the sensor people

# MSI-FB-PB100

Integration into Siemens Simatic Step 7

Fieldbus module for the programmable Safety Controllers MSI 100 and MSI 200



EN 700909 2013/05 We reserve the right to make technical changes

> SAFE IMPLEMENTATION AND OPERATION Operating instructions

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### 1 Description

The MSI-FB-PB100 is a module which allows the connection of the MSI XXX to the PROFIBUS-DP. The module is certified in accordance with the DPV1 specification (EN 50170).

You can find the GSD file (with the characteristic communication features of a PROFIBUS-DP device) online at www.leuze.com/controller/.



Figure 1 PROFIBUS gateway for the MSI XXX modules



Make sure that you always use the latest documentation. This is available for download under www.leuze.com/controller/.

### 2 Downloading the GSD file

- 1. The download link for the GSD file is available at www.leuze.com/controller/.
- 2. Click on the GSD file.
- 3. Save the GSD file by clicking on "OK".

### 3 Controls and indicators of the MSI-FB-PB100





- 1. Button
- 2. Status LEDs

The status LEDs are used to display the PROFIBUS address while the address is being set.

# 4 Example of addressing



Figure 3 Exemplary addressing

### 5 Setting PROFIBUS address on the MSI-FB-PB100

- 1. Press the button 1 (see Figure 2 on page 3) on the MSI-FB-PB100 for approx. 3 seconds (until PWR LED blinks with 2 Hz).
- The LEDs (see Figure 2 on page 3) on the MSI-FB-PB100 show the current PROFIBUS address (preset value: 4).
- 3. Set the PROFIBUS address by pressing the button on the MSI-FB-PB100 (see table).
- 4. Press the button on the MSI-FB-PB100 for six seconds to accept the address.
- 5. After the address has been accepted, all LEDs briefly illuminate.



	PB	LED code						
	address	SF	BF	ERR	DAT	PWR		
	0	0	0	0	0	0		
	1	1	0	0	0	0		
	2	0	1	0	0	0		
	3	1	1	0	0	0		
preset PB addre	4	0	0	1	0	0		
!	5	1	0	1	0	0		
	6	0	1	1	0	0		
	7	1	1	1	0	0		
	8	0	0	0	1	0		
	9	1	0	0	1	0		
	10	0	1	0	1	0		
	11	1	1	0	1	0		
	12	0	0	1	1	0		
	13	1	0	1	1	0		
	14	0	1	1	1	0		
	15	1	1	1	1	0		
	16	0	0	0	0	1		
	17	1	0	0	0	1		
	18	0	1	0	0	1		
	19	1	1	0	0	1		
	20	0	0	1	0	1		
	21	1	0	1	0	1		
	22	0	1	1	0	1		
	23	1	1	1	0	1		
	24	0	0	0	1	1		
	25	1	0	0	1	1		
	26	0	1	0	1	1		
	27	1	1	0	1	1		
	28	0	0	1	1	1		
	29	1	0	1	1	1		
	30	0	1	1	1	1		
	31	1	1	1	1	1		

## 6 INTERFACE system addressing



#### Please perform during initial startup!

- 1. Press the button (see Figure 2 on page 3) on the MSI-FB-PB100 for approx. 12 seconds (until PWR LED blinks with 4 Hz).
- 2. After releasing the button, the SF LED blinks (if the SF LED does not illuminate alone, press the button over and over until the SF LED illuminates alone).
- 3. Briefly press the confirm button on the MSI XXX.
- 4. All LEDs on the MSI XXX illuminate briefly as a confirmation; then the PWR LED illuminates.
- 5. Press the button on the MSI-FB-PB100 for approx. 6 seconds.
- 6. All status LEDs on the MSI XXX illuminate briefly one time.
- 7. The PWR LED and the DAT LED now illuminate on the MSI-FB-PB100.



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A project must exists on the MSI XXX before interface system addressing.

If there is still no communication via the Profibus during configuration, the BF LED and the SF LED continuously illuminate red.

