SD01761D/06/EN/01.16
71323805

Special Documentation
Proline Promag 400 PROFIBUS DP

Acyclic data transfer

Endress+Hauser
People for Process Automation

Document information

Document function

This manual is a Special Documentation and does not replace the Operating Instructions included in the scope of supply. It is part of the Operating Instructions and contains additional information regarding the "System integration" section for measuring devices with the PROFIBUS PA protocol.

Affected documentation

This Special Documentation is an integral part of the following Operating Instructions:

Measuring device	Documentation code
Proline Promag D 400 PROFIBUS DP	BA01232D
Proline Promag L 400 PROFIBUS DP	BA01233D
Proline Promag W 400 PROFIBUS DP	BA01234D

Address shifting configuration

Function description

The PROFIBUS master accesses the parameters (data) of the measuring device via the request telegram. Depending on the function code, individual parameters or a group of consecutive parameters are read- or write-accessed. If the desired parameters are not available as a group, the master must send an individual request telegram to the slave for every parameter.

The measuring device has a special memory area (address shifting configuration) for grouping non-consecutive parameters. The user can flexibly group up to 16 parameters in this memory area (each with a slot and an index). The master can talk to this entire data block via a single request telegram.

Structure

"Address shifting configuration" uses two data records: the configuration area (Index 190 to 221) and the assigned data area (Index 230 to 245).

In the configuration area, a slot/index list defines which parameters should be grouped. The measuring device cyclically reads out the values entered in the slot/index list and writes the associated device data to the data area. The polling cycle is automatic. Once the last entry in the slot/index list has been polled the cycle begins again from scratch. The grouped parameters in the data area can be read or written to by the master via PROFIBUS with just one request telegram.

The configuration area contains the indexes 190 to 221 with which up to 16 parameters can be grouped. Two indexes are used per parameter:
- The first index is for the slot value of the parameter
- The second index is for the index value of the parameter

The data area contains the indexes 230 to 245 and is permanently assigned to the configuration area.

Configuration area		Fixed assignment	Data area	
Index	User entry		Index	User entry
190	Slot value for parameter 1	→	230	Value for parameter-specific selection
191	Index value for parameter 1			
192	Slot value for parameter 2	→	231	Value for parameter-specific selection
193	Index value for parameter 2			
…				
220	Slot value for parameter 16	→	245	Value for parameter-specific selection
221	Index value for parameter 16			

Configuring address shifting

When configuring, the relevant slot and index values of the parameters must be entered in the slot/index list of the configuration area. The slot/index list can contain up to 32 entries for 16 parameters. Address shifting configuration supports float- and integer-type parameters with read and write access.

The slot/index list can be configured via:
- Local display
- Configuration tool (e.g. FieldCare)
- PROFIBUS Master.

The address shifting is configured via:
Expert menu → Communication submenu → Address shifting configuration parameter

Example

Configuration area			Fixed assignment	Data area	
Index	Entry = parameter			Index	Entry = selection
190	Slot value: 48	= Volume flow unit	→	230	1349 = m^3/h
191	Index value: 24				
192	Slot value: 48	= Temperature unit	→	231	1001 = °C
193	Index value: 7				
…					
220	Slot value: 54	= Empty pipe detection	→	245	9 = On
221	Index value: 30				

Accessing data via PROFIBUS DP

The PROFIBUS master uses the indexes 190 to 221 to access the address shifting data area. This data area contains the values of the defined parameters.

If, for example, index 230 has been entered for the volume flow via address shifting, the master can read out the current volume flow measured value in indexes 190 and 191.

Data area				
	Access via PROFIBUS			
Address shifting configuration	Slot	Index	Data type [1]	Access [2]
230 →	190	191	Integer/float	Read/write
231 →	192	193	Integer/float	Read/write
232 →	194	195	Integer/float	Read/write
…				
245 →	220	221	Integer/float	Read/write

1) The data type depends on the parameter entered in address shifting.
2) Data access depends on the parameter entered in address shifting. If the parameter entered supports read and write access, the parameter can also be accessed via the data area.

Slot/index list

Description	Slot	Index	Data type	Size [bytes]	Range
Channel	1 - 4	30	Enum16	2	9 : Volume flow 11 : Mass flow 37 : Flow velocity 1132 : Conductivity 39 : Electronic temperature
Start verification	64	26	Enum16	2	0 : Cancel 1 : Start
Totalizer	5 - 7	26	Record	5	

