

QUICK MANUAL

Profibus DP Interface Absolute Encoder



Sample: OCD-DPC1B-1213-C10S-H3P

PLC: Siemens S7-1200



DEVICE CONNECTION

Connection Cap Settings



- ▶ 1.1 Loosen two screws of the backside of the encoder and remove the connection cap.
- ≥ 1.2 The station (node) address is set by using the rotary switches in the cap. The values (x 10 or x 1) for the switches are marked at the switch. Possible addresses are between 0 and 99. Each address can only be used once in the network.
- ▶ 1.3 If the encoder is connected at the end or beginning of the bus line the termination resistor must be switched on (slide switch in position "ON").





DEVICE CONNECTION

Connecting Bus Lines and Power Supply

Power Supply	Clamp	Description
	B (left)	Bus line B (Bus in)
♥ ♥	A (left)	Bus line A (Bus in)
<u> ବିଭିତ୍ଧରି ବିଭିତ୍</u> ତର	-	0 V
	+	10 – 30 V
	B (right)	Bus line B (Bus out)
	A (right)	Bus line A (Bus out)
	-	0 V
Bus In Bus Out	+	10 – 30 V

Notes: The power supply has to be connected once (no matter which clamps). If the terminating resistor is switched on, the outgoing bus lines are disconnected.



DEVICE CONNECTION

Cable Connection



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Power Supply



Project Creation

1. Create a new project.

IA Siemens - C:\Use	rs\CSU\Desktop\qucik ma	nual\Profibus\Profibus DP Test\Profibus D)P Test	_ - ×	
			Totally	Integrated Automation PORTAL	
Start			Create new project		 2. Set project
Devices & networks	A	Open existing project	Project name: Path:	Profibus DP Test C:\Users\CSU\Desktop\qucik m	
DL C	•	Create new project	Version:	V14 SP1	
programmin	ıg 🍣 💿	Migrate project	Author:	CSU	
Motion & technology	*	Close project	Comment:		→ 3. Click on th
		Welcome Tour		Create	
Visualizatio		First steps			
Online & Diagnostics	1	Installed software		L.	
		Help			
	8	User interface language			
Project view		Opened project: C:\Users\CSU\Des	ktop\qucik manual\Profibus\Pro	ofib\Profibus DP Test	
× .	 Switch to th 	e project view.			

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name.

e create.



PLC Settings

1. Double-click to add a new device.





Communication Module Setting



1.Select the corresponding communication module under "device view".

2. Drag the communication module to the left of the PLC.



Import GSD File



1. Download the corresponding GSD file from the right side of the product data page of the official website of Posital and save it to the desktop.

TIA V14	Siemens - C:\Users	s\CSU\Desktop\q	ıcik	manu	al\Profi	bus\Profib	ous DP Tes	t\Profibu
Pro	oject Edit View	Insert Online	Op	otions	Tools	Window	Help	
2	🕴 📑 🔚 Save project	: 🔳 🐰 🗉 🕻	ĩ	Setting	js			
	Project tree			Suppo	rt packa	ges		
	Devices			Manag	e gener	al station d	lescription	Nes (GSD)
				Start A	utomati	on License	Manager	-0
ş			#	Show r	eferenc	e text		
Mo	Profibus DP Tes	t		Global	libraries	;		
E.		•						OR'

2. Under options, select manage general station description file (GSD).

Manage general	station description GSDs in the p	n files project			
Source path:	C:\Users\CSU\Desktop	olqucik manual	\Profibus\Profil	bus DP Test\AdditionalFile	s\GSD
Content of imp	oorted path				
File		Version	Language	Status	Info
🛃 frab4711.gsd			Default	Already installed	
					_
				Delete Insta	ll Canc

