

User Guide

SM-PROFIBUS DP-V1

Solutions Module for:

- Unidrive SP
- Commander SK
- Affinity
- Digitax ST
- Mentor MP

Part Number: 0471-0008-11
Issue Number: 11

The second method of transfer is called non-cyclic data and is used for sending values that only need to be changed occasionally or where the source or destination of the signal changes. This is the equivalent of a temporary patch lead that is removed after use.

2.2 Software Statement

This Solutions Module (SM) is supplied with the latest software version. When retro-fitting to an existing system, all software versions should be verified to confirm the same functionality as Solutions Modules of the same type already present. This also applies to products returned from a Control Techniques Service Centre or Repair Centre. If there is any doubt please contact the supplier of the product.

The software version of the Solutions Module can be identified by looking at Pr **MM.02** and Pr **MM.51**, where **MM** is the relevant menu number for the Solutions Module slot being used.

See Pr **MM.02** and Pr **MM.51** description later in this manual for more information.

The software version takes the form of xx.yy.zz, where Pr **MM.02** displays xx.yy and Pr **MM.51** displays zz (e.g. for software version 01.01.00 Pr **MM.02** will display 1.01 and Pr **MM.51** will display 0).

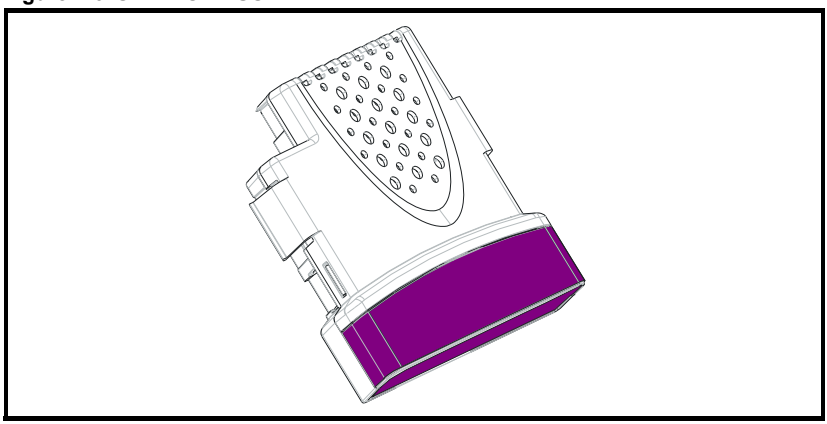
2.3 What is SM-PROFIBUS DP-V1?

The SM-PROFIBUS DP-V1 is a fieldbus Solutions Module that can be installed to the expansion slot(s) in any of the following drives to provide PROFIBUS-DP slave connectivity:

- Unidrive SP
- Commander SK
- Affinity
- Digitax ST
- Mentor MP

With the exception of the Commander SK drive, it is possible to use more than one SM-PROFIBUS DP-V1 or a combination of SM-PROFIBUS DP-V1 and other Solution Modules to add additional functionality such as extended I/O, gateway functionality, or additional PLC features.

Figure 2-3 SM-PROFIBUS DP-V1



2.4 General specification

2.4.1 Features

The following section gives a brief overview of the functionality available within SM-PROFIBUS DP-V1.

- Supported data rates (bits/s): 12M, 6.0M, 3.0M, 1.5M, 500k, 187.5k, 93.75k, 45.45k, 19.2k, 9.6k.
- Maximum of 32 input and 32 output cyclic data words supported
- PROFIdrive profiles (V2 and V4) supported
- Non-cyclic data channel supported
- Parallel acyclic/cyclic data communication

The SM-PROFIBUS DP-V1 is powered from the host drive's internal power supply.

2.4.2 Main differences between DP-V0 and DP-V1

The main differences between DP-V0 and DP-V1 supported by SM-PROFIBUS DP-V1 are:

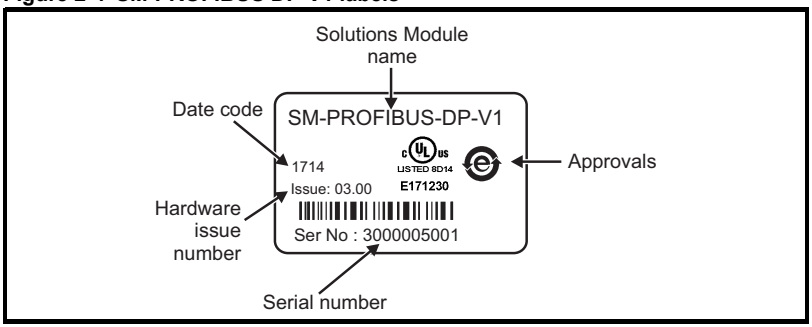
- PROFIdrive profile V4 support, which consists of
  - Standard Telegram 1
  - PROFIdrive PNU Access
  - Drive Identification
  - Fault Buffer
  - Identification and Maintenance Functions
- Non-cyclic data channel access

2.5 Solutions Module identification

The SM-PROFIBUS DP-V1 can be identified by:

1. The label located on the underside of the Solutions Module.
2. The color coding across the front of the SM-PROFIBUS DP-V1 (purple).

