PROFI BUS PROCESS FIELD BUS

PMA

KS 90-1/DP

PROFIBUS-DP option for KS 90-1, KS 90-1 *programmer*

PROFIBUS-DP slave

Cyclic transmission of more than 50 input and output values

Free definition of data content

Transmission of process and parameter data

Supporting acyclic DPV1 services

Inputs and outputs as decentral IO

Minimum depth behind panel

Simple Plug&GO -functions

advanced line

FEATURES

- **BluePort®** - controller / programmer with certified PROFIBUS-DP interface
- Simple access of process data by means of pre-configured data models
- Additional transmission of arbitrary process signals and parameters, easily selected with BlueControl
- Transmission length optimally adaptable to the requirements
- Acyclic DPV1 - functions for parameter transmissions and accesses to/from visualization and engineering stations
- Two data formats (Integer / Float)
- Use of inputs/outputs as decentralized I/O with forcing
- Simple bus connection via Sub-D connector possible
- Display and evaluation of bus faults
- Expanded diagnostic capabilities
- Access to all device data via the parameter channel for DPV0 master

APPLICATIONS

- Furnaces
- Burners and boilers
- Plastics processing
- Driers
- Heat treatment
- Thermal oil plants

DESCRIPTION

The PROFIBUS-DP version of the KS 90-1 allows the connection to PROFIBUS-DP networks. This enables decentralized, stand-alone industrial and process controllers to be integrated in complex PLC and PC-based systems. The PLC transmits setpoints and sequencing information to the KS 90-1, and cyclically polls the process values. The control function and the associated scaling and monitoring functions run automatically and fully independently. This ensures a high level of process safety, combined with fast projecting and commissioning.

DISPLAY AND OPERATION

The „day & night" display of the KS 90-1 features an equally high contrast under good and also less favourable lighting conditions.
The status fields provide a reliable indication of operating conditions, operating mode, and error messages. The text display is able to show various process values numerically or as a bargraph.

Front interface port and Engineering Tools

Controller tuning within seconds is now also possible with KS 90 equipment class. By means of the BlueControl software, including controller and loop simulation, and especially the convenient connection via the **BluePort®** front interface port, it is possible to implement the required control strategy without tedious study of operating instructions. Of course, practically all adjustments are also possible manually using the push-buttons in the front panel.

DECENTRALIZED I/O

Apart from the control function, all the inputs and outputs of the KS 90-1 are accessible, e.g. for integration into the PLC.

The basic functions of the KS 90-1/DP, such as inputs/outputs, control functions, etc. are described in more detail in the relevant data sheets for KS 90-1 (9498 737 40613) and KS 90-1 *programmer* (9498 737 40713).

TECHNICAL DATA

PROFIBUS-DP INTERFACE

Rear-mounted PROFIBUS-DP interface to IEC 61158, EN 50170, Vol. 2
Reading and writing of process values, parameters, and configuration data for DPV0.
Acyclic DPV1 services for master class 1 and class 2 are supported starting from DP firmware version 2.

BluePort® *FRONT INTERFACE PORT*

Independent connection via the front panel with a PC adapter (see „Accessories"). Configuration, parameter setting, and operation of the KS 90-1 are done by means of the BlueControl software.

DATA FORMAT

The transmission of data such as process value and setpoint is selectable between the Real format or as 16-bit data with one fixed decimal (FixPoint). Process data and selected parameters are written and read cyclically.

PARAMETER CHANNEL

Furthermore, process values, parameters, and configuration data are accessible via the parameter channel. These data are transmitted on demand during several cycles.

CONFIGURABLE PROCESS DATA MODULES

The process data that are to be transmitted cyclically are defined by the user during bus configuration. The following options are available:

- Objects with pre-defined contents (Modules A), „plug & go" functions
- Objects whose meaning is defined in the Engineering of the KS 90-1:
  - using the FixPoint data format (Modules B)
  - using the Float data format (Modules C)

Modules A.1 to A.4 may only be used once respectively.

