

## nanodac™ EtherNet/IP Guide



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#### Introduction

This guide is designed to illustrate how to set up the nanodac<sup>™</sup> to work with a control/compact logix PLC from Allan Bradley using the EtherNet/IP protocol.

You need to have:

- 1) A nanodac<sup>™</sup> recorder/controller
- 2) EtherNet/IP option enabled in the nanodac<sup>™</sup>

Configuration of the EtherNet/IP protocol needs to be done via iTools. You can connect to the nanodac<sup>™</sup> via two options:

- 1) Configuration clip (sold separately, P/N CPI101000000)
- 2) Ethernet port (RJ45, standard on nanodac<sup>™</sup>)

Assuming these conditions are met, you can now proceed in the configuration the EtherNet/IP option in the nanodac™

#### <u>iTools</u>

#### Setting up nanodac<sup>™</sup> for use in iTools (via Ethernet TCP/IP)

Using the Ethernet port on the back of the nanodac<sup>™</sup> is simple to use but you will need to add a TCP/IP port within iTools in order for it to recognize the nanodac. Simply go to your Control Panel, then click on the iTools icon.

Registry Settings - i	iTools Configuration		×
Product Key Seri	ial Ports TCP/IP	orization OPC Server St	artup
Configure TCP	/IP ports for MODBU	S over Ethernet	
Settings may be o	verridden by an Address	Space File. See OPC Ser	rver Startup tab.
Enabled	Connection Type	Host Name	Remote Port
Add	Remove		Edit
Ś		OK Cano	cel Apply

Click on the TCP/IP tab, then click Add...

New TCP/IP Port					×	
<u>N</u> ame: <u>C</u> onnection Type:	example MODBUS TCR	•	<b>-</b>	☑ Enab Step 1	led	
<u>T</u> imeout:	1500	ms				
<u>H</u> ost List:						
Host Name/IP Addres	\$\$		TCP Port	Block Size	Ping	
149.121.4.80			502	125	Yes	
Add	emove	5	Step 3		Edit	
$\sim$	Step 2			ок	Cancel	

(1) Enter a name for your nanodac, (2) click on Add... to assign the IP address of the nanodac, and (3) click OK After completing, you can exit out of the configuration, now load iTools, and then click on "Scan"

	1100is
	File Device View Options Window Help
퉬 Eurotherm	
🔂 Bridge	New File Open File Load Save Print Scan Add Remove Access Views Info
💋 GUIcon 2.0 Reference	🔳 Parameter Explorer 📓 Watch/Recipe 🛛 🙀 OPC Scope
💋 GUIcon 2.0 User Manual	
GUIcon 2.0	
💙 iTools Engineering Studio	
🔁 iTools Programmer Edi	
📐 iTools Wizards	
💏 OPC Scope	
Review QuickChart	
🔁 Review	
🌗 iTools Advanced	Browse 🔍 Find
🌗 Manuals	
🌗 More Tools	
🐌 TUS	

Be sure to choose the first option; "Scan all device addresses (255 first, then 1 to 255)"

Enable Background Scan	<b>—</b>
Scan all device addresses (255 first, 1)	hen 1 to 254)
Scan from device address	1 <u>t</u> o 254
	(permitted range: 1 to 254)
© <u>C</u> onnect via Series 2000 Interface Ac	lapter (not CPI)
Connect via CPI clip or IR cable	
Scan for <u>E</u> urotherm devices only	
ОК	

After about 5-10 seconds, you will see the device pop up in the left hand side. The icon next to the name indicates its synchronizing.