### 7 Integration into STEP 7

#### 7.1 Creating a project with SIMATIC 300

1. Starting SIMATIC Manager



Manager

Figure 4 SIMATIC Manager icon

#### 2. Create a new project

	SIMATIC Manager - [Test Alex2_281009 C:\Siemens\Step7\s7proj\Test_A_3]										
Ð	File	Edit	Insert	PLC	View	Options	Window	Help			
Г	N	ew							Ctrl+N		< No Filter >
Ð	New Project' Wizard 9 Open Ctrl+O Open Version 1 Project Close										
	м	ultipro	ject							۲	
	S: M	7 Mem emory	ory Card Card File	e						+ +	
	Sa	ave As	;						Ctrl+S		

Figure 5 Creating a new project

3. Assign a project name and click "OK"

Ne	lew Project					
ſ	[Lass excitates] [Charter [ 14 Martine]					
User projects   Libraries   Multiprojects						
	Name	Storage path				
	🞒 kgfdzui	C:\Siemens\Step7\s7proj\kgfc	Izui			
	B7_MR_28082009_1	C:\Siemens\Step7\s7proj\S7_	MR_~1			
	S7_Pro1	C:\Siemens\Step7\S7proj\S7_	Pro1			
	S7_Pro2	C:\Siemens\Step7\S7proj\S7_	Pro2			
	S7_Pro3	C:\Siemens\Step7\s7proj\S7_	Pro3			
	By S7_Pro4	C:\Siemens\Step7\s7proj\S7_	Pro4			
	By S7_Pro5	C:\Siemens\Step7\s7proj\S7_	Pro5			
	Pa Tost Alou	C-1 Ciamonal Chap 71 a 7proil Taal	Ala			
ſ	Add to current multiproject					
ľ	Name: Type:					
	Testproject			•		
ľ			E Libr	arv		
	Storage location (path):					
	C:\Siemens\Step7\s7proj		E	Browse		
OK L Cancel Help			Help			
L		Can		(incip		

Figure 6 Saving project name

4. Select the appropriate CPU in the "Insert" menu point under "Station".



5. The selected CPU is inserted into your project.



Figure 8 Selected CPU

6. Open the context menu of the inserted CPU. Click on "Open Object".



Figure 9 Opening object

7. The hardware configuration is displayed.



Figure 10 Hardware configuration

8. Close all application windows.

😹 HW Config: Configuring hardware	_ 🗆 🗙
Station PLC YetH Options Help	

Figure 11 Hardware configuration

9. Open the "Options" menu and select the "Install New GSD..." item.

🖳 HW Config: Configuring hardware						
Station PLC View	Options Help					
∎⊯₽₽	Customize Ctrl+Alt+E					
	Edit Catalog Profile Update Catalog					
-	Install HW Updates					
	Install New GSD					
	Import Station GSD					
	Find in Service & Support					

Figure 12 Installing GSD file

- 10. Now load the GSD file downloaded in chapter 2.
- 11. If the "Installation was successful" message appears, you can close the hardware editor.



Figure 13 "Installation was successful" message

12. Open the context menu of the inserted CPU. Click on "Open Object".

SIMATIC Manager - [Testproject C:\Siemens\Step7\s7proj\Testproj]			
B File Edit Insert PLC	View Options	Window Help	
	b 🗈 🔬 🖸		🔠 🎹 主 < No Filter >
	Din Harc	ware	_
- 🕅 SIMATIC 300(1)	Open Object	Ctrl+Alt+O	
	Cut	Ctrl+X	
	Сору	Ctrl+C	
	Paste	⊂trl+∀	
	Delete	Del	
	PLC		•
	Print		•
	Rename	F2	
	Object Propertie	s Alt+Return	
			_

Figure 14 Opening object

13. Open the "View" menu and select "Catalog"



14. The Catalog window opens.



Figure 16 Catalog window

15. You must now insert the appropriate devices into your project here.

#### 7.2 Hardware configuration

1. Select the "SIMATIC 300"  $\rightarrow$  "RACK 300"  $\rightarrow$  "Rail" item and insert it into your project.



Figure 17 Selecting rail

2. Select the "SIMATIC 300"  $\rightarrow$  "CPU 315-2 DP"  $\rightarrow$  "6ES7-315-2AF03-0AB0"  $\rightarrow$  "V1.2" item and insert it into your project.



Figure 18 Selecting CPU

3. The "Properties" window opens. Click on "New" and assign the bus segment a name.



Figure 19 Bus segment name

 Select the "PROFIBUS-DP" → "Additional Field Devices" → "Gateway" item. Now drag the MSI-FB-PB100 into your project.



Figure 20 Selecting gateway

 The "Properties" window opens. Under "Address", you must select the address which was configured in the MSI-FB-PB100 in chapter 4.



Figure 21 Gateway properties

 You can now drag the necessary GSD data from the Catalog window into your project under the "MSI-FB-PB100" item (see chapter 9).