Description	Slot	Index	Data type	Size [bytes]	Range
Unit totalizer	5 - 7	27	Enum16	2	1089 : g 1088 : kg 1092 : t 1093 : oz 1094 : lb 1095 : STon 1571 : cm^3 1035 : dm^3 1034 : m^3 1040 : ml 1038 : l 1041 : hl 32805 : Ml Mega 1572 : af 1043 : ft^3 1570 : fl oz (us) 1048 : gal (us) 1648 : kgal (us) 32806 : Mgal (us) 1052 : bbl (us;liq.) 1641 : bbl (us;beer) 1051 : bbl (us;oil) 32808 : bbl (us;tank) 1049 : gal (imp) 32807 : Mgal (imp) 32810 : bbl (imp;beer) 32809 : bbl (imp;oil)
Assign process variable	5 - 7	28	Enum16	2	9 : Volume flow 11 : Mass flow
Control totalizer	5 - 7	29	Enum8	1	0 : Totalize 1 : Reset + hold 2 : Preset + hold
Totalizer operation mode	5 - 7	30	Enum8	1	0 : Net flow total 1 : Forward flow total 2 : Reverse flow total 3 : Last valid value
Failsafe mode	5 - 7	31	Enum8	1	0 : Actual value 1 : Stop 2 : Last valid value
Output channel	8	38	Enum16	2	1 : External density
Input channel	11 - 12	33	Enum16	2	251 : None
Output channel	11 - 12	51	Enum16	2	891 : Flow override 1429: Start verification
Density unit	48	0	Enum16	2	1100 : g/cm^3 1101 : g/m^3 1099 : kg/dm^3 1103 : kg/l 1097 : kg/m^3 1628 : SD4°C 1629 : SD15°C 1630 : SD20°C 32833 : SG4°C 32832 : SG15°C 32831 : SG20°C 1107 : lb/ft^3 1108 : lb/gal (us) 32836 : lb/bbl (us;liq.) 32835 : lb/bbl (us;beer) 32837 : lb/bbl (us;oil) 32834 : lb/bbl (us;tank) 1430 : lb/gal (imp) 32838 : lb/bbl (imp;beer) 32839 : lb/bbl (imp;oil)

Description	Slot	Index	Data type	Size [bytes]	Range
Mass flow unit	48	4	Enum16	2	1318 : g/s 1319 : g/min 1320 : g/h 1321 : g/d 1322 : kg/s 1323 : kg/min 1324 : kg/h 1325 : kg/d 1326 : t/s 1327 : t/min 1328 : t/h 1329 : t/d 1606 : oz/s 1607 : oz/min 1608 : oz/h 1609 : oz/d 1330 : lb/s 1331 : lb/min 1332 : lb/h 1333 : lb/d 1334 : STon/s 1335 : STon/min 1336 : STon/h 1337 : STon/d
Corrected volume flow unit	48	5	Enum16	2	1592 : Nl/s 1593 : Nl/min 1594 : Nl/h 1595 : Nl/d 1588 : Nm^3/s 1589 : Nm^3/min 1590 : Nm^3/h 1591 : Nm^3/d 1596 : Sm^3/s 1597 : Sm^3/min 1598 : Sm^3/h 1599 : Sm^3/d 1604 : Sft^3/s 1360 : Sft^3/min 1361 : Sft^3/h 1605 : Sft^3/d 32853 : Sgal/s (us) 32854 : Sgal/min (us) 32855 : Sgal/h (us) 32856 : Sgal/d (us) 32858 : Sbbl/s (us;liq.) 32859 : Sbbl/min (us;liq.) 32860 : Sbbl/h (us;liq.) 32861 : Sbbl/d (us;liq.) 32863 : Sgal/s (imp) 32864 : Sgal/min (imp) 32865 : Sgal/h (imp) 32866 : Sgal/d (imp)
Temperature unit	48	7	Enum16	2	1001 : °C 1002 : °F 1000 : K 1003 : °R

Description	Slot	Index	Data type	Size [bytes]	Range
Volume flow unit	48	24	Enum16	2	1511 : cm^3/s 1512 : cm^3/min 1513 : cm^3/h 1514 : cm^3/d 32811 : dm^3/s 32812 : dm^3/min 32813 : dm^3/h 32814 : dm^3/d 1347 : m^3/s 1348 : m^3/min 1349 : m^3/h 1350 : m^3/d 1577 : ml/s 1563 : ml/min 1578 : ml/h 1579 : ml/d 1351 : l/s 1352 : l/min 1353 : l/h 1354 : l/d 1633 : hl/s 1634 : hl/min 1635 : hl/h 1636 : hl/d 32815 : Ml/s 32816 : Ml/min 32817 : Ml/h 1355 : Ml/d 1580 : af/s 1581 : af/min 1582 : af/h 1583 : af/d 1356 : ft^3/s 1357 : ft^3/min 1358 : ft^3/h 1359 : ft^3/d 1584 : fl oz/s (us) 1585 : fl oz/min (us) 1586 : fl oz/h (us) 1587 : fl oz/d (us) 1362 : gal/s (us) 1363 : gal/min (us) 1364 : gal/h (us) 1365 : gal/d (us) 1450 : kgal/s (us) 1454 : kgal/min (us) 1458 : kgal/h (us) 1462 : kgal/d (us) 1451 : Mgal/s (us) 1455 : Mgal/min (us) 1459 : Mgal/h (us) 1366 : Mgal/d (us) 1637 : bbl/s (us;liq.) 1638 : bbl/min (us;liq.) 1639 : bbl/h (us;liq.) 1640 : bbl/d (us;liq.) 1642 : bbl/s (us;beer) 1643 : bbl/min (us;beer) 1644 : bbl/h (us;beer) 1645 : bbl/d (us;beer) 1371 : bbl/s (us;oil) 1372 : bbl/min (us;oil) 1373 : bbl/h (us;oil) 1374 : bbl/d (us;oil) 32819 : bbl/s (us;tank) 32820 : bbl/min (us;tank) 32821 : bbl/h (us;tank) 32822 : bbl/d (us;tank)

