

Instructions for Initial Start-Up

of wenglor Products via Profibus



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- **1** Connecting and Configuring the Sensor and the Gateways
- 1.1 Wiring Diagrams
- 1.1.1 4-Pin Sensor with RS-232 Interface



1.1.2 8-Pin Sensor with RS-232 Interface



The sensor's switching output (e.g. A1) con be connected by wiring it to pin 10 at the gateway.

1.1.3 Scanner with 15-Pin D-Sub Plug Connector







1.1.4 Handheldscanner via RS-232 Interface with 9-Pin D-Sub Plug Connector

1.2 Configuring the Sensor

1.2.1 Configuring the Transit Time Sensor

Click Baud Rate in the Interface menu for the sensor and select the desired baud rate.

1.2.2 Configuring the Scanner

- 1 Connect the scanner to the PC with 15-pin to RS-232 adapter.
- 2 Start wenglor ESP software and establish connection with the Scanner.
- 3 Click the *App Mode* icon in the ESP software.





🧱 ESP - Unbenannt File Model Options Connect View Help ••× •••× •••× Ez) Ŏ DATA 2. EZ Mode Autoconnect Send/Recv Switch Model Configuration Camera Terminal Utilities Output Fc **Receive Reader Settings** × Lõj Save to Reader . Anna Read Cycl Symbol Quality Matchcode Diagnostics Communication Default all ESP Settings Parameters neauer vall Communications E RS232/422 Host Port - Host Port Connections Baud Rate 38.4K Parity None Stop Bits One Eight Data Bits Point-to-Point + Host Protocol Host 422 Status Disabled

5

4 Click *Receive Reader Settings* in the Send / Recv popup menu.

5 Then select **Configuration** \rightarrow **Communication**, and select the desired baud rate from the list.

🥵 ESP - Unbenannt	
File Model Options Connect Vie	n: Help
EZ Mode Autoconnect Send/Re	y Switch Model Configuration Camera Terminal Utilities Output For
Communication Read Cycle Sym	oologies I/O Symbol Quality Matchcode Diagnostics
Parameters	Reader Values
E RS232/422 Host Port	
Host Port Connections	
Baud Rate	_ 38.4K
Parity	600
- Stop Bits	1200
Data Bits	2400
+ Host Protocol	4800
Host 422 Status	10.02
RS232 Auxilliary Port	38.4K
Aux Port Connections	57.6K
- Baud Rate	115.2K*



6 In addition to this, enter an *"I"* under *Preamble* → *Preamble Characters* and a period "." under *Postamble* → *Postamble Characters*, and set both to *Enabled*.

🥵 ESP - Unbenannt	
File Model Options Connect Vie	w Help
EZ Mode Autoconnect Send/Rei	cy Switch Model Configuration Camera Terminal Utilities Output
2 & B	
Communication Read Cycle Sym	bologies I/O Symbol Quality Matchcode Diagnostics
Parameters	Reader Values
RS232/422 Host Port	
RS232 Auxilliary Port	
	Enabled
Preamble Characters	
Postamble	Enabled
Postamble Characters	
Response Timeout	12
- LRC Status	Disabled
L. Aux Port System Data Status	Disabled

1.2.3 Configuring 8-Pin Sensors

Connect the sensor to the PC via an RS-232 interface and establish a connection with the sensor via the Hyper Terminal. Then, enter an appropriate command in order to set the sensor's baud rate (default baud rate in the operating instructions).

Note: It's also possible to leave the baud rate unchanged and use the default setting.

1.2.4 Configuring the BR40

Start wBR40 software and set the start character to "*I*", the stop character to "." and select the desired baud rate under *RS-232*. Then enter a check mark next to *RS-232 active* and save the project to the sensor.