🔣 HW Config - [SIMATIC 300(1) (Configuration) Testproject]
🕅 Station Edit Insert PLC View Options Window Help
PROFIBUS(1): DP master system (1) PROFIBUS(1): DP
SIMATIC 300(1) Slot Designation UB PROFDP master system (1)

Figure 22 GSD data

### 8 Setting: byte order

- 1. Open the context menu of the MSI-FB-PB100 and select "Object properties".
- 2. Activate the "Parameter Assignment" tab.



Figure 23 Setting of byte order

3. You can set the byte order of the transmitted data here under "Device-specific parameters", item "Byte order".

### 9 Explanation of GSD data

You can find a comprehensive description in the package insert of the MSI-FB-PB100 supplied with the product.

You can download the package insert at www.leuze.com/ controller/.

#### 9.1 GSD data for MSI-FB-PB100

MSI-FB-PB100
Universal module
Digital inputs, outputs
Gateway: Module state
Gateway: Channel State 1
Gateway: Channel State 2
Gateway: Channel State 3
Gateway: Channel State 4
IFS: Slave Error State 1
IFS: Peripherie State 1

### 9.2 GSD data for MSI 10x

MSI100 – Objects	
MSI100 : Device	Interface
MSI100 : Safe IN w01	Safe inputs: I0 – I15
MSI100 : Safe IN w02	Safe inputs: I16 – I19
MSI100 : Safe OUT w01	Safe outputs: O0 – O3
MSI100 : None Safe OUT w01	Message outputs: M0 – M3 and external signals: EQ0 – EQ11
MSI100 : None Safe OUT w02	External signals: EQ12 – EQ15
MSI100 : PWR-LED	Diagnosis LED: PWR
MSI100 : ERR-LED	Diagnosis LED: ERR

### 9.3 GSD data for MSI 20x

MSI200 – Objects	
MSI200 : Device	Interface
MSI200 : Safe IN w01	Safe inputs: I0 – I15
MSI200 : Safe IN w02	Safe inputs: I16 – I19
MSI200 : Safe OUT w01	Safe outputs: O0 – O3
MSI200: None Safe OUT w01	Message outputs: M0 – M3 and external signals: EQ0 – EQ11
MSI200: None Safe OUT w02	External signals: EQ12 – EQ27
MSI200: None Safe OUT w03	External signals: EQ28 – EQ43
MSI200: None Safe OUT w04	External signals: EQ44 – EQ59
MSI200: None Safe OUT w05	External signals: EQ60 – EQ63
MSI200: Diag IN w01	Diagnosis LEDs: PWR, DATA, ERR and voltage supply terminal 24V/0V and
	short circuit O0 – O3
MSI200: Slave1 – Diag IN w01	Diagnosis LEDs EM1: PWR, ERR
MSI200: Slave1 – Diag IN w02	Diagnosis EM1: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave2 – Diag IN w01	Diagnosis LEDs EM2: PWR, ERR
MSI200: Slave2 – Diag IN w02	Diagnosis EM2: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave3 – Diag IN w01	Diagnosis LEDs EM3: PWR, ERR
MSI200: Slave3 – Diag IN w02	Diagnosis EM3: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave4 – Diag IN w01	Diagnosis LEDs EM4: PWR, ERR
MSI200: Slave4 – Diag IN w02	Diagnosis EM4: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave5 – Diag IN w01	Diagnosis LEDs EM5: PWR, ERR
MSI200: Slave5 – Diag IN w02	Diagnosis EM5: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave6 – Diag IN w01	Diagnosis LEDs EM6: PWR, ERR
MSI200: Slave6 – Diag IN w02	Diagnosis EM6: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave7 – Diag IN w01	Diagnosis LEDs EM7: PWR, ERR
MSI200: Slave7 – Diag IN w02	Diagnosis EM7: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave8 – Diag IN w01	Diagnosis LEDs EM8: PWR, ERR
MSI200: Slave8 – Diag IN w02	Diagnosis EM8: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave9 – Diag IN w01	Diagnosis LEDs EM9: PWR, ERR
MSI200: Slave9 – Diag IN w02	Diagnosis EM9: voltage supply terminal 24V/0V and short circuit O0 – O3
MSI200: Slave10 - Diag IN w01	Diagnosis LEDs EM10: PWR, ERR
MSI200: Slave10 - Diag IN w02	Diagnosis EM10: voltage supply terminal 24V/0V and short circuit O0 – O3

### 10 Example

The following modules are used in this example:

