

# **XC-PBOX-BD**

Manual

Xinje Electric Co., Ltd

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### **1.Installation**

Please do the following operations if the master station of XC-PBOX-BD is Siemens products.

(1) Copy XC-PBOX.GSD to the route of  $\.\Step7\S7data\gsd$ 

(2) Copy Xinje\_B.bmp <sup>Xinje\_B.bmp</sup> to the route of \...\Step7\S7data\nsbmp\ If the master station is not Siemens products, please copy XC-PBOX.gsd and Xinje\_B.bmp to the folder of gsd and bmp.

## 2. Configuration

#### 2.1 Install the XC-PBOX-BD

Open the cover on the left of the PLC, insert the BD into the pins, fix it with the screws and close the cover.



#### 2.2 Configure the XC-PBOX-BD

(1) Connect the PLC installed XC-PBOX-BD to the XCPpro software. In the software, click "configure/BD settings":

<b>XC</b>	PPro							
File	Edit	Search	View	Online	Configure	Option	Window	Help
1	a		B	P. A	PLC Co	mm Port	Settings	
		<b>F1</b> 00	비크		Security	y Settings		
₽ŀ		¥⊢l IK KAN		-∦1]}-	BD Set	tings		
Draiad	sins	Del SDel	15	F6 SF5	CAN Se	ettings		
Project	- 				Expans	ion Modu	le Settings	
Proj	ect					11 0		

(2) Choose "BD serial port":

PLC1 - BD Set	
PLC Config         Password         PLC Serial Port         BD         CAN         M CAN         Save Hold Memory         000 Module         I/O         000 MA Module         M Motion	BD Config(write to PLC when downloading) BD C No Config BD Serial Port C Other BD BD-2AD2PT-P B BD-2AD2PT-P B BD-2AD2PT DA-P

(3) Click "PLC serial port", choose serial port 3 and modbus num. The modbus num should be the Profibus slave station number. Here it is set to 5 for example.

Port 3  munication Mode Modbus Num
r : 3 Reply : 300 I Port User Protocol   drate: 19200 BPS abits: 8Bit bits: 1Bit ty: Even e:configuration effective, reboot PLC
o PLC OK Cancel

power and power on again for the PLC and click run

### 3. Wiring



The port of XC-PBOX-BD is the standard Profibus terminal, please see the terminal definition:

3. B (RxD / TxD P) 5. D-GND 6. VP (+) 8. A (RxD / TxD N)



5—GND and 6—VCC provide power for terminal resistor. If there is no terminal resistor, they will be vacant.

Note: Only pin 5, 6, 8, 3 need to be connected.

Both ends of the Profibus cable should connect terminal resistor. The terminal resistor can clear the signal reflection in the cable which is caused by resistor discontinuity and mismatching.

### 4. Operation

### **4.1 Introduction**

XC-PBOX-BD can be the slave station of Profibus DP. It realizes the interconnection between XC series PLC and Profibus DP system.

The theoretical address range of Profibus: 0~127, 127 is broadcast address.

Up to 32 master stations can be used. The station amounts can up to 127.

The station No. of XC-PBOX-BD should be in the range of 1-255 and in accord with the slave station no. of Profibus.



#### 4.2 DIP switch settings

Please set the baud rate of communicating between XC-PBOX-BD and Xinje PLC via DIP switch.



DIP switch 1	DIP switch 2	Baud rate (bps)
OFF	OFF	19200
OFF	ON	9600
ON	OFF	38400
ON	ON	115200

Note:

- 1. The default communication parameter is: data bit=8, stop bit=1, even parity.
- 2. Only DIP switch 1 and 2 are valid, 3 and 4 are invalid.

#### **4.3 LED**

There are four LED lights on the XC-PBOX-BD.

D4: the light flashes when reading the station No. of PLC serial port3, it always lights when got the station No.

D3: the state of Profibus.

D2: it lights when data is being sent.

D1: it lights when data is being received.