💙 iTools	😽 iTools
File Device View Options Window Help	File Device View Options Window Help
New File Open File Load Save Print Scan	Rew File Open File Load Save Print Scan
Graphical Wiring I Parameter Explorer III Terminal Wiring	😨 Graphical Wiring 🖽 Parameter Explorer 🔛 Terminal Wiring 🔛
() example.149-121-4-80-502-II       Image: Second system       Image: Second system <td><pre>     example.149-121-4-80-502-II     find     Channel </pre></td>	<pre>     example.149-121-4-80-502-II     find     Channel </pre>

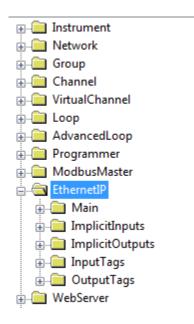
Once you see the "book" icon, this means it's fully synchronized and you cannot fully edit the configuration. Be advised that the first time you connect the nanodac<sup>™</sup> via iTools, it could take upwards of a minute to synchronize.

#### **Navigation**

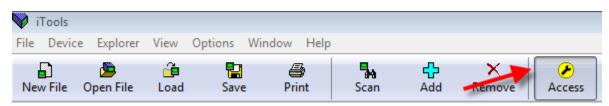
Click on "Parameter Explorer"

💙 iTools							
File Devic	e View	Options	Window	Help			
New File	Dpen File	🔒 Load	E Say	Print	Scan	다. Add	Re
🔁 Graphic	al Wiring	📕 Param	eter Explore	r 🕂 Termina	l Wiring 🛛 🔛	Watch/Rec	ipe

Navigate to EtherNetIP on the left hand side



On the right hand side of the screen, you should see all the parameters available to you: Blue color font indicates it is a read only parameter where black indicates it's a read/write parameter. If you go into Access mode (default password is 100), more parameters will become available to you.



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#### Parameter Explorer:

Untitled 1> - Parameter Explorer (EthernetIP)	🔳 < Untitled 1>	- Parameter Explorer (Ethern	etIP)			- • ×
	$\Leftarrow \star \Rightarrow \star$					-jai
Main ImplicitInputs ImplicitOutputs InputTags OutputTags	Main ImplicitIr	nputs ImplicitOutputs InputTa	igs OutputTags			
Name Description Address Value Wired From	Name	Description	Address	Value	Wired From	A
NetworkStatusC EtherNet/IP communications 32356 Offline (0)	🖉 Input1	Input 1 data destination	32358	4294967295	(not wired)	
ImplicitIO Implicit I/O data channel 26081	InputValue1	Raw value of Input 1	32360	0		
Explicit1 Explicit TCP connection 1 26097	/ Input2	See input 1 for details	32362	4294967295	(not wired)	-
Explicit2 Explicit TCP connection 2 26113	InputValue2	See input 1 value for details	32364	0		=
Mode EtherNet/IP operation mode 32767 Server (0) •	🖉 Input3	See input 1 for details	32366	4294967295	(not wired)	
ResetComms Resets the client or server cq 32355 No (0) *	InputValue3	See input 1 value for details	32368	0		
	🖉 Input4	See input 1 for details	32370	4294967295	(not wired)	
	InputValue4	See input 1 value for details	32372	0		
	🖉 Input5	See input 1 for details	32374	4294967295	(not wired)	
	InputValue5	See input 1 value for details	32376	0		
	🖉 Input6	See input 1 for details	32378	4294967295	(not wired)	
	InputValue6	See input 1 value for details	32380	0		
	🖉 Input7	See input 1 for details	32382	4294967295	(not wired)	
	InputValue7	See input 1 value for details	32384	0		
	🖉 Input8	See input 1 for details	32386	4294967295	(not wired)	
	InputValue8	See input 1 value for details	32388	0		
	🖉 Input9	See input 1 for details	32390	4294967295	(not wired)	
	InputValue9	See input 1 value for details	32392	0		
	🖉 Input10	See input 1 for details	32394	4294967295	(not wired)	
	InputValue10		32396	0		
	🖉 Input11	See input 1 for details	32398	4294967295	(not wired)	
	InputValue11	See input 1 value for details	32400	0		
	🖉 Input12	See input 1 for details	32402	4294967295	(not wired)	
	InputValue12	See input 1 value for details	32404	0		Ψ.
	<	m				- F
EthernetIP.Main - 6 parameters (15 hidden)	EthernetIP.Im	plicitInputs - 100 paramet	ers			

