control – motion – interface

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PB340 / PB306 / PB541

Profibus-DP Display Unit / BCD Thumbwheel Switch Set

PB 340
Display only

PB 306
Thumbwheel switch set only

PB 541
Display and thumbwheel switch set

Operating Instructions

Safety Instructions

- This manual is an essential part of the unit and contains important hints about function, correct handling and commissioning. Non-observance can result in damage to the unit or the machine or even in injury to persons using the equipment!
- The unit must only be installed, connected and activated by a qualified electrician
- It is a must to observe all general and also all country-specific and application-specific safety standards
- When this unit is used with applications where failure or maloperation could cause damage to a machine or hazard to the operating staff, it is indispensable to meet effective precautions in order to avoid such consequences
- Regarding installation, wiring, environmental conditions, screening of cables and earthing, you must follow the general standards of industrial automation industry
- - Errors and omissions excepted –

Version:	Description:
PB34001c_hk_03/2008	motrona format A5, single language

Table of Contents

1. Introduction

The PB340 / PB306 / PB541 series has been designed for display and/or remote preset of single parameters or registers (e.g. display of actual position or preset of line speed) in systems using a Profibus-DP network.

These units operate as Profibus-DP slaves according to EN 50 170.

PB340 is a display unit with a 6 decade, 15mm (0.59'') size LED-display.

PB306 is a 6 decade BCD thumbwheel switch set with a setting range of 0 … 999 999 *).

PB541 is a combination of both, PB340 and PB306, providing a display and a BCD thumbwheel switch set *).

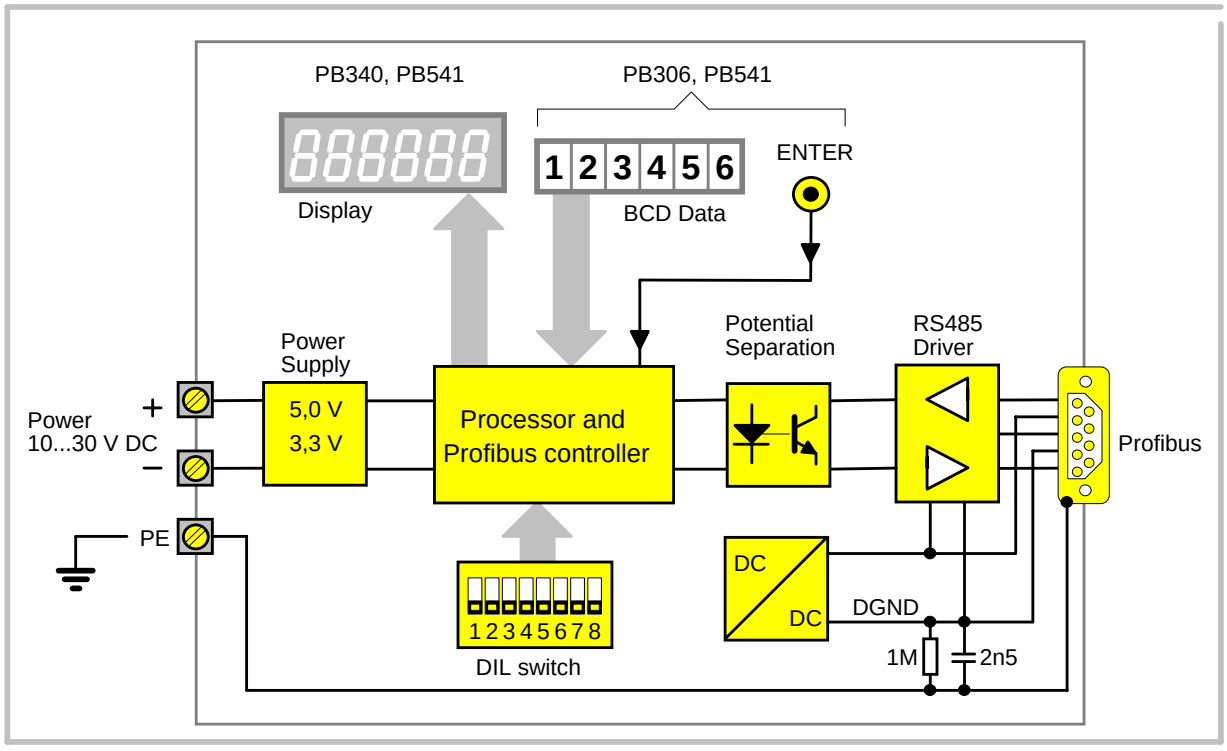
All units are built into DIN housings for front panel mounting.