- SIMATIC S7-300
- MSI-FB-PB100

#### 10.1 Hardware structure



### Figure 24 Hardware structure

### 10.2 GSD values used

	Order no. / designation	
MSI-FB-PB101	Digital inputs, outputs	Inputs and outputs of the MSI-FB-PB100
	MSI100 : Device	Must be set
MSI XXX	MSI100 : Safe IN w01	Display: safe inputs: I0 – I15
	MSI100 : Safe IN w02	Display: safe inputs: I16 – I19
	MSI100 : Safe OUT w01	Display: safe outputs: O0 – O3
	MSI100 : None Safe OUT w01	Display: message outputs: M0 – M3

#### 10.3 Monitoring variables

HW Config - [SIMAT: Station Edit Insert	IC 300(1) (Configurati PLC View Options	ion) Testpro Window Help	oject]	
	<u>6 BR 🎪</u>	💼 🗊 🗖	<b>B N</b>	
D(0) UR     CPU 315     X2     DP     D     D     D     D     CPU 315     X2     D     D     D     C	2 DP	PROFIB	US(1): DP mass	ter system (1) Ba
1				
11		1		
(4) EM-PB-G	ATEWAY-IFS	1		
(4) EM-PB-G	ATEWAY-IFS	]	Q Address	Comment
(4) EM-PB-G/	ATEWAY-IFS mber / Designation uts, outputs	1 Address 256257	Q Address 256257	Comment
(4) EM-PB-G, (4) EM-PB-G, (4) Corder Nu 112 Digital ing 3 3 MSIXXX	ATEWAY-IFS imber / Designation uts, outputs : Device 1	1 Address 256257	Q Address 256257	Comment
(4) EM-PB-G (4) EM-PB-G (4) C Order Nu 112 Digital ing 3 3 MSI XXX	ATEWAY-IFS imber / Designation uts, outputs : Device 1 : Master Input 15.0	1 Address 256257 284285	Q Address 256257	Comment
(4) EM-PB-G (4) EM-PB-G (4) EM-PB-G (4) Clocker Nu (112 Digital inp (3) 3 MSI XXX 4 66 MSI XXX 5 66 MSI XXX	ATEWAY-IFS imber / Designation uts, outputs : Device 1 : Master Input 15.0 : Master Input 19.16	1 Address 256257 284285 286287	Q Address 256257	Comment
(4) EM-PB-G (4) EM-PB-G (4) EM-PB-G (5) C Order Nu (112 Digital ing (12) C Order Nu (112 Digital ing (12) C Order Nu (12) C Order Nu (13) C Order Nu (13) C Order Nu (14) EM-PB-G (15) C Order Nu (15) C Order Nu (15	ATEWAY-IFS imber / Designation uts, outputs : Device 1 : Master Input 150 : Master Input 1916 : Master SafeDut	1 Address 256257 286287 288289	Q Address 256257	Comment
(4) EM-PB-G     (5)     (4) EM-PB-G     (7)	ATEWAY-IFS Imber / Designation uts, outputs : Device 1 : Master Input 150 : Master Input 150 : Master SafeOut : Master UnSafeOut	I Address 256257 284285 286285 288289 230231	Q Address 256257	Comment
(4) EM-PB-G. (4) EM-PB-G. (4) EM-PB-G. (5) C Order Nu 1 112 Digital ing 13 3 MSI XXX 14 66 MSI XXX 15 66 MSI XXX 15 66 MSI XXX 16 66 MSI XXX 17 66 MSI XXX	ATEWAY-IFS imber / Designation uts, outputs : Device 1 : Master Input 150 : Master Input 1916 : Master SafeOut : Master UnSafeOut	I Address 256257 284285 286287 288289 288289 289291	Q Address 256257	Comment 

Figure 25	Opening	context menu	u of the	MSI-FB-PB100
	• • • • · · · · · · · · · · · · · · · ·			

Parameters	Value		
🗆 🔄 Station parameters			
—🔳 DP Interrupt Mode	DPV0		
🕂 🧰 General DP parameters			
🕂 🧰 Device-specific parameters			
—Ⅲ IFS Application :	ELR, EMM		
— Byte order :	Intel		
—	Reset outputs		
— OUTPUT 1 controled by :	Profibus		
- OUTPUT 2 controled by :	Profibus		
- OUTPUT 3 controled by :	Profibus		
—	Profibus		
— Real power [₩]( * 0.001 )	1000		
—	1000		
- Power [VA]( * 0.001 )	1000		
- 🗐 Voltage [V]( * 0.001 )	100		
- Current [A]( * 0.001 )	1		
— Switchcycles (* 1)	1		
—[iii] Operatioon time [h]( * 0.001 )	1		

Figure 26 Object properties of the MSI-FB-PB100

• In the object properties of the MSI-FB-PB100, the conversion factors of the measurement values are defined.