lain ImplicitInpu	ts ImplicitOutputs InputTag	s OutputTags			
Name	Description	Address	Value	Wired From	
Output1	Output 1 data source	32558	4294967295	(not wired)	
OutputValue1	Raw value of Output 1	32560	0		
Output2	See output 1 for details	32562	4294967295	(not wired)	
OutputValue2	See output 1 value for details	32564	0		
Output3	See output 1 for details	32566	4294967295	(not wired)	
OutputValue3	See output 1 value for details	32568	0		
Output4	See output 1 for details	32570	4294967295	(not wired)	
OutputValue4	See output 1 value for details	32572	0		
Output5	See output 1 for details	32574	4294967295	(not wired)	
OutputValue5	See output 1 value for details	32576	0		
Output6	See output 1 for details	32578	4294967295	(not wired)	
OutputValue6	See output 1 value for details	32580	0		
Output7	See output 1 for details	32582	4294967295	(not wired)	
OutputValue7	See output 1 value for details	32584	0		
Output8	See output 1 for details	32586	4294967295	(not wired)	
OutputValue8	See output 1 value for details	32588	0		
Output9	See output 1 for details	32590	4294967295	(not wired)	
OutputValue9	See output 1 value for details	32592	0		
Output10	See output 1 for details	32594	4294967295	(not wired)	
OutputValue10	See output 1 value for details	32596	0		
Output11	See output 1 for details	32598	4294967295	(not wired)	
OutputValue11	See output 1 value for details	32600	0		
Output12	See output 1 for details	32602	4294967295	(not wired)	
OutputValue12	See output 1 value for details	32604	0		
î di serie de la companya de la comp					b.

*ImplicitInputs* and *ImplicitOutputs* are available for use when the nanodac<sup>™</sup> is configured as a client or server, whereas *InputTags* and *OutputTags* are available only as a Client(tags). The nanodac<sup>™</sup> does not support IOTags as a server!

#### Main Tab – Setting up as a Server

ImplicitInputs       ImplicitOutputs       Input Tags       Output Tags         Main       ImplicitInputs       ImplicitInputs       ImplicitInputs       ImplicitInputs         Name       Description       Address       Value       Wired From         NetworkStatusC       EtherNet/IP communications       32356       Online (2) ▼         ImplicitIO       Implicit I/O data channel       26081       149.121.4.95         Explicit1       Explicit TCP connection 1       26097       No Connection         Explicit2       Explicit TCP connection 2       26113       No Connection         Mode       EtherNet/IP operation mode       32767       Server (0) ▼         ResetComms       Resets the client or server cq       32355       No (0) ▼	🖽 example.149-121-4	4-80-502-ID255-nanodac ·	- Parameter Ex	plorer (Etherne	etIP)	- • ×
Name     Description     Address     Value     Wired From       NetworkStausC     EtherNet/IP communications     32356     Online (2) •       ImplicitI0     Implicit I/O data channel     26081     149.121.4.95       Explicit1     Explicit TCP connection 1     26097     No Connection       Explicit2     Explicit TCP connection 2     26113     No Connection       ✓     Mode     EtherNet/IP operation mode     322767	$\leftarrow \bullet \bullet \bullet$					-ja
NetworkStatusC       EtherNet/IP communications       32356       Online (2) ▼         ImplicitIO       Implicit I/O data channel       26081       149.121.4.95         Explicit1       Explicit TCP connection 1       26097       No Connection         Explicit2       Explicit TCP connection 2       26113       No Connection         Mode       EtherNet/IP operation mode       32767       Server (0) ▼	Main ImplicitInputs	ImplicitOutputs InputTags	0utputTags			
ImplicitIO     Implicit I/O data channel     26081     149.121.4.95       Explicit1     Explicit TCP connection 1     26097     No Connection       Explicit2     Explicit TCP connection 2     26113     No Connection       Mode     EtherNet/IP operation mode     32767     Server (0) ▼	Name De	escription	Address	Value	Wired From	
Explicit1         Explicit TCP connection 1         26097         No Connection           Explicit2         Explicit TCP connection 2         26113         No Connection           Mode         EtherNet/IP operation mode         32767         Server (0)	NetworkStatusC Eth	herNet/IP communications	32356	Online (2) 💌		
Explicit2         Explicit TCP connection 2         26113         No Connection           Mode         EtherNet/IP operation mode         32767         Server (0)	ImplicitIO Imp	plicit I/O data channel	26081	149.121.4.95		
Mode EtherNet/IP operation mode 32767 Server (0) -				No Connection		
		plicit TCP connection 2		No Connection		
ResetComms Resets the client or server of 32355 No (0) •						
	🖉 ResetComms 🛛 Re	esets the client or server co	32355	No (0) 💌		
EthernetIP.Main - 6 parameters (15 hidden)	EthernetIP Main -	6 parameters (15 bidde	nì			