Figure 2-4 SM-PROFIBUS DP-V1 labels



2.5.1 Date code format

The date code is four numbers. The first two numbers indicate the year and the remaining numbers indicate the week of the year in which the drive was built.

Example:

A date code of 1710 would correspond to week 10 of year 2017.

3 Mechanical installation

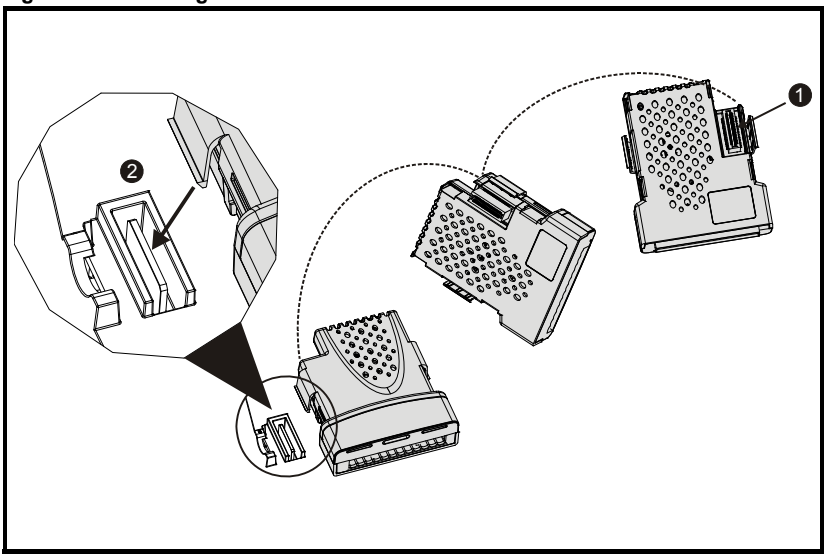
WARNING

Before installing or removing a Solutions Module in any drive, ensure the AC supply has been disconnected for at least 10 minutes and refer to Chapter 1 *Safety information* on page 8. If using a DC bus supply ensure this is fully discharged before working on any drive or Solutions Module.

3.1 General Installation

The installation of a Solutions Module is illustrated in Figure 3-1.

Figure 3-1 Installing a Solutions Module



The Solutions Module connector is located on the underside of the module (1). Push this into the Solutions Module slot located on the drive until it clicks into place (2). Note that some drives require a protective tab to be removed from the Solutions Module slot. For further information, refer to the appropriate drive documentation.

4 Electrical installation

4.1 Terminal descriptions

The SM-PROFIBUS DP-V1 has a standard 9-way female D-type connector for the PROFIBUS-DP network.

Figure 4-1 SM-PROFIBUS DP-V1 terminals

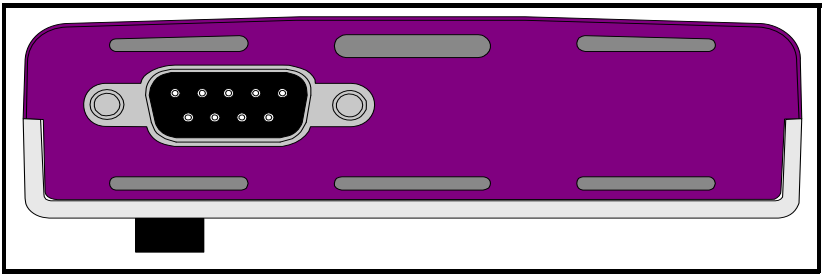


Figure 4-2 SM-PROFIBUS DP-V1 D-Type pin out

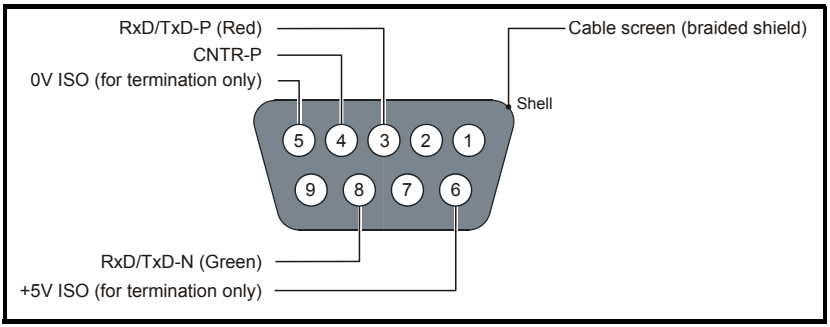


Table 4.1 D-Type connections

D-type Terminal	Function	Description
3	RxD/TxD-P	Positive data line (B) - Red
8	RxD/TxD-N	Negative data line (A) - Green
6	+5V ISO	+5V isolated, use only for termination resistors
5	0V ISO	0V isolated, use only for termination resistors
4	CNTR-P	RTS line
1, Shell	Shield	Cable shield connection

Control Techniques recommend using connectors approved by Profibus International at all times.