LED lights: D1, D2, D3, D4

#### 4.4 Debug

Now we take Siemens S7-300 series PLC (315-2AH14-0AB0) as an example to explain the debug process.

Suppose the S7-300 sets ON M0-M7 of Xinje PLC via XC-PBOX-BD. And set double word register (D0,D1) to 12345678, set (D3,D4) to 87654321. And read the value of M20-27 and (D100, D101)(D102, D103).

- (1) Open the Siemens simatic manager software, build a new project.
- (2) Name the project:

Name	Storage path	
Add to	o current multiproject	
<u>A</u> dd to <u>m</u> e:	o current multiproject	<u>Т</u> уре:
Add to me: inje	o current multiproject	<u>T</u> ype: Project
Add to me: inje orage	o current multiproject	Type: Project □ E Library

(3) Insert new object/Simatic 300 station, name it as PBOXOPC:

SINATI	C Manager - xi	nje	
<u>F</u> ile <u>E</u> dit	<u>I</u> nsert P <u>L</u> C <u>V</u> iew	<u>O</u> ptions <u>W</u> indow	Help
🗋 🗅 😅 🛛	1 📾   X 🖻 🖻	💼 😨 🖳 🖣	n 📴 📰 🚹 Ko F
🛃 xinje	C:\Program	Files\Siemen:	s\Step7\s7proj\xinje
🖃 🎒 👥	Cent	CANIAN	1) 🖳 MPI(1)
	Lut	CtrltA	
	Сору	Ctrl+C	
	Paste	Ctrl+V	
	Delete	Del	
	Insert New Object		SIMATIC 400 Station
	PLC	•	SIMATIC 300 Station
	Ronomo	<b>R</b> 2	SIMATIC H Station
	Rename	FZ	SIMATIC PC Station
	Ubject froperties	Alt+Return	Other Station

(4) Click PBOXOPC, it will show below window:

SINATIC Nanager - xin	je
<u>F</u> ile <u>E</u> dit <u>I</u> nsert P <u>L</u> C <u>V</u> iew	<u>O</u> ptions <u>W</u> indow <u>H</u> elp
D 🛩   🎛 🛲   👗 🖻 🖻	🚵   😨 💁   º 🔤 🔂 🗰   💽   < N
🖹 xinje C:\Program H	Files\Siemens\Step7\s7proj\xinj
E Sinje RBOXOFC	DU Hardware

(5) Double click the hardware, you will see below window:

🙀 HV Config - [PBOXOPC (Configuration) xinje]	
에 Station Edit Insert PLC View Options Window Help	_ @ ×
D 😅 💱 🗒 🖏 🎒 🖻 🕄 🏙 🏜 🚯 🗖 🚼 🕅	
^	=
	Find: Mt Mi
	Profil Standard 💌
	<ul> <li> <b>PROFIDUS DP</b> </li> <li> <b>PROFIDUS-PA</b> </li> <li> <b>SIMATIC 300</b> </li> </ul> <li> <b>SIMATIC 400</b> </li> <li> <b>SIMATIC PC Based Control 300/400</b> </li> <li> <b>SIMATIC PC Station</b> </li>
	PROFIBUS-DP slaves for SIMATIC S7, M7, and $\underline{\tau}_{\leq}$ C7 (distributed rack)

(6) Click Insert/insert object, it will show below window:

🎠 HV Config - [PBOXOPC (Configuration) xin	je]			
🂵 Station Edit Insert PLC View Options Window Help				- 8 ×
🗅 😅 🖫 🖷 🖬 🎒 🖶 🛯 🏜 🏙 🖺 🗔 💥 K	?			
W PROFIBUS DP	^	-		비지
PROFINET IO		Find:		mt mi
SIMATIC 300		Profil	Standard	
SIMATIC PC Base		110111	Jocandard	<u> </u>
		E TH P	ROFIBUS DP	
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<			TMATTC 300	
		± 🖬 S	IMATIC 400	
		🛨 🕅 S	IMATIC PC Based C	ontrol 300/400
		🛨 🖳 S	IMATIC PC Station	