3. Select the FRABA GSD file and install it.







Profibus DP Encoder Setting

Profibus DP Test + Devices & networks			_ / i X	Hardware catalog	
	📱 Topology view	ሐ Network view 📗	Device view	Options	
Network	🔽 🛍 🖫 🛄 🍳 ±		etwork ove 🔹 🕨		
			Pevice	✓ Catalog	
			▼ S7-1200 sta	<search></search>	init init
	Slave 1		► CM124	🖌 Filter Profile: <all></all>	- 👔
CPU 1215C	FRABA Encoder	DP-NORM	▶ PLC_1 ▼ GSD device 1	🕨 🛅 Distributed I/O	^
	Not assigned		Slave 1	Power supply and distribution	_
				Field devices Field devices	
		•		Other field devices	
		-			
				Drives	
				Encoders	≣
				FRABA	
				▼ 🕞 FRABA Posital	
				FRABA Encoder	
				OCD-DPB1B	
		×		I SIEMENS AG	
< .	> 112%		< II >	Gateways	~

1.Under network view, select "Other field the selec
devices" \rightarrow "Porfibus
$DP" \to ``Encoders" \to ``FARBA" \to ``$
Posital" \rightarrow "FRABA Encoder" \rightarrow "OC

2. Drag the selected encoder into network view.

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eld

FRABA D-DPB1B"



Profibus DP Interface Connection





Encoder Input/output Address Setting

Profibus DP Test ► Ungrou	ped devices 🕨 Slave_1			_	_ = = ×	Hardware catalog 🛛 🖬 💷 🕽	
	i i i i i i i i i i i i i i i i i i i	🖥 Topolo	av view 📥 Network	view 📑 D	evice view	Options	
Slave_1 [FRABA Encoder]	🔽 🖽 🕎 🚰 🛄 🔍 ±		Device overview				1
		<u>^</u>	Firmware	Comment		✓ Catalog	
		=	4.0			<earch></earch>	f
						🖌 Filter Profile: <all> 💌 💓</all>	
5104						Head module	
						III Universal module	
						Class 1 Singleturn	
		4				Class 1 Multiturn	
						Class 2 Singleturn	
	DF-HORM					EDARA 2.1 Singleture	
						FRABA 2.1 Surgietum	
						FRABA 2.2 Singleturn	
						FRABA 2.2 Multiturn	
< III > 1	00%	. 🗋	<		>		

Profibus DP Test ▶ Ungrouped devices ▶ Slave_1												
						📲 Top	ology vie	w B Network	view 🛛 🚺 Device vi	ew		
	Device	e overview										
	···· 省	Module	Ri	ack	Slot	I address	Q address	Туре	Article no.	Fi		
		Slave_1	0		0			FRABA Encoder	OCD-DPB1B	4.0		
		FRABA 2.2 Multiturn_	_2_1 0)	1	6871	6871	RABA 2.2 Multiturn				
		FRABA 2.2 Multiturn	2_2 0)	2	7273		RABA 2.2 Multiturn				
								-				
2	_											
e vie	<u> </u>											
, și	•											
ă												
	<					1111				>		

1.Under device view, select the Posital encoder.

2. Select the encoder feature configuration version and drag in the device overview. Note: this manual takes "FRABA 2.2 Multiturn" as an example. This version has the most complete programming functions.

≥ 3. Set encoder input/output address: I address: 68...71, 72...73 Q address: 68...71



Encoder Profibus Address Setting

Profibus DP Test > Ungrouped	devices 🕨 Slave_1			_∎≣×
	🖉 T	opology view	H Network view	🛐 Device view
Slave_1 [FRABA Encoder]	🛛 🖽 🕎 🖌 🔚 🛄 🔍 ±			
	DP-NORM			Device data
< Ⅲ		> 100%		
Slave_1 [Module]		🔍 Properties	🗓 Info 📃 Diagn	ostics 🗖 🗖 🗖 🤝
General IO tags Syst	tem constants Texts			
✓ General Catalog information	PROFIBUS address			
PROFIBUS addres	Interface networked with			
General DP parameters Watchdog	Subnet	PPOEIRUS 1		
SYNC/FREEZE	Subnet.	Add new si	ubnet	
Hardware identifier		Add new st	abriet	
	Parameters			
	Address:	3		
	Highest address:	126		
	Transmission speed:	1.5 Mbps		
				×
				*

 I. Encoder Profibus address setting:
 Note: the value shall be the same as that set by the address rotation switch of the connection cap of the encoder, see Page 1.

2.Transmission speed.