A printout of the GSD file necessary for the use of this unit can be found under section 5. of this manual. The file itself is available on the CD supplied with every unit.

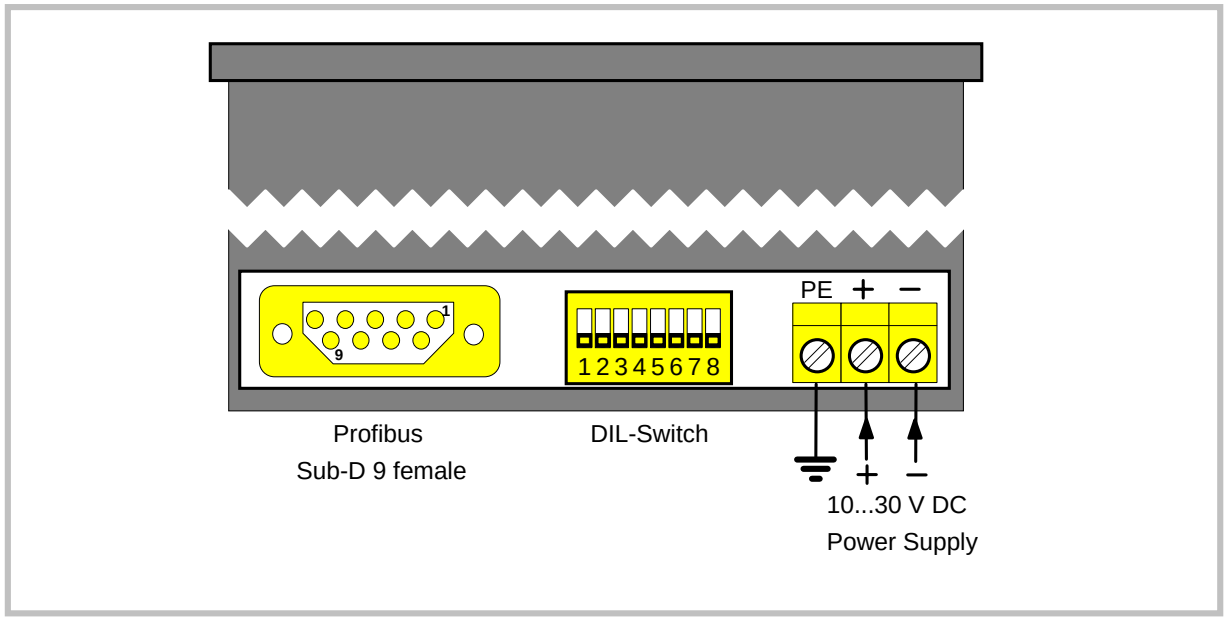
You can also download this file at any time from the DOWNLOAD site of our homepage: http://www.motrona.com

*) With supplementary ordering information **"Option VZ000"** the unit is available as a 5 decade plus sign version (setting range -99999 to +99999)

2. Block Diagram and Terminal Assignment



Power supply screw terminals, Profibus connector and DIL switches for setup are located on the backplane of the unit.



Profibus connector pin assignment:

Pin:	Signal:	Function
1	Screen	Screen / Earth connection
2	n. c.	–
3	RxD/TxD-P	Data +
4	CNTR-P (RTS)	Request To Send
5	DGND	Reference Potential (Ground)
6	VP	Power supply + 5 V / 50 mA
7	n. c.	–
8	RxD/TxD-N	Data -
9	n. c.	–