(7) Click "SIMATIC 300", then click "RACK-300", it will show below window:

🏨 HV Config - [PBOXOPC (Configuration) xinje	1	
💵 Station Edit Insert PLC View Options Mindow Help		
D 😅 💱 🛱 💱 🎒 🕒 🖻 🕍 🏙 🏙 🗊 🗖 🚼 🏌		
PROFIBUS DP	^	·
PROFINET IO		Eind: Mt M
		Profil Standard
Cateway		BY PROFIBUS DP     BOTTBUS-PA
₽Rail		+ THOFINES IN
		SIMATIC 300
		E SIMATIC 400
		H SIMAILL PL Based Control 300/400

(8) Click Rail, it will show below window:

🙀 HV Config - [PBOXOPC (Configuration) xinje	]	
🕅 Station Edit Insert PLC View Options Window Help		_ 8 :
D 😅 🔓 🗣 🎒 🕒 🖻 🛍 🏜 🚯 🗖 器 📢		
	^	S
		Eind:
		Profil Standard
		PROFIBUS DP
5		FROFINET IO
7		SIMATIC 300
		SIMATIC 400
		E SIMATIC PC Based Control 300/400
		E SIMATIC PC Station

(9) Click Option/update catalog, then do the operations in below window:

📑 HV Confi	g – [PBOXOPC	(Configuratio	n) xinje	:]			
D Station Ed	lit <u>I</u> nsert <u>P</u> LC	<u>V</u> iew <u>O</u> ptions <u>W</u> i	ndow <u>H</u> elp				_ 8 ×
0 🚅 🔓 🖬	<b>R</b>   4   4	2   🔬 🏟 🕞	🗖 🚟 K?				
(0) 1IP				^	-		
					<u>F</u> ind:		Mt Mi
2	Copy		Ctrl+C		Profil	Standard	•
3	<u>P</u> aste		Ctrl+V			Jorandard	
4	<u>I</u> nsert Object.			1	E ₩ P	ROFIBUS DP	
5	Add Master Sys	tem			+ # P	ROFINET IO	
7	Disconnec <u>t</u> Mas	ter System			± 🕅 S	IMATIC 300	
	Insert PROFI <u>N</u> E	[ IO System			🛨 🞆 S	IMATIC 400	
	Disconnect PRO	FINET IO System			🛨 🎆 S	IMATIC PC Based C	ontrol 300/400

(10)Choose the matched power module for the PLC. Here we choose PS307 2A, CPU 315-2DP\6ES7 315-2AG10-0AB0\V2.6:



(11) Click v2.6, it will show below window, choose the master station (S7-300) No. of XC-PBOX-BD, here we choose 2. Then click "New..." button in the window:

🔩 HV Config -	[PBOXOPC	(Configuration)	xinje]		1
Station Edit	Insert PLC	Yiew Options Window	Help		
		E   🛍 🛍   🔁			
🚍 (0) UR 🛛 🥊	roperties	- PROFIBUS inter	rface DP (RO/S2.	1) [	3
1 PS 3	General	Parameters			1
3 4	<u>A</u> ddress:	2 -	If a subnet the next ava	is selected, ilable address is	
5			-		
7	Subset				
	not	networked		<u>N</u> ew	10/4(
				Properties	
				Delete	
	ОК			Cancel Help	j / <sup>M7</sup>
<					

<u>H</u> ighest PROFIBUS Address:	126 <u> </u>	<u>O</u> ptions
<u>T</u> ransmission Rate:	500 Kbps 1.5 Mbps 3 Mbps 6 Mbps 12 Mbps	
<u>P</u> rofile:	DP Standard User-Defined	

(12)Click "Network settings", set the transmission rate to 12Mbps.

(13) Click - PROFIBUS (1): DP master system (1) , then choose "Profibus DP\ Additional

Field Devices\ Gateway\ PBOX", double click PBOX, then set the slave station No. of PBOX to 5.

