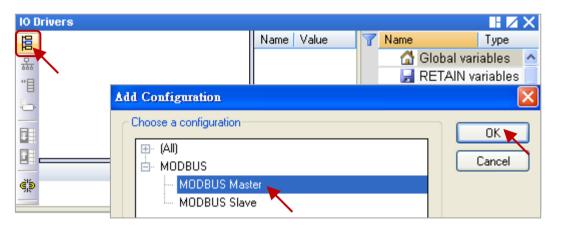
Classification	Win-GRAF	English FAQ-0	011				
Author	Eva Li	Version	1.0.0	Date	Jan. 2016	Page	1/12
How to Enal to link ET-70	000 I/O	Win-GRA Modules	?		lodbus F		
1.1. Enabling	the win-	GRAF PAC a	s a iviodo	us ICP/UL	JP Waster		
(Modbu (Modbu () () XPAC (Support I WinPAC	<b>Tin-GRAF P</b> us TCP/UDP <b>TOP</b> UDP LAN XP-8xx8 Max. 100 Sla	Master) -CE6 ve Devices) 3-CE7 3 3 -CE7	RS-408		VP-x208-CE -GRAF PAC rus TCP Slave)	ries I/O Module	S
The Setting Steps: 1. Click the tool in Workspace Workspace Test_01 File Main Watch (for d Soft Sco Initial values	con "Open <u>O1</u> Project <u>Toc</u> ograms	ols <u>W</u> indow <u>H</u> elp Drivers	- -	to open the	🟠 🖻 §g (	習 🕍 🔊 I 「 Name	
99 Binding Conl 99 Global define 199 Variables ■ Types	es 🤾	ild Build Cross	/	Runtime Call sta	ack Breakpoints	Name Control C	Value
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- 2. Click "Insert Configuration" icon in the left side of the "I/O Drivers" window, and then click "MODBUS Master", then click "OK" to enable a Modbus Master.
  - Note: One "Modbus Master" can set up multiple Ports (see the next step), can set as a Modbus Master RTU/ASCII Port or a Modbus Master TCP/UDP Port or can set up not to enable the setting.



3. Click the tool icon "Insert Master/Port" in the left side and open the setting window. Then, select the "MODBUS on Ethernet" and set up the related items, and then click "OK".

ivers *			×
Mo MODBUS Master		Туре	
		bal variables TAIN variables	
MODBUS Master Port		in	
	Þ	nBadIndex	-
MODBUS on Ethernet	ок р	nDivZero	~
Address: 192.168.1.100	Cancel	>	
Mc Port: 502		Value	
			>
UDP - MODBUS RTU			
UDP - Open MODBUS			
ph			
Serial MODBUS-RTU			
⊆om. port:			
	After receiv	ed an answer	,
Delay between requests	🖊 wait for 10	ms, and then	
		xt request.	
Delay (ms): 10	send the ne		
Delay (ms): 10	send the ne		
Try to reconnect after communication error			r+
Try to reconnect after communication error Manage diagnostic info for slaves	If not need the	e TCP/UDP Po	rt
Try to reconnect after communication error Manage diagnostic info for slaves		e TCP/UDP Po	rt
<ul> <li>✓ Try to reconnect after communication error</li> <li>✓ Manage diagnostic info for slaves</li> </ul>	If not need the	e TCP/UDP Po	rt

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	Port:	l: If as a Modbu	nber of the us TCP Mas	e Slave device.	"TCP – (	Open MODBU	S".	").		
	Delay:	Fill in the del	ay time (e.	g., 10 ms, can	be 0 ~ 1	0000).				

