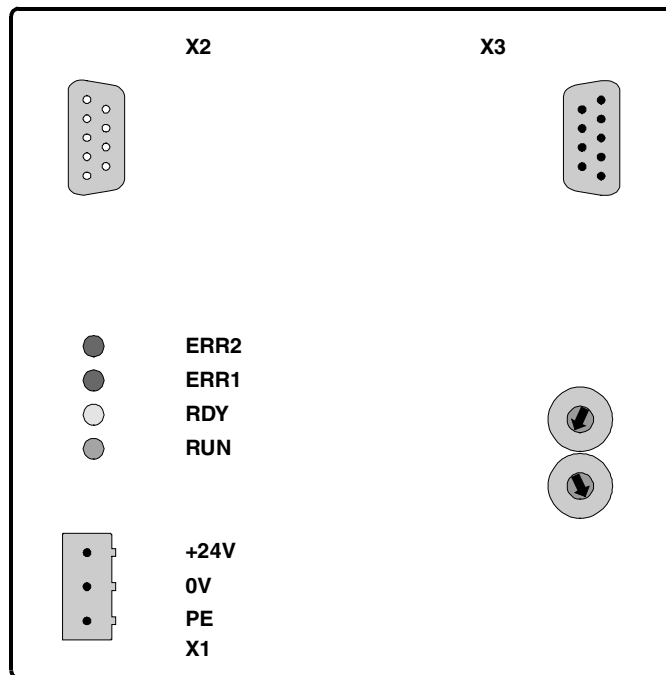


User's Manual

42/24-15-0 EN



Application

- Use** The Profibus DP interface is used to integrate an Advance Optima Process Analyzer System in a Profibus DP network.
- The Profibus DP interface is hardware-implemented using a PKV 30-DPS protocol converter.
- Function** The protocol converter acts as a Profibus DP slave and a Modbus master. Advance Optima is connected to the protocol converter via the Modbus interface (peer-to-peer connection).

Specifications

Specifications	Processor	16-bit with timer, interrupt and DM controller
	Memory configuration	128 KByte RAM, 512 KByte Flash
	Modbus interface	RS-232C interface connected to potential, max. transfer rate of 19.2 kBaud
	Transfer formats	Asynchronous/synchronous, NRZ/NRZI, SDLC/HDLC
	Profibus interface	Floating RS-485 Profibus DP interface, max. transfer rate of 12 MBaud
	LED indicators	Protocol converter running and ready for communication, serial port errors
	Operating voltage	18–30 VDC
	Power consumption	max. 0.15 A at 24 V
	Operating temperature	0–50°C
	Protection	IP 50
	Dimensions	105 x 105 x 80 mm (L x W x H)
	Installation	Rail-mounted per DIN EN 50022