🙀 HW Config - [PBOXOPC (Configuration) xinje]	
🖬 Station Edit Insert ELC View Options Window Help	_ 8 ×
D # 2~ 8 % # 10 18 1 🛍 🏜 🌓 🗖 🖏 19	
	Find: nt mi
2 CPU 315-2 DP	Profil Standard
3 December PROFIPHS interface PROV	PROFIBUS DP
4 Properties - PROFIDOS Interface PDOA	- Additional Field Devices
6 General Parameters	
Address: 5	E Cateway
	T DP/DP Coupler
Transmission rate: 12 Mbps	DP/RS232C Link
	PBOX Iniversal module
2ubnet:	empty
PROFILEUS(1) 12 Mbps	read 8 bits (0xxxx)
Properties	read 16 bits (Uxxxx)

(14) As the chapter 1 said, we copy the file XC-PBOX.GSD to  $\.\Step7\S7data\gsd$ , and copy the file Xinje\_B.bmp to  $\.\Step7\S7data\nsbmp$ , now we can see the Xinje station picture in the below window:

HW Config - [PBOXOPC (Configuration) -	— xinje]
🕅 Station Edit Insert PLC View Options Mindow	Help
D 😅 🔓 🖏 🎒 🐴 📾 🛍 🏙 🗊 🗖	뮎 ▶?
Image: CPU 315-2 DP           B2         DP           3         4           5         5	PROFIBUS(1): DP master system (1)
6	

(15) double click the Xinje station picture, it will show below window. Set the data update mode: At every MD end or At MD scan end.

_ C 22 2~ 8 9; 23   10 C   1	Properties - DP slave General Parameter Assignment		
(0) UR     (1) FS 307 2A     (2) CPU 315-2 DP     (2) DP     (3)	Parameters ついていたいのでは、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のでので、 日本のので、 日本ので、 日本ので、 日本ので、 日本ので、 日本のので、 日本のので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本ので、 日本のので、 日本ので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のので、 日本のの 日本のので、 日	Value 在MD扫描结束后 At MD_scan End	Standard FIBUS DP Additional Riald
4 5 8 	E User_Prm_Data (O to 3)	03, 00, 00, 00	Switching Dev J/O Gateway H-AS-I DP/DP Coup H-DP/RS232C

(16) Configure the read and write.

Read: read the value of Xinje PLC to Profibus.

Write: write the value of Profibus to Xinje PLC.

Force single bit and Set single word: write the value of Profibus to Xinje PLC.

E E E	Config - [PB	OXOPC (Con	figur	ation) ·	x	inje]			
🛄 <u>S</u> ta	tion <u>E</u> dit <u>I</u> nse	rt <u>P</u> LC <u>V</u> iew	Option	s <u>W</u> indow	Help	,			
	; =~ <b>= \$</b> 1	3   <b>b</b> 8	<b>á á</b>			<b>₩</b> ?			
1 2 3 4 5 6 7	) UR PS 307 2A CPU 315-2 DF	DP				PR	OFIEUS (1):	DP master syste	m (1)
1									
		1			4			1	
S	DP ID	Order Numbe	r / Des	ignation	I	Add	Q Address	: Comment	
1	8DI	status	0		- 22		327		
2	800	control		0					
3	8DI	read 8 bits(0)	1						
4	211	read 2 DWords	2562						
5	227	write 2 DWords		20020					
6	8D0	write 8 bits((		20					
7									
(17) A	fter making the n to below wind	program, clic dow:	ck save	and corr	pile	<b>F</b> , th	en click d	lownload to me	dule 💼.
🥜 SII	LATIC Lanag	er – xinje	e						
<u>F</u> ile	<u>E</u> dit <u>I</u> nsert 1	PLC View Or	otions	<u>W</u> indow	Help				
	2   <b>27</b> 🛲   X	. 🖻 🖬 🕯	<b>b</b>   9			8-8- 8-8-	i   🗈   Г	< No Filter >	_
🖹 xi	inje C:\J	Program Fi	les\	Siemens	:\St	ep7\si	lproj\x:	inje	
i - A	xinje <b>PBOXOPC</b> CPV 315 	j-2 DP Program(4) Sources Blocks	jûj Hard	lware		СРО З	15-2 DP		-

(18) click "Blocks", it will show <sup>OB1</sup>, double click OB1, it will show below window, then click ok to enter programming window. Then make the program in it.

