# **BACnet/IP Gateways**



# FAQ for GW-549x

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## 1. How to manipulate GW-549x via ICDT BACnet Pioneer?

ICDT BACnet Pioneer is a free BACnet software and developed by ICDT Tech. Co. Ltd. The following example is how to switch on the DO[0] and read DI[0] back on the ICPDAS M-7055D, a Modbus/RTU Slave, connected to GW-5492 via ICDT BACnet Pioneer, and you can test GW-5493 in the similar way.

(1) Install the ICDT BACnet Pioneer <u>http://www.icdt.com.tw/main/index.php/2013-07-09-05-16-50/2013-07-18-14-43-35/file</u> /24-bacnetpioneerv1001

Refer to the ICDT website for the details: <u>http://www.icdt.com.tw</u>

- (2) M-7055D Setup as follows, DO.PWR wire to *Power Supply +24VDC*, GND to *Power Supply Ground*, and DO0 to DI0. Power up M-7055D and GW-5492 which LAN1 connects to the internet.
- (3) GW-5492 is configured that *BOO* is mapping to DO0 of M-7055D and *BIO* is mapping to DI0 of M-7055D

Devices	Modbus- ID M-705 Comm TCP Ac	5D unication —— Idress	T	rpe TCP	M1	Unit							
	Point -		Add	]									
	ID	Address	Count	Туре	Type Define	Sampling(ms)	TimeOut(ms)	ScaleFactor	Intercept	Low	Hi	Read/Write	Del
	DIO	0	1	DISCRETE INPUT	BIT	1000	7000	1	0			Read	Del
	DOO	0	1	COIL	BIT	1000	7000	1	0			Write	Del
	Save	Delete											Þ

MultiStateOutput	Mapping			Roup	1							
MultiStatemput	Object Type Binary	Input		Dave	Jave Jave Jave Jave Jave Jave Jave Jave							
Angles Velue	BACnet Object Manning											
AnalogValue		pping										
AnalogOutput	Object Identifier	Device	Point	Index	Object Name	COV Increment	COVPeriod(sec)	Unit	Relinquish De			
- Analoginput	BIO	M-7055D	DIO	0	BIO	0	0	NO UNITS	0			
BinaryMutnut												
BinaryValue												
Dinary value												
MultiStateOutput	Mapping —				_							
MultiStateInput	Object Type Binary	Output		Save								
−MultiStateValue				·	,							
AnalogValue	BACnet Object Ma	pping										
AnalogOutput	Object Identifier	Device	Point	Index	Ohiect Name	COV Increment	COVPeriod(sec)	Unit	Relinguish De			
AnalogInput		M 7055D	DOD	0		0	0		0			
BinaryInput		IVI-7055D	000	U	воо	U	U	NO UNITS	U			
BinaryOutput												
BinaryValue												

Refer to the websites for details:

GW-549x:

http://www.icpdas.com/root/product/solutions/industrial\_communication/fieldbus/ bacnet\_ip/gateway/gw-5492.html

ftp://ftp.icpdas.com.tw/pub/cd/fieldbus\_cd/bacnet/gateway/gw-5493/manual

M-7055D:

http://www.icpdas.com/root/product/solutions/remote\_io/rs-485/i-7000\_m-7000/i-7055.html

http://ftp.icpdas.com/pub/cd/8000cd/napdos/7000/manual/7000dio.pdf

(4) Execute Recent to get the Device ID/Instance of your computer and GW-5492 (default 3577). Choose **3577**,

💥 B&Cnet Pioneer	
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3577	

(5) Click on *Device 3577(.....)*, and it will scan the objects of GW-5492.



(6) Click on BINARY OUTPUT→0, and it will scan the properties and values of BOO. Notice Out Of Service is False.

💥 BACnet Pioneer 📃 🗖 🔀
3577 🚽 🕨   🔚 🍈 🛃 🕕
<ul> <li>Device 3577(192.168.255.1)</li> <li>DEVICE</li> <li>3577</li> <li>BINARY INPUT</li> <li>0</li> <li>BINARY OUTPUT</li> <li>• 0</li> <li>Active Text : BOOActive Text</li> <li>Description : BINARYOUTPUT</li> <li>Event State : Normal</li> <li>Inactive Text : BOOInactive Text</li> <li>Object Identifier : BINARY OUTPUT 0</li> <li>Object Type : Binary Output</li> <li>Out Of Service : False</li> <li>Polarity : Normal</li> <li>Fresent Value : Active</li> <li>Priority Array : 16</li> <li>Reliability : No Fault Detected</li> <li>Relinquish Default : Inactive</li> <li>Status Flags : In Alarm=False Fault=False Overridden=False Out Of Service=False</li> </ul>
BINARY OUTPUT-O Present Value : Active

(7) Double Click on the item *Present Value*, and set BO0 to *Active*.

