# DMS3

# Actuator controls
# REMATIC Profibus XXR X.XPA-Xx

# Profibus DP

Appendix
74 1226 02

# 1. General information about Profibus DP

Serial bus systems for communication are used for exchange of information between automation systems and connected field devices. In comparison with conventional technology, savings in commissioning and maintenance are achieved by using bus technology. Bus systems used today are open and standardized.
The user can choose within a large product range. Profibus DP is an international open bus protocol which is used successfully around the world.
The application range of bus technology includes automation in the areas of processing, manufacturing and construction.

## 1.1 Basic characteristics

Profibus distinguishes between master and slave devices. Communication is based on messages change between MASTER and SLAVE.
Typical slave devices are actuators, valves, input/output devices and measuring transmitters.
Slave devices (such as the REMATIC PROFIBUS actuators) are peripheral devices.
The Profibus DP communication is based on a protocol incl. the slave addresses of functional codes with offset addresses, process data and checksums.

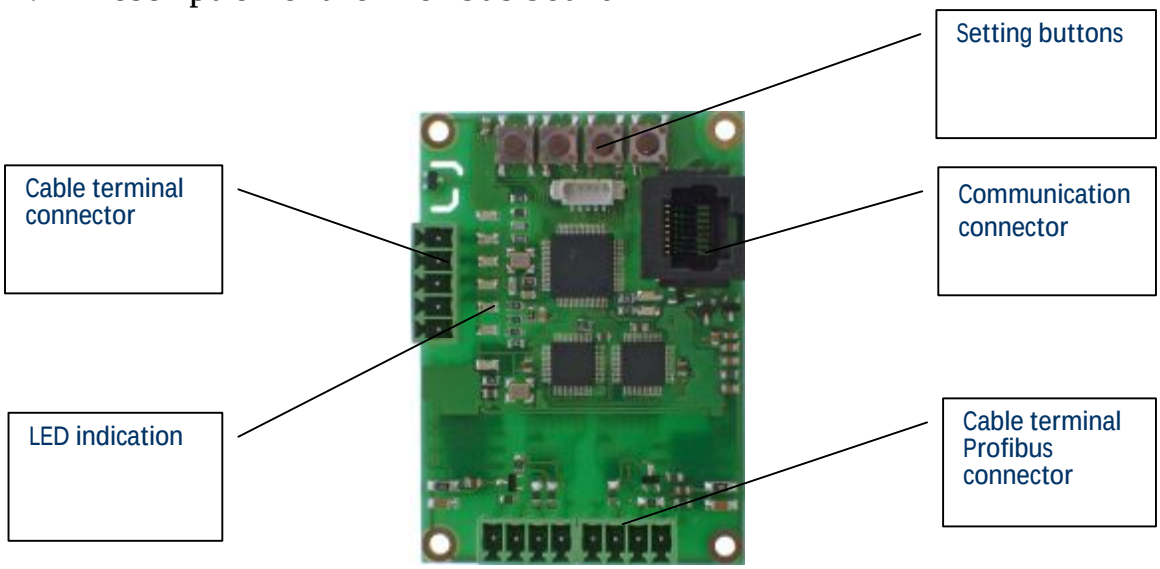
## 1.2 Range of application

DMS3 PX actuator controls are designed for the operation of REMATIC actuators.

## 1.3 Setting in operation

No special configuration file is required for a Profibus slave operation set up.

## 1.4 Description of the Profibus board



## 1.5 Communication Profibus

### 1.5.1 Outputs

| Address | Bit | Meaning |
|---|---|---|
| 0 | 0 | Open |
| | 1 | Close |
| | 2 | 3 positional regulation<br>0=2 positional regulation by Open and Close<br>1=3 positional position regulation setting in the ‰ |
| | 3 | Reset active errors |
| | 4 | Reset last errors |
| | 5..7 | - |
| 1 | 0..7 | Required position 0..1000 ‰ – higher byte |
| 2 | 0..7 | Required position 0..1000 ‰ – lower byte |

