

GREISINGER electronic GmbH

EASYBus PROFIBUS Gateway



Operating manual

GW 110PB



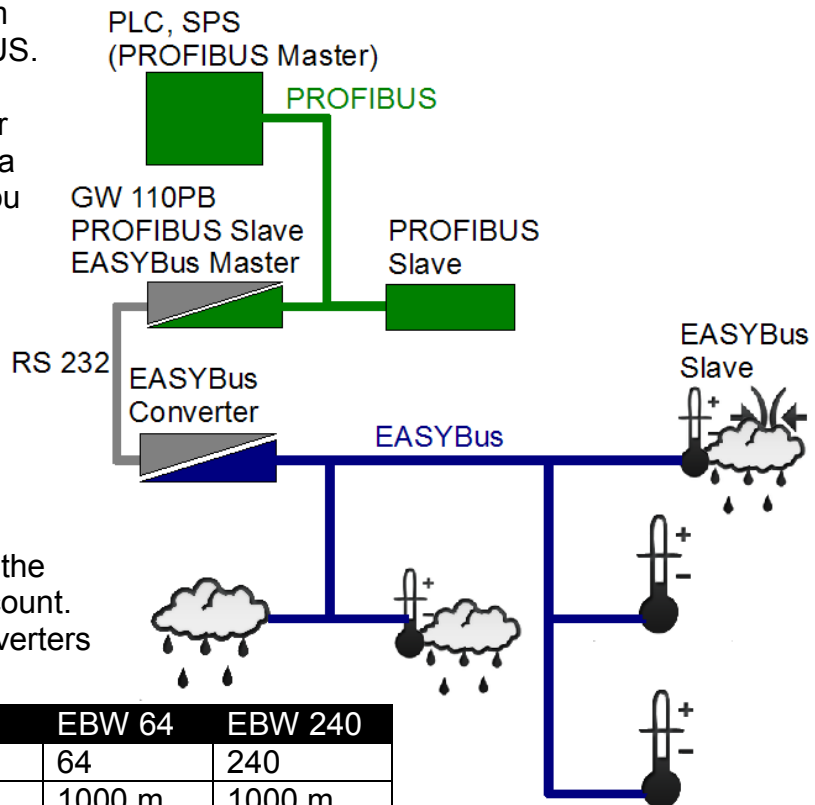
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1. Abstract

The GW 110PB connects from the EASYBus to the PROFIBUS.

A SPS, PLC, can easily gather measuring values or other data from an EASYBus module. You can connect and talk to any EASYBus module. An EASYBus level converter has to be connected to the EASYBus gateway via a DB-9 cable.



The level converter used sets the maximum EASYBus module count. Following EASYBus level converters can be used:

	EBW 1	EBW 64	EBW 240
Module count up to	9	64	240
Cable length up to	200 m	1000 m	1000 m
Power drain	5 W	15 W	30 W
Overload indication	no	yes	yes

2. The EASYBus

The EASYBus is a low-cost 2-pin connection bus system based on the M-Bus system. The EASYBus features logger, programmable control loops, transducers, display modules and switching modules. The loggers have a battery runtime of up to 6 years. The devices are intended for fixed measuring, long-term-measuring or climate-supervision. The EASYBus can be connected in line, bus, star, tree or mixed bus-topology with a maximum length of up to 1000 m. The main advantages are the polarity-free 2-pin-connection and the supply of the modules over the bus-wiring. The easy and comfortable configuration and initialization of the EASYBus-modules is done with the free software tool EASYBus-Configurator (download at www.greisinger.de).

3. Required accessories

EASYBus level converter with RS 232 interface (EBW 1, EBW 3, EBW 64).
 EASYBus-Configurator (from Version 2.0) for EASYBus system initialization.
 GW 110PB with power supply and PROFIBUS GSD-File

4. Connection

The EASYBus level converter has to be connected with the included cable. With an EBW 64 the connection can be made alternatively by connecting via appliance terminal.

Gateway	Level converter (EBW 64)
1Rx232	TxD
2Tx232	RxD
3AP-GND	GND

5. Configuration

Both upper rotary switches must be set to 0. Different positions could result in a fault of the complete PROFIBUS! The switch "Termination" has to be set to on or off according to the PROFIBUS wiring to activate or deactivate the internal PROFIBUS termination circuitry of the GW 110PB.