As a server, all you need to do is set the "**Mode**" to **Server\***. It's up to the settings in your PLC to talk to the nanodac<sup>™</sup>. "**ResetComms**" simply resets the EtherNet/IP protocol. Please note that any change made will not be saved until the user logs our or the "ResetComms". Its recommend that you only trigger a "*reset comms*" after **ALL** changes are made.

As a server, you need to provide your PLC with Input & Output instances as well as, configuration values. They are as follows:

	Instances	Size	
Input	100	50	16 bit
Output	112	50	16 bit
Configuration	128	0	16 bit

RPI (response) 1000mS (default)\*\*

Once a Client device has connected successfully, The NetworkStatusCode should indicate Online(2) and you will see the IP address of the Client that is connected.

\*Please note that you still need to configure the implicit input and output tables as shown later in the guide.

\*\*It is possible for you to achieve speeds as fast as 125mS however, this speed cannot be guaranteed and can be subject to slip depending upon the load of the nanodac™. If you need a faster response rate, you can go as fast as 125mS. Suggest that you contact technical support for additional assistance.

#### Main Tab – Setting up as a Client

Clicking on the drop down of the "Mode" tab gives you the following:

Server (0)	
IOClient (1)	
TagClient (2)	

**Client (IO)** - The instrument is acting as an EtherNet/IP client device on the network, exchanging implicit IO data with a specified server device.

**Client (Tags)** - The instrument is acting as an EtherNet/IP client device on the network, exchanging cyclic tag data with a specified server device.

	ImplicitInput	ts ImplicitOutputs InputTag	gs Output]	ags	
N	lame	Description	Address	Value	Wired From
10	DStatusCode	EtherNet/IP1/0 server statu:	32353	Offline (0) 💌	
In	mplicitI0	Implicit I/O data channel	26081		
E	xplicit1	Explicit TCP connection 1	26097		
E	xplicit2	Explicit TCP connection 2	26113		
🖉 М	1ode	EtherNet/IP operation mode	32767	IOClient (1) 💌	
/ S	erverAddress	IP address of a server device	28969	0.0.0.0	
🖊 In	nputInstance	Implicit input assembly instan	32758	100	
🖊 In	nputSize	Implicit input assembly data s	32759	100	
/ 0	utputInstance	Implicit output assembly insta	32760	112	
/ 0	)utputSize	Implicit output assembly data	32761	100	
/ С	ConfigInstance	Configuration assembly instar	32762	128	
/ C	ConfigSize	Configuration assembly data	32763	0	
/ С	ConnectionType	Implicit I/O connection type	32766	Point2Point (0) 💌	
/ P	riority	Level of message priority	32764	Scheduled (2) 💌	
/ R	}pi	Requested Packet Interval (r	32765	1000	
/ D	ResetComms	Besets the client or server or	32355	No (0) 🔻	

Apply the correct Input, output, configuration instances and sizes and set the Connection type and RPI. This information should be provided by the manufacturer of the EtherNet/IP compatible device you are trying to connect to.

**Point to Point (default):** The implicit I/O data will be directly communicated between the client and server devices only. **Multicast:** All implicit output data from the nanodac<sup>™</sup> will be sent to a multicast IP address where a number of clients can register their interest.