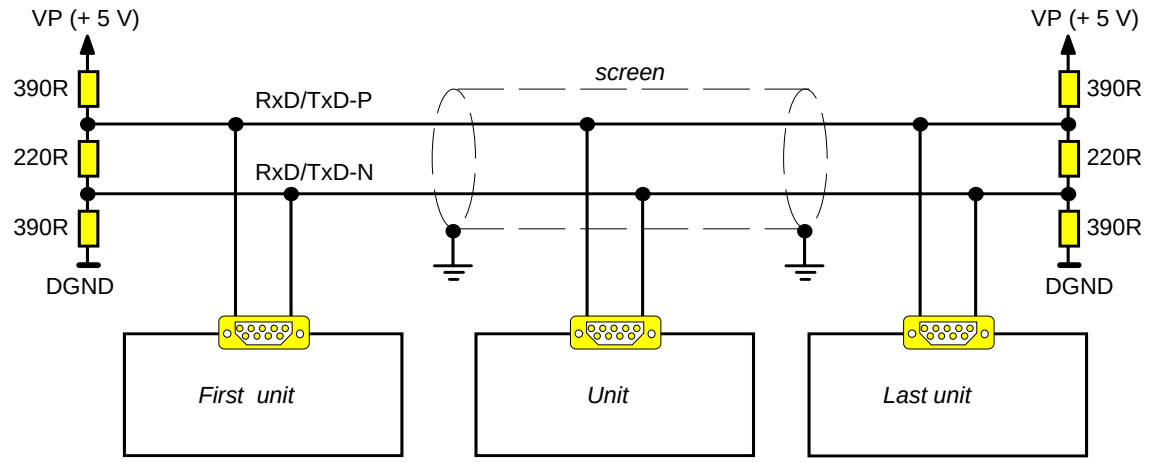
The following cables are recommended for Profibus (EN 50 170 "Type-A cable"):

Impedance:	135 … 165 Ω
Capacitance:	< 30 pF / m
Loop resistance:	< 110 Ω / km
Wire diameter:	> 0,64 mm (0.025'')
Conductor cross section:	> 0,34 mm²

Depending on the Baud rate, the following maximum cable length must not be exceeded:

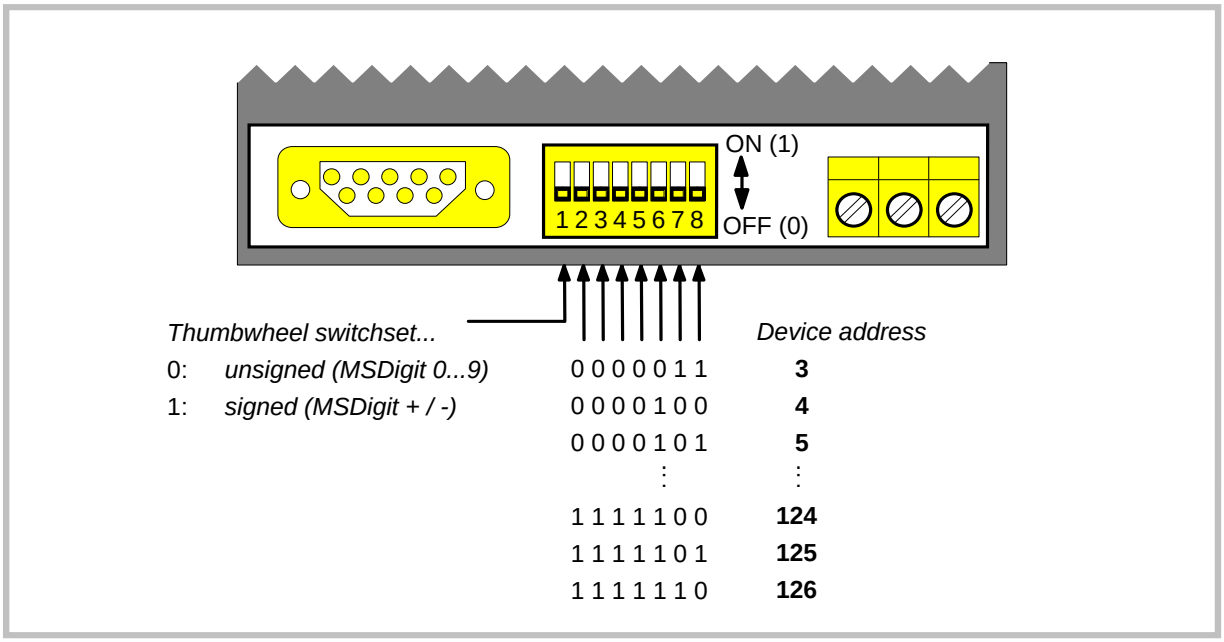
Baud rate (kbit / s)	9,6	19,2	93,75	187,5	500	1500	3000	6000	12000
Max. cable length (m)	1200			1000	400	200	100		