NwBR40					
Datei Bearbeiten Ansicht Reader Hilfe Info					
	$ \mathbf{e}_{\mathbf{v}} \in \mathbf{v}_{\mathbf{v}} $				
Projekt 🛛 🗙	R5-232	🛛 Verknüpfungen 🛛 🔀			
NewProject Kamera Timing Diject 1 Diject 1 Collect 1 Co	RS-232 Statzeichen / FS-232 Aktiv Stoppzeichen 0 <13> Stoppzeichen 1 <10> Trennzeichen . Fullzeichen H	Objekte Object 1 R5232 Object 2 S5555 Object 3 S55555 Object 4			



1.3 Configuring the Profibus Gateway

1.3.1 Baud Rate

Set the baud rate at the gateway with the rotary selector switch designated **RS-232 Mode**. A list indicating which setting is used for which baud rate is included in the operating instructions for the gateway.

Notes:

- As an alternative, you can set the baud rate with the help of the software by turning the rotary selector switch to the F position (baud rate is taken from Profibus).
- The baud rates for 4-pin sensors can be found in their respective operating instructions.

Important: After changing the baud rate for the gateway, disconnect it briefly from electrical power in order to activate the new setting.

1.3.2 Address

Select an unused address for the gateway in hex format with the two rotary selector switches under *Slave IO*.

Important:

- Maximum permissible value: 125 (7D)
- After configuring the gateway, disconnect it briefly from electrical power in order to activate the new settings.

2 Adding a Profibus to the Hardware Manager in S7 Software

Proceed as follows in order to add a Profibus:

1 Double click the **MPI / DP** entry.

🚍 (0) UR				
1	PS 307 2A			
2	CPU 315-2 PN/DP			
XI	MPI/DP			
X2	PN-IO			
3				
4	DI8/D08xDC24V/0,5A, Out~			
5				
6				
7				
8				
9				
10				
11				



🙀 HW Konfig - [SIMATIC 300-Station (Konfiguration) S7_ProfinetGateway]		_	ðX
🏙 Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe			- 8 >
	_		
E (0) UR			
	Sucher	·]	M† Mi
2 T LFU 315-2 FN/UP X1 M/UP	Profil:	Standard	•
X2 M2/U2 3 0 4 DB/D08b0C24V/05A, Dut" 5 - 7 - 8 - 9 - 10 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 10 - 11 - 12 - 14 - 15 - 16 - <		PROFIBUS-PA PROFINEUS-PA PROFINET IO SIMATIC 200 SIMATIC 200 SIMATIC PC Based Control 300/400 SIMATIC PC Station	
	PROFIL	IET IO Curtor	
	PRUFI	NET TU-System	τ.
Drücken Sie F1, um Hilfe zu erhalten.			Änd

2 Select the Profibus interface and click *Properties*.



3 Select the address you want to assign to the S7, and add a new connection by clicking *New*.

📴 HW Konfig - [SIMATIC 300-Station (Konfiguration) S7_ProfinetGateway]	- - X
🏙 Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe earbeiten Ansicht Favoriten Extras ?	_ 8 ×
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1 PS 307 2A	
	Profil: Standard 💌
X2 PN40	PROFIBUS-DP
3 4 III DI2/DD2/DC20//DEA Du/~	PROFIBUS-PA
	E SIMATIC 300
6	E SIMATIC 400
	SIMATIC PC Based Control 300/400 SIMATIC PC Station
10 Etgenschaften - MP//DP - (KU/SZ.1)	
Ligenschaften - PROFIBUS Schnittstelle MPI/0P (RU/S2.1)	
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Subnetz:	
nicht vernetzt Neu	
Löschen	
	✓
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2 CPU 315-2PI653V2.32	-
X1 MFLDP 2 2047	
	-
	-
	-
8	
9	-
	PROFINET IO-System E
2	
Drücken Sie F1, um Hilfe zu erhalten.	Änd

4 The following window appears, with which you can configure the Profibus in the *Network Settings* tab.

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Nation Search Enrugen Zesystem Anson Euros Fenser Hire	
Image:	Proti Standard Proti Standard Image: Standard Standar

vwenglor[®]



5 Acknowledge all settings by clicking **OK**.

HW Konfig - [SIMATIC 300-Station (Konfiguration) S7_ProfinetGateway]	— — —
Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe	_ 8 ×
	T
Image:	■ x Sucherr. Politi. Standard • # PROFIBUS-DP • # PROFIBUS-PA • # BISMATIC 300 • # BISMATIC 200 • # BISMATIC 200 • # BISMATIC PO Based Control 300/400 • # SIMATIC PC Station
(i) UR	
Steckplatz Ill Baugupp. B F.L. M E A Kommer DK 1 IPS 307 2A GES7 Image: Commer Comme	
6 7 8 9 10 11	PROFINET IO-System

