## AutoCONFIG™

Software for AutoEXEC & AutoPILOT PRO Systems Startup Guide P/N 1-0485-068

Revision D





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# **Revision History**

<b>Revision Level</b>	Date	Comments
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## Chapter 1 General Information

### About this Guide

This document is a startup guide for the Thermo Scientific AutoCONFIG software when used with the Thermo Scientific AutoEXEC or AutoPILOT PRO flow computers. Reading this guide will help you:

- Install the software
- Establish communications with the flow computer
- Use the Measurement Config wizard to configure meter runs
- Understand how to use the AutoCONFIG software help system, which provides details on how to use all the functions the software offers, access to other manuals, information on instrument hardware and connections, and more.

The startup guide does not provide instrument installation or specific instructions on all the software's capabilities. For that information, refer to the instrument's manual(s) and the AutoCONFIG software help system.

With your AutoEXEC or AutoPILOT PRO flow computer, you should receive the following items:

- The product user guide (p/n 1-0443-048 for AutoEXEC flow computer, 1-0500-005 for AutoPILOT PRO flow computer)
- The AutoCONFIG software startup guide (p/n 1-0485-068)
- Troubleshooting AutoEXEC and AutoPILOT PRO Systems (p/n 1-0443-072)
- If requested, the Thermo Scientific AutoCONFIG configuration software

If any of these items are missing, contact Thermo Fisher Scientific at 713-272-0404.

### Receiving the Instrument

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# Chapter 2 Installation & Connections

### Hardware

Refer to the instrument manual for flow computer installation and wiring instructions. If you have other instruments as part of your system, a Thermo Scientific AutoMITTER PRO transmitter for example, reference the manufacturer's documentation.

### Communication Connections for AutoEXEC Flow Computer

A serial connection is used to establish initial communications with the instrument.

To connect your PC to a flow computer with rack or panel mount configuration (standard enclosure), use a straight through DE9 extension cable (p/n 5-0580-002) to provide connection to the local RS232 DCE port on the CPU board.

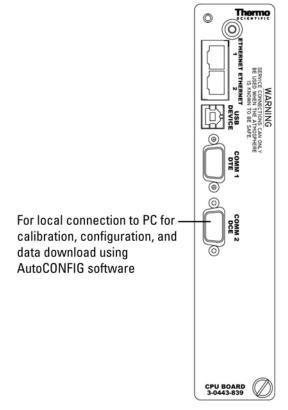
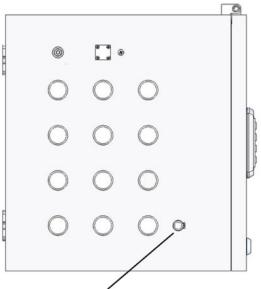


Figure 2–1. AutoEXEC CPU face plate (rack or panel mount): PC connection

To connect your PC to a flow computer with a pole mount configuration (NEMA 4X enclosure), use a 6-pin circular connector cable (p/n 3-0446-090) to connect to the bottom of the enclosure.



Warning Ensure the area is non-hazardous before connecting to the local RS232 port. ▲



For local connection to PC for calibration, configuration, & data download using AutoCONFIG

**Figure 2–2.** Bottom view of AutoEXEC NEMA 4X enclosure (pole mount): PC connection

If the flow computer is connected directly to a network, you can establish communications with it after setting up its IP address, which is discussed in "Setting up an IP Address" in Chapter 3.

## Communication Connections for AutoPILOT PRO Flow Computer

The AutoPILOT PRO main board provides one RS232 compatible local communication port (TB8) for calibration and configuration of the unit using a laptop and the AutoCONFIG software. Connection is made through the CHIT connector mounted in the bottom of the flow computer enclosure. Thermo Fisher manufactures optional cable assemblies for this connection. They are listed below.

Table 2–1. Cable assemblies	for CHIT connector
-----------------------------	--------------------

Assembly P/N	Description
3-0446-090	DB9S connecter with 15-ft cable for use with the six-position connecter
3-0446-090-B	DB9S connecter with 25-ft cable for use with the six-position connecter

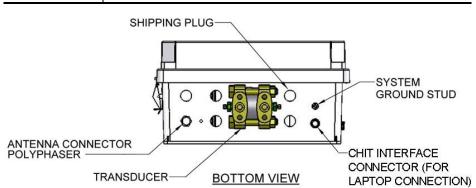


Figure 2–3. Bottom view of AutoPILOT PRO flow computer to show location of CHIT connector

**Note** If using the optional communication expansion board, refer to the AutoPILOT PRO user guide for wiring diagrams and jumpers settings. ▲

### Software Installation

When you have made the required connections, you are ready to install the AutoCONFIG software. Create a folder on your hard drive, and copy the contents of the product CD into it. Double-click the setup.exe file and follow the instructions as they appear on the screen.

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# Chapter 3 Establishing Communications

After software installation is complete, double-click the AutoCONFIG icon on your desktop to open the program. The Communication Parameters screen is displayed that allows you to create connections and establish communications. Once communication is established, the main screen will be displayed.

**Note** If you establish communications and notice that the software is running slowly or you receive COMM errors, refer to "Special PC Setup for AutoCONFIG Software" at the end of this chapter. ▲

If communications do not establish, check the connections between the flow computer and the PC.

### Setting Communication Parameters

The Communication Parameters screen allows you to set up connection information for multiple locations or units. There are three types of connections: off line, remote via TCP/IP, and local (RS232 serial).

Initial communication is established via a local connection. To do this, ensure the proper connections are made between the flow computer and the PC. Open the software, and go to "Creating a Local Connection" for instructions on how to establish initial communication with the flow computer via the AutoCONFIG software.

Once you have done this, return to this section for information on how to create an off line connection or a remote connection via TCP/IP. You can open the Communication Parameters screen at any time through the main menu (System > Connection) or the Connect to Unit icon on the toolbar, which is shown below.



Connect to Unit icon

### Creating an Off Line Connection

An off line connection allows you to create or modify a configuration.

onnection l	nfo	Connection	List			
Name	Test Database	Name	Unit Type	Adress	Comm	Phone
nume	Test Database	202 Test	AutoEX	1	COM 1	
	(1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	AutoWAVE	AutoEX	1	COM 1	
Jnit Type	AutoEXEC - AutoPilot Pro 👻	Host 212 Conn		1	COM 1	40
		Host Port Test	AutoEX	1	COM 1	
Address	255	IP Connection	AutoEX	1	TCP/IP	
	· · · · · · · · · · · · · · · · · · ·	Local Mode	AutoEX	255	COM 1	
Comm. Port	Off Line	Test Database	AutoEX	255	Off Line	
	a Default Configuration an Existing Configuration					
AutoExe	c C AutoPilot Pro					
🔽 Adjust 1	Table 15 Text IV Enable Calculations					
		•				
l fiolde with	* must be filled in	Connect	Save		lete	Close

Figure 3–1. Establishing an offline connection

- 1. Name: Enter a name that describes this connection.
- 2. Comm Port: Select Off Line.
- 3. Create a New Off Line Config: Choose whether you want to create a default configuration or modify an existing configuration.
- 4. AutoEXEC/AutoPILOT PRO: Select the appropriate flow computer.
- 5. Adjust Table 15 Text: Checking this item allows you to edit Table #15, which is the text table.
- 6. Enable Calculations: Select whether you want to enable calculations for this connection.
- 7. Click **Save** and the connection will be added to the Connection List. Delete connections in the Connection List by highlighting the connection and clicking **Delete**.
- 8. To make the connection, click **Connect**. If you chose to create a new configuration in step 3, skip to step 10. If you chose to modify an existing configuration, continue to the next step.

9. Click the **Browse** button to locate the configuration file (.cfg). Open it, and it will appear in the dialog box, as shown below. Click on the file, and click **Ok**.

elected Path	C:\Progr	am Files\Thermo\AutoCONFIG\	Browse	Cancel Ok
Selected File	Test Con	fig.cfg		
	reated	Unit Type	Information	Value
Test Config.cfg 0	3/23/10 01:11:5	5 AutoExec		

Figure 3–2. Selecting the configuration to modify

10. The New Database screen will open, which allows you to modify an existing configuration.



**Caution** If you are modifying an existing configuration and adding entries to a configuration item, reference "Adding Entries to an Existing Configuration" later in this chapter. If not done properly, modifying the number of entries will create an invalid configuration. ▲

Comm			
Connecti	Table Name	Number of Entries	-
Jonnecti	1-Floating Point Value	32	
*Name	2-Discrete Value	32	Adress
	3-Byte Value	32	1
	4-16-Bit Word Value	32	1
*Unit Type	15-Text	1310	
*Address	16-Physical Analog Input	32	11
	17-Physical Smart XDucer Input	32	255
*Comm. P	18-Physical Honeywell DE Input	32	255
	19-Physical Discrete Input	32	
Creat	20-Physical Accumulator	32	
	21-Physical Analog Output	32	
• Cre:	22-Physical Discrete Output	32	
<b>C</b> 11	33-PID	4	
O Moc	34-Proportional Output	4	
	35-High/Low Selection	4	
Auto	36-Alarm Status	8	
	37-Point Type Conversion	1	
🔽 Adji	38-Differential Pressure Flow	8	
	39-AGA 7 Flow	8	
	40-AGA 10 Speed of Sound	1	
ll fields 1	41-Meter Station	6	I Close
	42-Meter Run Switching	2	Close



### Creating a Remote Connection via TCP/IP

You can establish communications with a flow computer that is connected directly to a network. Before you do this, however, you need to set up the unit's IP address (later in this chapter). Once done, create a connection to it as described in this section.

🍓 Commun	cation Parameters					×
Connection I	ıfo	Connection	List			
*Name	IP Connection	Name	Unit Type	Adress	Comm	Phone#
Hume	IF Connection	202 Test	AutoEX	1	COM 1	
Constantine -		AutoWAVE	Auto EX	1	COM 1	
*Unit Type	AutoEXEC - AutoPilot Pro 👻	Host 212 Conn		1	COM 1	40
		Host Port Test	Auto EX	1	COM 1	<u></u>
*Address	1	IP Connection	AutoEX	1	TCP/IP	
1		Local Mode	AutoEX	255	COM 1	
*Comm. Port	TCP/IP (WINSOCK)	Test Database	Auto EX	255	Off Line	
"IP Address "Port	10.210.64.97 5002 3 "Num. Nulls 0 "RX Delay 6					
*Num Retries	3 *Num. Nulls 0 *RX Delay 6	•				•
All fields with	* must be filled in	Connect	Save	D	elete	Close

Figure 3–4. Establishing a remote connection

- 1. Name: Enter a name that will help you identify this connection.
- 2. Unit Type: Select AutoEXEC-AutoPILOT PRO.
- 3. Address: Enter the physical address of the unit you will connect to.
- 4. Comm. Port: Select TCP/IP (WINSOCK).
- 5. IP Address: Enter the IP address of the RTU.
- 6. **Port:** Set the port number the unit will use when communicating with the server.
- 7. **Number of Retries:** Set the number of times the software should attempt to connect to the unit before timing out and declaring failure.
- 8. Number of Nulls: Set the number of null bytes to pad the data packet with if there is not enough data to fill the last packet.