The Profibus line must be terminated by a resistor network on the extreme ends of the cable (i.e. on the first unit and on the last unit).
The shield of the cable must be connected to protection earth.



3. Transmission Baud Rate and Unit Address

The unit does not require a Baud rate preset because the baud rate of the network will be automatically recognized while the communication is starting up.
All Profibus-DP baud rates from 9.6 kbit/s to 12 Mbit/s are supported.
Positions 2…7 of the DIL switch select the unit address, value range 3…126. This address cannot be changed by the master by the Set_Slave_Address service.
Switch position 1 defines the most significant digit of the front thumbwheel switches to be transmitted as a numeral or a sign (PB306 and PB541 only).
Version providing a sign (option VZ000) require position 1 to be set to "ON"!



DIL switch settings are only read upon initialization.
Changes during normal operation will not be recognized! After change of DIL switch settings you must therefore cycle the power supply of the unit.

4. Communication

During start-up of the communication the master must transmit the **configuration data** according to the unit type:

Unit Type:	Configuration Data:		Meaning:
PB340	A3	hex	4 byte output data
PB306	93	hex	4 byte input data
PB541	B3	hex	4 byte input data + 4 byte output data

When transmitting the **parameter data** to the unit, the position of the decimal point in display can be set by the user parameter "decimal point":

status	wd_fact_1	wd_fact_2	tsdr	Ident high	Ident low	group_Ident	"decimal point"
Profibus-DP parameter data (→ EN 50 170)							1 byte user parameter data

The diagnosis data provide 6 bytes of Profibus-DP diagnosis data and 5 byte of device specific diagnosis data

diag 1	diag 2	diag 3	diag 4	Ident high	Ident low	sign_len = 05 hex	status_type = 81 hex	slot_nr= 00	specifier = 00	error = XX
Profibus-DP diagnosis data (→ EN 50 170)						device specific diagnosis data ("State PDU")				

After successful start-up the data communication begins. Both input and output data are transmitted as signed 32-bit data.

Received output data (PB340, PB541) will be displayed immediately. When the display value range of -99999 … 999999 is exceeded, "------" will appear in the display.

With PB306 and PB541 units the data of the thumbwheel switch set will be transferred to the input data buffer upon pressing the ENTER button, and then transmitted with the next cycle.

The actual communication state of the slave unit is indicated by display (PB340, PB541) or by the front LED (PB306):

Display: (PB340, PB541)	LED: (PB306)	Profibus-DP state:	Device state:
" . . . . . "	off	Power_on	initialization
" - - - - - - "	flashing slowly	Wait_Prm Wait_Cfg	Ready, waiting for start-up
"XXXXXX" (output data)	on	Data_Exchange	Communication active
"_EXXX_"	flashing quickly	(Power_on)	Fatal Error

A fatal error can be reset only by switching of power supply.

