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# How to Exchange Data between PACs (Data Binding)?

"Binding" function is used to exchange data between ICP DAS Win-GRAF PACs, the data transmission is event triggered. It is much more efficient than polling way. Win-GRAF offers two ways to set up Binding:

- **PUBLIC:** Publish one PAC's own data, or for use of VB .net, C#, C or Soft-GRAF HMI in the same PAC.
- **EXTERN:** To get data from other PAC.

#### Application Diagram:



### Note:

The max. number of "Binding" (EXTRN) can be used by one Win-GRAF PAC:

XPAC XP-8x48-CE6		Max. 32	
	WP-8x48	May 16	
WINPAC	WP-5238-CE7	IVIAX. 10	
ViewBAC	VP-42x8-CE7	Max. 16	
VIEWPAC	VP-22x8-CE7		

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1.1. The "Pl	JBLIC" Settin	Ig								
Vhen the PAC s	ets up the "PU	BLIC" area, n	neans to publi	sh its ow	vn data.					
1. Mouse righ	nt-click on the t	oolbar "Ope	n Binding Con	figuratio	on" icon	to oper	n the "	Binding" \	window.	
2. Click "PUBLIC (: 9000)" to configure the data to be published as PUBLIC; "Address" field needs not to										
fill in; "Por	t" field is fixed	to "9000", d	o not change i	t.						
🖉 Win-GRAF - Tes	et 3									
äle <u>E</u> dit <u>V</u> iew Inse:	rt Project <u>T</u> ools <u>W</u> i	ndow <u>H</u> elp		Open Bin	nding Co	nfigura	tion			
	XBBXX	5 2 2	iii III & 强 🛛	🙆 🖪 🖇	g 🕑 🖌	ا <mark>هر</mark> ا				
vorkspace fract_3	Binding	Hand Network		Vame	Value	7	Name	Ty	pe	
Exception p	programs 💍	L	000)	lame F uddress	PUBLIC			Global variabl RETAIN varia	es 🦉	
🛄 🏦 Main	∎+			Port S	9000			Main		
Watch (for	debugging) cope		"F	UBUC" a	area		PonBadInde:		B	
Initial value	nfiguration	ne Ide	entifier ne	eds not	to fill	ster N	ame	Variable a	rea	
g Global defi	nes		in	the Add	ress.					
Variables										
	<					>				
in the Varia In the follo finished, th	able area. Right wing table, the ne screen is as b	t-click on "Gl variables ar pelow.	obal variables e used for this	and prosections and prosections of the second	ess "Ins' e. You c	' key to an set u	add tl ap you	he new va Ir own. Af	iriables. ter	
Var	iables Name	Data Ty	/pe	Y Nar	me 🚮 Globa	l variabl	Гуре es	D		
Pi	ublic_BOOL	BOOI	L	P	ublic_BO	OL E	IOOL			
F	Public_INT	INT		P	ublic_INT	IT C	NINT			
P	ublic_DINT	DINT	-	P	ublic_WC					
Pu	blic_WORD	WOR	D	P	ublic_REA					
Pr	ublic_REAL	REAL	-	Main Press "Enter" kev						
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4. Right-click on the "PUBLIC (: 9000)", and then select the variables that you want to publish, and drag them to the "Name" area. "Identifier" field will automatically generate numbers (if other PAC wants to access the data, need to set the same ID number).

**Note:** "PUBLIC" can use up to 8192 variables; "Identifier" number can only be "1 ~ 8192".



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1.2. The "EX	TERN" Setting	:					
Vhen the PAC se	ets up the "EXTEF	RN" area,	means will get	the data	from other e	xternal PA	.C.
	/D	LII :					
5. Click the li	holow to set up	t ICON IN	the left side, it		withe Group	window.	Follow the
uescription	below to set up		Jw, and then c	IICK OK	button.		
Bindi	ing						
뮯	∃ <b>¤t</b> Network		Name	Value			
	⊞	000)	Name Address	PUBLIC			
∎+			Port	9000			
Group			X				
Name				1			
EXTERN:1							
			Cancel			ſ	
Address					PAC1		PAC2
Address	192.168.1.100/2	00.168.1.10			₽₽/	Ľ	р.р.)
Port	9000						
							+
							<b>_</b>
Name:	Can he modifier	to the di	sired name				
Addross:	Entor the IP add	ross of th	o BAC which d	ata will b	a abtained (a	νσ "102 1	68 1 100")
Audress.			e FAC Which u	ata wili b	e obtained (e	g., 192.1	.00.1.100 ).
			uresses (e.g.,	197.109"	1.100/200.10	0.1.100 ; l	
	use two Etherne	et Ports), s	so that when c	me iP add	aress occurs a	iny proble	m, it will try to
	link the second	IP address	S.				