🞇 BACnet Pioneer	
j 🔎 3577 💽 🕨 🔚 🍪 🛃 🕕	
<ul> <li>Device 3577(192.168.255.1)</li> <li>DEVICE</li> <li>3577</li> <li>BINARY INPUT</li> <li>0</li> <li>BINARY OUTPUT</li> <li>0</li> <li>Active Text : BOOActiveText</li> <li>Description : BINARYOUTPUT</li> <li>Event State : Normal</li> <li>Inactive Text : BOOInactive Text</li> <li>Object Identifier : BINARY OUTPUT 0</li> <li>Object Name : ANALOGOUTPUT</li> <li>Object Type : Binary Output</li> <li>Out Of Service : False</li> <li>Polarity : Normal</li> <li>Present Value : Active</li> <li>Priority Array : 16</li> <li>Reliability : No Fault Detected</li> <li>Relinquish Default : Inactive</li> <li>Status Flags : In Alarm=False Fault=False Overridden=False Out Of Set</li> </ul>	ervice=False
BINARY OUTPUT-0 Present Value : Active	

- (8) Click on **BINARY INPUT** $\rightarrow$ **0** $\rightarrow$ **Present Value**, and check the status of BI0 is **Active**.
  - Notice *Out Of Service* is *False*
  - In the ICDT Pioneer, the data will be updated while you click and stay on the item.



### 2. How to manipulate GW-549x via BACnet VTS?

This part is The following example is how to switch on the DO[0] and read DI[0] back on ICPDAS M-7055D, a Modbus/RTU Slave, connected to GW-5492 via Visual Test Shell (VTS), and you can test GW-5493 with Modbus/TCP Slave in the similar way.

(1) Get Visual Test Shell (VTS). Refer to the websites,

http://vts.sourceforge.net/ or http://sourceforge.net/projects/vts

- (2) M-7055D Setup as follows, DO.PWR wire to *Power Supply +24VDC*, GND to *Power Supply Ground*, and DO0 to DI0. Power up M-7055D and GW-5492 which LAN1 connects to the internet.
- (3) GW-5492 is configured that *BOO* is mapping to DO0 of M-7055D and *BIO* is mapping to DI0 of M-7055D

- Devices	- Modbus ID M-7055 Commu TCP Ad	D nication	т <u>і</u>	/pe TCP	M1	Unit							
	Point -	Addroce	Add	Type	Tune Define	Sampling(me)	Time()ut(me)	ScaleFactor	Intercent	Low	Hi	DeadAl/rite	Del
		Audress	1	DISCRETE INPUT	BIT	1000	7000	1	П	LUW		Read	Del
	DOD	0	1	COIL	BIT	1000	7000	1	0			Write	Del
	Save	Delete						- 					•

MultiStateOutput	Mapping										
MultiStateInput	Object Type Binary	Input		Save							
−MultiStateValue											
AnalogValue	BACnet Object Ma	BACnet Object Mapping									
AnalogOutput	Object Identifier	Device	Point	Index	Object Name	COV Increment	COVPeriod(sec)	Unit	Relinquish De		
AnalogInput	BIO	M-7055D	DIO	0	BIO	0	0	NO UNITS	0		
BinaryInput											
BinaryOutput											
iBinary∨alue											
MultiStateOutput	Mapping —										
MultiStateInput	Ohiect Type Binary	Outnut		Save							
−MultiStateValue	l object type binary	odipat			,						
−AnalogValue	BACnet Object Ma	oping									
AnalogOutput	Object Identifier	Device	Point	Index	Object Name	COV Increment	COVPeriod(sec)	Unit	Relinguish De		
AnalogInput	B00	M-7055D	D00	0	B00	0	0		0		
BinaryInput		GER 000D	000		500	-	~				
BinaryOutput											
<sup>i</sup> BinarγValue											

Refer to the websites for details:

GW-549x:

http://www.icpdas.com/root/product/solutions/industrial\_communication/fieldbus/ bacnet\_ip/gateway/gw-5492.html

ftp://ftp.icpdas.com.tw/pub/cd/fieldbus\_cd/bacnet/gateway/gw-5493/manual

M-7055D:

http://www.icpdas.com/root/product/solutions/remote\_io/rs-485/i-7000\_m-7000/i-7055.html

http://ftp.icpdas.com/pub/cd/8000cd/napdos/7000/manual/7000dio.pdf

(4) Execute www.visual Text Shell for BACket . If you've configured the Devices, Ports and Names in VTS, you

can jump to step(8).