# 1.1.1. Read AI Data

1. Click the icon "Insert Slave/Data Block" in the left side to create a "Data Block".

IO Drivers *		
E Mo MODBUS Master	Name	Value
品 Open MODBUS: 192.168.1.100:502	Mode	Open MODBUS
	Address	192.168.1.100
	Port	502
	Reconnect after error	
	Slaves diagnostics	
	Delay between requests (ms)	10
	Disabled	

2. In the "MODBUS Master Request" setting window, set up the following items, and then click "OK".

MODBUS Master Request	
Request     OK       Description:	<u>In this example</u> a. <u>Slave/Unit</u> :
MODBUS Request     <2> Read Input Bits     <3> Read Holding Registers     <4> Read Input Registers     <5> Write single call bit     C     Data block   Base address:   1   Nb items:     4     Activation   Image: Periodic:     1000   ms     15000	<ul> <li>Fill in the Net-ID of the Slave device (Usually is "1").</li> <li>b. <u>MODBUS Request</u>: Select "&lt;4&gt; Read Input Registers".</li> <li>c. <u>Base address</u>: Default to start from 1. <u>Nb items</u>: The AI numbers to read (here is 4).</li> </ul>
e Timeout: 1000 ms Nb trials: 1	]
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### Note:

If want to change the "Base address", please use mouse to right-click the "MODBUS Master", and then select "MODBUS Master Addresses" to change the value.

d. Activation: the sending way of Modbus Request.
 <u>Periodic</u>: Send request periodically. In this case, it sends request every 1 Sec. "on error" means that when an error occurs, the next sending time (in this case, 15 seconds).
 On call: It will send the request once when a

program calls it. On change: It will send the request once when data is changed.

IO Drivers E □····Mo MODBUS Master								
resses								
dresses	ОК							
1	Cancel							
1								
1								
1								
	resses dresses 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							

- e. <u>Timeout</u>: Set up the max. time to wait for the response. If exceeds it, that means an error. (For Modbus TCP/UDP, recommended: 1000 ~ 3000 ms; this example is 1000 ms)
- 3. Open the "Variables" window, set up the variables want to use.

Workspace	IO Drivers *									
⊟— <mark>i]]</mark> Test_2	🗧 🖂 Mo MODBUS Master	Name	Value							
🗄 🖂 Exception programs	표         Dpen MODBUS: 192.168.1.100:502	Request	<4> Read Input Registers							
🛓 🦳 🎦 Programs	**     **     **	Slave/Unit	1							
🛄 🖭 Main		Address	1							
🗄 — 📴 Watch (for debuggi		Nb Item	4							
Soft Scope	Tips:	Activation	Periodic							
📰 Initial values	press "F1" key to see the setting	Period (ms)	1000							
	method for MODBUS Master.	Period on error	15000							
🚽 😽 🚽 Global defines	¢þ	Timeout (ms)	1000							
🚮 Variables 🍗	7	Number of trials	1							
E Types	<b>I</b> +	Description								

Please follow the table to set up 4 WORD (16 bit) variables.

Variable Name	Data Type	Dim.	Description
Word_1 ~ Word_4	WORD		Used to read the AI data (16 bit)
Status	DINT	5	Used to record the read/write status