Module A.1: General-Controller (FixP):

Process data			
Reading	Bytes	Writing	Bytes
Process value (C.Inp) Output value (Ypid) Setpoint (SP.ef)	6	Setpoint (SP) Output value (Yman)	6

Module A.2: General-Controller (Float):

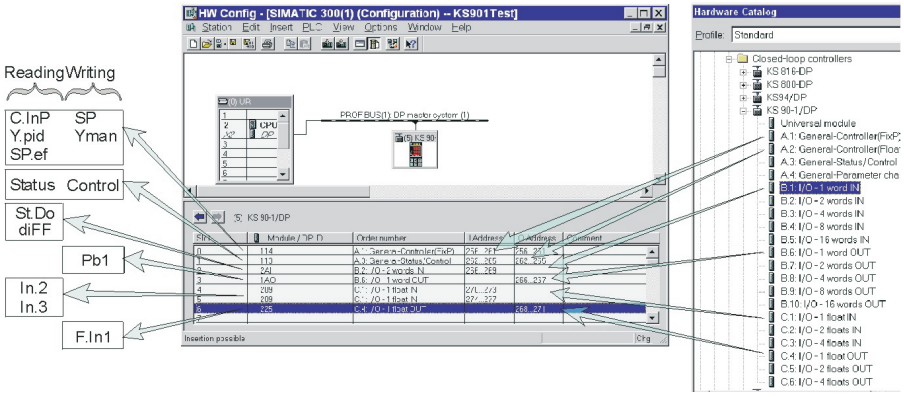
Process data			
Reading	Bytes	Writing	Bytes
Process value (C.Inp) Output value (Ypid) Setpoint (SP.ef)	12	Setpoint (SP) Output value (Yman)	12

Module A.3: General- status / control:

Process data			
Reading	Bytes	Writing	Bytes
Status	4	Control values	4

Module A.4: General- parameter channel:

Parameter channel			
Reading	Bytes	Writing	Bytes
Reply data	8	Requested data	8



Modules B: Variable input/output data (FixP):

Module	Words	Variable	Type
B.1	1	IN1	FixP
B.2	2	IN1 … IN2	FixP
B.3	4	IN1 … IN4	FixP
B.4	8	IN1 … IN8	FixP
B.5	16	IN1 … IN16	FixP
B.6	1	OUT1	FixP
B.7	2	OUT1 … OUT2	FixP
B.8	4	OUT1 … OUT4	FixP
B.9	8	OUT1 … OUT8	FixP
B.10	16	OUT1 … OUT16	FixP

Modules C: Variable input/output data (Float):

Module	Words	Variable	Type
C.1	2	IN1	Float
C.2	4	IN1 … IN2	Float
C.3	8	IN1 … IN4	Float
C.4	2	OUT1	Float
C.5	4	OUT1 … OUT2	Float
C.6	8	OUT1 … OUT4	Float

Up to 115 bytes of transmitted input and output data can be defined.

DATA CONTENTS

Status words (Module A.3)

- Automatic or manual operation
- Controller on/off
- Alarms and controller outputs
- Origin of setpoint
- Errors and status information
- Reading the digital inputs
- Status of programmer (if applicable)

Control words (Module A.3)

- Auto/manual switchover
- Controller off, setpoint switchover
- Forcing of digital inputs
- Forcing of digital outputs
- Local/remote switchover
- Programmer functions (if applicable)

IN1...IN16 (modules B, C)

The data to be read by the KS 90-1/DP (≤57) can be defined with the BlueControl Engineering Tool. It is possible to access signals and parameters.

OUT1...OUT16 (modules B, C)

The data to be transmitted to the KS 90-1/DP (≤57) can be defined with the BlueControl Engineering Tool. It is possible to access signals and parameters.

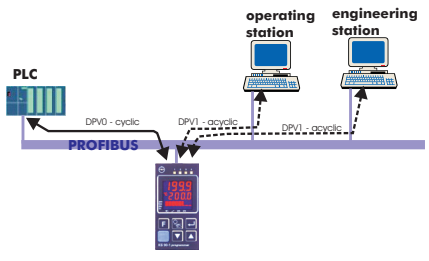
DPV1 FUNCTIONS

Extended PROFIBUS functions for DPV1 can be used for a standard, acylic communication of parameters etc.
KS 90-1 supports acyclic DPV1 services:

- one connection to DP master class 1 (e.g. PLC):
  Read, Write, Alarm, Alarm_Ack.
- two connections to DP master class 2 (e.g. operating / engineering stations):
  Initiate, Abort, Read, Write

An engineering up-/download between **BlueControl®** and KS 90-1 is possible using DPV1 services (available for PROFIBUS interface cards from company Hilscher, e.g. CIF50-PB, CIF60-PB).