The RPI can go as fast as 8Hz or 125mS. *Please see above notice regarding this speed.* 

#### Implicit Inputs/Outputs

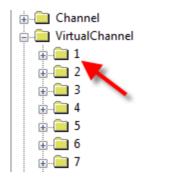
Implicit inputs are inputs into the nanodac<sup>™</sup> when in server or client modes. Implicit outputs are outputs from the nanodac<sup>™</sup> when in server or client modes.

When bringing inputs into the nanodac<sup>™</sup>, you can wire directly from the parameter of choice to the EthernetIP parameter into any other block/tag you desire (i.e. specific tag to trigger an event like auto/manual mode) or you can choose to wire the input directly into a Virtual Channel.

\*NOTE - in order to record the value coming into the nanodac<sup>™</sup>, you must wire to a virtual channel.

Think of a virtual channel as a memory allocation; you have **30** of these in the nanodac<sup>™</sup>. It can do simple math, totalize, or function as a counter. One of the math functions is **COPY**. As a copy function, its job is to simply **copy** whatever value is wired into its input1 parameter.

To configure a virtual channel expand on the folder called **VirtualChannel** and click on the folder called **1**.



You will get this:

Main	Trend Al	arm1 Alarm2			
N/	ame	Description	Address	Value	Wired From
🖉 D.	escriptor	Text string to describe the vir	19200	VirtualChan 1	
ر 🖉 🖉	уре	Specifies the type of virtual c	7168	Math (1) 💌	
🖉 0)	peration	Specifies the operation of the	7169	Off (0) 🔻	

From this point, the virtual channel is set up as a Math function however, it's currently turned off. Let's rename the channel and set its operation to "**Copy**"

Ma	in Trend A	larm1 Alarm2			
	Name	Description	Address	Value	Wired From
	Descriptor	Text string to describe the vir	19200	EtherNet/IP Input 1	
	Туре	Specifies the type of virtual c	7168	Math (1) 💌	
	Operation	Specifies the operation of the	7169	Copy (11) 💌	
	PV	The process variable (output	288	0.00	
	Status	The PV (output) status	289	Good (0) 💌	
	Resolution	Specifies the resolution/numl	7170	0	
	Units	Units descriptor	19221		
	Input1	Input 1	7175	0.00	

Once complete, you can repeat the process for as many (up to 30) virtual channels as needed.

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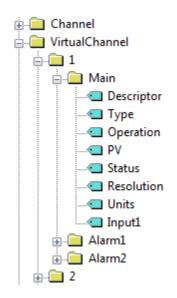
Click back on the EthernetIP folder, and then click on the ImplicitInputs tab

• • • • [ [					-
ain ImplicitIng		Lo i ut	7		 
ain ImplicitIng	outs ImplicitOutputs InputTag	gs   Output Lags	3		
Name	Description	Address		Wired From	
lnput1	Input 1 data destination	32358	4294967295	(not wired)	1
InputValue1	Raw value of Input 1	32360	0		
🖊 Input2	See input 1 for details	32362	4294967295	(not wired)	-
InputValue2	See input 1 value for details	32364	0		
🖊 Input3	See input 1 for details	32366	4294967295	(not wired)	
InputValue3	See input 1 value for details	32368	0		
lnput4	See input 1 for details	32370	4294967295	(not wired)	
InputValue4	See input 1 value for details	32372	0		
linput5	See input 1 for details	32374	4294967295	(not wired)	
InputValue5	See input 1 value for details	32376	0		
linput6	See input 1 for details	32378	4294967295	(not wired)	
InputValue6	See input 1 value for details	32380	0		
linput7	See input 1 for details	32382	4294967295	(not wired)	
InputValue7	See input 1 value for details	32384	0	· · · ·	
linput8	See input 1 for details	32386	4294967295	(not wired)	
InputValue8	See input 1 value for details	32388	0		
linput9	See input 1 for details	32390	4294967295	(not wired)	
					Þ.