### 1.5.2 Inputs

| Address | Bit | Meaning |
|---|---|---|
| 0 | 0..7 | Actual position 0..1000 ‰ – higher byte |
| 1 | 0..7 | Actual position 0..1000 ‰ – lower byte |
| 2 | 0 | Torque Open |
| | 1 | Torque Close |
| | 2 | Blockage torques |
| | 3 | Release blockage local control |
| | 4 | Control |
| | 5 | 00 – OFF<br>01 – Remote<br>10 – Local<br>11 – OFF |
| | 6 | Real direction of the motor |
| | 7 | 00 – stop<br>01 – open<br>10 – close |
| 3 | 0 | Real direction of rotation sensor |
| | 1 | 00 – stop<br>01 – open<br>10 – close |
| | 2 | - |
| | 3 | Parameters protected by password or not admitted |
| | 4 | Errors |
| | 5 | Warnings |
| | 6 | Profibus Data Exchange channel 1 |
| | 7 | Profibus Data Exchange channel 2 |
| 4 | 0 | Relay READY |
| | 1 | Relay 1 |
| | 2 | Relay 2 |
| | 3 | Relay 3 |
| | 4 | Relay 4 |
| | 5 | Relay 5 |
| | 6 | Primary channel Profibus |
| | 7 | 00 – none |

| Address | Bit | Meaning |
|---|---|---|
| | | 01 – channel 1<br>10 – channel 2 |
| 5 | 0 | Error/Warning – ESD |
| | 1 | - |
| | 2 | Error/Warning – Torque Calibration |
| | 3 | Error/Warning – Torque |
| | 4 | Error/Warning – Stroke |
| | 5 | Error/Warning – Rotation |
| | 6 | Error/Warning – EEPROM |
| | 7 | Error/Warning – Menu mode |
| 6 | 0 | Error/Warning – RAM |
| | 1 | Error/Warning – Parameters |
| | 2 | Error/Warning – Torque sensor |
| | 3 | Error/Warning – Sensor of position 1 |
| | 4 | Error/Warning – Sensor of position 2 |
| | 5 | Error/Warning – Sensor of position 3 |
| | 6 | Error/Warning – Sensor of position 4 |
| | 7 | Error/Warning – Regulator calibration |
| 7 | 0 | Error/Warning – Rotation |
| | 1 | Error/Warning – Temperature < |
| | 2 | Error/Warning – Temperature > |
| | 3 | Error/Warning – Module LED |
| | 4 | Error/Warning – Module Torque |
| | 5 | Error/Warning – Module Position |
| | 6 | Error/Warning – Bus error |
| | 7 | Error/Warning – Thermo fuse |
| 8 | 8 | Error/Warning – Power supply/Relay module |
| | 9 | Error/Warning – Phase |
| | 10 | Error/Warning – Relay |
| | 11 | Error/Warning – Reset |
| | 12 | Error/Warning – ROM |
| | 13 | Error/Warning – Module LCD |
| | 14 | Error/Warning – Wrong command |
| | 15 | Error/Warning – Manual control |
| 9 | 0 | Error/Warning – Wrong position |
| | 1 | Error/Warning – Module type Position |
| | 2 | Error/Warning – Module type Torque |
| | 3 | Error/Warning – Module type LED |
| | 4 | Error/Warning – Module type LCD |
| | 5 | Error/Warning – Module type Power Supply/Relay |
| | 6 | Error/Warning – I2C |
| | 7 | Error/Warning – Power frequency |

| Address | Bit | Meaning |
|---|---|---|
| 10 | 0 | Error/Warning – Voltage +5V |
| | 1 | Error/Warning – Torque check |
| | 2 | Error/Warning – Profibus activity |
| | 3 | Error/Warning – E2P |
| | 4 | Error/Warning – Profibus channel 1 |
| | 5 | Error/Warning – Profibus channel 2 |
| | 6..7 | - |
| 11 | 0..7 | Last error 1 |
| 12 | 0..7 | Last error 2 |
| 13 | 0..7 | Last error 3 |
| 14 | 0..7 | Torque -327..328 % - higher byte |
| 15 | 0..7 | Torque -327..328 % - lower byte |
| 16 | 0..7 | Temperature -127..+128 °C |

### 1.5.3 Functions I&M

| Marking | Size [byte] | Data type | Value |
|---|---|---|---|
| HEADER | 10 | Specifically by manufacturer | Unused, values 0x00 |
| MANUFACTURER_ID | 2 | unsigned 16 | 0x0285 |
| ORDER_ID | 20 | string | „REMATIC DMS PROFIBUS“ |
| SERIAL_NUMBER | 16 | string | Serial number actuator |
| HARDWARE_REVISION | 2 | unsigned 16 | 0= Single - channel version<br>1= Two-channel version |
| SOFTWARE_REVISION | 4 | 1 char<br>3 unsigned 8 | byte 0=‘V‘<br>byte 1=1<br>byte 2=0<br>byte 3=8 |
| REVISION_COUNTER | 2 | unsigned 16 | 0x0000 |
| PROFILE_ID | 2 | unsigned 16 | 0xF600 |
| PROFILE_SPECIFIC_TYPE | 2 | unsigned 16 | 0x0000 |
| IM_VERSION | 2 | 2 unsigned 8 | byte 0=1<br>byte 1=1 |
| IM_SUPPORTED | 2 | unsigned 16 | 0x0000 |