🌽 SIMATIC Manager - xinje	
<u>File Edit Insert PLC View Options M</u> indow	Help
D 😅 🔐 🛲 🕺 🖻 🖻 🏙 🔍 🏪 🖆	<sup>1</sup> 2 ]> ﷺ 💼   < No Filter > 💽 🏹 🞇 🥯 🖷 🖬 🕅 🐶
🗃 xinje C:\Program Files\Siemen	s\Step7\s7proj\xinje
🖃 🎒 xinje 🚵 System data	G-081
E BOXOPC	Properties - Organization Block
⊡ 🖅 S7 Program (4) □ 🕒 Sources	General - Part 1   General - Part 2   Calls   Attributes
Blocks	Name: DB1
	Symbolic Name:
	Symbol Comment:
	Created in Language: STL
	Project nath
	Storage location
	of project: [C. diversion files Gremens Grep (sipily) (single
	Date created: 07/22/2011 10:34:08 AM
	Last modified: 02/07/2001 03:03:43 PM 02/15/1996 04:51:12 PM
	C <u>o</u> mment: "Main Program Sweep (Cycle)"
	OK Cancel Help

Programming window:	

🗱 LAD/STL/FBD – [OB1 ]	xinje\PBOXOPC\CPU 315-2 DP]	
🖶 File Edit Insert PLC Debug	<u>V</u> iew Options <u>W</u> indow <u>H</u> elp	_ @ X
0 🖻 🔓 🖬 🖨 🕺 🖪 🖪	요 여 🕼 🏜 🔽 🗣 🎯 !<<>! 🗖 🖪 🔛 🕂 🕂 -0 🕾 🖵 그	r 3-r ( <b>N?</b>
X New network T FB blocks T FC blocks	Contents Of: 'Environment\Interface'	
	Network 1): Title:	<u> </u>
	Comment:	<u> </u>
Program		>

#### Program:



(19) After making the program, save and download to the module. Turn On the RUN switch of S7-300. The SF BF LED is OFF on the S7-300, it means the communication is successful. Then turn off the RUN switch.

Now please open the XCPpro software, connect it to the Xine PLC with XC-PBOX-BD (please

configure the XC-PBOX-BD at first in the software). Click free monitor

the monitor list (see figA). Then turn on RUN switch of S7-300, the monitor data is shown in figB. (M20-M27,D100 D102 are the data write from S7-300 to XC series PLC.

MO	ON			
M1	OFF			
M2	ON			
M3	OFF			
M4	ON			
M5	OFF			
M6	ON			
M7	OFF			
M20	OFF			
M21	OFF			
M22	OFF			
M23	OFF			
M24	OFF			
M25	OFF			
M26	OFF			
M27	OFF			
DO	12345678			
D2	87654321			
D100	0000000			
D102	0000000			
FigΔ				
MO	ON			
M1	OFF			
M2	ON			
M3	OFF			
M4	ON			
M5	OFF			
M6	ON			
M7	OFF			
M20	ON			
M21				
	ON			
M22	ON ON			
M22 M23	ON ON ON			
M22 M23 M24	ON ON ON ON			
M22 M23 M24 M25	ON ON ON ON ON			
M22 M23 M24 M25 M26	ON ON ON ON ON ON			
M22 M23 M24 M25 M26 M27	ON ON ON ON ON ON ON			
M22 M23 M24 M25 M26 M27 D0	ON ON ON ON ON ON 12345678			
M22 M23 M24 M25 M26 M27 D0 D2	ON ON ON ON ON ON 12345678 87654321			
M22 M23 M24 M25 M26 M27 D0 D2 D2 D100	ON ON ON ON ON ON 12345678 87654321 12345678			
M22 M23 M24 M25 M26 M27 D0 D2 D2 D100 D102	ON ON ON ON ON ON ON 12345678 87654321 12345678 87654321			