- Port: Fixed to use "9000", do not change it.
- 6. In the variable area, set up the data type you want to get. (Refer Step 3 Right click on "Global variables" and press "Ins" key to add the variables). The variables that listed in the table are used for this example. You can set up your own. After finished, the screen is as below.

Variables Name	Data Type
PAC1_BOOL	BOOL
PAC1_DINT	DINT
PAC1_REAL	REAL
Error_Status	DINT

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7. Please drag the variables you need into the "Name" area of the "EXTERN:1".

**Note:** "Identifier" field will automatically generate numbers, please change them to the same as the opened IDs of the PAC that you want to get data from.

Bin	ding *									HZ	4 X
몼	📄 🚠 PUB	LIC (:9000)		^	Name	Value	7	Name		Туре	
-	Can	1:Public_BOOL			Name	EXTERN:1		Public REA	AL.	REAL	^
-		2:Public_INT			Addr	192.168.1		PAC1 BOO	DL	BOOL	
∎+		- S:Public_DINT				9000		PAC1_DINT	Г	DINT	i i i
-		4:Public_WORD		=				PACT REA	NL.	REAL	
<u>F</u>		5:Public REAL					1	Error Statu	s	DINT	~
	e 提 EXT	ERN:1 (192.168.1.)	100/200.168.1.100:9000)	2		11		<	Var	iable area	а
	Name	Identifier	Destination				N.	ame	Valu	le	
	PAC1_BOOL	1	Exchange data	- '							
	PAC1_DINT	_2	Exchange data								
	PAC1_REAL	3	Exchange data								
	Error_Status	4	Exchange data								
<b>*</b> >	Binding Var	iables					111				

8. As the picture below, "Error\_Status" variable is used to determine the communication status of the PAC, please set this ID to "0" and then double-click "Destination" field and set it to "Connection error status".

Bin	ding *										H	ΖX
	♣       ➡       ♣       PUBLIC (:9000)       ▲         ▲       ■       1:Public_BOOL       ▲         ■       2:Public_INT       ■       3:Public_DINT         ↓       ■       3:Public_VORD       ■         ✓       ■       5:Public_REAL       ■         ●       ♣       EXTERN:1 (192.168.1.100/200.168.1.100:9000)       >						Value EXTERN:1 192.168.1 9000	7	Name Public_DI Public_BC PAC1_RE PAC1_DIN PAC1_BO Error Stat	VT OOL AL IT OL us	Type DINT BOOL REAL DINT BOOL DINT	
1	Name		D	estination		i i			<	OAT WEST		2
	PAC1_DINT PAC1_REAL Error_Status Binding / Varia	2 3 0 bles	E> C	change data <u>change data</u> Exchange data Variable error statu Variable date stam Variable time stam	IS P D			1.100		I Mos		
( )	Build Cross r	eferences Runti	me	Connection error s	tatus		tal sampling trace	1	Prompt HMI	7		^
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## Note:

a. If "EXTERN" set up two IP addresses (step 5), then the "Error\_Status" will return two communication statuses. As the following table, use 8 bits to indicate the connection status. The bit 0 ~ 3 represents the first IP connection status (If all bits are "1", the value is 15); the bit 4 ~ 7 represents the second IP connection status (If all bits are "1", the value is 240). As long as the value is not equal to "0", it means that there are connection errors.

IP2	Connec	tion Sta	itus	IP1	Connec	tion Sta	tus	Status Description
<b>2</b> <sup>7</sup>	<b>2</b> <sup>6</sup>	<b>2</b> ⁵	<b>2</b> <sup>4</sup>	<b>2</b> <sup>3</sup>	<b>2</b> <sup>2</sup>	<b>2</b> <sup>1</sup>	<b>2</b> <sup>0</sup>	Status Description
	(	)	0 Connection OK					
	(	)		≠0 (1 ~ 15) IP1 Connection error				
	≠ 0(16	5~240)			(	)		IP2 Connection error
	≠	0			≠	0		IP1 and IP2 Connection error

b. The return value of the "Error\_Status" is an integer value. The following division operation provides a way to determine this value. Dividing this value by 16, the quotient represents the IP2 connection status, and the remainder represents the IP1 connection status. If the values are not equal to "0", it means that there is any connection error. For example: If "Error\_Status" = 16, divided by 16, the quotient = 1 (≠ 0, IP2 Connection error) and the remainder = 0 (IP1 Connection OK); If "Error\_Status" = 3, divided by 16, the quotient = 0 (IP2 Connection OK) and the remainder = 3 (≠ 0, IP1 Connection error);

### Notice:

Please ignore the description of the "Connection status" and "Variable status" in the "Networked applications - Dual binding on redundant ETHERNET" of the "HTML Help" that opened when press "F1" key. That explanation is wrong and does not comply with the ICP DAS Win-GRAF PAC. Please ignore it.



Click the link for more Win-GRAF FAQ: https://www.icpdas.com/en/fag/index.php?kind=273#840

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