Notice that under the "**Wired From**" section, it shows (not wired). The beauty of iTools is that you can simply drag any tag you want over to this field to "wire" from one parameter to another\*. Let's go ahead and wire the first two inputs into virtual channel 1 and 2.

## \*Note that iTools always assumes source to destination, so make sure you wire the correct way around. Select the source and drag to the destination

Expand on Virtual Channel  $\rightarrow$  1  $\rightarrow$  Main and you should see something like below:



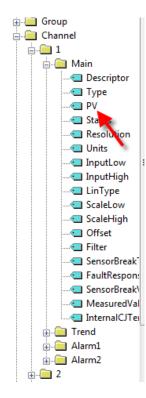
We want to drag the tag called Input1 over to the Input1 field of the Implicit Inputs. Likewise, we will do the same for Virtual Channel 2

$  \cdot   \rightarrow   \cdot   \equiv$					-
ain ImplicitInp	uts ImplicitOutputs InputTag	gs OutputTags	3		
Name	Description	Address	Value	Wired From	
lnput1	Input 1 data destination	32358	3858759947	VirtualChannel.1.Main.Input1	
InputValue1	Raw value of Input 1	32360	0		=
Input2	See input 1 for details	32362	3858825483	VirtualChannel.2.Main.Input1	
InputValue2	See input 1 value for details	32364	0		
lnput3	See input 1 for details	32366	4294967295	(not wired)	
InputValue3	See input 1 value for details	32368	0		
Input4	See input 1 for details	32370	4294967295	(not wired)	
InputValue4	See input 1 value for details	32372	0		
Input5	See input 1 for details	32374	4294967295	(not wired)	
InputValue5	See input 1 value for details	32376	0		
Input6	See input 1 for details	32378	4294967295	(not wired)	
InputValue6	See input 1 value for details	32380	0		
lnput7	See input 1 for details	32382	4294967295	(not wired)	
InputValue7	See input 1 value for details	32384	0		
lnput8	See input 1 for details	32386	4294967295	(not wired)	
InputValue8	See input 1 value for details	32388	0		
nput9	See input 1 for details	32390	4294967295	(not wired)	
					- F

Now once wired you should see the destination show up under the "Wired From" section. If this was a live connection and you were transmitting data from the PLC, you would see the Raw\* value match what was coming from the PLC.

## \* RAW is referring to the value that is coming in to the nanodac prior to any formatting that may be applied once it has followed the connected wire.

To transmit data to the PLC, we do a similar process. Let's say we want to retransmit channels 1 and 2 to the PLC. Simply expand on Channel  $\rightarrow$  1  $\rightarrow$  Main. We want to retransmit the "PV" as such:



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Doing so will show the following:

• • • •					
1ain ImplicitInp	uts ImplicitOutputs InputTag	ıs OutputTags	-		
Name	Description	Address	Value	Wired From	
🖊 Output1	Output 1 data source	32558	3942646018	Channel.1.Main.PV	
OutputValue1	Raw value of Output 1	32560	0		
🖉 Output2	See output 1 for details	32562	3942711554	Channel.2.Main.PV	
OutputValue2	See output 1 value for details	32564	0		
🖉 Output3	See output 1 for details	32566	4294967295	(not wired)	
OutputValue3	See output 1 value for details	32568	0		
🖉 Output4	See output 1 for details	32570	4294967295	(not wired)	
OutputValue4	See output 1 value for details	32572	0		
🖉 Output5	See output 1 for details	32574	4294967295	(not wired)	
OutputValue5	See output 1 value for details	32576	0		
🖊 Output6	See output 1 for details	32578	4294967295	(not wired)	
OutputValue6	See output 1 value for details	32580	0		
🖉 Output7	See output 1 for details	32582	4294967295	(not wired)	
OutputValue7	See output 1 value for details	32584	0		
🖊 Output8	See output 1 for details	32586	4294967295	(not wired)	
OutputValue8	See output 1 value for details	32588	0		
🖊 Output9	See output 1 for details	32590	4294967295	(not wired)	
(					- F