## 1.6 Bus cables

Only cables according to standard EN 50170-2, cable type A, may be used for bus wiring.
A maximum of up to 125 bus devices may be connected in one segment.
If more devices are to be connected to one bus network, more segments must be connected with repeaters.
The bus cable must be laid at a distance of min. 20 cm from other cables.
It should be laid in a separate, conductive and earthed cable wiring system.
It must be ensured that there are nodifferences in potential between the individual devices on the bus (perform a potential compensation).

Cable specification
Impedance: 135 to 165 Ohm, at a frequency of 3 to 20 MHz.
Cable capacity: < 30 pF per metre
Cross section: > 0.34 mm², corresponds to AWG 22
Loop resistance: 110 Ohm per km
Screening: CU shielding braid or shielding braid and shielding foil

## 1.7 Termination for DMS3 PROFIBUS

First and last device on line must be execute from terminations. This is done by connecting connection at terminals (in the case of the single-channel version on channel 1, in the case of the two-channel version also on channel 2):
B1 / P with T1 +, B2 / P with T2 +
A1 / Ns T1-, A2 / Ns T2-
In addition to the impedance termination with a 220 Ohm resistor, it also causes 390 Ohm polarization resistors (pull-down and pull-up) to be connected.

An example of a bus connection is shown in figures below.
Terminal numbers indicated in example as 1,2,3,4,5,6 for single-channel version, resp. 7,8,9,10,11,12 for second channel may vary depending on particular type of actuator. For example, in Modakt MxRx PA and MxRx PA-Ex actuators, terminal numbers are marked as 19,20,21,22,23,24 for the single-channel version, respectively. 25,26,27,28,29,30 for second channel. The specific terminal number is given in relevant actuator wiring diagram. In principle, designations B1 / P, A1 / N, T1 +, T1- for single-channel version, resp. B2 / P, A2 / N, T2 +, T2- for the second channel remain unchanged in all schemes connected to Profibus communication protocols.

Bus connection for channel 1 (fig.1)