- 9. **RX Delay:** RX Delay is the number of seconds that the instrument should wait to receive a reply from the flow computer before it gives up and attempts another message.
- 10. After configuring a new connection, click Save and the connection will be added to the Connection List. When you want to make this connection, open this screen and double-click the connection in the list. Click Connect. Delete connections in the Connection List by highlighting the connection and clicking Delete. If you have problems connecting, check the hardware connections.

### Creating a Local Connection

Below are general instructions on how to establish a local connection.

**Note** If using RS485 2-wire mode to establish communication with the AutoPILOT PRO flow computer, refer to Table 3-1 for configuration.

onnection l	nfo				Connection	List			
Name	Local Mode		1		Name	Unit Type	Adress	Comm	Phone#
Nume	Local Mode				202 Test	AutoEX	1	COM 1	
					AutoWAVE	AutoEX	1	COM 1	
Unit Type	AutoEXEC - Aut	oPilot Pro 👻			Host 212 Conn	AutoEX	1	COM 1	40
1996	1				Host Port Test	AutoEX	1	COM 1	
Address	255	5			IP Connection	AutoEX	1	TCP/IP	
					Local Mode	AutoEX	255	COM 1	
Comm. Port	COM1	-			Test Database	AutoEX	255	Off Line	-
Phone #		*(	TS Wait	0				1	1
*Baud Rate	57.6 K	• *F	TS Wait	0					1
*Parity Bit	None	▼ *F	TS Rise	0					
*Stop Bit	1 Stop	•	RTS Fall	0					-
			_						
*Num Retries	3 *Num.	Nulls 0	*RX Dela	<b>y</b> 6	4	1			

Figure 3–5. Establishing a local connection

- 1. Name: Enter a name that describes and will help you identify this connection.
- 2. Unit Type: Select AutoEXEC-AutoPILOT PRO.
- 3. Address: For local connections, the address must always be 255.
- 4. Comm Port: Select the communications port (COM1, COM3).

- 5. Baud Rate: The baud rate for local connections should be 57600.
- 6. Parity Bit: Select the communications port parity. None is the default.
- 7. Stop Bit: Select the communications port stop bits. 1 is the default.
- 8. **CTS Wait:** CTS Wait is the amount of time in milliseconds the program should wait for the CTS signal to be returned from the software's local communications device after raising a RTS.
- 9. **RTS Wait:** RTS Wait is the amount of time in milliseconds the program should delay raising a RTS after receiving the last data byte from the flow computer.
- 10. **RTS Rise:** RTS Rise is the amount of time in milliseconds the RTS signal should be raised before the program sends the first data byte to the flow computer.
- 11. **RTS Fall:** RTS Fall is the amount of time in milliseconds the program should hold the RTS signal as high after sending the last data byte to the flow computer.
- 12. Number of Retries: Set the number of times the software should attempt to connect to the unit before timing out and declaring failure.
- 13. Number of Nulls: Set the number of null bytes to pad the data packet with if there is not enough data to fill the last packet.
- 14. **RX Delay:** RX Delay is the number of seconds that the instrument should wait to receive a reply from the flow computer before it gives up and attempts another message.
- 15. After configuring a new connection, click **Save** and the connection will be added to the Connection List. When you want to make this connection, open this screen and double-click the connection in the list. Click **Connect**. Delete connections in the Connection List by highlighting the connection and clicking **Delete**. If you have problems connecting, check the hardware connections.

If using RS485 2-wire mode to establish communication with the AutoPILOT PRO flow computer, configure communication parameters based on the table below.

Address	Comm Port	Baud Rate	Parity Bit	CTS Wait	RTS Wait	RTS Rise	RTS Fall	Num Retries	Num Nulls	RX Delay
1	1	1200	None	0	0	0	20	3	0	5
1	1	2400	None	0	0	0	10	3	0	3
1	1	4800	None	0	0	0	5	3	0	3
1	1	9600	None	0	0	0	10	3	0	1
1	1	19.2K	None	0	0	0	5	3	0	1
1	1	38.4K	None	0	0	0	3	3	0	1
1	1	57.6K	None	0	0	0	2	3	0	1

 Table 3–1. Configuration for AutoPILOT PRO RS485 2-wire mode communication

### Setting up an IP Address

Before you can establish a remote connection with a flow computer that is connected to a network, the unit's IP address must be set up. Once this is done, you can access the flow computer from any PC that is also connected to the network.

- 1. Open the AutoCONFIG software and connect to the unit via a local connection.
- Expand the Communications heading in the navigation bar. Select 96-Communication Port(s) > Ethernet Port #1/Ethernet Port #2 for the AutoEXEC flow computer or Ethernet Port #1 for the AutoPILOT PRO flow computer.

Navigation Bar	₹×	Communication Port Definition - Ethernet Port #1	$\exists  \flat  \textbf{X}$
Physical Data Point(s)	¥	T Auto Refresh Refresh Apply Help 🕎	
Calculation(s)	¥		
Communication(s)	*		
<ul> <li>⇒ 96-Communication Port(s)</li> <li>→ Host Comm Port# 1</li> <li>→ Comm Port# 1</li> <li>→ Comm Port# 2</li> <li>→ Comm Port# 3</li> <li>→ Comm Port# 4</li> <li>→ Comm Port# 5</li> <li>→ Comm Port# 6</li> <li>→ 485 Port #1</li> <li>→ 485 Port #2</li> </ul>		Calculation Enabled  Descriptor EthernetPott#1 Mode Slave  Protocol Format RTU  Address 1 Write Enable Enabled  Callout Block 0	
Ethemet Port #1 Ethemet Port #2 9-97-Modbus Slave 9-98-Modbus Master 9-100-Chromatograph 9-101-Tank Gauge	×	Slave Password Num.       1       Comm. Block Ref.       1         Password Reg. Num.       0       Comm Block       Modbus Slave         Value       0       Block Index       Entry #1         Security Access       Comm Option       Comm Option         © Operator       Maintenance       © Standard Address       © 4.3.2.1 (Daniel Float)	
Interface		Operator     Maintenance     Standard Address     4,3,2,1 (Daniel Float)     Supervisor     Engineer     C Extended Address     C 1,2,3,4 (IEEE Float)	
Miscellaneous	×	C Extended Address C 1.3.3.4 (LCE Hod)     C 2.1.4.3     C 2.1.4.3     C 2.1.4.3     C 3.4,1.2	
		Ethernet IP addr - chnl 0         000 -000 -000 -000         Ethrnt gateway- chnl 0         000 - 000 - 000 - 000           Ethernet netmsk - chnl 0         000 -000 -000         Ethrnt MAC addr - chnl 0         00 : 00 : 00 : 00 : 00 : 00           Mdbs Enc Port Num Chnl 0         5002         Mdbs IP Port Num Chnl 0         502	

Figure 3–6. Setting up an IP address for a slave

3. Enable the port by changing the Calculation field to Enable. If you are setting up the port as a master, skip to step 4. If you are setting up the port as a slave, the Ethernet port will be used as the host port. The required fields are listed below in the general order of appearance on the screen.

**Description:** Enter a description of the port.

Mode: Select Slave.

**Protocol Format:** Select the slave mode protocol format (ASCII or RTU).

Address: Enter the slave mode communications address.

Write Enable: Enable/disable the port's write function.

Callout Block: This field is for future development.

Slave Password Number: You can assign up to five different passwords per communication port. This value represents the password selected to configure.

**Password Register Number:** The host must write the password value to the register number entered here.

Value: Enter the password value.

Defining Tasks for Ports – Comm Block Ref, Comm Block, and Block Index

You can configure up to 256 different blocks, or tasks, for each port. If you are setting up the first task for this port, select 1 in the **Communications Block Reference** field. If you are setting up the tenth task for this port, select 10, etc.

Next, select what type of function the port will be performing for this task in the **Communications Block** field. Options are: None, Modbus slave, Modbus master, chromatograph, and tank gauge.

The last step is to select the **Block Index** that corresponds to the communications block you chose.

**Security Access:** Set the access level a user must have to access this configuration from the flow computer keypad.

Comm Option block

**Standard Address:** This parameter defines the protocol driver's Modbus address as an 8 bit value (0-255).

**Extended Address:** This parameter defines the protocol driver's Modbus address as a 16 bit value (0-65535).

**4,3,2,1 (Daniel Float), etc.:** These are the options for the floating point byte order. Select how bytes and words will be sent.

Message Pad: This parameter tells the communications driver to add "nulls" (0's) to the end of the message to assist in extending the time that RTS control is held high.

At the bottom of the screen, configure the Ethernet settings: **the IP address**, **network mask**, **and Ethernet gateway**. The MAC address is configured at the factory.

For Modbus using TCP/IP, enter the Modbus encapsulated port number and IP port number.

4. If you are setting up the port as a master, the Ethernet port will be used to poll another device.

Navigation Bar	Ψ×	Communication Port Definition	Ethernet Port #1		4
Physical Data Point(s) Calculation(s)	×	Auto Refresh Refresh	Apply	Help 🔮	
Communication(s)           9-9-Communication Port(s)           - Host Comm Port# 1           - Comm Port# 2           - Comm Port# 3           - Comm Port# 4           - Comm Port# 5           - Comm Port# 6           - 485 Port #1           - 485 Port #1           - Ethernet Port #1           Ethernet Port #1           Ethernet Port #2           9-97-Modbus Slave           9-94-Nodbus Master           -100-Chromatograph           -101-Tank Gauge	*	Celculation Enabled Descriptor Ether Mode Master Comm. Block Ref. 1 Comm Block Modbus Siz Block Index Entry #1	net Port #1	Repeat Timer Protocol Format	0
terface liscellaneous	* *				
			000-000-000-000	Ethrnt gateway- chnl 0	000 - 000 - 000 - 000
		Ethernet netmsk - chnl 0	000-000-000-000	Ethrnt MAC addr - chnl 0	00 : 00 : 00 : 00 : 00
			5002	Mdbs IP Port Num Chnl 0	502

Figure 3–7. Setting up an IP address for a master

Descriptor: Enter a description of the port.

Mode: Select Master.

**Repeat Timer:** This value controls how often the master begins a new poll. This entry is in seconds. For example, if you enter 5, the master will begin a new poll every five seconds.

Protocol Format: Select ASCII or RTU format.

# Defining Tasks for Ports – Comm Block Ref, Comm Block, and Block Index

You can configure up to 256 different blocks, or tasks, for each port. If you are setting up the first task for this port, select 1 in the **Communications Block Reference** field. If you are setting up the tenth task for this port, select 10, etc.

Next, select what type of function the port will be performing for this task in the **Communications Block** field. Options are: None, Modbus slave, Modbus master, chromatograph, and tank gauge.

The last step is to select the **Block Index** that corresponds to the communications block you chose.