6 The Profibus should now be displayed in the hardware monitor.

🗃 (0) U	R	
1	PS 307 2A	
2	CPU 315-2 PN/DP	
XI	MPI/DP	
X2	PN-IO	
3		
4	DI8/D08xDC24V/0,5A, Out~	
5		
6		
7		
8		
9		
10		
11		



3 Installing the Gateway to the S7 Software

3.1 Incorporating the wenglor Gateway into the Simatic Manager

Select *Install DDBFs* from the *Extras* menu in the *Hardware Configuration* for the S7 to this end. Then select the memory location to which the wenglor DDBF has been written and click *Install*.

GSD-Dateien installieren			×
GSD-Dateien installieren:	aus dem Verzeichnis	•	
C:\Gateways			Durchsuchen
Datei Ar GSDML-V1.0-wenglor-20090504.xml 04 WENG0C23.gsd	usgabestand Version 4.05.2009 V1.0 	Sprachen Englisch, Deutsch Default	
ZAG73AN01 (ZAG73AN01): Profibus <=>	Sensor Gateway		
Installieren Brotokoll anzeigen		Alle abwählen	
Schließen			Hilfe



If everything functions correctly, the "wenglor sensoric gmbh" directory should then appear in the right-hand column under *Profibus-DP* \rightarrow *Other field devices* \rightarrow *Gateway*.

💐 HW Konfig - [SIMATIC 300 (Konfiguration) S7_Profibus]	
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7	🗄 🧰 Sensorik
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	Geitere FELDGERATE
(0) UR	Wenglor sensoric gmon
	日本 3 7AG73AN01
I Deugruppi. D., FL. M. E., A. Kommerkel	
	DP/BS232CLink
2 10 0 0 0 0 2 1 0 0 1 2 2 0 0 1 2 2 0 0 1 2 2 0 0 1 2 2 0 0 1 2 2 0 0 1 2 2 0 0 1 2 0 0 0 1 2 0 0 0 0	The DP/DP-Koppler, Ausgabestan
82 8940 3046	+ Compatible Profibus-DP-Slaves
	- W PROFIBUS-PA

Important: In the event that problems are encountered while installing the DDBF, delete any previously installed DBBF or XML file from the the temporary directory of the S7 installation folder (C:\Programs\Siemens\Step7) in the "S7tmp" subdirectory!

Drag and drop the ZAG73AN01 module into the Profibus. Then enter the address of the gateway to be addressed. Enter the address in decimal format.

🐺 HW Konfig - [SIMATIC 300 (Konfiguration) S7_Profibus]	
💵 Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe	_ Ə ×
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ordcken bie F1, um hilre zu erhalten.	JANG



3.2 Configuring the Gateway

Double click the interconnected gateway in the hardware monitor included in the Simatic Manager. Then click the *Device specific parameters* entry under *Parameterize*. The baud rate only has to be entered if the RS-232 mode has been set to "F" at the gateway, otherwise this value is irrelevant. Then enter the sensor's start and stop characters in decimal format. These values are included in the operating instructions for the sensor.

 \rightarrow Enter **0** as the start and stop characters for the scanner, and set RS-232 time to 10 ms.

Note: The table for converting ASCII to decimal format is on pages 19 and 20 of the operating instructions for the gateway.





3.3 Adding a Transmission Mode

Click the module on the Profibus to this end, so that a list containing I/O addresses appears at the bottom of the monitor. Then drag and drop the desired transmission mode from the right-hand list under **Profibus-DP** \rightarrow **Other field devices** \rightarrow **Gateways** \rightarrow **wenglor sensoric gmbh** \rightarrow **ZAG73AN01** \rightarrow ... into the DP list for the ZAG73AN01 (see section 4.3.3).