Acyclic communication services



ADDITIONAL FUNCTIONS

Decentralized I/O

Direct access to all inputs and outputs of the KS 90-1/DP is possible via the process image in the PLC. This enables the input/output functions to be used for other purposes than control. Analog values are transmitted in the scaled format.

Input forcing

It is possible to overwrite (configure) all physical inputs via PROFIBUS-DP. This enables e.g. process values to be accessed via remote I/Os (e.g. RM 200) for transmission via the bus.

Back-up controller operation

During „normal" operation, the control output signals are computed by the Master device. The KS 90-1/DP is used to poll the process values, generate the output signal, and for display.
If the Master device or the bus communication develops a fault, the KS 90-1/DP takes over the control function automatically and bumpless.

DIAGNOSTICS & BEHAVIOUR AFTER FAULTS

In case of a failure of the PLC or the bus connection (communication fault), the KS 90-1/DP either continues operation independently using the last transmitted values, or the controller is switched off (configurable). If required, the communication fault can be signalled by means of a limit signal.
Faults in the PROFIBUS communication can be indicated via the LEDs, and are stored as error messages in the error list:

- dP.1 no bus access
- dP.2 parameter fault
- dP.3 configuration fault
- dP.4 no exchange of useful data

ELECTRICAL CONNECTIONS

Bus connection via rear terminals, type depending on model:

– Flat-pin terminals 1 x 6,3 mm or 2 x 2,8 mm to DIN 46 244.

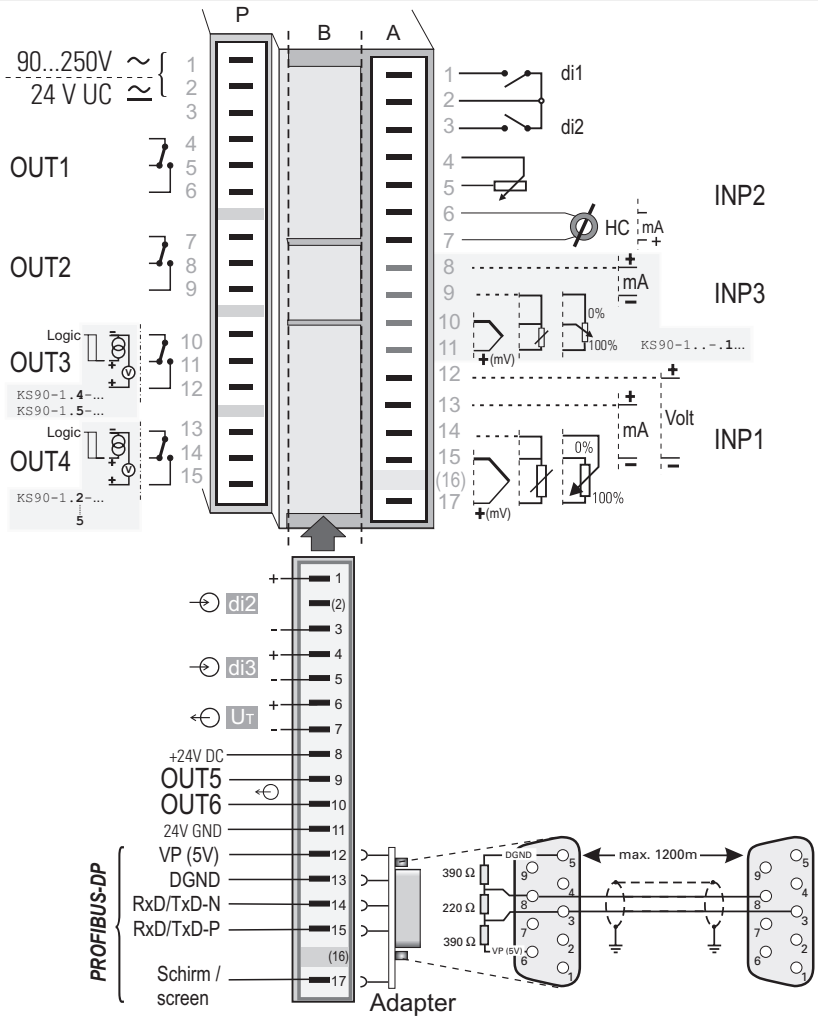
– or screw terminals

➢ The conversion to Sub-D connectors via an adapter (see „Accessories") is recommended.