At the bottom of the screen, configure the Ethernet settings: **the IP address**, **network mask**, **and Ethernet gateway**. The MAC address is configured at the factory.

For Modbus using TCP/IP, enter the Modbus encapsulated port number and IP port number.

- 5. Click the Apply and Refresh buttons.
- 6. Perform a warm restart (Tools > Warm Restart).
- 7. When you are ready to establish the remote connection to this unit, follow the steps in "Creating a Remote Connection via TCP/IP".

### Adding Entries to an Existing Configuration



When modifying a flow computer configuration, you have the option to add items to the configuration. This section provides an example of how to do this.

**Caution** Take care when adding entries to the configuration. Text and calculation threads must be connected as well; otherwise, an invalid configuration will be created.  $\blacktriangle$ 

**Note** If adding physical input entries to the configuration, reference the special notes section at the end of the following procedure. ▲

The following example shows you how to change the number of PID entries in an existing configuration from four entries to eight.

- Select the configuration you are going to modify by establishing an offline connection (File > Connection) and selecting Modify an Existing Configuration.
- 2. Click **Connect**, and the New Database screen will open. This is where you can change the number of entries for each table. In this example, change the number of entries for Table #33 from 4 to 8. Click **OK**.

Comm					×
Connecti	Table Name	Number of Entries	*		
connecti	18-Physical Honeywell DE Input	32			
*Name	19-Physical Discrete Input	32		pmm	Pho
	20-Physical Accumulator	32		DM 1	1
	21-Physical Analog Output	32		PM 1	-
*Unit Type	22-Physical Discrete Output	32		DM 1 DM 1	40
*Address	Ø 33-PID	8		EP/IP	
	34-Proportional Output	4		DM 1	1
*Comm. P	35-High/Low Selection	4		f Line	1
	36-Alarm Status	8		-	-
Creat	37-Point Type Conversion	1			
	38-Differential Pressure Flow	8			
C Crei	39-AGA 7 Flow	8			
<b>C</b> 11	40-AGA 10 Speed of Sound	1		-	
Moc	41-Meter Station	6		-	-
	42-Meter Run Switching	2			-
Autc	43-Historical Average	6			-
I Adjı	44-Floating Point Scaling	1			1
M Aujt	45-16-Bit Word Scaling	1		-	-
	46-Discrete Logical OR	1			
	47-Discrete Logical AND	1			•
Il fields 1	48-Floating Point Summing	1		Close	1
	49-PLC Program	4	•	Ciuse	

Figure 3–8. Changing the number of table entries

3. When the main program window opens, expand the Calculation(s) heading in the navigation bar, followed by the 33-PID item. In Figure 3–9, notice the last four items under Table 33. These are the four additional entries. In software versions prior to WA30MBOM, the new entries will be labeled "PID Calc#4". In software versions WA30MBOM and newer, the new entries will be labeled "No Descriptor".



Software versions WA30MBOM and newer

Software versions prior to WA30MB0M Figure 3–9. New Table #33 entries

4. Double-click on each new entry to open that entry's page. Notice that the descriptions change to "NULL" when you do because the calculation descriptions do not have text entries connected to them. See Figure 3–10.

### Establishing Communications

Adding Entries to an Existing Configuration

Navigation Bar 4 ×	PID PID PID PID		4 b <b>x</b>
Physical Data Point(s)	Auto Refresh Refresh	Арріу Неір 💇	
Calculation(s)	Desciption	Output	
	Calculation Disabled Descriptor ID Mode Manual Failure Status Normal Process Variable #1 Process Variable #2 Process Variable #3 Process Variable #5 Process Variable #5 Process Variable #6 Process Variable #7 Process Variable #7 Process Variable #8 Process Variable #8 Process Variable #8 Process Variable #9 Process Variable #10 Total	Output Value     Output Value     Output Mode     Analog Output     Open Discrete Out     Off     Open Limit Discrete In     Off     Open     Costrol Mode     Local     P     Open     Setpoint     O     R. Setpoint     O     Op. Setpoint     O     Ramp Setpoint     O     Namo Output     Open     Set	to. Term 10 Itegral Term 3 erivative Term 0 rror Deadband 0 ID Action Forward • lax PV 0 lopy Enable Disabled • etpoint Track Disabled • eil Mode Fixed •
48-Floating Point Summing     49-PLC Program     50-Floating Point Copy     51-Liquid Flow     53-Prover Calculation     56-Deceptiv Colevition	Manual Override In Calibration I/O Failed Low Alarm Hi Alarm	Low Low Alarm Hi Hi Alarm Invalid Pt Ref Def Value in Use Out of Range	

Figure 3–10. Configuration pages for new PID entries

5. Expand the Physical Data Point(s) heading in the navigation bar, followed by the 15-Text item. Double-click on List ALL Text Entries, and wait for the table to populate.

Navigation Bar 🛛 🕈 🗙	PID	PID PID PID	Table 15 Text	$\triangleleft \flat \mathbf{x}$
Physical Data Point(s) *		uto Refresh	Refresh Apply	Help 🕑
1-Floating Point Value     2-Discrete Value     3-Byte Value     4-16-Bit Word Value     15-Text     List ALL Text Entries		Text Table 15		
16-Physical Analog Input		Entry	Text (maximum 16 char allowed)	
		▶ 1	Diff. Pressure	
⊞ 18-Physical Honeywell DE Inpu		2	InH2O	
		3	Density Pressure	
B 20-Physical Accumulator		4	Prover Pressure	
		5	Static Pressure	
		6	Psig	
Calculation(s) *		7	Density Temp	
		8	Prover Temp	
E⊢ 33-PID		9	Density	
PID Calc# 1		10	GM/CC	
PID Calc# 2		11	Temperature	
- PID Calc# 3		12	DegF	
PID Calc# 4		13	Pulse Accum.	
NULL		14	Frequency	
···· NULL		15	Pulses	
NULL		16	Meter Pulses	
I NULL		17	Error Pulses	
34-Proportional Output		18	Density Freq.	
		•		
36-Alarm Status	1			
37-Point Type Conversion				

Figure 3–11. Table #15: Text table

6. Scroll down the text table until you find the text entries for the item you are adding. In this example, find the PID entries. Click on the text entry to highlight it, right-click, and select **Copy**.

Contraction of the second s	ID PID PID PID Ta	Refresh Apply Help	
1-Floating Point Value 2-Discrete Value 3-Byte Value 4-16-Bit Word Value 15-Text		ingeneration in the second sec	
List ALL Text Entries	Text Table 15		
16-Physical Analog Input	Entry	ext (maximum 16 char allowed)	
17-Physical Smart XDucer Inpu	880	t 22-30 Descr2	
18-Physical Honeywell DE Inpu	881 1	iscrete Out#31	
19-Physical Discrete Input	882 1	t 22-31 Descr2	
20-Physical Accumulator	883 1	iscrete Out#32	
21-Physical Analog Output	884	t 22-32 Descr2	
22-Physical Discrete Output	▶ 885	PID Calc# 1	
ulation(s)	886 1	ID Calc# 2 Copy	
32-Calculation Thread Allocation	887 1	ID Calc# 3 Paste ht	
33-PID	888	ID Calc# 4 Clear	
PID Calc# 1	889	rop Calc#1 Paste with physical descriptive update	
PID Calc# 2	890	rop Calc#2 Access Security	
PID Calc# 3	891	rop Calc#3	
PID Calc# 4	892 1	rop Calc#4	
NULL	893 1	i/Low Calc#1	
···· NULL		i/Low Calc#2	
···· NULL		i/Low Calc#3	
NULL		i/Low Calc#4	
34-Proportional Output		larm Status#1	
85-High/Low Selection	1		
36-Alarm Status	Land -	base in the second s	

Figure 3–12. Copying a text entry

7. Scroll down the text table further until you reach the first entry that says "Spare Text #nnn". In this example, the entry is #1083. Click on the text to highlight it, right-click, and select **Paste**. Repeat this for the remaining new entries.

Navigation Bar 🛛 🗛 🗙	PID PID PID Table 15 Text	4.1
	Auto Refresh Apply Help	
8⊢ 1-Floating Point Value 8⊢ 2-Discrete Value 8⊢ 3-Byte Value 9⊢ 4-16-Bit Word Value 9⊢ 15-Text	Text Table 15	
List ALL Text Entries		
⊢ 16-Physical Analog Input ⊢ 17-Physical Smart XDucer Input		
17-Physical Smart XDucer Inpu 18-Physical Honeywell DE Inpu	1081 Product Conf#32	
19-Physical Discrete Input	1082 Audit Log# 1	
20-Physical Accumulator	1083 PID Calc# 1	
	1084 PID Calc# 1	
21-Physical Analog Output 22-Physical Discrete Output	1085 PID Calc# 1 1086 PID Calc# 1	
alculation(s)	1086 PID Calc# 1 1087 Spare Text #1087	
	1088 Spare Text #1088	
32-Calculation Thread Allocatio	1089 Spare Text #1089	
33-PID PID Calc# 1	1090 Spare Text #1090	
PID Calc# 2	1091 Spare Text #1091	
PID Calc# 3	1092 Spare Text #1092	
PID Calc# 4	1093 Spare Text #1093	
NULL	1094 Spare Text #1094	
NULL	1095 Spare Text #1095	
NULL	1096 Spare Text #1096	
NULL	1097 Spare Text #1097	
- 34-Proportional Output	1098 Spare Text #1098	
35-High/Low Selection		
36-Alarm Status		

Figure 3–13. Creating new text entries

 Edit the new entries so they follow the appropriate naming convention. In this case, make the first new entry "PID Calc# 5", the second entry "PID Calc# 6", and so on. When you have renamed all the entries, click Apply.

Navigation Bar 🛛 🗛 🗙	PID PI	PID PID	Table 15 Text		4 10 ×
Physical Data Point(s) *	Aut	o Refresh	Refresh Apply	Help 🥎	
List ALL Text Entries		ext Table 15			
16-Physical Analog Input		Entry	Text (maximum 16 char allowed)	<b>•</b>	
17-Physical Smart XDucer Inpu		1081	Product Conf#32		
18-Physical Honeywell DE Inpu		1082	Audit Log# 1		
19-Physical Discrete Input	0	1083	PID Calc# 5		
20-Physical Accumulator		1084	PID Calc# 6		
21-Physical Analog Output		1085	PID Calc# 7		
22-Physical Discrete Output	1	1086	PID Calc# 8		
Calculation(s)		1087	Spare Text #1087		
		1088	Spare Text #1088		
B 33-PID	1	1089	Spare Text #1089		
PID Calc# 1		1090	Spare Text #1090		
PID Calc# 2		1091	Spare Text #1091		
PID Calc# 3		1092	Spare Text #1092		
PID Calc# 4		1093	Spare Text #1093		
NULL		1094	Spare Text #1094		
NULL		1095	Spare Text #1095		
NULL		1096	Spare Text #1096		
NULL		1097	Spare Text #1097		
34-Proportional Output		1098	Spare Text #1098	1990	
35-High/Low Selection		1 4000			
😐 36-Alarm Status					
37-Point Type Conversion					
# 38-Differential Pressure Flow					

Figure 3–14. New text entries renamed

- 9. Now that the new text entries have been created and named appropriately, you need to copy them to the associated configuration entries. For this example, copy the text entries to the Descriptor fields in the new PID entries.
  - a. On the text table, click on the gray box to the left of the text entry (PID Calc# 5 in this case) to highlight it. Right-click and select **Copy**.
  - b. Go to the PID Calc# 5 configuration page. Place the cursor over the word **Descriptor**, right-click, and select **Paste**. The Descriptor field will display "PID Calc# 5". Click the **Apply** button.
  - c. Repeat this for the remaining entries. The figure below shows the new PID entries renamed and the Descriptor field for PID Calc# 8 updated.