🕕 HW Konfig - [SIMATIC 300 (Konfigu	ration) S7_Profibus]					
III Station Bearbeiten Einfügen Zielsysten	n Ansicht Extras Fenster Hilfe					_ ð ×
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(2) ZAG73AN01 Steckplatz DP-Kennung	Bestellnummer / Bezeichnung	E-Adresse	A-Adresse	Kommentar	Sens SIMA SIMA SIMA SIMA SIMA SIMA SIMA SINA SINA SINA SINA	onik JDYN JDYN JDRIVE DREG JVERT MICS IS IS Erer FELDGERÄTE ZO
						AU aleeway wenglor sensoric gmbh → ZAG73AN01 → ZAG73AN01 Universalmodul 1 bytein/1 byte-out (trans 1 bytein/1 byte-out 2 byte-in/32 byte-out → Z
Einfügen möglich						Änd



3.4 Setting Input and Output Bytes

In order to be able to incorporate the bytes into the programming, they have to be assigned to unused S7 inputs and outputs. Double click the transmission mode which has been added to the ZAG73AN01 list to this end, and then enter the input byte and the output byte.

HW Konfig - [SIMATIC 300 (Konfiguration) S7_Profibus]	
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🙀 HW Konfig - [SIMATIC 300 (Konfiguration) S7_Profibus]	🔳 🗗 🔀
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Adresse: Länge: Einheit: Konsistent über: Anfang: 100 16 Byte Einheit Steckplatz DP-Kennung B ProzeBabbild: DB1-PA 63 16 2 1 63 16 3 1 Image: Image: Image: 4 14 Byte Image: Einheit	
OK Abbrechen Hilfe	



4 Checking the Existing Connection in S7 Software

4.1 Adding a Variables Table

Right click into the user interface under S7 program \rightarrow modules, and select Add new object \rightarrow Variables table.

🛃 SIMATIC Manager - [S7_Profil	bus C:\Prog	gramme\Siemen	s\Step7\s7proj\S7_F	Profi]	
B Datei Bearbeiten Einfügen Ziels	ystem Ansicht	Extras Fenster	Hilfe		_ 7 ×
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Image: S7_Profibus Image: SIMATIC 300 Image: S7_Programm Image:					
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	1	öschen	Del	-	
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	L B R B	Jmverdrahten Jausteine vergleiche Referenzdaten Jausteinkonsistenz p	n rüfen	Funktion Datenbaustein Datentyp Variablentabelle	
	C	rucken	•		
	S	Objekteigenschafter Spezielle Objekteiger	Alt+Return hschaften •		
I					

Then right click the table and select *Add range*.





Then add both of the ranges which you installed in accordance with section 3.3. For example, with a range of 100 to 115, the **As of operand** range would be set to IR 100 and the number of bytes would be set to 16.

Se s	ATIC Manager - [S7_Profibus C:\Programme\Siemens\Step7\s7proj\S7_Profi] 🔹 🛃	×
	ei Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe 📮 🖻	×
	2 🔢 🛲 🔏 🖻 🕿 💁 📴 🖽 🏛 💽 < Kein Filter > 🔽 💆 🞇 🕮 🛱 🗖 🕺	
8	Var - VAT_1	
	abelle Bearbeiten Einfügen Zielsystem Variable Ansicht Extras Fenster Hilfe	
	🖞 VAT_1 S7_Profibus\S7-Programm	
	Coperand Symbol Anzei Statuswert Steuerwert	
	Bereich einfligen	
	Ab Operand: AB 100	
	Anzahl: 16 📑 Byte(s)	
	Anzeigeformat: HEX DEZ	
	ZEICHEN BIN	
	Steuerwert	
	OK Abbrechen Hilfe	

Now set the display format to *characters*, because most sensors transmit data in ASCII format. If you have a sensor which transmits data in hex format, set the display format to hex.

Proceed in the same manner for the output bytes, but enter OR instead of IR in the As of operand.

4.2 Setting Up the Variables Table

Set the first operand (the toggle byte which always changes its value so that the gateway knows that new data are coming) to Hex for the input, as well as for the output. Right click *Characters* to this end, and select hexadecimal. Set the second operand (the length byte which specifies the length of the value that will be transmitted) to Dec for IR, as well as for OR.