#### FigB

(20) Monitor the data of S7-300. Right click the data needs to monitor:

R H	Config - [PBC	XOPC (Configura	tion)	xinje]	
<mark>]]]</mark> <u>S</u> ta	tion <u>E</u> dit <u>I</u> nser	t <u>PLC V</u> iew <u>O</u> ptions	: <u>W</u> indow <u>H</u> e	lp	
		🖻 🕄    🎪 🎪		<b>₩</b> 2	
	)) UR		<u>C</u> opy <u>P</u> aste		Ctr] Ctr]
2 82 3 4 5 6 7	CPU 315-2	DP:	Replace ( Add Mast Disconne Disconne PROFINET PROFINET Isoc <u>h</u> ron	Object er System c <u>t</u> Master System ROFI <u>NET</u> IO System ct PROFINET <u>I</u> O System IO Domain Management. IO Topology e Mode	
			Specify	Module	
			Delete		Del
			<u>G</u> o To <u>F</u> ilter A	ssigned Modules	
			<u>M</u> onitor/I	Nodi fy	
<			<u>E</u> dit Syml Object Pr Open Obj	bols roperties ect With	Alt Ctr]
	(5) PBOX	[	P <u>r</u> oduct : FAOs	Support Information	Ctr] Ctr]
S	DP ID	Order Number / Desi	Find Man	ual	Ctr]
1 2	800	control	1000000	10 1020 21	8897.0
3	16DI	read 16 bits(Oxxxx)	Start De	vice Tool	
4	8DI	read 8 bits(Oxxxx)	3	i	
5	16DI	read 16 bits(Oxxxx)	4	5	

(21) Choose "monitor" to see the data. The data are the same to the setting data in XC series PLC.

Online via assigned CPU services											
Path: xinje\PBOXOPC\CPU 315-2 DP											
	Add:	ress	Sym	bol	Display	s	tatus value				
1	I	1.0			BIN		2#1				
2	I	1.1			BIN		2#0				
3	I	1.2			BIN		2#1				
4	I	1.3			BIN		2#0				
5	I	1.4			BIN		2#1				
6	I	1.5			BIN		2#0				
7	I	1.6			BIN		2#1				
8	I	1.7			BIN		2#0				
9	I	2.0			BIN						
×	🗙 Row Not Effective Update Force Symbol with F										
B1	-Bun conditionally										
	Monitor				AdStatus Value						
						-					
Modi <u>f</u> y				Mod <u>i</u> fy Value			I/O <u>I</u>				
0	👌 <u>T</u> rigg										
	Close										

(22)Monitor the Read 2 Dwords with the same way:

Online via assigned CPU services											
Path: xinje\PBOXOPC\CPU 315-2 DP											
		Address PIW 256		Symbol	Display	Status value					
	1			256		HEX	₩#16#1234				
	2		PI₩	PIW 258		HEX	W#16#5678				
	3		PI₩	260		HEX	W#16#8765				
	4		PI₩	262		HEX	₩#16#4321				

### **5.** Notices

1. The Xinje PLC only can be slave station with XC-PBOX-BD. XC-PBOX-BD only can be used with Xinje PLC. Please choose the Xinje PLC which can expand BD module.

2. After configuration of the XC-PBOX-BD, please re-power on it.

3. The station No. in the PLC should be accord to the Profibus slave station No., especially for SCADA application.



7th, No.100 Dicui Rd, Wuxi, China Tel: 86-0510-85134139 Fax: 86-0510-85111290 www.xinje.com Email: cheerfiona@gmail.com