uthor	·	nglish FAQ-			1	2016			2
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-	g up, it will show <mark>ted Manual</mark> - Se	-		not famil	liar with	the me	thod, re	efer the <u>Wi</u>	<u>n-Gl</u>
Variables									
🍸 Name	🛆 Тур	e Dim	n. Attrib.	Syb. I	Init value	User	Tag	Description	
Status	s DIN	г (О	4]						
Word_									
Word_	1252								
Word_	3-2 0222025								
Word_	_4 WO	RD				1			
< > 10 Dr	rivers Variables	_							
Variables a <u>lotice:</u> This	Drivers" window rea to the "Sym example shows ome "Status[0] ~	bol" area of "Status" is a	the Data Blo an Array vari	ock. able. Whe	en drag	it to the	"Symb	ol" area, it	will
) Drivers *									
🗧 🖃 Modb	US Master		Name	Value		🝸 Nam	e	🖉 Туре	Dir
다. · · · · · · · · · · · · · · · · · · ·	en MODBUS: 192.168	.1.100:502	Request	<4> Read Inp	out Regis 🔺	Sta	atus	DINT	[0
±•∎	<4> Read Input Regis	sters (1) [14]	Slave/Unit	1		4 100000	ord_1	WORD	
			Address	1	4.4	/ 10//	ord 2	WORD	
-			Address	.19	X				
⊃ Symbol	Operation	Offset Ma	ask Storage		Range	We	ord_3	WORD	
Status[0]	Data exchange	0 FFF	ask Storage F Default		Range	We We	ord_3 ord_4	WORD WORD	
Status[0]	Data exchange Data exchange	0 FFF 0 FFF	ask Storage FF Default FF Default		Range	We We	ord_3 ord_4	WORD	
Status[0] Word_1 Word_2	Data exchange Data exchange Data exchange	0 FFF 0 FFF <del>- 0 - F</del> FF	ask Storage F Default F Default F Default	<sup>-</sup>	Range	We We	ord_3 ord_4	WORD WORD	
Status[0] Word_1 Word_2	Data exchange Data exchange Data exchange Data exchange Data exchange	0 FFF 0 FFF <del>- 0 - F</del> FF 0 FFF	ask Storage F Default F Default F Default F Default		Range		ord_3 ord_4	WORD WORD	
Status[0] Word_1 Word_2	Data exchange Data exchange Data exchange	0 FFF 0 FFF <del>- 0 - F</del> FF	ask Storage F Default F Default F Default F Default			Name	ord_3 ord_4	WORD WORD	
Status[0] Word_1 Word_2	Data exchange Data exchange Data exchange Data exchange Data exchange	0 FFF 0 FFF <del>- 0 - F</del> FF 0 FFF	ask Storage F Default F Default F Default F Default	<sup>-</sup>	Range	Name	ord_3 ord_4	WORD WORD	
Set the "Op Code"; whe	Data exchange Data exchange Data exchange Data exchange Data exchange Variables	0 FFF 0 FFF 0 FFF 0 FFF 0 FFF 0 FFF 0 FFF 0 FFF 0 FFF 0 FFF	ask Storage F Default F Default F Default F Default F Default to "Error rep eset to "0".)	port" (If re	eading d	ata fails	, its val	WORD WORD	of

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6. Select "Word\_1 ~ Word\_4" and click "Iterate property" to set up the "Offset" value (From: 0; By: 1).

目	🖯 Mo MODBU	S Master		Na	me	Value				
品	🗄 🐰 Oper	n MODBUS: 192.168.1.1	00:502	Re	quest	<4> Read	l Input l	Regist		
*	Ė <b>~*∎</b> <	(4> Read Input Registers)	s (1) [14]	Sla	ve/Unit	1				
				1000	dress	1				
0					ltem	4				
					tivation	Periodic				
					riod (ms)	1000				
-					riod on err	15000				
ġįs					neout (ms)	1000				
∎+		8			mber of tri	1				
8.	-			De	scription					
÷	Symbol	Operation	Offset N	/lask	Storage		7	Range (I		
	Status[0]	Error report	O FI	FFF	Default					
	Word_1	Data exchange	0	FF	Default					
	Word_2	Data exchange	1							
	Word_3	Data exchange	2 3 Na							
	Word_4	Data exchange	3 Na	ame	%					
	<		Fre	om:	0	\$		By:	1	\$
4 >	10 Drivers	Variables		Results						

Now, we have finished the setting to read AI data. In the following section, we will describe how to read/write the DI, DO, and AI data of the ET-7000 module. You can also refer the FAQ-009 to know the configure way to read/write the DI, DO, AI and AO data.

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# 1.2. Connecting ET-7000 Series I/O Module

ICP DAS ET-7000 is a series of I/O module supporting Modbus TCP Slave protocol. The Win-GRAF PAC can enable the Modbus TCP Master to connect the ET-7000 modules. The maximum recommend the amount of the connecting ET-7000 modules depends on the PAC model, such as the XP-8xx8-CE6 and WP-5238-CE7, recommends a maximum of 200; the WP-8xx8, VP-22x8-CE7 and VP-42x8-CE7 is recommended that no more than 32.