**Note** Be sure to click **Apply** after copying the text entry over to the Descriptor field. ▲

#### Establishing Communications

Adding Entries to an Existing Configuration

Navigation Bar 🛛 📮 🗙	PID PID PID Table	15 Text						∢ ⊳ ×
Physical Data Point(s) 🛛 🗧	🗖 Auto Refresh 🛛 🛛 🛛 🦳	efresh Apply			Help 🕎			
Calculation(s) *	Desciption		Output					
<ul> <li>⊕ 32-Calculation Thread Allocation</li> <li>⇒ 32-PID</li> <li>⇒ PID Calc# 1</li> <li>⇒ PID Calc# 2</li> <li>⇒ PID Calc# 2</li> <li>⇒ PID Calc# 3</li> <li>⇒ PID Calc# 4</li> <li>⇒ PID Calc# 5</li> <li>⇒ PID Calc# 6</li> <li>⇒ PID Calc# 7</li> <li>⇒ 93-FigHt/vow Selection</li> <li>⊕ 34-Proportional Output</li> <li>⊕ 34-Proportional Output</li> <li>⊕ 34-Proportional Output</li> <li>⊕ 34-Propertial Pressure Flow</li> <li>⊕ 39-AGA 7 Flow</li> <li>⊕ 41-Meter Station</li> <li>⊕ 41-Meter Station</li> <li>⊕ 41-Meter Station</li> <li>⊕ 44-Floating Point Scaling</li> <li>⊕ 45-Floating Point Scaling</li> <li>⊕ 45-Floating Point Scaling</li> <li>⊕ 45-Ploating Point Summing</li> <li>⊕ 49-PLC Program</li> <li>⊕ 50-Floating Point Summing</li> <li>⊕ 50-Floating Point Summing</li> <li>⊕ 50-Floating Point Summing</li> </ul>	Calculation Disa Descriptor Disa Mode Man Failure Status Norr Process Variable #1 Process Variable #1 Process Variable #3 Process Variable #3 Process Variable #4 Process Variable #6 Process Variable #7 Process Variable #7 Process Variable #7 Process Variable #8 Process Variable #8 Process Variable #8 Process Variable #10 Total Fail Mask	abled  PID Calc# 8 0 ual  mal 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Output Value Output Mode Output Mode Open Discrete Out Open Limit Discret Close Limit Discret Close Limit Discret Settings Control Mode L Setpoint R Setpoint R Setpoint R Setpoint Ramp Setpoint Ramp Setpoint Ramp Setpoint Ramp Setpoint Ramp Coutput Close Clo	Disabled	0 og Output	Pro. Term Integral Term Derivative Term Error Deadband PID Action Max PV Copy Enable Setpoint Track Fail Mode	10 3 0 Forward • Disabled • Fixed •	
51-Liquid Flow     53-Prover Calculation     56 Density Calculation	Low Alarm		Def Value in U					
< <u>&gt;</u>								

Figure 3–15. New entry names updated

10. The new entries must be connected to a calculation thread:

- a. Expand the **32-Calculation Thread Allocation** item under the Calculation(s) heading. Double-click on **Entry #1**.
- b. Click in the **Calculation Item** box. The Block Reference is the calculation connected to that item.

Navigation Bar 🛛 🗛 🗙	PID PID PID PID Calcul	ation Thread			4 ⊅ 🗙
Physical Data Point(s) *	Auto Refresh Ref	resh Apply	Help 🕑		
Calculation(s) *					
E- 32-Calculation Thread Allocation	Thread Priority	0	Last Cycle Time	370780 mSec	
Entry #2	Thread Descriptor	0	Shortest Cycle Time	0 mSec	
😐 33-PID	Reset Cycle Times	Idle 👻	Longest Cycle Time	370780 mSec	
34-Proportional Output     35-High/Low Selection     36-Alarm Status	Repeat Timer	1 Seconds	Thread Status	0	
<ul> <li>B 37-Point Type Conversion</li> <li>B 38-Differential Pressure Flow</li> </ul>	Calculation Item		Shortest Cycle Time	0 mSec	
<ul> <li>B - 39-AGA 7 Flow</li> <li>B - 40-AGA 10 Speed of Sound</li> </ul>	Block Reference	38-Differential Pressure Flow -Entry #1 -Field #0	Longest Cycle Time	360 mSec	
40-AGA to Speed of Sound     41-Meter Station     42-Meter Run Switching	Last Cycle Time	0 mSec	Block Status	0 mSec	

Figure 3–16. Scrolling through calculation threads

c. Scroll down the item list until nothing is displayed next to Block Reference. This is the first free calculation item. In this example, all the calculation items in Entry #1 are connected. So Entry #2 must be used. The first free calculation item in Entry #2 is 27.

Navigation Bar 🛛 📮 🗙	PID PID PID PID Calculation Thread		4 ⊅ 🗙
Physical Data Point(s) * Calculation(s) *	Auto Refresh Refresh Apply	Help 🕎	
32-Calculation Thread Allocation     Entry #1	Thread Priority 0 Thread Descriptor 0	Last Cycle Time 370780 mSec Shortest Cycle Time 0 mSec	
Entry #2     33-PID     34-Proportional Output	Reset Cycle Times Idle	Longest Cycle Time 370780 mSec	
<ul> <li>B - 35-High/Low Selection</li> <li>B - 36-Alarm Status</li> </ul>	Repeat Timer 1 Seconds	Thread Status 0	
37-Point Type Conversion     38-Differential Pressure Flow	Calculation Item 27 -	Shortest Cycle Time 0 mSec	
⊕ 39-AGA 7 Flow     ⊕ 40-AGA 10 Speed of Sound	Block Reference	Longest Cycle Time 0 mSec	
	Last Cycle Time 0 mSec	Block Status 0 mSec	

Figure 3–17. Calculation item with no block reference

d. In the navigation bar, right-click on the first new entry (in this case, PID Calc# 5), and select **Copy**.

Navigation Bar 4 × P	D PID PID PID Calcul	ation Thread			4 ⊳ 3
Physical Data Point(s) ×	Auto Refresh Re	fresh Apply	Help 💇		
Calculation(s) *	· · · · · · · · · · · · · · · · · · ·				
32-Calculation Thread Allocation     Entry #1	Thread Priority	0	Last Cycle Time	370780 mSec	
Entry #2	Thread Descriptor	0	Shortest Cycle Time	0 mSec	
- 33-PID	Reset Cycle Times	Idle 👻	Longest Cycle Time	370780 mSec	
PID Calc# 1	Repeat Timer	1 Seconds	Thread Status	0	
PID Calc# 3					
PID Calc# 4	Calculation Item	27 🔽	Shortest Cycle Time	0 mSec	
PID Calc# Copy	Block Reference		Longest Cycle Time	0 mSec	
PID Calc# Set Access Level >	Last Cycle Time	0 mSec	Block Status	0 mSec	
34-Proportional Output					

Figure 3–18. Copying the new entry to the Calculation Thread Allocation table

e. Place the cursor over Block Reference on the Calculation Thread Allocation page, right-click, and select **Paste**. The Block Reference should now be labeled with the entry you copied. In this case, it should show "33-PID-Entry #5-Field #0".

Navigation Bar 🛛 🗛 🗙	PID PID PID PID Calculation	Thread			4 ⊳ ×
Physical Data Point(s) × Calculation(s) ×	Auto Refresh Refresh	Apply	Help		
32-Calculation Thread Allocation Entry #1	Thread Priority	0	Last Cycle Time	370780 mSec	
Entry #2	Thread Descriptor	0	Shortest Cycle Time	0 mSec	
∃ 33-PID	Reset Cycle Times Idle	•	Longest Cycle Time	370780 mSec	
PID Calc# 1 PID Calc# 2	Repeat Timer	1 Seconds	Thread Status	0	
PID Calc# 3		12			
PID Calc# 4 PID Calc# 5	Calculation Item 27		Shortest Cycle Time	0 mSec	
PID Calc# 6	Block Reference 33-PI	D -Entry #5 -Field #0	Longest Cycle Time	0 mSec	
PID Calc# 8	Last Cycle Time	0 mSec	Block Status	0 mSec	
34-Proportional Output					

Figure 3–19. New calculation thread added

- f. Repeat this process until all new entries have been connected to a calculation item. If continuing with this example, PID Calc# 6 will be copied to calculation item 28, PID Calc# 7 will be copied to calculation item 29, and PID Calc# 8 will be copied to calculation item 30.
- g. Once you have copied all the entries over to a calculation item, click **Apply**.
- At this point, you can save the new configuration (Files > Upload Configuration From RTU). For more instructions on how save a configuration file, refer to the software help system

### Special Notes when Adding Physical Input Entries

If you are adding items to any of the physical input tables, you may need to link text to more than one field on the input table. As an example, modify an existing configuration with 32 discrete input entries to have 34 and then follow the steps below.

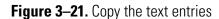
	New Database		×
Comm			
Connecti	Table Name	Number of Entries	<b>^</b>
connecti	1-Floating Point Value	32	
*Name	2-Discrete Value	32	Adress
	3-Byte Value	32	1
	4-16-Bit Word Value	32	1
*Unit Type	15-Text	1508	1
*Address	16-Physical Analog Input	32	1
Address	17-Physical Smart XDucer Input	32	255
*Comm. P	18-Physical Honeywell DE Input	32	255
	19-Physical Discrete Input	34	
Creat	20-Physical Accumulator	32	
	21-Physical Analog Output	32	
C Crei	22-Physical Discrete Output	32	
	33-PID	8	
Moc	34-Proportional Output	4	
	35-High/Low Selection	4	
Auto	36-Alarm Status	8	
	37-Point Type Conversion	1	
🔽 Adjı	38-Differential Pressure Flow	8	
	39-AGA 7 Flow	8	
	40-AGA 10 Speed of Sound	1	
Il fields 1	41-Meter Station	6	- Close
H	42-Meter Run Switching	2	Close

Figure 3–20. Changing the number of discrete input entries

- 1. After modifying a configuration to have 34 discrete input entries, review steps 5–8 of the previous section. These steps show you how to create new text entries for the Descriptor fields on the PID configuration pages. A physical input configuration has two Descriptor fields (Descriptor #1 and Descriptor #2). Create text entries for both fields as described below.
  - a. Scroll to the text entry that says "Discrete In#1," and copy it. Paste it into the first spare text entry. Go back to Discrete In#1 text entry, and copy the one just below it labeled "Pt 19-1 Descr2". Paste it into the next spare text entry.