(5) Click on *Edit→Devices...,* set the Name to *MyDevice*, Instance to *1111*, and push *OK*.

¥TS - [vts3.cfg]							
le <u>Edit Y</u> iew <u>S</u> end E <u>P</u> ICS <u>T</u> e	sts <u>H</u> elp						
Delete All Packets Ctrl+D		? 🔽	1				
Refresh	7 (P (D		340				
o. De <u>v</u> ices	Destination	SNET	SADDR	DNET	DADDR	Service Type	
Ports							
Change Logfile							
Capture Filter							
Display <u>Filter</u>							
Preferences							
	<b>6</b>						
Device	Configuration						
				1			
	👺 MyDevice, 1111		Dev	ice   Options	 		
			Nan	ne:	MyDevice		
			Inst	ance:	1111	Segmentati	ion
			Seg	ment Size:	1024	C Bot	h   -
			Wir	idow Size:	1	C Trar	nsmit
			Nex	t invoke ID:	10	( Non	ie –
			Ven Mar	A OF ID.	1024		
			APT	II Timeout	5000	F Router	
			API	)U Seg Timeou	ut: 1000	I-Am	
			API	)U Retries:	3		
				20.7			
			1	nport	<u>E</u> xport	OK	Cancel
			19442	1000	11		
						() ()	

(6) Click on *Edit*→*Ports...*, push *New* button and configure as follows,

- Name set to *MyPort*. Check on *Enable*
- Network set to **1**. Choose *MyDevice*
- On *IP* Page, *Interface* choose one network device which can communicate with GW-5492
- Push **OK** or **Apply** to continue

😵 v	TS - [vts3.cfg]											
File	Edit View Send EPICS Te	ests <u>H</u> elp										
D	Delete All Packets Ctrl+D		8 🛛									
	Refresh	0 (P ()		20								
No.	De <u>v</u> ices	Destination	SNET	SADDR	DNET	DADDR	Service	Туре				
	Por <u>t</u> s											
	<u>N</u> ames Change <u>Logfile</u> Capture Filter Display <u>Fi</u> lter											
	Preferences	Port Con	Port Configuration									
-		Name		Туре	Confia		Status	New				
		MyP	ort	IP	0xBAC	);Realte	New					
								Delete				
								OK				
								Cancel				
		<u>N</u> ame:	MyPort				✓ Enable	Apply				
		Net <u>w</u> ork:	1	MyDe	vice	•						
		Null	IP	Ethernet	ARCNET	MSTP 1	PTP					
-		Interface	Realte	k RTL816	BC(P)/8111C	C(P) PCI-E G	igabit Etherne	t NIC - Packe 💌				
		UDP Por C Raw C BTR C BBB C BBB C BDP C Fore Hgs	t: OxBA (Annex-J ID (Annex-J ign Device t: X.X.X.	C0 H) > ) e (Annex-J) x[/mask][:p	Usually 0x 0 = dynam BHR Pee BBMD Pe BBMD Pe	BAC0 (4780 ically assign ens	08) ed					
			1	1					1			
<									>			
Edit t	ne port definitions including activa	ting and deactivating po	rts.					NU	M /			

(7) Click *Edit* → *Names...*, Push *New* button and the configuration as follows,

- Address Type choose *Local Station*
- Name is **GW-5492**
- Port choose *MyPort*
- Address set the IP of GW-5492: 192.168.255.1:47808 (GW-5492's default setting)
- Push **OK** and continue

Notice: TD is for your computer, and do not remove it.

Delete All Packets Ctri	+D	οx.		8 🗧					
Kerresn	01	(F	0						
Devices		D	estination	SNET	SADDR	DNET	DADDR	Service Typ	e
Ports Mamaa									
Change Logfile									
Capture Filter									
Display <u>F</u> ilter									
Preferences									
		Ne	imes						
		-	and stores of		-	Luc i			
		-	Name TD		Port	Network	Address 192,169,20	1 20:47808	New
			GW-5492		MyPort		192.168.25	55.1:47808	Delete
									Import
									Export
		- '			. A				UK
		Ē	Address <u>I</u>	уре		<u>N</u> ame	GW-5492		Cancel
			Null			Pert I	MuRot		
			C Loca	l Broadca   Station	ist				
			C Rem	ote Broad	cast	Networ <u>k</u>			
			C Rem	ote Statio	n	Address	192.168.255.1	:47808	
			4 GIOD	al Broadc	ast	I	Hex (C0-A8-00	-01-BA-C0)	
							or in .poirt (132.	100.0.1.47000	

(8) Click on Send  $\rightarrow$  Object Access  $\rightarrow$  WriteProperty, and WriteProperty window shows up.