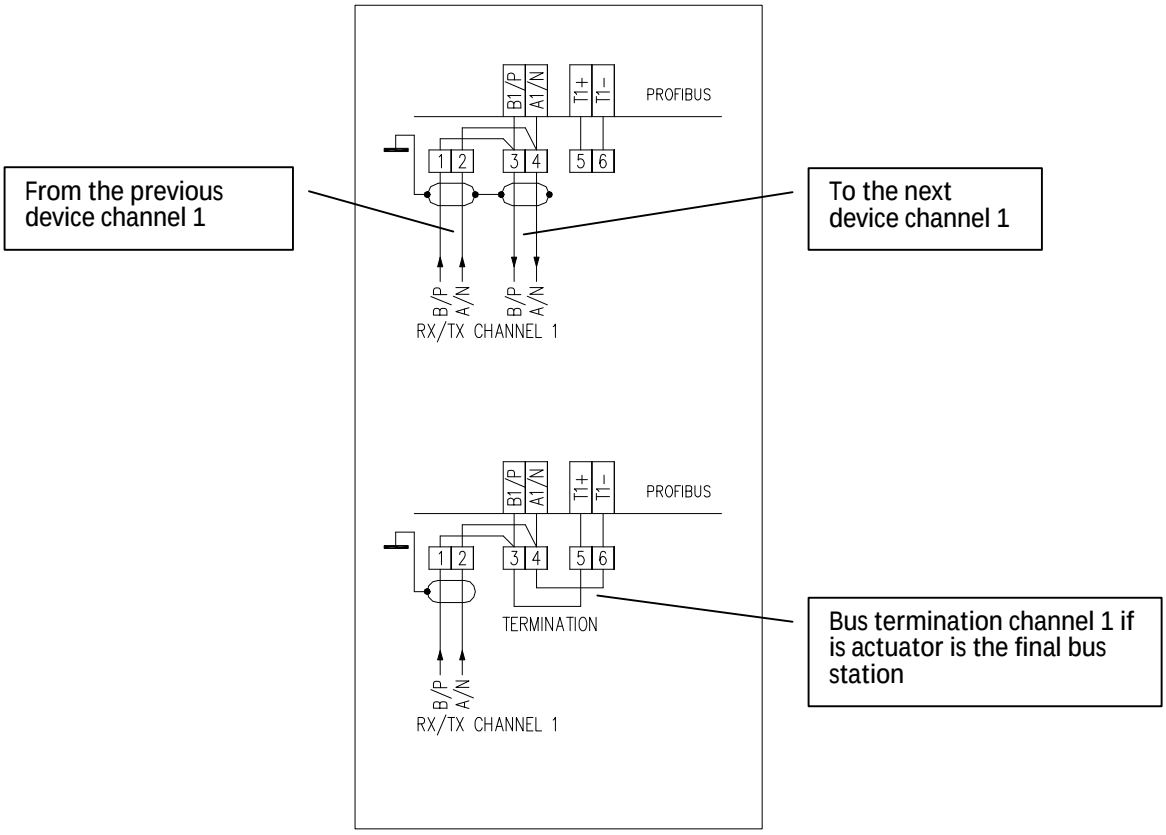



**Fig.1**

Bus connection for channel 1 and channel 2 (Fig.2)

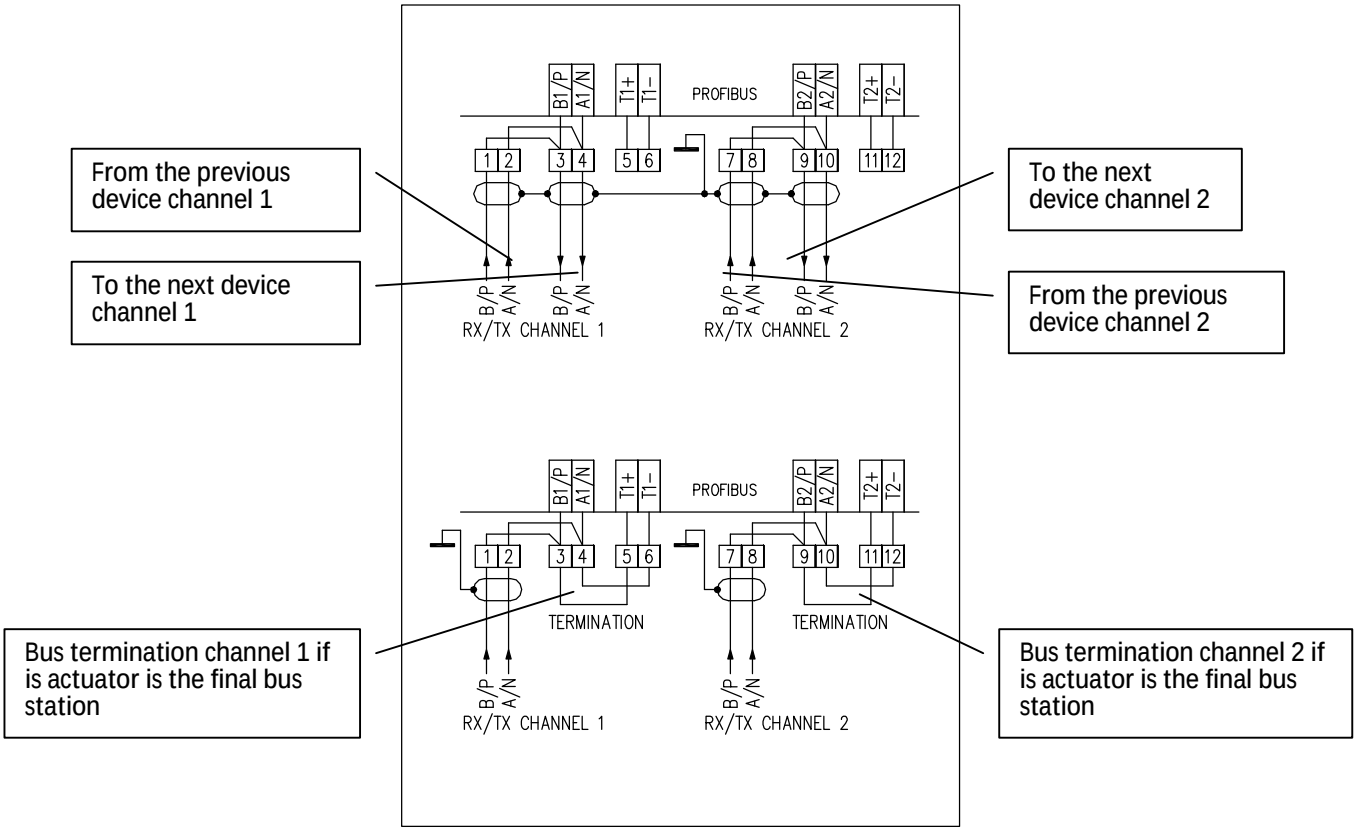



**Fig.2**

## 1.8 Shield connection for REMATIC

The shielding of bus cables should be connected with cable glands.