Description	Slot	Index	Data type	Size [bytes]	Range
					1367 : gal/s (imp) 1368 : gal/min (imp) 1369 : gal/h (imp) 1370 : gal/d (imp) 1466 : Mgal/s (imp) 1470 : Mgal/min (imp) 1474 : Mgal/h (imp) 1478 : Mgal/d (imp) 32823 : bbl/s (imp;beer) 32824 : bbl/min (imp;beer) 32825 : bbl/h (imp;beer) 32826 : bbl/d (imp;beer) 32827 : bbl/s (imp;oil) 32828 : bbl/min (imp;oil) 32829 : bbl/h (imp;oil) 32830 : bbl/d (imp;oil)
Volume unit	48	25	Enum16	2	1571 : cm^3 1035 : dm^3 1034 : m^3 1040 : ml 1038 : l 1041 : hl 32805 : Ml Mega 1572 : af 1043 : ft^3 1570 : fl oz (us) 1048 : gal (us) 1648 : kgal (us) 32806 : Mgal (us) 1051 : bbl (us;oil) 1052 : bbl (us;liq.) 1641 : bbl (us;beer) 32808 : bbl (us;tank) 1049 : gal (imp) 32807 : Mgal (imp) 32810 : bbl (imp;beer) 32809 : bbl (imp;oil)
Mass unit	48	26	Enum16	2	1089 : g 1088 : kg 1092 : t 1093 : oz 1094 : lb 1095 : STon
Corrected volume unit	48	50	Enum16	2	1574 : Nl 1573 : Nm^3 1575 : Sm^3 1053 : Sft^3 32852 : Sgal (us) 32857 : Sbbl (us;liq.) 32862 : Sgal (imp)
Conductivity unit	48	79	Enum16	2	1697 : nS/cm 1552 : µS/cm 1554 : µS/m 1303 : µS/mm 1553 : mS/m 1302 : mS/cm 1551 : S/cm 1299 : S/m 1301 : kS/m 1300 : MS/m
Reset all totalizers	44	6	Enum16	2	0 : Cancel 3 : Reset + totalize
Channel	9 - 10	30	Enum16	2	894 : Empty pipe detection 865 : Low flow cut off 1430: Verification status
Slot shifting 1	1	190	Uint8	1	0…255

Description	Slot	Index	Data type	Size [bytes]	Range
Index shifting 1	1	191	Uint8	1	0...255
Slot shifting 2	1	192	Uint8	1	0...255
Index shifting 2	1	193	Uint8	1	0...255
Slot shifting 3	1	194	Uint8	1	0...255
Index shifting 3	1	195	Uint8	1	0...255
Slot shifting 4	1	196	Uint8	1	0...255
Index shifting 4	1	197	Uint8	1	0...255
Slot shifting 5	1	198	Uint8	1	0...255
Index shifting 5	1	199	Uint8	1	0...255
Slot shifting 6	1	200	Uint8	1	0...255
Index shifting 6	1	201	Uint8	1	0...255
Slot shifting 7	1	202	Uint8	1	0...255
Index shifting 7	1	203	Uint8	1	0...255
Slot shifting 8	1	204	Uint8	1	0...255
Index shifting 8	1	205	Uint8	1	0...255
Slot shifting 9	1	206	Uint8	1	0...255
Index shifting 9	1	207	Uint8	1	0...255
Slot shifting 10	1	208	Uint8	1	0...255
Index shifting 10	1	209	Uint8	1	0...255
Slot shifting 11	1	210	Uint8	1	0...255
Index shifting 11	1	211	Uint8	1	0...255
Slot shifting 12	1	212	Uint8	1	0...255
Index shifting 12	1	213	Uint8	1	0...255
Slot shifting 13	1	214	Uint8	1	0...255
Index shifting 13	1	215	Uint8	1	0...255
Slot shifting 14	1	216	Uint8	1	0...255
Index shifting 14	1	217	Uint8	1	0...255
Slot shifting 15	1	218	Uint8	1	0...255
Index shifting 15	1	219	Uint8	1	0...255
Slot shifting 16	1	220	Uint8	1	0...255
Index shifting 16	1	221	Uint8	1	0...255
Shifted values	1	230 - 245	ByteArray	512	–

www.addresses.endress.com

Endress+Hauser

People for Process Automation