😽 VIS - [vts3.cfg]		×					
<u>File Edit View Send</u> E <u>P</u> ICS <u>T</u> ests <u>H</u> elp							
🗋 🚅 🛃 🎒 New Packet	📰   💡 🛃	_					
E B B B B M M							
No. TimeStam - MyPort (IP)	tion SNET SADDR DNET DADDR						
IP •							
BVLL							
Network							
Alarm and Event							
File Access							
Object Access 🕨 🕨	AddListElement						
Remote Device Management 🕨	ChangeList-Error						
Virtual Terminal	CreateObject						
Simple/Segment ACK	CreateObject-ACK						
Errors	CreateObject-Error						
	DeleteObject						
	ReadProperty						
	ReadProperty-ACK						
	ReadPropertyMultiple						
	ReadPropertyMultiple-ACK						
	Read Range						
	RemoveL1stElement						
	WriteProperty						
	WritePropertyMultiple						
	while roperty womple-Entor						

(9) WriteProperty →*IP* Page : Destination chooses *GW-5492* 

WriteProperty		
[IP] BVLCI   NPCI   Confirmed-Request   WriteProperty	MyPort 🔹	
Destination GW-5492 <b>•</b> 192.168.255.1:47808	IP         BVLL         Network         Alarm and Event         File Access         Object Access         AddListElement         CreateObject         CreateObject-ACK         CreateObject-Error         DeleteObject         ReadProperty         ReadPropertyAcK         ReadPropertyMultiple         ReadPropertyMultiple         ReadRange         RemoveListElement         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple	
Object ID required	<ul> <li>Send</li> </ul>	
	Close Send & Close	

#### (10)WriteProperty → WriteProperty Page, set binary-output, 0, present-value,

WriteProperty		×
IP   BVLCI   NPCI   Confirmed-Request WriteProperty	MyPort	-
Object ID binary-output, 0 ID Property present-value  Array Value Any Priority	IP         BVLL         Network         Alarm and Event         File Access         Object Access         AddListElement         CreateObject         CreateObject-ACK         CreateObject-Error         DeleteObject         ReadProperty-ACK         ReadPropertyMultiple         ReadPropertyMultiple         ReadPropertyMultiple         ReadPropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple         WritePropertyMultiple	
C0A8FF01 BAC0810A 00150104 0003410F 0C010000 0019553F 91013F	History:0 - Send	
	<u>C</u> lose Send & Close	

BinaryPV(active), and push Send & Close button. The steps are described as follows,

• Object ID: Push *ID...* button, and choose *binary-output*, and instance is *0* while BO*0*.

Object ID 🛛 🗙
An object identifier is made of two components: an object type and an instance number.
Object Type binary-output 🗨
Reserved Type 4 Reserved types range 0127
Vendor Type Vendor Types range 1281023
Instance 0 Instance range 04194303
Here is how the value can be entered directly:
binary-output, 0
OK

- Property choose *Present-Value*
- Value: Push Any... button, and a window shows up. Choose BinaryPV and push Set... and set active.

ABSTRACT-SYN1	ГАХ.&Туре		
Type BinaryPV	Context Data 9101	<u>A</u> dd <u>R</u> emove	BACnet BinaryPV
<pre>Ivpe BinaryPV</pre>		>	BinaryPV active
<u>C</u> ontext		Set	
	OK Can	cel	

• Push *Send & Close* button, and VTS will show the transmit packets and receive the GW-5492 feedback one.

File E	dit <u>V</u> iew Sen	d EPICS	<u>T</u> ests <u>H</u> elp							
	ê 🗑 🖗 🗡	÷ ت	* 5	PE 📰 🛛 🦿						•
Ē 🛛	C 🐹 🔛 🗉	) en ex	₹} {} {}	0						
No.	TimeStamp	Port	Source	Destination	SNET	SADDR	DNET	DADDR	Service Type	
<b>→</b> 0	15:55:45.359	MyPort	TD	GW-5492					WriteProperty, ID=73 binary-output_0, present-value, active (1)	
← 1	15:55:45.359	MyPort	GW-5492	TD					Simple ACK, ID=73, WriteProperty ACK	

Get DIO status (Active)

(11) Click Send  $\rightarrow$  Object Access  $\rightarrow$  ReadProperty, and ReadProperty window will show up.