The gateway needs a PROFIBUS slave address. This can be set with the two lower rotary switches (ID High and ID Low). The input is HEX coded. For a PROFIBUS slave address of 7 (factory default) ID High is 0 and ID Low is 7 (see picture). Different addresses have to be set as mentioned in the table below, just add ID High and ID Low. The GW 110PB changes the address after restarting (disconnect from power supply, wait a short time and reconnect the power supply).

ID High	ID Low	ID High	ID Low
0	0	0	0
1	16	1	1
2	32	2	2
3	48	3	3
4	64	4	4
5	80	5	5
6	96	6	6
7	112	7	7
8	128	8	8
9	144	9	9
A	160	A	10
B	176	B	11
C	192	C	12
D	208	D	13
E	224	E	14
F	240	F	15

5.1 PROFIBUS termination

The GW 110PB features a switchable internal PROFIBUS termination. The PROFIBUS has to be terminated on both line ends. This is usually done within the PROFIBUS-cable, an active PROFIBUS-terminator or with the switch Termination on the GW 110PB. The switch Termination should only be set to ON when the internal termination should be activated.

6. LED States

EASYBus-side (Upper LEDs of GW 110PB near rotary switch S4 and S5)

State	State LED	LED 1	LED 2	LED 4	LED 8
Startup	Red	Green	Green	Green	Green
Unknown PROFIBUS state	Red	Off	Off	Off	Off
Bus not active	Red	Green	Off	Off	Green
Bus Error	Red	Off	Green	Off	Green
Waiting for configuration	Red/Green	Green	Off	Green	Off
Waiting for parameter	Red/Green	Off	Green	Green	Off
Waiting for datatransfer	Off	Green	Off	Off	Off
Active datatransfer	Green	Green	Off	Off	Off

PROFIBUS-side (Lower LEDs of GW 110PB near rotary switch High and Low ID)

State	Bus LED	State LED
Bus error	Red	Red
Waiting for master (SPS)	Red	Red/Green
Bus active, no error	Off	Green

7. Programing

There are different values that could be gathered form EASYBus modules. An EASYBus module has to be queried by its address to get a value. With the callcode and the address in the query (see table below) the module will respond with the desired data.

7.1 Query

Byte 1	Byte 2
Address	Callcode

7.2 Response

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Address	Callcode	Errorcode	State	User data			

7.3 Callcode

Callcode	Commando	Returntype (Byte 5 ... 8 of response)
Display-Parameter		
0x01	Read display value	32Bit Float
0x02	Read min.-display range	32Bit Float
0x03	Read max.-display range	32Bit Float
0x04	Read display unit	32Bit Integer
0x05	Read display measuring	32Bit Integer
Module-Parameter		
0x10	Read serialnumber	32Bit Integer
State-Parameter		
0x21	Read state	32Bit Integer
0x22	Read min.-alarm value	32Bit Float
0x23	Read max.-alarm value	32Bit Float

With Byte 4 (State) is not 0, the module has an additional information about its actual state. The state can be read with callcode 0x21 (read state).

All integer return values are coded. Please decode them with the help of the appendix tables.

When Byte 3 (Error) is not 0 an error occurred. The user data is invalid but could contain additional information about the error.

8. Device description file

A device description file (GSD) is included (EASYBus.GSD). It describes the EASYBus gateway for the PROFIBUS master project work.

9. Appendix Tables

9.1 State

User data (Byte 5 ... 8) of read state (0x21)

Bit	Hex	Description	Device display
Bit 0	0x0001	Max. alarm	
Bit 1	0x0002	Min. alarm	
Bit 2	0x0004	Display range overrun	FE3
Bit 3	0x0008	Display range underrun	FE4
Bit 8	0x0100	Measuring range overrun	FE1
Bit 9	0x0200	Measuring range underrun	FE2
Bit 10	0x0400	Sensor error	FE9
Bit 12	0x1000	System fault	FE7
Bit 13	0x2000	Calculation not possible	FE11
Bit 15	0x8000	Low battery	FE8

9.2 Errorcodes

When Byte 3 (Error) is not 0 an error occurred.

Error	Reason	
23	Module not responding	The module sent no response to a query. The address of the module does not exist. Check the EASYBus. Maybe a cable fault caused this error.
25	CRC-Error	The CRC calculation was wrong. Maybe more than one module is responding simultaneously. Please perform an EASYBus system initialization.
26	Response address wrong	A wrong module responded. Please perform an EASYBus system initialization.
36	Return value is error code	A local sensor module error has occurred. The user data contains the extended errorcode.
38	Unknown Callcode	The module does not know or support the callcode.