Copy Descriptor text entry.

ito Refresh	Refresh Apply	
Text Table 15		
Entry	Text (maximum 16 char allowed)	-
628	Pt 18-32 Descr2	
629	Discrete In#1	
630	Pt 19-1 Descr2	
631	Discrete In#2	
632	Pt 19-2 Descr2	
633	Discrete In#3	
634	Pt 19-3 Descr2	
	Discrete In#4	
635	Discrete III#4	
635 636	Pt 19-4 Descr2	



Paste	into	spare	text	entry.

Auto R	lefresh	Refresh Apply	
Text	Table 15		
	Entry	Text (maximum 16 char allowed)	
	1083	PID Calc# 5	
	1084	PID Calc# 6	
	1085	PID Calc# 7	
	1086	PID Calc# 8	
	1087	Spare Text #1087	
	1088	Spare Text #1088	
ų	1089	Spare Text #1089	
	1090	Spare Text #1090	
	1091	Spare Text #1091	

Figure 3–22. Paste the text entries

b. Repeat this for the second new discrete input entry.

c. Rename the text entries appropriately. For this example, you should have Discrete In#33, Pt19-33 Descr2, Discrete In#34, and Pt19-34 Descr2.

uto R	efresh	Refresh Apply	
		43	
<b>T</b> /	Table 15		
Text	Entry	Text (maximum 16 char allowed)	
	1076	Product Conf#27	
	1077	Product Conf#28	
	1078	Product Conf#29	
	1079	Product Conf#30	
- li	1080	Product Conf#31	
	1081	Product Conf#32	
	1082	Audit Log# 1	
	1083	PID Calc# 5	
	1084	PID Calc# 6	
	1085	PID Calc# 7	
	1086	PID Calc# 8	
	1087	Discrete In#33	
	1088	Pt 19-33 Descr2	
1	1089	Discrete In#34	
	1090	Pt 19-34 Descr2	
	1091	Spare Text #1091	
Ĵ,	1092	Spare Text #1092	
	1093	Spare Text #1093	

Figure 3–23. New text entries added to the Text table

- d. Click Apply.
- 2. Step 9 of the procedure in the previous section shows you how to copy the text entries over to the Descriptor fields. For physical inputs, you will also need to copy the second Descriptor text entry and possibly the On and Off entries. The steps for performing these additional actions are listed below.
  - a. On the text table, click on the gray box to the left of the text entry (Discrete In#33 in this case) to highlight it. Right-click and select **Copy**.
  - b. Go to the physical input configuration page. Place the cursor over Descriptor #1, right-click, and select Paste. The Descriptor #1 field will now display "Discrete In#33".
  - c. Click on the gray box to the left of the text entry (Pt19-33 Descr2 in this case) to highlight it. Right-click and select **Copy**.
  - d. Go to the physical input configuration page. Place the cursor over **Descriptor #2**, right-click, and select **Paste**. The Descriptor #2 field will now display "Pt19-33 Descr2".

e. The physical discrete input pages have On Descriptor Text and Off Descriptor Text fields. Go to Table #15 and locate the On and Off text entries. They are usually located around item 20.

Navigation Bar 🛛 🗛 🗙 🖸	Discrete Input Discrete Input Table 15 Text	4 Þ
Physical Data Point(s) * 🔺	🗆 Auto Refresh Refresh Apply Help 😵	
a 1-Floating Point Value B 2-Discrete Value B 3-Byte Value		
4-16-Bit Word Value		
15-Text	Text Table 15	
List ALL Text Entries		
16-Physical Analog Input	Entry Text (maximum 16 char allowed)	
17-Physical Smart XDucer Inpu	19 On	
18-Physical Honeywell DE Inpu 19-Physical Discrete Input	20 Off	
Discrete In#1	21 Pct	
Discrete In#1	22 Data Log# 1	
Discrete In#2	23 Data Log# 2	
Discrete In#4	24 Data Log# 3	
Discrete In#5	25 Data Log# 4	
Discrete In#6	26 Data Log# 5	
Discrete In#7	27 Data Log# 6	
Discrete In#8	28 Data Log# 7	
- Discrete In#9	29 Data Log# 8	
Discrete In#10	30 Data Log# 9	
Discrete In#11	31 Data Log# 10	
Discrete In#12	32 Data Log# 11	
Discrete In#13	33 Data Log# 12	
Discrete In#14	34 Data Log# 13	
Discrete In#15	35 Data Log# 14	
Discrete In#16	36 Data Log# 15	
- Discrete In#17		
Discrete In#18		
Discrete In#19		

Figure 3–22. On and Off text entries

- f. Click on the gray box to the left of the On text entry to highlight it. Right-click and select **Copy**.
- g. Go to the physical input configuration page, place the cursor over **On Descriptor Text**, right-click, and select **Paste**.
- h. Click on the gray box to the left of the Off text entry to highlight it. Right-click and select **Copy**.
- i. Go to the physical input configuration page, place the cursor over **Off Descriptor Text**, right-click, and select **Paste**.

**Note** Be sure to click **Apply** after copying the text entries.

Figure 3–23 shows what the screen will look like with the new text entries connected.

#### **Establishing Communications**

Adding Entries to an Existing Configuration

Navigation Bar 4 ×	Discrete Input Discrete Inp	ut Tabl	le 15 Text			4 ▷ 🗙
Discrete In#15     Discrete In#16	Auto Refresh Refre	esh	Apply	Help 🤡		
Discrete In#17						
Discrete In#18	Descriptor #1		Discrete In#33	Current Status	ManOvrd	ſ.
Discrete In#19	Descriptor #2		Pt 19-33 Descr2	Current Value	-	
Discrete In#20	On Descriptor Text		On		-	
Discrete In#21	Off Descriptor Text		Off	Last On Date	00/00/00	)
Discrete In#22				Last On Time	00:00:00	)
Discrete In#25	Aud/Alm Reg Index		0	Last Off Date	00/00/00	1
Discrete In#24	Alarm Detection	•	Enabled	Last Off Time	00:00:00	
Discrete In#26	Alarm Condition State		1		00.00.00	
Discrete In#27	I/O Board Address		0	Live Value		
Discrete In#28	I/O Board Pt. #		0	Invert Input	Don't Invert Input	
Discrete In#29	no board rear		0	In Manual	Normal	
··· Discrete In#30				Manual Value	Off 🗸	
Discrete In#31					1011	
Discrete In#32	Data Blocks			Security Access		
Discrete In#33 : Pt 19-33 Des Discrete In#34 : Pt 19-34 Des	Audit/Alarm Data Block In	dex	-			
	Not Assigned	-	Log Audits	Measruemer	nt	Technician
	INOT Assigned	<u> </u>	Log Alarms	Control		Supervisor
Communication(s) ×						
Interface ¥						
Miscellaneous × 🗸						

Figure 3–23. Example of additional physical discrete input entry with new text entries connected

3. Since this is a physical input, you do not need to follow step 10 of the main procedure, which connects the calculation to a thread. You can now save the configuration with the additional physical input entries.

# Special PC Setup for AutoCONFIG Software

If you notice that the AutoCONFIG software is running slowly or you receive COMM errors, the PC may not be set up to use a greater share of the processor time to run background services. Follow the procedure below to determine if this may be the cause of the communication problems.

**Note** This procedure changes a PC system setting. This setting may remain changed, as it should not affect other programs you run. ▲

 On the PC desktop, right-click the My Computer icon and select Properties. The System Properties screen will open. You can also access this screen by selecting Start > Control Panel > System.

System Restore	Automa	atic Updates	Remote
General Compu	ter Name	Hardware	Advance
	S	/stem:	
		Microsoft Window	vs XP
	-	Professional	
		Version 2002	
		Service Pack 3	
<b>—</b> ———————————————————————————————————	B	egistered to:	
		admin	
		76487-OEM-001	903-00102
Manufactured and support	orted by:	Dell Latitude D81	0
		Intel(R) Pent	tium(R) M
	1.00	processor 2.13Gł	Ηz
		2.13 GHz, 2.00 G	B of RAM
		Physical Address	Extension
		<u> </u>	
		Support Inform	ation

Figure 3–24. System Properties screen

2. Click the Advanced tab, and under Performance, click Settings.

	store Automa	atic Updates	Remote
General	Computer Name	Hardware	Advanced
'ou must be la	ogge <mark>d</mark> on as an Administra	tor to make most of t	hese changes
Performance			
12112	, processor scheduling, m	emory usage, and vi	rtual memory
	11 (Ta		
		_	Settings
User Profiles			43
Desktop setti	ings related to your logon		
			Settings
	lecovery		
Startup and F			
	ip, system failure, and deb	ugging information	
	ıp, system failure, and deb	ougging information	
	ip, system failure, and deb	ougging information	Settings
	ip, system failure, and deb	ougging information	Settings
	ip, system failure, and deb		Settings

Figure 3–25. Selecting Performance Settings

3. Click the **Advanced** tab on the Performance Options screen. Check what is selected under Processor scheduling. Select **Background services** if not already selected. Click **Apply**.

erformance 0	ptions	? ×
Visual Effects Advan	ced Data Execution Prevention	
Processor schedulin	g	
By default, the con processor time to r	nputer is set to use a greater share un your programs.	of
Adjust for best per	formance of:	
C Programs	Background services	
Memory usage		
By default, the con memory to run you	nputer is set to use a greater share r programs.	of
Adjust for best per	formance of:	
Programs	C System cache	
Virtual memory		
A paging file is an a if it were RAM.	rea on the hard disk that Windows	uses as
Total paging file siz	e for all drives: 1536 MB	
	Ch	ange
r	1	
	OK Cancel	Apply

Figure 3–26. Changing the system performance setting

- 4. Click **OK** to return to the desktop.
- 5. Run the software to determine if changing this setting has resolved the communication problem.

# **Chapter 4 Configuring a Meter Run with the Measurement Config Wizard**

**Overview** The Measurement Config wizard helps you configure gas and/or liquid runs easily by presenting the screens in a logical order, taking you through each configuration step required. If you want to configure one meter run, a DP meter run for example, expand the **38-Differential Pressure Flow** heading, right-click over an entry, and select **Config Wizard**. This wizard will take you through the configuration process for one meter run only. To configure multiple runs, select the Measurement Config wizard from the Tools menu.

This chapter provides instructions on using the Measurement Config wizard for multiple runs in two sections: one for gas runs (DP or AGA 7 flow) and one for liquid flow runs.