New Packet       Send Again											
D.	TimeStam •	<ul> <li>MyPort (IP)</li> </ul>	stination	SNET	SADDR	DNET	DADDR	Service Type			
0 1	15:55:45. 15:55:45.	IP BVLL Network Alarm and Event File Access	¥-5492					WriteProperty, ID=73 binary-output_0, present-value, active (1) Simple ACK, ID=73, WriteProperty ACK			
		Remote Device Management Virtual Terminal Simple/Segment ACK Errors	Created Created Created Deleted	List-Erro Object Object-AC Object-Err Object	r X ror						
			ReadPi ReadPi ReadPi ReadPi ReadR Remov WriteP WriteP WriteP	operty opertyAt opertyMu opertyMu ange eListElem roperty ropertyMu ropertyMu	CK ultiple ultiple-ACK uent ultiple-Ecco						

(12) ReadProperty  $\rightarrow IP$  Page: Destination chooses *GW-5492* 

ReadProperty		
[IP] BVLCI   NPCI   Confirmed-Request   ReadProperty	MyPort	-
<u>D</u> estination GW-5492 <b>▼</b> 192.168.255.1:47808	<ul> <li>IP</li> <li>BVLL</li> <li>Network</li> <li>Alarm and Event</li> <li>File Access</li> <li>Object Access</li> <li>AddListElement</li> <li>CreateObject</li> <li>CreateObject-ACK</li> <li>CreateObject-Error</li> <li>DeleteObject</li> <li>ReadProperty</li> <li>ReadPropertyMultiple</li> <li>ReadPropertyMultiple-ACK</li> <li>RemoveListElement</li> <li>WritePropertyMultiple</li> <li>WritePropertyMultiple</li> <li>WritePropertyMultiple</li> <li>WritePropertyMultiple</li> <li>WritePropertyMultiple</li> <li>WritePropertyMultiple</li> </ul>	
Object ID required	- Send	
	Close Send & Cl	ose

#### (13) ReadProperty *->ReadProperty* Page, set *binary-input, 0, present-value*, and push *Send &*

ReadProperty	
ReadProperty         IP       BVLCI       NPCI       Confirmed-Request       ReadProperty         Object ID       binary-input, 0       ID         Property       present-value           Array	MyPort  IP BVLL Network Alarm and Event File Access Object Access AddListElement ChangeListError CreateObject CreateObject
	CreateObject-Error DeleteObject ReadProperty ReadProperty-ACK ReadPropertyMultiple ReadPropertyMultiple ReadPropertyMultiple-ACK ReadRange
	WriteProperty WritePropertyMultiple WritePropertyMultiple
001955	Close Send & Close

*Close* button. The steps are described as follows,

• Object ID: Push *ID...* button and choose *binary-input*, and instance is *0* while BO*0*.

Object ID	×									
An object identifier is made of two components: an object type and an instance number.										
Object Type	analog-input									
Reserved Type	0 Reserved types range 0127									
Vendor Type	Vendor Types range 1281023									
Instance	0 Instance range 0.,4194303									
Here is how the value can be entered directly:										
	analog-input, 0 OK									

- Property: choose *Present-Value*
- Push *Send & Close* button, and VTS transmits packet and you can confirm that GW-5492's DI0 is *Active*.

<b>3</b> 8 v	TS - [vts3.cfg]										
File	<u>E</u> dit <u>V</u> iew <u>S</u> en	d E <u>P</u> ICS	<u>T</u> ests <u>H</u> elp								
	D 😂 🗑 🎒 X U 🏟 🕸 🖾 🖼 🔋 😵										
Ē	🖥 📷 📓 副 副 副 数 分 分 分 の										
No.	TimeStamp	Port	Source	Destination	SNET	SADDR	DNET	DADDR	Service Type		
→0	15:55:45.359	MyPort	TD	GW-5492					WriteProperty, ID=73 binary-output_0, present-value, active (1)		
← 1	15:55:45.359	MyPort	GW-5492	TD					Simple ACK, ID=73, WriteProperty ACK		
$\rightarrow 2$	16:01:11.890	MyPort	TD	GW-5492					ReadProperty, ID=74 binary-input_0, present-value		
<b>←</b> 3	16:01:11.890	MyPort	GW-5492	TD					ReadProperty-ACK, ID=74, binary-input_0, present-value, active (1)		
Ready	r								NU	IM //	