9.3 Extended Errorcodes (user data Byte 5 ... 8)

16352	10000000	Measuring range overrun
16353	10000001	Measuring range underrun
16362	10000010	Calculation not possible
16363	10000011	System fault
16364	10000012	Low battery
16365	10000013	No sensor
16366	10000014	Recording error: EEPROM error
16367	10000015	EEPROM checksum error
16368	10000016	Recording error, Error 6: System restarted
16369	10000017	Recording error: data pointer
16370	10000018	Recording error: marker, data invalid
16371	10000019	Data invalid

9.4 Units

User data (Byte 5 ... 8) of read display unit (0x04)

Temperature	°C	1
	°F	2
	K	3

Frequency	U/min	50
	Hz	53
	Pulses	55

Current	A	100
	mA	101
	µA	102

Voltage	V	105
	mV	106
	µV	107

Humidity	%r.H.	10
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Speed	m/s	60
	km/h	61

Power	W	111
	kW	112
	Wh	115
	kWh	116
	Wh/m ²	119

Pressure	inHg(0°C)	18
	inHg(60°F)	19
	bar	20
	mbar	21
	Pascal	22
	hPascal	23
	kPascal	24
	mPascal	25
	mm Hg	27
	PSI	28
	mm H ₂ O	29

Distance	mm	70
	m	71
	inch	72
	ft	73

Resistance	mOhm	120
	Ohm	121
	kOhm	122
	MOhm	123

Specific resistance	kOhm*cm	125
	MOhm*cm	126

Conductivity	S/cm	30
	mS/cm	31
	µS/cm	32

Flow	l/s	79
	l/h	80
	l/min	81
	m ³ /h	82
	m ³ /min	83
	Nm ³ /h	84

General	%	150
	°	151
	ppm	152
	g/kg	160
	g/m ³	161
	mg/m ³	162
	kJ/kg	170
	kcal/kg	171
	mg/l	172
	dB	175
	dBm	176
	dBa	177

pH/Redox	pH	40
	rH	41

Weight & Force	g	90
	kg	91
	N	92
	Nm	93

Oxygen	mg/l O ₂	45
	%Sat O ₂	46
	%O ₂	47

9.5 Measurements

User data (Byte 5 ... 8) of read display measuring (0x05)

Temperature	Temperature	1	Gas	CO Concentration (gaseous)	60
	Temperature Difference	2		CO2 Concentration (gaseous)	61
Humidity	Rel. Air Humidity	10	Distance	Distance	70
	Atmospheric Humidity	11		Height	71
	Enthalpy	12		Level	72
	Dewpoint Temperature	13	General	Frequency	100
	Dewpoint Distance	14		Revolutions	101
	Wet Bulb Temperature	15		Counter	102
	Material moisture u	16		Pulses	103
	Absolute humidity	17		Average absolute pressure	110
Wet-basis moisture w	18	Average relative pressure		111	
		Velocity		120	
Pressure	Absolute Pressure	20	Lumious flux	130	
	Relative Pressure	21	Illuminance	131	
	Absolute Pressure Min.	22	Luminance	132	
	Absolute Pressure Max.	23	Lumious intensity	133	
	Relative Pressure Min.	24	Flow	140	
	Relative Pressure Max.	25	Current	160	
	Pressure Difference	26	Voltage	180	
	Pressure Difference Min.	27	Loudness	190	
Pressure Difference Max.	28	Loudness level	191		
Conductivity	Conductivity of Fluid	30	Sound pressure	192	
	Resistance of Fluid	31	Sound pressure level	193	
	Salinity	32	Resistance	200	
	Total Dissolved Solids	33	Conductance	220	
	Conductance of Fluid	34	Conductivity	221	
pH/Redox	Resistivity of Fluid	35	Wind Direction	223	
	PH-Value	40	Carboxy-haemoglobin	225	
	ORP	41	Interface Operation	239	
	ORP (Hydrogen Electrode)	42			
Oxygen	RH-Value	43			
	Oxigen Partial Pressure (dissolved)	50			
	Oxigen Concentration (dissolved)	51			
	Oxigen Saturation (dissolved)	52			
	Oxigen Partial Pressure (gaseous)	53			
	Oxigen Concentration (gaseous)	54			