**Note** Liquid flow calculations are available with the AutoPILOT PRO flow computer if you do not need frequency based densitometer inputs or require proving capabilities. ▲

**Note** This section does not provide information on each parameter. For this level of detail, reference the Measurement Config wizard section in the software help system. ▲

## For Gas Meter Runs

Follow the procedure in this section to configure DP and/or AGA 7 meter runs using the Measurement Config wizard.

- Go to Tools > Measurement Config Wizard. The software will ask if you want to run the Measurement Config wizard. Click OK to continue.
- 2. If you are not connected to an instrument (offline connection), the screen shown below will be displayed. Select **DP Flow** or **AGA** 7 **Flow** and the number of runs to configure. If you want to configure gas quality for historical archives, check the **Change Configuration History** box, and select the type of gas quality to use. When you are ready to continue, click **Next**.

If you are connected to an instrument, the Gas Quality Selection for Historical Archive blocks will not be displayed (gas quality cannot be configured from within the wizard).

⊢Number of Runs Sel						
Gas	Number of Runs	2	DP Flow Gas Quality Sel	ection For Historical Archive		
🔽 AGA 7 Flow	Number of Runs	1	C No Gas Quality AGA7 Flow Gas Quality Change Configuration C No Gas Quality	Use G, BTU, CO2, N2 Selection For Historical Archive onHistory     Use G, BTU, CO2, N2	C Use All	
Liquid Flow Turbine/Orifi	ice Number of Runs	¥				
					-	

Figure 4–1. Selecting the meter runs and gas quality

3. The wizard will inform you that the software is working and ask you to wait. This may take a few minutes.

4. When the Set Unit Date & Time screen appears, select Automatic to use the time and date as set in the PC, or select Manual to enter the time and date manually. Click Apply.

🔒 Measur	ement Confi	guration \	Vizard - I	DP Flow:					_ 🗆 :
Orifice The Isentropic I Pipe Diame Orifice Diam	nal Exp. Coeff. ermal Exp. Coeff. Exponent eter meter	Enabled DP Fi	9.25E-06	Allow Modify Coeffs nit Date & Time	Contract Hour Pressure Base Temperature B Low Dp Cutoff Manual Flow C	lase	Normal	8 4.65 Diff Pre 60 Temp 0.5 Diff Pre •	
Floating Po AGA2530 ( AGA2530 F	ric Pressure oint Orif Ref temp Pipe Ref temp Tap Location 1000	Downstrea	O Man	omatic (Use PC Date ual (User inputs dat inesday, March			06 \$\$	tal Mole Percen	
Methane	98.5					Cancel Ap	ply I-Nona	ine	0
Ethane	0			0	INT CITAILE			ine	0
Propane	0		02	0	N-Hexane	0	Helium		0
H2O	0		I-Butane	0	N-Heptane	0	Argon		0
H2S	0		N-Butane	0	N-Octane	0	Air		0
CO2	1		N2	0.5	C6	0	Neo-Pe	nta	0
				<< Back	: Ne:	d >>	E.	Download & Exit	Close

Figure 4–2. Setting the unit time and date

5. On the DP Flow page, configure the static and gas quality data for the first meter run. Going with the example above, run #1 is a DP run that will be referred to as DP Flow Calc#1.

DP Flow Calc#1	December 1			
	Pressure Base	1	4.65 Diff Pre	
38001	Temperature Base		60 Temp	
6.2E-06 - Allow Modify	Low Dp Cutoff		0.5 Diff Pre	
925E-06 Coeffs	Manual Flow Cutoff	Normal	-	
1.3	Static Pressure Type	Gauge	•	
8.071 Pipe/Orifice	Calculation Method	AGA 2530-1992	-	
4.02 Pipe/Onfice	Fpv Calculation Method	AGA8 Gross		
14.73 Atm Pres	GQ Data Definition Block	GQ Data Bik#1	•	
		(firster)		
68				
68				
Downstream				
	625:06 925E:06 13 8.071 Pipe/Onfice 4.02 Pipe/Onfice 14.73 Atm Pres 68	62E-06       Allow Modify       Low Dp Cutoff         925E-05       Coeffs       Manual Flow Cutoff         1.3       Static Pressure Type         8.071       Pipe/Orifice       Calculation Method         4.02       Pipe/Orifice       Fpv Calculation Method         14.73       Atm Pres       GQ Data Definition Block	6:2E:06     Coeffs     Low Dp Cutoff       9:2E:05     Coeffs     Manual Flow Cutoff     Normal       1:3     Static Pressure Type     Gauge       8:071     Pipe/Onfice     Calculation Method     AGA 2530-1992       4:02     Pipe/Onfice     Fpv Calculation Method     AGA8 Gross       14:73     Atm Pres     GQ Data Definition Block     GQ Data Bik#1	6:2E:06       Coeffs       Low Dp Cutoff       0.5 Diff Pre         9:25E:06       Coeffs       Manual Flow Cutoff       Normal       •         1.3       Static Pressure Type       Gauge       •         8:071       Pipe/Onfice       Calculation Method       AGA 2530-1992       •         4:02       Pipe/Onfice       Fpv Calculation Method       AGA8 Gross       •         14:73       Atm Pres       GQ Data Definition Block       GQ Data Bik≠1       •

Figure 4–3. Configuring static data and gas quality for DP Flow Calc#1

**Note** For this example, the DP runs will be configured first and the AGA 7 run last. If you selected AGA 7 meter runs only in the previous screen, skip the DP run configuration steps and go to step 9. ▲

6. On the DP Flow Factors page, enable any required flow factors and set the engineering units for DP Flow Calc#1. When you have completed this page, click Next.

**Note** More on these factors, including the equations used, can be found in the software help system. ▲

PpW Factor     U     Temperature     •F       Volume     MCF       Volume     MCF/       Calculation Enable     Disabled     MMBTU	Location Factor					1	Engineering Units	18	
atitude (Degrees)       0       Fpwl Dp Corr. Calc. Enable       Disabled       Atmospheric Pressure       PSI         Height (Feet)       0       Fpwl g0       0       Differential Pressure       PSI         iactor       0       Fpwl g0       0       Static Pressure       PSI         Vell Stream       Factor       0       Flow Rate       MCF         Factor       0       Image: Calculation Enable       Disabled       MMBTU         Calculation Enable       Disabled       MMBTU/       Energy       MMBTU/         Calculation Enable       Disabled       MMBTU/       Energy       MMBTU/         WV       Manual       Water Content       0       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Disabled       Image: Calculation Enable       Image: Calculation Enable       Image: Calculation Enable       Disabled       Image: Calculation Enable       Image: Calculation Enable       Image: Calculation Enable       Image: Calculation Enable <td< th=""><th>Calculation</th><th>Disabled</th><th>-</th><th>Fpwl Sp Corr. Calc. Enable</th><th>Disabled</th><th>-</th><th>Pipe/Orifice</th><th>inch</th><th>+</th></td<>	Calculation	Disabled	-	Fpwl Sp Corr. Calc. Enable	Disabled	-	Pipe/Orifice	inch	+
iactor       0       Fpwl g0       0         Fpwl Factor       0       Static Pressure       PSI         Temperature       %F       Valume       MCF         Vall Stream       Image: Static Pressure       MCF         Factor       0       Image: Static Pressure       MCF         Factor       0       Image: Static Pressure       MCF         Volume       MCF       Image: Static Pressure       MCF         Flow Rate       MCF/       Image: Static Pressure       MMBTU         Factor       0       Image: Static Pressure       MMBTU         WV       Image: Static Pressure       MMBTU/       Image: Static Pressure       MMBTU/         WV       Image: Static Pressure       Image: Static Pressure       Image: Static Pressure       MMBTU         Calculation Enable       Disabled       Image: Static Pressure       Image: Static	atitude (Degrees)			Fpwl Dp Corr. Calc. Enable	Disabled	-	Atmospheric Pressure	PSI	-
Fixed Factor     O       Fixed Factor     O       Vell Stream     O       Calculation Enable     Disabled       Factor     O       WV     Energy Rate       Calculation Enable     Disabled       WV     MMBTU/       Calculation Enable     Disabled       Water Content     O			0				Differential Pressure	inH20	-
Vell Stream     Volume     MCF       Calculation Enable     Disabled     MCF/       Factor     0     Energy     MMBTU       Calculation Enable     Disabled     MMBTU/       WV     Calculation Enable     Disabled     MMBTU/       WV     With Content     0	actor		0				Static Pressure	PSI	-
Vell Stream     Flow Rate     MCF/       Calculation Enable     Disabled     Energy     MMBTU       Factor     0     Energy Rate     MMBTU/       WV     Calculation Enable     Disabled     MMBTU/       Calculation Enable     Disabled     MMBTU/       WV     Water Content     0				Ppw Pactor		0	Temperature	٥F	-
Calculation Enable Disabled  Factor 0						-	Volume	MCF	¥
Calculation Enable Disabled  Factor 0	Vell Stream					-	Flow Rate	MCF/	*
Factor 0 Energy Rate MMBTU/ WV Calculation Enable Disabled Correction Mode Manual Water Content 0	Calculation Enable	Disabled	-				Energy	MMBTU	-
WV Calculation Enable Disabled Correction Mode Manual Water Content 0	and the second	-					Energy Rate	MMBTU/	*

Figure 4–4. Configuring DP Flow Calc#1 factors and engineering units

7. The wizard will read the current I/O connections from the RTU and display them on the DP Flow Connections page. Confirm the connections, and click **Download & Next** to continue with the configuration process. If you click the **Download & Exit** button, the wizard will download the current run configuration and close. You will return to the main AutoCONFIG window. When you click either of these buttons, you will be notified by the software that the calculation will be configured if you continue. Select Yes to continue.

Diff Pressure	Physical Smart XC - Smart Xd	cr#1 : Pt 17-1 Descr2		
Static Pressure	Physical Smart XC - Smart Xd			
Temperature	Physical Analog In 👻 Analog In			

Figure 4–5. Connecting to physical inputs

8. If you clicked the Download & Next button in the previous step, one of two things will happen depending on where you are in the configuration process. If continuing with the example of two DP runs and one AGA 7 run, there are two runs left to configure. The next screen will be the DP Flow screen for the second DP run (DP Flow CAlc#2). Return to step 5. After configuring the second DP run (when you reach this point again), the first screen for the last run (an AGA 7 run) will be displayed. Go to step 9. If you selected only one run or if this is the last run to be configured, the software will ask if you want to run the Calibration wizard. Click Yes to run the wizard. If you click No, the software will display that configuration is complete. The screen will close, and you will return to the main AutoCONFIG window.