5. GSD-File

```
;*****************************************************************************
;
;       GSD-File for PB340/306/541
;
;       File:           mksr0553.gsd
;       Version:        02
;       Date:           07.01.2008
;       Author:         Thomas Jaeckle
;
;       motrona GmbH
;       Zwischen den Wegen 32
;       78239 Rielasingen - GERMANY
;       Tel.: ++49/7731/9332-0 Fax: ++49/7731/9332-30
;       Email: thomas.jaeckle@motrona.com
;
;*****************************************************************************
;
;
#Profibus_DP
;
;
; <Ext-User-Prm-Data-Def-List>
;
ExtUserPrmData = 1 "decimal point"              ; User parameter: Display Decimal Point
Unsigned8 0 0-5                                  ; Default value: 0, value range: 0...5
EndExtUserPrmData
;
;
;General parameters:
;
GSD_Revision = 1
Vendor_Name = "motrona"
Model_Name = "PB340/306/541"
Revision = "01"
Ident_Number = 0x0553
Protocol_Ident = 0                               ; Profibus-DP
Station_Type = 0                                 ; Slave
FMS_supp = 0                                     ; No FMS supported
Hardware_Release = "340PB11"
Software_Release = "01"
```

```
;
9.6_supp = 1                          ; Supported baud rates
19.2_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1
;
MaxTsdr_9.6 = 60
MaxTsdr_19.2 = 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 = 2                 ; RTS-Signal (CNTR-P): TTL-level
24V_Pins = 0                          ; No 24V supply on Profibus-connector
Implementation_Type = "DPC31"
;
;
; Slave-Specification:
;
Freeze_Mode_supp = 1                  ; Freeze-Mode supported
Sync_Mode_supp = 1                    ; Sync-Mode supported
Set_Slave_Add_Supp = 0                ; Set_Slave_Address not supported
Auto_Baud_supp = 1                    ; Automatic baudrate recognition
Min_Slave_Intervall = 10
Fail_Safe = 1                          ; Fail-Save-Mode supported
Max_Diag_Data_Len = 11                ; 5 byte user diagnostic data
Modul_Offset = 0
Slave_Family = 6                      ; HMI unit
Modular_Station = 1
```

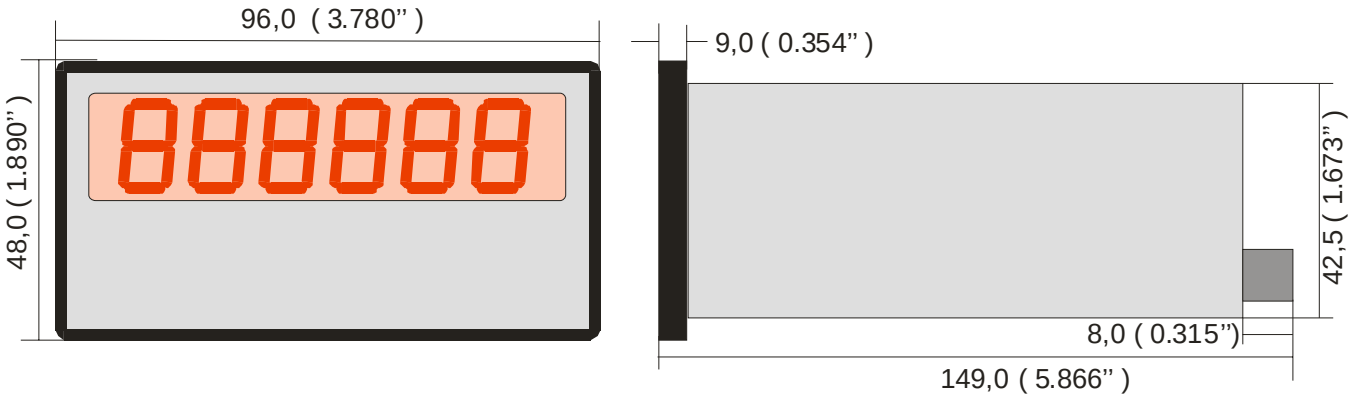
```
Max_Module = 1                          ; Modular station with one module
Max_Input_len = 4                       ; 32 bit input data (PB306/541)
Max_Output_len = 4                      ; 32 bit output data (PB340/541)
Max_Data_len = 8                        ; Max. 2 * 32 bit data (PB541)
;
; UserPrmData:
;
Max_User_Prm_Data_Len = 1               ; 1 byte user parameter data
;
; Module Definition List:
;
Module="PB340" 0xA3                     ; Config. PB340: 4 byte output data
Ext_Module_Prm_Data_Len = 1
Ext_User_Prm_Data_Const(0) = 0x00
Ext_User_Prm_Data_Ref(0) = 1
EndModule
;
Module="PB306" 0x93                     ; Config. PB306: 4 byte input data
Ext_Module_Prm_Data_Len = 1
Ext_User_Prm_Data_Const(0) = 0x00
EndModule
;
Module="PB541" 0xB3                     ; Config. PB541: 4 byte input data +
Ext_Module_Prm_Data_Len = 1             ; 4 byte output data
Ext_User_Prm_Data_Const(0) = 0x00
Ext_User_Prm_Data_Ref(0) = 1
EndModule
```