For more information about the ET-7000 series products, please visit the website: <a href="http://www.icpdas.com/root/product/solutions/remote\_io/ethernet\_io/ethernet\_io\_selection.html">http://www.icpdas.com/root/product/solutions/remote\_io/ethernet\_io/ether

# 1.2.1. Use Internet Browser to Set the ET-7000 Modules

Before the first time using the ET-7000, you must set up the ET-7000 by using the Internet Browser. When the ET-7000 shipping from the factory, the settings are: IP address = 192.168.255.1; Mask = 255.255.0.0. Please set the IP of your PC in the same network (e.g., set the IP to 192.168.255.100, Mask = 255.255.0.0), then open the browser (such as IE), and enter the IP of the ET-7000 to connect it.

# **<u>Notice</u>**: The Dip Switch on the rear of the ET-7000 must stay in the "Normal" position.

		ge - Windows Internet E: :://192.168.255.1/	xplorer	
Username: Admin Password: Admin (Case sensitive)	及密碼。 警告:此伺服器要: 式傳送(基本驗證 使用者名稱(U): 密碼(P):	255.1 的伺服器 192.168.255.1 需要 求您的使用者名稱及密碼以 ,不含安全連線)。	以不安全的方	

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			г		1_					
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Click "Configuration 'Submit".	n" > "Module I/	O Setting	gs" to set up the	range	of cha	nnels as	below	, and then click		
PET-7000 Web page - Windo	ows Internet Explorer									
😋 💽 🗢 🙋 http://192.168.2	55.1/					▼ +→ ○	K 2 百度	走一下,你就知道		
🚖 我的最愛 🏾 🏉 PET-7000 We	eb page				0	🟠 • 📾 •	- 🖶 -	網頁(P) - 安全性(S) - 工!		
ICP DAS	Modbus	s Settings (/	Al Basic Setting)	-						
Overview			Range (40427)			Enable (00	595)			
Configuration	Ch0		[05] +/-2.5V		~	OFF C ON	1949 - Chick			
Basic Settings	Ch1		[04] +/-1V		~	And the second second	C ON C			
Module I/O Settings	Ch2		[0F] T/C K-type, -270°C ~	1372°C	~					
	Ch3		[0F] T/C K-type, -270°C ~	1372°C	~		•	Set as "ON" to		
Web HMI     Pair Connection	Ch4		[05] +/-2.5V		~		•	enable it.		
More Information	Ch5		[05] +/-2.5V		~		•			
	Ch6		[05] +/-2.5V		~		•			
	Ch7		[05] +/-2.5V		~		•			
	Ch8		[05] +/-2.5V		~		•			
Set "Al Data Forr	ch9		[05] +/-2.5V		~		•			
		L	Function			Action				
to "ON" (Enginee	er), Modbus Ad	uress	50/60 Hz rejection for AI				· 0-50/	1=60 Hz (default=1)		
means:	landara da la companya da la	1	AI Data Format					/1=60 HZ (default=1) 1=Engineeer (default=0)</td		
± 2.5: -25000 ~ +	25000	1	Recover AI Calibration Val	ues to Factor	v Setting			y == crigineeer (deraun=0)		
± 1 : -1000 ~ +1	1000				, boung	1				
258 : 25.8 (°C)				Sub	mit					

Users can set the ET-7018Z's "AI Data Format" to "ON" (Engineering) for more convenient usage. For example:

Type Code	Range	Data Format	Minimum	Maximum
04	1~11/	Engineering	-10000	+10000
04	-1 ~ +1 V	2's comp HEX	8000h	7FFFh
05	-2.5 ~ +2.5 V	Engineering	-25000	+25000
05	-2.5 <sup>°</sup> +2.5 V	2's comp HEX	8000h	7FFFh
	Туре М	Engineering	-20000	+10000
18	Thermocouple -200 ~ 100°C	2's comp HEX	8000h	4000h

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### **1.2.2.** Restore/Open the Demo Project

This paper provides the following Win-GRAF demo projects, you can click the Win-GRAF menu bar "File" > "Add Existing Project" > "From Zip" to restore/open/check the demo projects.

