ES7292-1AG40-0XA0                       | 7 pin, tin-plated, keyed-right |
| EM Digital 16 x Inputs / Digital 16 x Outputs (EM DT32)<br>(6ES7288-2DT32-0AA0) | 6ES7292-1AL30-0XA0                       | 11 pin, tin-plated             |
| EM Digital 16 x Inputs / Relay 16 x Outputs (EM DR32)<br>(6ES7288-2DR32-0AA0)   | 6ES7292-1AL30-0XA0                       | 11 pin, tin-plated             |
|                                                                                 | 6ES7292-1AL40-0XA0                       | 11 pin, tin-plated, keyed      |
| EM Analog 4 x Inputs (EM AE04) (6ES7288-3AE04-0AA0)                             | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Analog 8 x Inputs (EM AE08) (6ES7288-3AE08-0AA0)                             | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Analog 2 x Outputs (EM AQ02)<br>(6ES7288-3AQ02-0AA0)                         | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Analog 4 x Outputs (EM AQ04)<br>(6ES7288-3AQ04-0AA0)                         | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Analog 2 x Inputs / Analog 1 x Outputs (EM AM03)<br>(6ES7288-3AM03-0AA0)     | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Analog 4 x Inputs / Analog 2 x Outputs (EM AM06)<br>(6ES7288-3AM06-0AA0)     | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM RTD 2 x 16 bit (EM AR02) (6ES7288-3AR02-0AA0)                                | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM RTD 4 x 16 bit (EM AR04) (6ES7288-3AR04-0AA0)                                | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM TC 4 x 16 bit (EM AT04) (6ES7288-3AT04-0AA0)                                 | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |
| EM Profibus DP SMART (EM DP01) (6ES7288-7DP01-0AA0)                             | 6ES7292-1BG30-0XA0                       | 7 pin, gold-plated             |