9.	On the AGA7 Flow screen, configure the static and gas quality data for
	the AGA 7 meter run.

	8.5 H2 0 CC 0 O2 0 I-B		N-Pentane N-Hexane N-Heptane	0 0 0 0	<b>100 Total Mole I</b> N-Nonane N-Decane Helium Argon Air	Percent 0 0 0 0
BTU 10 Methane 9( Ethane Propane	8.5 H2 0 CC 0 O2		) I-Pentane N-Pentane N-Hexane	0	N-Nonane N-Decane Helium	0
BTU 10 Methane 94 Ethane	8.5 H2 0 CC	)	) I-Pentane ) N-Pentane	-	N-Nonane N-Decane	0
BTU 10	8.5 H2		(1997)	0		
111-11-11-11-11-11-11-11-11-11-11-11-11	100 Spi	ecific Gravity	0.6		100 Total Mole I	Percent
C0. Dob						
		U	GQ Data Definition BI	ock GQ	Data Blk#9 💌	
Pulse Frequency		0	Fpv Calculation Meth		A8 Gross 🗾	
Accumulator Pulse Co Data Valid Alarm Input		0	Calculation Method		A 7 - Turbine 💌	
Low Frequency Cutoff Accumulator Pulse Co		0.1	Static Pressure Type	Ga	ige 🗾	
Low Flow Cutoff Time		5	Manual Flow Cutoff	Nor	mal 👱	
Atmospheric Pressure 14.73			M Correction Factor		1	
Pipe Diameter		0	Temperature Base		60	
ID .	AGA/	39001	Pressure Base		14.65	
Descriptor	1017	Calc#1	Contract Hour Flow Rate Filter Time		8	

Figure 4–6. Configuring AGA7 static and gas quality data

10. On the AGA7 Flow Factors page, enable any required flow factors and set the engineering units for AGA7 meter run. When you have completed this page, click **Next**.

Measurement Configura	ition Wizard - A	GA7 Flow Factors:	AGA7 Calc# 1		_ 0
				Engineering Units	
K Meter Factor	123.5			Pipe/Orifice inch	-
K Meter Factor Eng. Unit	0	Meter Factor In Use	0	Atmospheric Pressure PSI	-
				Static Pressure PSI	-
Variable Factor Table Enable	Disabled 👻			Temperature OF	
					·
K Meter Factor #1 Frequency	0	K Meter Factor #1	0		•
K Meter Factor #2 Frequency	0	K Meter Factor #2	0	Flow Rate MCF/	-
K Meter Factor #3 Frequency	0	K Meter Factor #3	0	Energy MMBTU	-
K Meter Factor #4 Frequency	0	K Meter Factor #4	0	Energy Rate MMBTU/	-
K Meter Factor #5 Frequency	0	K Meter Factor #5	0	Uncorr. Flow Rate MACF/	-
K Meter Factor #6 Frequency	0	K Meter Factor #6	0	[	
K Meter Factor #7 Frequency	0	K Meter Factor #7	0		
K Meter Factor #8 Frequency	0	K Meter Factor #8	0	Well Stream	
K Meter Factor #9 Frequency	0	K Meter Factor #9	0	Calculation Enable Disabled	-
K Meter Factor #10 Frequency	0	K Meter Factor #10	0	Factor	0
ocation Factor				Fwv	
Fpwl Sp Corr. Calc. Enable	Disabled 🗸	Fpwl gl	0	Calculation Enable Disabled	•
r pin op com cale. Enable	Disabled	Fpwl g0	0	Correction Mode Manual	-
		Fpwl Factor	0	Water Content	0
		i più i detta	U	Fwv	0
					0
		<< Back	Next >>	Download & Exit	Close

Figure 4–7. Configuring AGA7 factors and engineering units

11. On the AGA7 Flow Connections screen, select whether this configuration is for an AGA 7 turbine run or AGA 7 auto-adjust. The wizard will read the current I/O connections from the RTU and display them here. Confirm the connections, and click **Download & Next** to continue with the configuration process. If you click the **Download & Exit** button, the wizard will download the current run configuration and close. You will return to the main AutoCONFIG window. When you click either of these buttons, you will be notified by the software that the calculation will be configured if you continue. Select **Yes** to continue.

🛃 Measuremer	nt Configuration	Wizard - AGA7 Flow Conne	ections: AGA7 Calc# 1		_ 🗆 ×
Calculation Met	AGA7 - Turbine 👻				
Static Pressure	Physical Analog II 👻	AGA7 Calc# 1 : Static Pressure	•		
Temperature	Physical Smart XI 👻	AGA7 Calc# 1 : Temperature	•		
Accum Pulse	Physical Accum	AGA7 Calc# 1 : Accum Pulse	•		
		<< Back	Download & Next >>	Download & Exit	Close

Figure 4–8. Connecting to physical inputs

12. If there are more runs to configure, click the Download & Next button. The next screen will be the static data and GQ screen for the next run. If you have configured the final run, click the Download & Exit button. The software will ask if you want to run the Calibration wizard. Click Yes to do so. If you click No, the software will display that configuration is complete. The screen will close, and you will return to the main AutoCONFIG window.

## For Liquid Flow Runs

Follow the procedure in this section to configure liquid flow runs using the Measurement Config wizard.

- 1. Go to **Tools > Measurement Config Wizard**. The software will ask if you want to run the Measurement Config wizard. Click **OK** to continue.
- 2. Select **Turbine/Orifice** and the number of runs to configure. Click **Next**.

-Number of Runs Sele	ction					
Gas						
DP Flow	Number of Run		P Flow Gas Quality S No Gas Quality	election For Historical Are Use G, BTU, CU2, N2	chive C Use All	
AGA 7 Flow	Number of Run		GA7 Flow Gas Qualit No Gas Ouality	y Selection For Historical <sup>C USE G, BTU, CU2,</sup> N7	Archive C Use All	
Liquid Flow						
Turbine/Orifi	Number of Run	•				
	1 2 47 3					
	5 5	0				
	6					
	8					

Figure 4–9. Selecting the liquid flow run

3. The wizard will display "Collecting Liquid Data, Please Wait" to inform you the software is working and ask you to wait. This may take a few minutes.

4. When the Set Unit Time & Date screen appears, select Automatic to use the time and date as set in the PC, or select Manual to enter the time and date manually. Click Apply.

Measurement Con     Calculation     Descriptor     Meter ID     Flow Type      Density     Atmospheric Pressure     Static Pressure     Temperature     Pipe/Orifice     Differential Pressure     Viscosity	Enabled Liquid Calc#1 51001 Turbine GM/CC PSI Set Ur PSI PSIG oF inch inH20 Centipose	]	ne to download to unit.)		
		<< Back	Next >>	Download & Exit	Close

Figure 4–10. Setting the unit time and date

 On the first configuration page, enter the run descriptions, select whether a turbine or orifice flow type, and set the engineering units. When you have completed this page, click Next.

alculation	Enabled	•		
escriptor	Liquid Calc			
leter ID		001		
low Type	Turbine	•		
Density	GM/CC	Gross	BBL/HR	
Atmospheric Pressure	PSI	Net	BBL/HR	
Static Pressure	PSIG	Mass	KLB/HR.	
Temperature	°F .	K Factor	Pulse/BBL	
Pipe/Orifice	inch	,		
Differential Pressure	inH20			
Viscosity	Centipose	7		

Figure 4–11. Setting general run descriptions, type, and engineering units

6. If you selected a **turbine** flow type in the previous screen, the screen shown in Figure 4–12 will be displayed. Select a single or dual turbine meter pickup pulse, enter the meter K Factor, and select whether meter linearization should be enabled. Click **Next** and continue to the next step.

If you selected an **orifice** meter, the screen shown in Figure 4–13 will be displayed. Select a single, dual, or triple DP input, and then enter the mid and high DP switch values. Click **Next** and continue to the next step.

🖶 Measurement Configu	uration Wizard - Liq	uid Flow: Liquid Calc#1		_ 🗆 ×
Turbine Pickup K Factor Error Count limit Linear Meter Factor Enable	Single 500 0 Disabled	Pulse/BBL		
		<< Back Next >>	Download & Exit	Close

Figure 4–12. Screen for turbine flow type

🛃 Measuremen	t Configuration W	izard - Liquid Flo	w: Liquid C	alc#1			_ 🗆 ×
-Orifice							
DP Selection	Single						
Mid DP Switch		0					
High DP Switch		0					
						1 1000	
			<< Back	Next >>	D	lownload & Exit	Close

Figure 4–13. Screen for orifice flow type

7. If you enable the meter linearization function, enter up to ten flow meter pulse frequencies (in Hz). Each frequency must be greater than the previous frequency. When ready, click **Next**.

leasurement Configuration Wizard	- Liquid Flow: Liquid Calc#1	_
Linear Meter Factor #1 Frequency	200	
Linear Meter Factor #2 Frequency	400	
Linear Meter Factor #3 Frequency	800	
Linear Meter Factor #4 Frequency	1200	
Linear Meter Factor #5 Frequency	1800	
Linear Meter Factor #6 Frequency	2000	
Linear Meter Factor #7 Frequency	2500	
Linear Meter Factor #8 Frequency	3000	
Linear Meter Factor #9 Frequency	4000	
Linear Meter Factor #10 Frequency	5000	

Figure 4–14. Entering the flow meter pulse frequencies

8. If you are not going to measure density, select **None** in the Density Type field, and click **Next**. Go to step 9. If measuring density, select the density type and the source of temperature and pressure. Click **Next**.

Figure 4–15. Density configuration screen

9. The wizard will read the current I/O connections from the RTU and display them here. Confirm the connections, and click Download & Next to continue with the configuration process. If you click the Download & Exit button, the wizard will download the current run configuration and close. You will return to the main AutoCONFIG window. When you click either of these buttons, you will be notified by the software that the calculation will be configured if you continue. Select Yes to continue.

Once you have made the necessary connections, click Next.

leasuremen	t Configuration V	Viza	rd - Liquid Flow Connection	ons: Liquid Calc#1	[
	r		(		
Temperature	Physical Analog Input	•	Liquid Calc#1 : Temperature	<b>.</b>	
Static Pressure	Physical Analog Input	-	Liquid Calc#1 : Static Pressure	<u> </u>	
Acc Pulse Count			Liquid Calc#1 : AccInput	<u> </u>	
Error Accum Pul	Physical Accum Input		Liquid Calc#1 : ErrorAcc	<b>.</b>	
Density	Physical Analog Input	-	Liquid Calc#1 : Density	•	

Figure 4–16. Physical input connections

10. The software will ask you to wait while it downloads the data.

 The Product Setup screen gives you the opportunity to configure products. If you do not want to do this, select No in the Setup Products Now drop-down, and click Next. Skip the remainder of this step.

If you want to configure a product now, select Yes in the Setup Products Now drop-down, followed by how many products you want to configure. Click the Next button, and the setup screen for the first product will appear (Figure 4–18). When you complete this page, click Next, and the configuration page for the next product will open. Continue this process until you have set up each product.