6. Technical Specifications

Supply Voltage	:	10...30 V DC
Current Consumption	:	PB306: approx. 70 mA (24 V) PB340, PB541: approx. 100 mA (24 V)
Communication Profile	:	Profibus-DP Slave, EN 50 170
Ident Number / GSD-File	:	0553 hex, mksr0553.gsd
Baud Rates	:	9.6 / 19.2 / 93.75 / 187.5 / 500 kbit/s, 1.5 / 3 / 6 / 12 Mbit/s
Thumbwheel switch set	:	0 ... 999 999 - 99 999 ... + 99 999 (Option VZ000)
Display	:	LED 15 mm (0.59'') - 99 999 ... 999 999
Protection class (front side9):		PB340: IP44 *) PB306, PB541: IP40 *)
Operating Temperature	:	0° ... +45°C (32° … 113°F)
Storage Temperature	:	-25° … +70°C (-13° … -158°F)
Weight	:	PB306, PB340: approx. 270 g PB541: approx. 350 g
Conformity and Standards	:	EMC 89/336/EEC: EN 61000-6-2 EN 61000-6-3 LV73/23/EEC: EN 61010-1

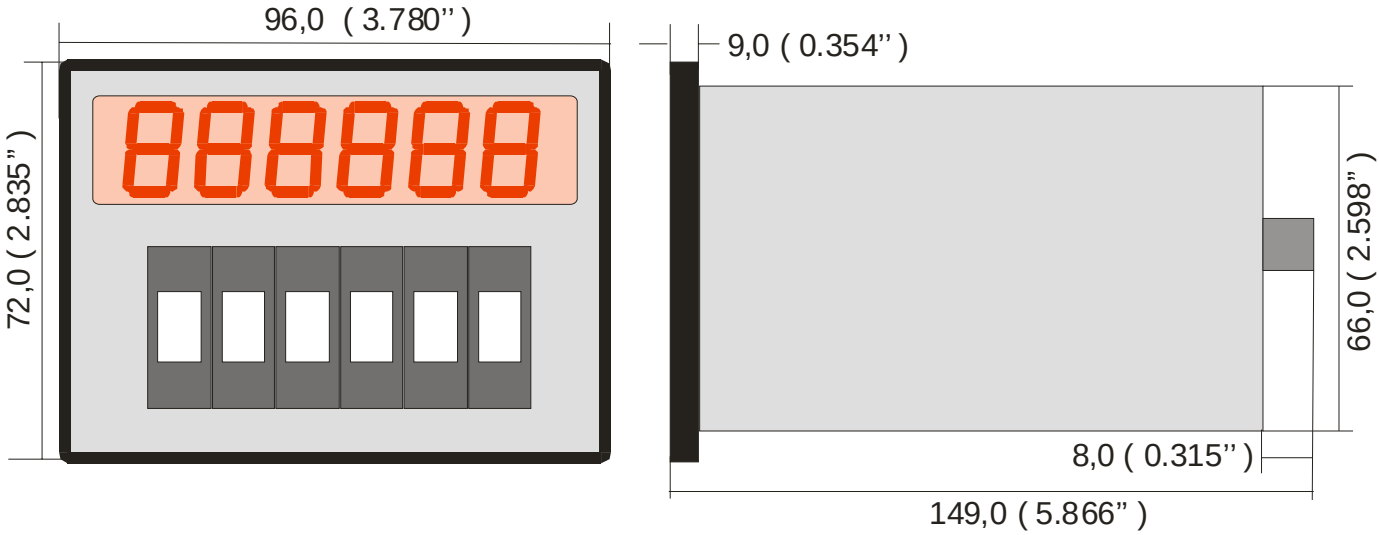
7. Dimensions

PB 306, PB 340:



Panel Cut-Out: 92 x 43 mm (3.622 x 1.693'')

PB 541:



Panel Cut-Out: 92 x 67 mm (3.622 x 2.638'')