Encoder Parameter Settings

Profibus DP Test > Ungrouped devices > Slave_1													
				📇 To	oology vie	w 🖁 Metwork	view 📑 🖬 De	vice view					
Device overview						II							
a 🔐 Module		Rack	I address	Q address	Туре	Article no.	1						
Slave_	1	0	0			FRABA Encoder	r OCD-DPB1B						
FRABA	2.2 Multiturn_2_1	0	1	6871	6871								
FRABA	2.2 Multiturn_2_2	0	2	7273	FRABA 2.2 Multiturn								
<				1111									
FRABA 2.2 Multiturn_2	_1 [Module]	Propertie	s 🚺 Info	Diagnostics									
General IO tags	System const	ants	Texts										
✓ General Catalog information	Device	specific	ters										
Device-specific paramet	ers												
Hex parameter assignm	ent		Code sec	uence:	ncreasing c	lockwise (0)		-					
I/O addresses		Scaling	function	control:	nable								
Hardware identifier		Desired	, and a second		000								
		Desired	Measurin	g units:	1096								
	De	sired mea	asuring ur	nits per:	Revolution			-					
		P	hysical im	pulses:	2								
	-	Total r	neasuring	range:	3192								
	•	L	ower limit	switch:	Enable			•					
		L	ower limit	switch:	000								
		U	pper limit	switch:	Enable			-					
		U	pper limit	switch:	7000								
		Ve	locity outp	ut unit:	t: Steps/1000 ms								
		Comr	nissioning	mode:	Disable			-					
	Sho	rter diagn	ostics (16	bytes):	No			•					

Select "Device view"→select "Device overview"→Right click on the "FRABA 2.2 Multiturn"→ "General" \rightarrow "Devicespecific parameters", encoder parameter setting:

- ▶ 1.Code sequence
- 2.Desired measuring units
- ≥ 3.Revolution
- ▶ 4.Total measuring range
- **5**.Lower/Upper limit switch: disable by default.
- **6.**Velocity output unit
- **7**.Commissioning mode: disable by default.
- ▶ 6.Shorter diagnostics(16 bytes): disable by default.



Program Blocks





Network 1: Encoder Position Value Output



1. Encoder output value Bit0-Bit24: position value

2. Encoder output value bit25-bit31: status value **3**. When reading the position value, the state value "bit25-bit31" should be cleared by using logical operation, and the program section is shown as left:

Note: first enter the address bit, such as ID68, MD100, then modify the variable name



Network 2: Encoder Speed Value Input





Network 3: Preset Order

▶ 1.To activate the preset order, Bit31 of the input value to the encoder need to be set to 1.

		St	atus	s bit	ts				Da	ita I	bits																
	Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
Master → (DCD	1	0	0	0	0	0	0	Transfer of the required position value (= preset value)																		
$OCD \rightarrow Ms$	aster	1	0	0	0	0	0	1	New = required position value is transferred																		
	aster	•	•	•	•	•	•	· ·	10		- 10	quii	cu	pos	nuo	11 90	aiuc	, 15	uai	1310	nuc						
Master → (DCD	0	0	0	0	0	0	0	Re	eset	bit	31	– n	orm	nal r	noc	le										
OCD → Ma	aster	0	0	0	0	0	0	1	New = required position value is transferred																		



2.Transfer "16#8000000" to "QD68" byMOVE instruction to achieve Bit31 to 1.





Network 4: Reset Order

▶ 1. After each execution of the preset command, Bit31 should be reset before the next preset order.

		St	atu	s bi	ts				Da	Data bits																	
	Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
Master → (DCD	1	0	0	0	0	0	0	Tra	ans	fer	of tl	he r	equ	ire	d po	ositi	on	valı	ue (= p	res	et v	alu	e)		
OCD → Ma	aster	1	0	0	0	0	0	1	Ne	New = required position value is transferre										rrec	ł						
Master → (DCD	0	0	0	0	0	0	0	Re	eset	t bit	31	– n	orm	nal i	noc	le										
OCD → Ma	aster	0	0	0	0	0	0	1	New = required position value is transferred																		

≥ 2. Transfer "16#0000000" to "QD68" by MOVE instruction to achieve Bit31 to 0.





Network 5: Status Bit Reading





Watch and Force Table

3.Select display format.