ADDRESSES

0...126 (factory setting: 126)
Off: bus operation disabled

Electrical connections KS 90-1/DP:



TERMINATING RESISTORS

Must be provided in the connector

CABLE

Cable to IEC 61158, type A.
(EN 50 170, Vol. 2)

TRANSMISSION SPEED AND LEAD LENGTHS

Automatic bit rate detection

Bit rate	Max. lead length per segment
9,6 … 93,75 kbit/s	1200 m
187,5 kbit/s	1000 m
500 kbit/s	400 m
1,5 Mbit/s	200 m
3 … 12 Mbit/s *	100 m

* Only possible with a Sub-D connection adapter!

ACCESSORIES

ENGINEERING SET

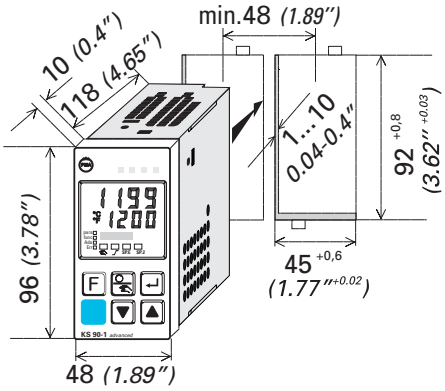
Consisting of:

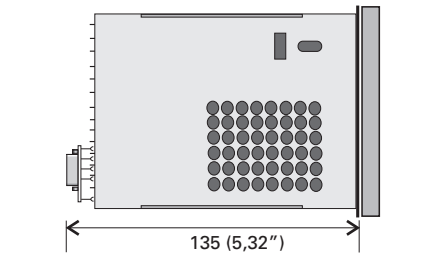
- GSD file
- Manual with description of data
- Step7® application samples for an easy introduction.
- Function modules for Siemens Step7® for reading/writing parameters and configuration data via the parameter channel (DPV0).

ACCESSORY EQUIPMENT

Description		Order no.
Connecting adapter Sub-D for flat-pin connectors		9407-998-07001
Connecting adapter Sub-D for screw terminals		9407-998-07011
Engineering Set KS 90-1/DP	German	9407-999-10511
Engineering Set KS 90-1 /DP	English	9407-999-10501

Dimensions (mm):





ORDERING INFORMATION

K S 9 0 - 1		-					-	00
KS 90-1/DP								
flat-pin connecting terminals	0							
screw terminals	1							
90..250V AC, 4 relays		0						
24VAC / 18..30VDC, 4 relays		1						
90..250V AC, 3 relays+ mA/V/logic		2						
24VAC / 18..30VDC, 3 relays+ mA/V/logic		3						
90..250V AC, 2 relays+ 2 mA/V/logic		4						
24VAC / 18..30VDC, 2 relays+ 2 x mA/V/logic		5						
no options			0					
RS485/422 + U_T + di2/3 + OUT5/6			1					
PROFIBUS-DP + U_T + di2/3 + OUT5/6			2					
INP1 and INP2				0				
INP1, INP2 and INP3				1				
Controller					0			
Program controller with 8 programs					1			
Program controller with 16 programs					2			
Standard configuration						0		
Configuration to customer specification						9		
without operating instruction							0	
German operating instruction							D	
English operating instruction							E	
French operating instruction							F	
Standard								0
cULus certification								U
Certified to EN 14597 (replaces DIN 3440)*								D

* only for controller version

ACCESSORIES

Description		Order no.
Current converter 50A AC		9404-407-50001
PC-adapter for **BluePort**® front interface		9407-998-00001
Standard rail adapter		9407-998-00061
Operating manual	German	9499-040-62918
Operating manual	English	9499-040-62911
Operating manual	French	9499-040-62932
BlueControl Mini	German/English	www.pma-online.de
BlueControl Basic	German/English	9407-999-11001
BlueControl Expert	German/English	9407-999-11011

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