#### **Other Items**

Showing the EtherNet/IP Operator View:

By default, the EtherNet/IP view is turned off however you can quickly turn it back on. Doing so will allow you to view the data coming in and going out to/from the nanodac<sup>™</sup> however note that the values displayed on the nanodac<sup>™</sup> are only those that have been wired as explained above. Go to the Instrument Folder then click on "Display"

<b>4</b>	• → •   🗎										
Clo	ck Locale Se	ecurity	Display	Info	Note	es E	nables	Visibility	Calibration	InputAdjust	PromoteList Ou 1
	Name	Descrip	otion			Addre	ss		Value	Wired From	
Ø	Brightness	Display	brightnes	s		42	40	Brightnes	s100 (100) 🔻		
Ì	ScreenSaverAft	Screen	i saver aft	er (in mir	nute	42	41		10 🕶		
Ø	ScreenSaverBri	Screen	i saver bri	ghtness		42	42	Brightr	ness50 (50) 💌		
Þ	HomePage	Home j	page			42	43	Vertic	alTrend (0) 💌		
Ø	HPageTimeout	Home	page time	out (in mi	inuti	42	44		Off (0) 🔻		
			l trend (op				45		On (1) 🝷		
	HorizontalTrend	Horizor	ntal trend	(operator	vie		46		On (1) 🔻		
Ì	FutureTrend	Future	trend (ope	erator vie	w)	43	47		Off (0) 🔻		
Ì	VerticalBar	Vertica	l bar (opei	rator viev	v)	42	47		On (1) 🔻		
Ø	HorizontalBar	Horizor	ntal bar (oj	perator v	iew	42	48		On (1) 🔻		
Ì	Numeric	Numeri	ic (operato	or view)		42	49		On (1) 🔻		
Ø	AlarmPanel	Alarm F	<sup>p</sup> anel (ope	erator vie	w)	43	31		Off (0) 🔻		
Ì	LoopControl	Loop c	ontrol (op	erator vie	ew)	42	50		On (1) 🔻		
Ì	DualLoopContro	Dual lo	op contro	l (operato	or vi	42	51		Off (0) 🔻		
Ì	Cascade	Cascad	de control	(operato	r vie	43	38		Off (0) 🔻		
Ì	Programmer	Program	mmer inter	face (op	erat	43	39		Off (0) 🔻		
Ø	SteriliserPage	Sterilise	er (operao	tr view)		43	32		Off (0) 🔻		
Þ	PromoteListView	Promot	e list (ope	rator viev	N)	43	30		Off (0) 🔻		
Ø	ModbusMaster	Modbu	s Master (	operator	vie	43	34		Off (0) 🔻		
Ø	EIPServerPage	EtherN	et/IP (ope	erator vie	w)	43	35		On (1) 🔻		
Ø	TrendBackgroui	Trend I	backgroui	nd		42	52		Black (0) 💌		
Ø	HistoryBackgrou	History	backgrou	ind		42	64	D	arkGrey (1) 💌		
Ø	HTrendScaling	Horizor	ntal trend	scaling		42	53		Hide (0) 💌		
Ø	FaceplateCyclin	Facepl	ate cyclin	g		42	54		On (1) 🔻		
Ø	LoopSetpointCo	Loop s	etpoint co	lour		42	55	0	Drange (25) …		
Þ	NumberFormat	Numbe	r format			43	50	R	ounded (0) 💌		
•											

Mentioned previously, in order to record data, you must wire the Implicit inputs to a virtual channel which is set up as COPY. However, if you are not trending the data, you must also tell the nanodac<sup>™</sup> if you want to record it.

\*NOTE – you can trend up to 6 points. If you trend a point, it will automatically be recorded. You can record up to 34 points!