5. Select the variable to modify.

ject tree 🛛 🛛		Profibu	us DP Test → PLC_1 [CPU 1	1215C DC/DC/I	DC] 🕨 Watch an	d force tables	▶ Table 1		
evices									
	B	#	1 1 1 1 1 1 1	oon oon ⊳ 1				Q	
		i	Name	Address	Display format	Monitor valu	ue	Modify	4
Tevice configuration	^	1	"Encoder input 1" 🔳	%ID68	Bin	-			
🖏 Online & diagnostics		2	"Encoder output"	%QD68	Hex				
🔻 🛃 Program blocks		3	"Encoder input 2"	%IW72	Hex				
📑 Add new block		4	"Encoder position value"	%MD100	DEC				
🜁 Main [OB1]		5	"Velocity output unit(ms)"	%MW110	DEC			1000	
🕨 🙀 Technology objects	≡	6	"Step distance unit(mm)"	%MW0	DEC			10	
External source files		7	"Speed value(m/s)"	%MD104	DEC				
🕨 🚂 PLC tags		8	"Preset button"	%M200.0	Bool			FALSE	
PLC data types		9	"Reset button"	%M200.1	Bool			FALSE	
🕶 🔙 Watch and force tables		10	"Encoder Ready"	%M120.0	Bool				
💣 Add new watch ta		11	"Commissioning mode"	%M120.2	Bool				
Itable 1		12	"Normal mode"	%M120.1	Bool				
		13	"Beyond limit"	%M120.3	Bool				
🕨 📴 Online bickups		14	"Counterclockwise"	%M121.0	Bool				
🔻 🔄 Traces		15	"Clockwise"	%M121.1	Bool				
🌁 Add new trace		16		<add new=""></add>					
🕨 🔄 Measurements									
🕨 🛃 Combined measur									
Device proxy data	~								
III	>	<							

1. Add a new watch table.

4. Set the modify value.



Compile



▶ 1. Right-click PLC→ select "compile" → select "hardware and software (only changes)".
▶ 2. Check that the hardware and software configuration Settings are correct.



Download Configuration to PLC



- ▶ 1. Click the download button.
- 2. Begin your search.
- **3**. Select the corresponding PLC.
- 4. Click download.
- ≥ 5. Click "all started" after downloading.



Watch and Force

2. Modify all select value.

1.Monitor all.

Prot	ofibus DP Test ト PLC_1 [CPU	bus DP Test + PLC_1 [CPU 1215C DC/DC/DC] + Watch and force tables + Table 1											
# # ₩ 10 91 % # 10 m													
	i Name	Address	Display format	Monitor value	Modify	9							
1	"Encoder input 1"	%ID68	Bin 💌	2#0000_1110_0000_0000_0000_0000_1011_0011									
2	"Encoder output"	%QD68	Hex	16#0000_0000									
3	"Encoder input 2"	%IW72	Hex	16#0000									
4	"Encoder position value"	%MD100	DEC	179									
5	"Velocity output unit(ms)"	%MW110	DEC	0	1000								
6	"Step distance unit(mm)"	%MW0	DEC	0	10		4						
7	"Speed value(m/s)"	%MD104	DEC	0									
3	"Preset button"	%M200.0	Bool	FALSE	FALSE		4						
9	"Reset button"	%M200.1	Bool	FALSE	FALSE		1						
10	"Encoder Ready"	%M120.0	Bool	TRUE									
11	"Commissioning mode"	%M120.2	Bool	FALSE									
12	"Normal mode"	%M120.1	Bool	TRUE									
13	"Beyond limit"	%M120.3	Bool	TRUE									
14	"Counterclockwise"	%M121.0	Bool	FALSE									
15	"Clockwise"	%M121.1	Bool	TRUE									
16		<add new=""></add>											
	<		1111				3						

1.After switching to online, observe the parameters of each variable.

2. Changing "Preset button" the value to 1 and then the current position value is set to 0. After activation, changing "Reset button" to 1 and activate, and then can preset again. ■ 3. "Velocity output unit" should be the same as the parameters set in Page 12.

▶ 4. "step distance unit" shall be set with the actual distance unit