Click the *constant* icon in order to start communication (observe variable).



4.3 Starting Communication via the Variables Table

4.3.1 Receiving Data from the Sensor

After clicking the detail icon, the variables table displays the data transmitted by the sensor under the input bytes.

MAT	IC Manager -	[S7_Profibu:			p7\s7proj\S7						<u> </u>
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186 T	Tabelle Bearbeil	ten Einfügen	Zielsystem Variable Ar	icht Extra	s Fenster Hilf	e			_ 7	×	
				2 1	ON GO W	66. 47. 11.					
				<u> </u>							
8	AB 107	7EICHEN	B#16#00								
<u>a</u>	AB 108	ZEICHEN	B#16#00								
10	AB 109	ZEICHEN	B#16#00								
11	AB 110	ZEICHEN	B#16#00								
12	AB 111	ZEICHEN	B#16#00								
13	AB 112	ZEICHEN	B#16#00							-	
14	AB 113	ZEICHEN	B#16#00								
15	AB 114	ZEICHEN	B#16#00								
16	AB 115	ZEICHEN	B#16#00								
17											
18	EB 100	HEX	B#16#DA								
19	EB 101	DEZ	12								
20	EB 102	ZEICHEN	'0'								
21	EB 103	ZEICHEN	'6'								
22	EB 104	ZEICHEN	'0'								
23	EB 105	ZEICHEN	'D'								
24	EB 106	ZEICHEN	41								
25	EB 107	ZEICHEN	'2'								
26	EB 108	ZEICHEN	'5'								
27	EB 109	ZEICHEN	'9'								
28	EB 110	ZEICHEN	'5'								
29	EB 111	ZEICHEN	B#16#00								
30	EB 112	ZEICHEN	'6'								
31	EB 113	ZEICHEN	'7'								
32	EB 114	ZEICHEN	B#16#00								
33	EB 115	ZEICHEN	B#16#00								
34											
	- 64 - J C2 D						a la	5.0			
o/_Pr	ronbus\57-Progra	mm				V RUN	ADS <	5.2		11.	

Note: If the first byte doesn't change its value (doesn't toggle), the sensor doesn't transmit any data and the most recently transmitted data are displayed.

4.3.2 Transmitting Data to the Sensor

In order to transmit a command to the sensor, the transmit bytes (after byte 2) must first be set to the right data type (see table 4.3.3). Then set the transmission mode to the right length (see table 4.3.3). Proceed as follows after these settings have been completed:

- 1 Change the toggle byte to the other value.
- 2 Specify the length of the subsequent command.
- 3 Enter the command.
- 4 Then transmit your entry to the sensor by clicking the **M** icon.

v (
Example: ASCII command: TB LB 1 6 0 2 0 p 1 9	
Command: /020p19.	
Hex command: TB LB ST a (BR40 example) 2 32 24 00 01 00 23 00 00 00 00 00	00
01 05 01 00 01 00 00 00 00 00 00 00 03 00 00 00 42	с 73
c CS CS d SP SP 70 40 00 2E 3B	
Command: 24 00 01 00 23 00 00 00 00 00 00 00 01 05 01 00 01 00 00 00 00 00 00 00 00 00 00	a: Frame

 b: Data Header
 Entry

 c: User Data
 d: Frame End
 (see interface protocol for the sensor)

 TB...
 Toggle-Byte
 LB...
 Length Byte
 CS...
 Checksum

 SP...
 Stop Character
 ST...
 Start Character

4.3.3 Information Table for the Individual Sensors

Sensor	Data Type, In	Data Type, Out	Transmission Mode
CP, WP, FP, A1P, A2P	ASCII	ASCII	At least 16 bytes in/out
4-pin sensors	ASCII	ASCII	1 byte in/out, transparent
Transit Time Sensors	ASCII	ASCII	At least 16 bytes in/out
BR40 OCR Reader	HEX	ASCII / HEX	64 bytes in/out
Scanners	ASCII	ASCII	Any (depending barcode length)

5 Programming

Important: Error module OB121 must be present in the program!

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