Items Included

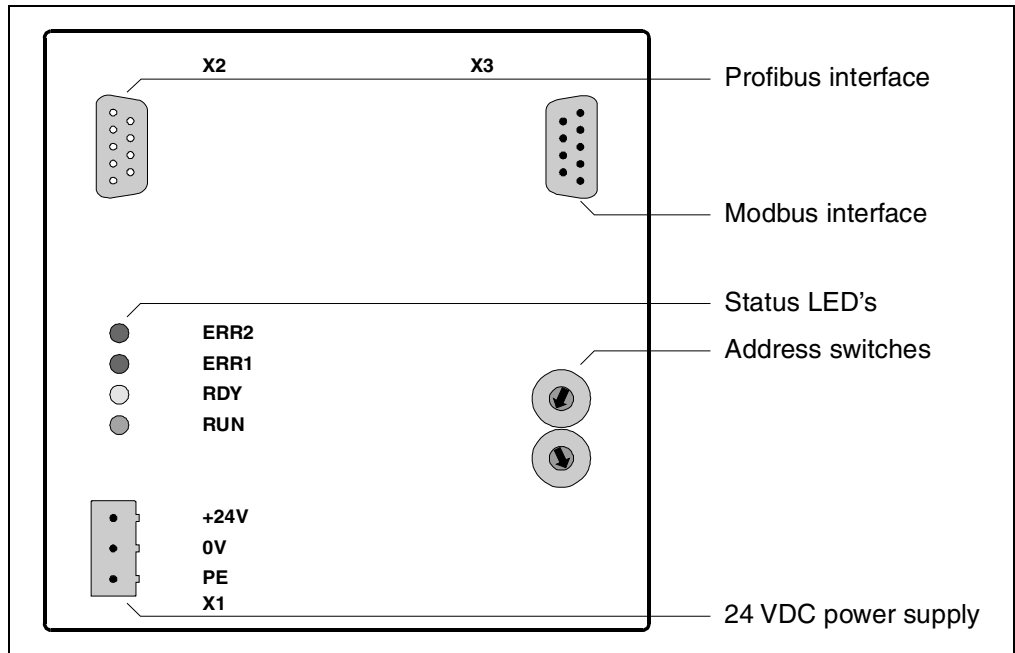
Items Included

Qty	Description
1	PKV 30-DPS protocol converter
1	Modbus interface connecting cable
1	Diskette with <ul style="list-style-type: none">• GSD file• File with protocol converter initialization data• Bit maps• Excel file with Profibus image• Documentation (PDF format)

Using the Protocol Converter

Figure 1

Protocol converter
(front view)



CAUTION!

The protocol converter should only be connected to an analyzer system with a serial number shown on the label on the outside of the protocol converter. The protocol converter serial number and the serial number of the associated analyzer system are also indicated at the top of the "Profibus Image" table delivered with the analyzer system.

Setting the address

Set the Profibus DP slave address using the two address switches.

Connecting signal leads

Connect the Profibus cable to the X2 receptacle and the Modbus cable to the X3 plug.

The Modbus interface type is set to RS 232 at the factory.

Connecting the power supply

Connect the 24-VDC power supply to plug X1. The power supply needs to be grounded.

Status LED's

LED	Color	Status	Meaning
RUN	Green	On	Communication in progress
		Irregular blinking	Initialization fault
		Off	No communication
RDY	Yellow	On	Protocol converter ready
		Regular blinking	Bootstrap loader active
		Irregular blinking	Hardware fault or system fault
		Off	Hardware defect
ERR1, ERR2	Red	On	Port error

Data Format

Modbus protocol and IEEE-754 format

The Modbus protocol only uses 16-bit registers for data transfer. Some Advance Optima data are stored in the IEEE-754 format (32 bit). For this reason, the application must perform preformatting.

IEEE-754 format

Designation	Number of bits	Meaning
S	1	Prefix bit (0 = positive, 1 = negative)
E	8	Exponent in 2nd complement representation. The actual value is the exponent decimal minus 127.
M	23	Mantissa. The most significant bit of the normalized mantissa ahead of the decimal point is implicitly 1 but not stored. The value range is thus between 1.0 (included) and 2.0.

Example

The number -12.5 is stored as hexadecimal value 0xC1480000. The following table shows the memory allocation:

Address	+0	+1	+2	+3
Format	SEEEEEEE	EMMMMMMM	MMMMMMMM	MMMMMMMM
Binary	11000001	01001000	00000000	00000000
Hexadecimal	C1	48	00	00

Explanation

- The prefix bit is 1 so the value is negative.
- The exponent is binary 10000010; this is equivalent to the decimal value 130. The exponent value is thus 130-127 = 3.
- The stored mantissa has a binary value of 10010000000000000000000. Adding the (unstored) leading 1 ahead of the decimal point results in the value 1.10010000000000000000000.
- After fitting the mantissa to the exponents (shifting three places) the result is 1100.100000000000000000000. This binary value corresponds to the decimal value 12.5. With the prefix the value is -12.5.

Mapping Advance Optima data on the Profibus

Advance Optima data is mapped to the Profibus according to the "Profibus Image" table delivered with the system.

The table also available as a Excel file on the diskette supplied with the protocol converter.



Hartmann & Braun