# 2. System DMS3 Profibus DP - Technical data

Technical parameters:

| | |
|---|---|
| Marking: | DMS3 P1 or DMS3 P2 |
| Function: | fieldbus module Profibus DP (Control unit) |
| Version HW: | DMS3 Px 1305 |
| Version FW: | 1.XX |
| LED indicator: | 1xgreen, 2xyellow, 1xred |
| Termination fieldbus DLIN: | 136 Ω |

Profibus:

| | |
|---|---|
| Line specification: | EIA-485 (RS485) 2-wire version, galvanic isolated |
| Options: | Single-channel version DMS3 P1 |
| | Redundant version DMS3 P2 (Simple redundancy) |
| Transmission medium | Twisted, screened copper cable according to IEC 61158 |
| Device types | Profibus slave |
| Bus access | Token-passing between the masters and polling between master and slave |
| Address: | 1..126 |
| Supported baud rate: | 9,60 Baud |
| | 19,20 Baud |
| | 45,45 Baud |
| | 93,75 Baud |
| | 187,50 Baud |
| | 500,00 Baud |
| | 1500,00 Baud |

```
;=================================================
```

# 3. GSD file

GSD file (REGA0C2A.GSD) is available on request in electronic form. Its text part is as follows

```
GSD File for REMATIC DMS PROFIBUS
;
; Vendor:   REGADA, s.r.o.
;           Strojnicka 7
;           08001 Presov
;           Slowakei
;           Tel: +421 51 7480 411
;           Fax: +421 51 7480 412
;
; ================================================
;
; Function: actuator controls with Profibus-DP interface
;
;
;
; Order Number : REMATIC DMS PROFIBUS
;
; ------------------------------------------------
; author: EHL elektronika s.r.o., P. Kolomaznik
;                                 J. Hakl
;   Tel.: +420 326 303 010
;   FAX.: +420 326 303 073
; ------------------------------------------------
;
; history
; ================================================
; 9.3.2009 V1.00  first version
;
; 21.3.2012 V2.00 modification for DMS3
; 21.11.2015 V2.01
; 11.01.2015 V2.03  45.45_supp
;
; ------------------------------------------------
;
#Profibus_DP
GSD_Revision=4
;General parameters
Vendor_Name             = "REGADA, s.r.o."
Model_Name              = "REMATIC DMS PROFIBUS"
Revision                = "1"
Ident_Number            = 0x0C2A
Protocol_Ident          = 0
Station_Type            = 0
FMS_supp                = 0
Hardware_Release        = "08/10"
Software_Release        = "1.X"
9.6_supp                = 1
19.2_supp               = 1
45.45_supp              = 1
93.75_supp              = 1
187.5_supp              = 1
500_supp                = 1
1.5M_supp               = 1
3M_supp                 = 0
```

```
6M_supp                 = 0
12M_supp                = 0
MaxTsdr_9.6             = 60
MaxTsdr_19.2            = 60
MaxTsdr_45.45           = 60
MaxTsdr_93.75           = 60
MaxTsdr_187.5           = 60
MaxTsdr_500             = 100
MaxTsdr_1.5M            = 150
MaxTsdr_3M              = 250
MaxTsdr_6M              = 450
MaxTsdr_12M             = 800
Redundancy              = 0
Repeater_Ctrl_Sig       = 0
24V_Pins                = 0

; Slave-Specification:
Freeze_Mode_supp        = 1
Sync_Mode_supp          = 1
Set_Slave_Add_Supp      = 0
Auto_Baud_supp          = 1
Min_Slave_Intervall     = 6
Fail_Safe               = 0
Modular_Station         = 0
Modul_Offset            = 0
Slave_Family            = 4
Implementation_Type     = "VPC3+"
Bitmap_Device           = "DMS"
Max_Diag_Data_Len       = 6

; UserPrmData: Length and Preset:
User_Prm_Data_Len       = 3
User_Prm_Data           = 0x00,0x00,0x00

; Module Definition List
Module = "Bytes:17 In, 3 Out, Cons " 0xC0,0x82,0x90

1

EndModule
```

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