4.2 PROFIBUS-DP connectors

There are many manufacturers of PROFIBUS-DP connectors. Always ensure that any connectors used on the network are fully approved for use with PROFIBUS-DP. Some of the connector types available include built in termination that allows the network to be isolated, this can be very useful when fault finding. For data rates above 1.5Mbs connectors installed with integrated inductors should be used.

5 Getting started

This section is intended to provide a generic guide for setting up SM-PROFIBUS DP-V1 and a master controller. Figure 5-1 is intended as a guide only and is provided to detail the stages that are required to achieve a functioning network. It is recommended that all of this chapter is read, before attempting to configure a system.

NOTE Due to the large number of PLCs/masters that support PROFIBUS-DP only generic details can be provided. Support is available through your supplier or local Control Techniques Drive Centre.

NOTE Before contacting your supplier or local Control Techniques Drive Centre for support ensure you have read Chapter 10 *Diagnostics* on page 59 of this manual and check you have configured all parameters correctly.
Ensure the following information is available before calling:

- A list of all parameters in SM-PROFIBUS DP-V1.
- The drive firmware version (*see the relevant drive user guide*).
- The SM-Profibus DP-V1 firmware version.

5.1 Conventions used in this guide

The configuration of the host drive and Solutions Module is done using menus and parameters. A menu is a logical collection of parameters that have similar functionality. In the case of a Solutions Module, the parameters will appear in menu 15 for the Commander SK, and in menu 15, 16, or 17 for the Unidrive SP, Affinity, Mentor MP and Digitax ST depending on the slot the module is installed in.

The menu is determined by the number before the decimal point and the parameter by the number following the decimal point.

The method used to determine the menu or parameter is as follows:

- Pr **MM.xx** - Menu corresponding to the Solution Module and any parameter.
- Pr **xx.00** - signifies parameter number 00 in any menu.

5.2 Minimum software versions required

Table 5.1 Minimum software versions required for use with SM-PROFIBUS

Product	Software Version	SM-PROFIBUS Version
Unidrive SP	V01.06.00 or later	V01.00.00 or later
Affinity	V01.00.00 or later	V03.00.00 or later
Digitax ST	V01.00.00 or later	V03.00.00 or later
Commander SK	V01.06.00 or later	V03.00.00 or later
Mentor MP	V01.02.00 or later	V03.02.00 or later

8.4 PROFIBUS DP-V1 Overview

The PROFIBUS DP-V1 specification allows for the standard cyclic process data (as defined in the DP-V0 specification) and the additional acyclic parameter data to be transmitted in the same bus cycle.

The DP-V1 message is contained within the acyclic part of the PROFIBUS-DP cycle and uses the slave node address to access the parameter channel.

For further details of the PROFIBUS DP-V1 functionality refer to the official PROFIBUS website at www.profibus.com

The following services will be supported:

- Class 1 Master Read and Write
- Class 2 Master Read and Write
- Class 2 Master Initiate Connection
- Class 2 Master Abort Connection

A class 1 master must be in data exchange with the slave before it can perform a request via the DP-V1 channel. A class 2 master must initiate the connection with the slave before sending the DP-V1 message, likewise it must then abort the connection when it is no longer required.

NOTE SM-PROFIBUS DP-V1 supports the simultaneous connection to one class 1 master and one class 2 master.

SM-PROFIBUS DP-V1 supports the following features:

- DP-V1 Parameter Access
- PROFIdrive PNU Access (see section 11.11 *PROFIdrive PNU access*)
- Fault Buffer (see section 11.12 *Fault Buffer*)
- Drive Identification (see section 11.13 *Drive Identification*)
- Identification and Maintenance Functions (see section 11.14 *Identification and Maintenance Functions*)

The maximum DP-V1 message length is restricted to 128 bytes including the four bytes of the DP-V1 header and the four bytes of the PROFIdrive request, this leaves a maximum of 120 bytes for the parameter data; the maximum number of parameters that can be read or written in a single message is shown in Table 8.1.

Table 8.1 Single message parameter limitation

Mode	Maximum number of parameters	
	16-bit	32-bit
Read	20	20
Write	12	10