Go to your Group Folder and click on Trend:

ŧ	<untitled 1=""> -</untitled>	Parameter Explorer (Group)				
-	$\bullet \rightarrow \bullet   \equiv$					
Fre	nd Recording					
	Name	Description	Address	Value	Wired From	
Ì	Descriptor	Group descriptor	23296	Furance 1		
Ì	Interval	Interval	4098	NTERVAL_10SEC (6)		
Ì	MajorDivisions	Major divisions	4100	5		
Ì	Point1	Trend point 1	4102	Channel1 (1) 💌		
Ì	Point2	Trend point 2	4103	Channel2 (2) 💌		
ļ	Point3	Trend point 3	4104	Channel3 (3) 💌		
Ì	Point4	Trend point 4	4105	Channel4 (4) 💌		
Ì	Point5	Trend point 5	4106	NoTrend (0) 💌		
1	Point6	Trend point 6	4107	NoTrend (0) 💌		

From here you can edit the name of the group, the interval at which the nanodac<sup>M</sup> updates its trending (125ms to 1 hour) and the 6 points you want to trend. Channels 1 - 4 are selected by default.

\*NOTE – Trending and recording are independent from one another. You can trend at a faster or slower rate than what you record.

We want to trend channels 1 and 2 as well as, Virtual Channels 1 and 2, which is the data from the PLC.

▦	<untitled 1=""> -  </untitled>	Parameter Explorer (Group)				
4	$\bullet \to \bullet$					-)÷
Tre	end Recording					
	Name	Description	Address	Value	Wired From	
	Descriptor	Group descriptor	23296	Furance 1		
	Interval	Interval	4098	INTERVAL_10SEC (6) -		
	MajorDivisions	Major divisions	4100	5		
	Point1	Trend point 1	4102	Channel1 (1) 💌		
	Point2	Trend point 2	4103	Channel2 (2) 💌		
	Point3	Trend point 3	4104	VirtualChan1 (5) 💌		
	Point4	Trend point 4	4105	VirtualChan2 (6) 💌		
	Point5	Trend point 5	4106	NoTrend (0) 💌		
	Point6	Trend point 6	4107	NoTrend (0) 💌		

Now, the nanodac<sup>™</sup> will trend and record channels 1, & 2 as well as Virtual channels 1 & 2

If you click on the Recording tab you will see the following:

	Parameter Explorer (Group)				
⇐ ▾ ᆃ ▾│ 🔳					
Trend Recording					
Name	Description	Address	Value	Wired From	A
FlashSize	Size of the internal flash	4151	0.00		
FlashDuration	Time until flash history files be	4153	0.00	l	
🖉 Enable	Enable recording	4128	Yes (1) 💌		
🖉 Interval	Interval	4130	INTERVAL_10SEC (6) 💌		
🖉 Compression 👘	The UHH file compression ra	4160	Normal (0) 💌		
Channel1En	Channel 1 enable	4131	Yes (1) 💌		
Channel2En	Channel 2 enable	4132	Yes (1) 💌		
🖉 Channel3En	Channel 3 enable	4133	Yes (1) 💌		
🖉 Channel4En	Channel 4 enable	4134	Yes (1) 💌		=
VirtualChan1En	Virtual Channel 1 enable	4135	Yes (1) 💌		
VirtualChan2En	Virtual Channel 2 enable	4136	Yes (1) 💌	_	
🖉 VirtualChan3En	Virtual Channel 3 enable	4137	No (0) 💌	1	
🖉 VirtualChan4En	Virtual Channel 4 enable	4138	No (0) 💌		
🖉 VirtualChan5En	Virtual Channel 5 enable	4139	No (0) 💌		
🖉 VirtualChan6En	Virtual Channel 6 enable	4140	No (0) 💌		
🖉 VirtualChan7En	Virtual Channel 7 enable	4141	No (0) 💌		
🖉 VirtualChan8En	Virtual Channel 8 enable	4142	No (0) 💌		
🖉 VirtualChan9En	Virtual Channel 9 enable	4143	No (0) 💌		1
🖉 VirtualChan10Ei	Virtual Channel 10 enable	4144	No (0) 💌		

Notice that the channels in blue are also the ones being trended. Likewise, because they are blue they cannot be modified. If you would like to add a point simply select the appropriate channel and change from No to Yes.