Demo Project	File Name	Description
ET-7060	demo_ET7060.zip	Read 6 DIs, write 6 DOs
ET-7018Z	demo_ET7018z.zip	Read 10 Als

1. Click the tool icon "Open Fieldbus Configuration" to open the "I/O Drivers" window.

Workspace	10 0	)rivers							ΗZ	×
⊡… ((demo_ET7060)	目	P Mo MODBUS Master	•	_			1	7 Name	Туре	
E Exception programs	몳	👜 🚠 Open MODBU	S: 192.168.1.128:50	2				ET7060_DI_00	BOOL	1
🛱 🧰 Programs	*	🖽 📲 🖓 🗄 🖂 🗄 🗄	Input Bits (1) [16]					ET7060_DI_01	BOOL	
📖 通 Main		😟 – *🖪 <15> Write	: Coil Bits (1) [16]					ET7060_DI_02	BOOL	
🖻 — 📜 Watch (for debugging)	-0-	MODBUS Slave		•				ET7060_DI_03	BOOL	
Soft Scope		5						ET7060_DI_04	BOOL	
🔜 Initial values		Request	Slave/Unit	Address	Nb Item	Activation	Peric	ET7060_DI_05	BOOL	1
📲 🚮 Binding Configuration		<2> Read Input Bits	1	1	6	Periodic	50	ET7060_status	DINT	
🚽 🖇 🚽 Global defines	¢.	<15> Write Coil Bits	1	1	6	On Change	0	ET7060_RL_00	BOOL	
🚮 Variables	-						Alterna	ET7060_RL_01	BOOL	
E Types	∎+	<					>	<	>	

2. Double click "Open Modbus: IP:502" to open the "MODBUS Master Port" window.

#### Notice:

All demo projects in this chapter can enable the Win-GRAF PAC as a Modbus **TCP** Master. Fill in the current IP address of your ET-7000, and set "Port" to "502" and "Protocol" to "TCP - Open Modbus".

MODBUS on f <u>A</u> ddress: <u>P</u> ort: Pr <u>o</u> tocol:		DK ancel	
<u>⊆</u> om. port:	5-RTU Enter the curren of your ET-7000		
Delay between ro Delay (ms):	quests 5		
Manage <u>d</u> iagno:	: after communication error tic info for slaves open and manage this port)		

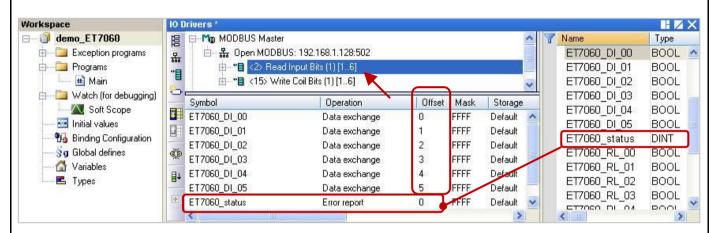
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### 1.2.3. Connecting the ET-7060 (6 DI, 6 Relay)

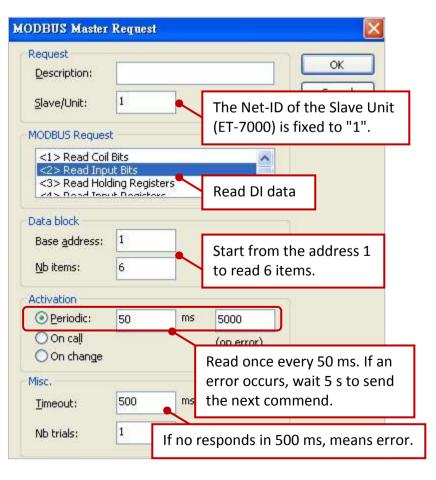
The ET-7060 is a 6 DI and 6 Relay channels Ethernet I/O module. The Win-GRAF demo project for this section is "demo\_ET7060.zip". Please refer <u>Section 1.2.1</u> to set up the module channels using the Internet Browser, and restore/open the demo project.

### Demo Description:

This demo creates two Data Blocks, one is used to read 6 DI data, the other is used to write 6 DO data. 1. Double click the first Data Block (<2> Read Input Bits) to open the setting.



**Note:** (See the figure above) The "Offset" value starts at "O" and the Modbus address of variable is equal to the "Offset" value plus 1 (Base address). Moreover, if you set the "Operation" as "**Error report**", the "Offset" value for the mapping variable (Date Type: DINT) must set to "**0**".



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2. Double click the second Data Block (<15> Write Coil Bits) to open the setting window.

Workspace	10 Drivers *							
emo_ET7060		Master			^	🕎 Nar	me	Туре
🗄 📄 Exception programs		MODBUS: 192.168.1.12	8:502			E	17060_DI_02	BOOL 🔺
🖻 🛄 Programs	*= *= <2	Pread Input Bits (1) [1					17060_DI_03	BOOL
🛄 Main		5> Write Coil Bits (1) [1	6]		~		T7060_DI_04	BOOL
🗈 📄 Watch (for debugging)	Symbol	Opera	tion	Offset Mask	Storage	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	17060_DI_05	BOOL
Soft Scope	ET7060_RL_00		kchange 0		Default		17060_status	DINT
Initial values 	ET7060_RL_01	Data e:	kchange 1	FFFF	Default		17060_RL_00	BOOL BOOL
g Global defines	ET7060_RL_02		kchange 2		Default		17060_RL_01 17060_RL_02	BOOL
Variables			kchange 3	10 State 10 State	Default		17060_RL_03	BOOL
E Types	ET7060_RL_04 ET7060_RL_05		kchange 4 kchange 5		Default Default		T7060_RL_04	BOOL
	E <		kenange 0		Derduit	F	17060 RI 05	BOOL
		1.14H						
	Data block Base <u>a</u> ddress: <u>N</u> b items:	1 st gle coil bit gle holding register	The Net-II (ET-7000) Write DO Start from to write 6	is fixed data.	to "1".	it		
	Activation Operiodic:	0 ms	5000					
	On call		(on error)					
	On change							
	Misc.	•	Write data	a, if data	a is chang	ged.		
	Timeout:	500 ms						
	Nb trials:	1	If no respo	onds in !	500 ms, r	neans	error.	
						1		
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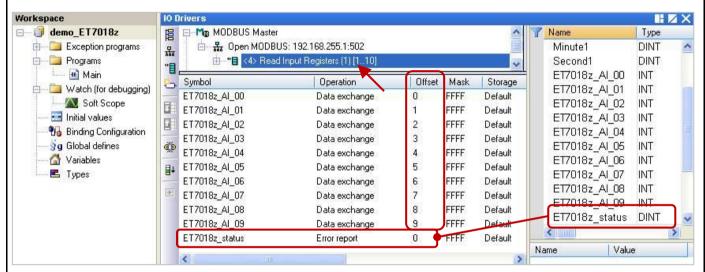
# 1.2.4. Connecting the ET-7018Z (10 AI)

The ET-7018Z is an 10 AI channels Ethernet I/O module. The Win-GRAF demo project for this section is "demo\_ ET7018z.zip". Please refer <u>Section 1.2.1</u> to set up the module channels using the Internet Browser, and restore/open the demo project.

### Demo Description:

This demo creates one Data Block to read 10 AI data.

1. Double click the first Data Block (<4> Read Input Registers) to open the setting window.



### Note: (See the figure above)

- The "Offset" value starts at "0" and the Modbus address of variable is equal to the "Offset" value plus 1 (Base address).
- 2. If you set the "Operation" as
  "Error report", the "Offset" value for the mapping variable
  (Date Type: DINT) must set to "0".
- 3. If AI range is -32768 ~ 32767, please declare the data type as "INT" for the variable.



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