🛃 Measurement Con	figuration Wizard	- Product Setup			_ 🗆 ×
Product Setup					
Product Setup Setup Products Now? How many Products #-	Yes 💌				
		<< Back	Next >>	Download & Exit	Close

Figure 4–17. Product Setup screen

Descriptor D API Table Used	Product Conf#1 129001 Table 23/24 A	ASTM 1250 Selection SG Overide	1250-80 • 0.624	
Meter Factor	1			
inear Meter Factor #1 Frequency	200	Linear Meter Factor #1	0.98	
Linear Meter Factor #2 Frequency	400	Linear Meter Factor #2	0.985	
Linear Meter Factor #3 Frequency	800	Linear Meter Factor #3	0.99	
Linear Meter Factor #4 Frequency	1200	Linear Meter Factor #4	0.99	
linear Meter Factor #5 Frequency	1800	Linear Meter Factor #5	0.995	
linear Meter Factor #6 Frequency	2000	Linear Meter Factor #6	0.998	
Linear Meter Factor #7 Frequency	2500	Linear Meter Factor #7	0.999	
inear Meter Factor #8 Frequency	3000	Linear Meter Factor #8	1	
inear Meter Factor #9 Frequency	4000	Linear Meter Factor #9	1.01	
inear Meter Factor #10 Frequency	5000	Linear Meter Factor #10	1.02	

Figure 4–18. Configuration screen for first product

12. If you do not need to configure a densitometer, select **No** in the Setup Densitometers Now drop-down, and click **Next**. Go to step 13.

If you want to set up a density calculation, select **Yes** in the Setup Densitometers Now drop-down. Click **Next**, and the configuration page for the first density calculation appears (Figure 4–20). When you complete this page, click **Next**, and the configuration page for the next density calculation will open. Continue this process until you have configured each densitometer.

# Configuring a Meter Run with the Measurement Config Wizard For Liquid Flow Runs

leasurement Configuration Wizard - Densil	ometer setup	
Densitometer Setup		
etup Densitometers Yes		
low many Densitometers		
	<< Back Next >>	Download & Exit Close

## Figure 4–19. Densitometer Setup screen

alculation	Disable	ed 💌	Descriptor		Densito	meter#1			
ensitometer ID	10.000	56001	Densitometer Type		Sarasota	•			
eriod(micro-Seconds)		0	Density Temperatu	ıre		0			
ensity Pressure		0	Density Frequency	e l		0			
G		0				0	GM/CC		
arasota Density									
D0	0	то	0	к			0		
coef	0	Tcal	0	Pcoef			0		
Pcal	0								
JGC Density									
K0		K1 E-4		K2 E-6					
KT E-5		Tcal		к					
0									
Solartron Density									
K0		K1 E-4		K2 E-6					
K18 E-5		K19 E-5		K20A E	7				
K20B E-9		K21A E-7		K21B E	9				
KR		KJ		Referen	ce Temp.				

#### Figure 4–20. Configuration screen for the first densitometer

13. Densitometer configuration is the final part of a liquid flow run configuration. After you complete step 12 and click **Next**, the software will ask if you want to run the Calibration wizard. Click **Yes** to run the wizard. If you click **No**, the software will display that configuration is complete, and you can close the window to return to the main AutoCONFIG window.

# Chapter 5 Gas Quality

# Configuring a Gas Chromatograph

Configuring a gas chromatograph (GC) to an AutoEXEC or AutoPILOT PRO flow computer involves programming the communication port on which the GC is going to be connected. Follow the procedure outlined below to do this.

1. Open the AutoCONFIG software. Expand the Communication(s) heading of the navigation bar. Select the comm port to be used under Table 96. For this procedure, comm port #1 will be used. Change the Calculation field to Enabled.

Navigation Bar 4	× Communication F	Port Definition - Comm Port# 1	1
Physical Data Point(s)	× 🗖 Auto Refresh	Refresh Apply	Heip 🕎
Calculation(s)	×		
Communication(s)	*		
96-Communication Port(s)           Host Comm Port           -Comm Port#1           -Comm Port#2           -Comm Port#3           -Comm Port#4           -Comm Port#6           -Comm Port#8           -Ethemet Port #1           -Ethemet Port #2           98-Modbus Slave           191-Tank Gauge           101-Tank Gauge	Calculation Descriptor Mode Baud Rate Data Bit Parity Stop Bit Slave Password Password Reg. 1 Value	Num. 0	RTS Delay 0 mSec Handshaking None v Protocol Format RTU v Address 1 Write Enable Enabled v Callout Block Ref. 1 Clear Entire Block Index Entry #1 v Comm Option
Interface		nen 🗖 Teo	echnician  © Standard Address  © 4.3.2.1 (Daniel Float)
Miscellaneous	× □ Control	r⊓ Sur	upervisor C Extended Address C 1.2.3.4 (IEEE Float) C 2.1.4.3 Message Pad C 3.4.1.2

Figure 5–1. Selecting the communication port

2. The GC communicates to the flow computer as a master. So select **Master** from the Mode drop-down. The screen changes, as shown in Figure 5–2.

Select the port from Table #96 that will be used by the GC.

#### Gas Quality

Configuring a Gas Chromatograph

Navigation Bar	ąΧ	Communication Port Definition - Comm Port# 1	∢
Physical Data Point(s)	¥	Auto Refresh Refresh Apply	Help 💇
Calculation(s)	¥		
Communication(s)	*		
B-         96-Communication Port(s)           Host Comm Port           -Comm Port#1           -Comm Port#2           -Comm Port#4           -Comm Port#6           -Comm Port#7           -Comm Port#8           -Ethemet Port #1           -Ethemet Port #2           ® 974/odbus Slave           ® 98-Modbus Slave           ® 101-Tank Gauge		Calculation Enabled Descriptor Comm Port# 1 Mode Master • Baud Rate 9600 • Data Bit 8 Bits • Parity None • Stop Bit 1 • Comm. Block Ref. 1 • Comm. Block Ref. 1 • Comm Block Modbus Slave • Block Index Entry #1 •	
Interface	×		
Miscellaneous	×		

Figure 5–2. Master mode configuration page

3. Configure the communication port. For this example, the GC being connected will communicate via RS232 communication with the following port settings.

**Note** The following information is for this example. The port configuration for the GC should match the port configuration of the instrument to which the GC will be connected.  $\blacktriangle$ 

- a. Baud Rate: 1200
- b. Data Bit: 7
- c. Parity: Even
- d. Stop Bit: 1
- e. Protocol: ASCII
- f. Comm Block Ref, Comm Block, and Block Index:

Set the block reference for the port. If you are setting up the first task for this port, set the Comm Block Ref to 1. If you are setting up the tenth task for this port, set it to 10, etc.

Since you are configuring the port for a GC, select **chromatograph** from the Comm Block drop-down.

Select the block index (entry #) that corresponds to the communications block you chose.

4. Click Apply.

The GC can now communicate with the flow computer through the configured communication port. To view the live GC analysis, go to **Communication(s) > 100-Chromatograph**. Select the chromatograph stream that corresponds to the block index you selected in the above procedure. For example, if you selected Entry #1, the GC data will go to Chrom Stream #1. Table #100 Chrom Stream #1 (for this example) will send GC data internally to Table #128 under the respective GQ data block.

# **Gas Quality** without a GC If a gas chromatograph is not being used, you can configure gas quality through the Gas Quality Data table (#128), which is under the Calculation(s) heading of the navigation bar.

Auto Refresh	Refresh	Apply		He	elp 🔡		
Descriptor ID	GQ	Data Blk#1	Audit Regis	ter Offset	13	001	
BTU	1	128001 1000					
Specific Gravity		0.6	100 Total N	Iole Percent			
				Ster Succession			
Methane	98.5	H2	0	I-Pentane	0	N-Nonane	0
Ethane	0	CO	0	N-Pentane	0	N-Decane	0
Propane	0	02	0	N-Hexane	0	Helium	0
H2O	0	I-Butane	0	N-Heptane	0	Argon	0
H2S	0	N-Butane	0	N-Octane	0	Air	0
CO2	1	N2	0.5	C6	0	Neo-Penta	0

Figure 5–3. Gas Quality Data table

Configure the parameters on this page as follows and then click Apply.

- 1. Descriptor: Enter a description of the gas quality data block.
- 2. ID: The gas quality block ID.
- 3. BTU and Specific Gravity: Enter the gas quality data.
- 4. Audit Register Offset: This value is used to generate Modbus registers that are logged in the event trail. As an example, assign an offset of 13001 to gas quality block #1 and 13101 to gas quality block #2. If you change the methane percentage for gas quality block #1, the unit will log 13005. If you change the methane percentage for gas quality block #2, the unit will log 13105. The index value of 5 corresponds to the methane percentage item of Table #128 (Gas Quality Data).
- 5. Gas Components section: Enter the gas components in percentages, for a total of 100%.

This page intentionally left blank.

# Chapter 6 System Status & System Control Tables

The System Status and System Control tables allow you to view important system information and set basic system parameters. Access both tables through the Miscellaneous heading on the navigation bar.

## System Status (Table #30)

The System Status table has two tabs: General and System I/O Counts.

The General page displays read-only information pertaining to various aspects of system status.

Refresh Refresh	Apply	Неір
Gener	al	System I/O Counts
Last Startup Type	0	RTU Device Type Off-Line
Last System Start Date	10170	RTU Software Version 0
Last System Start Time	10000	Low Voltage Alm Status 0
Battery Voltage	0	Entry Log to Event Log
Execution Status	1	Execution Status 0
Execution Status	1	Execution Status 0
Exection Date	10170	Exection Date 0
Execution Time	10000	Execution Time 0
File Load Status	0	File Load Status 0
File Load Date	10170	File Load Date 0
File Load Time	10000	File Load Time 0
File Load Size	207588	File Load Size 0

Figure 6–1. General page of System Status table

**Last Startup Type:** The last start-up type. Possible displays are: 0 (cold start) and 1 (warm start).

Last System Start Date/Time: The date and time of the last system start-up.

**Battery Voltage:** The battery voltage that the flow computer sees at the power input terminal.

RTU Device Type: Displays the type of device currently connected.

**RTU Software Version:** The software version of the currently connected device.

Low Voltage Alarm Status: Displays whether a low voltage alarm is currently active. Possible displays are: 0 (alarm clear) and 1 (alarm active).

Entry Log to Event Log: This flag indicates that an entry has been logged to the system error log and should be retrieved by the Host/user, etc. Reset the flag by issuing a "2468" numerical command into the Configuration Load Control field in Table #31.

#### **Configuration block**

**Execution Status:** The status of the configuration. Possible displays are: 0 (configuration idle), 1 (configuration running), and 2 (configuration failure).

**Execution Date/Time:** The date and time the configuration file was executed.

File Load Status: The configuration file load status. Possible displays are: 0 (no configuration loaded), 1 (configuration loaded), 2 (configuration executed), and 3 (configuration generated).

File Load Date/Time: The last date and time the configuration file was loaded.

File Load Size: The size of the configuration file.

#### IsaGraph block

**Execution Status:** The status of the IsaGraph. Possible displays are: 0 (IsaGraph idle), 1 (IsaGraph running), and 2 (IsaGraph failure).

**Execution Date/Time:** The date and time the IsaGraph file was executed.

File Load Status: The IsaGraph file load status. Possible displays are: 0 (no IsaGraph file loaded), 1 (IsaGraph file loaded), and 2 (IsaGraph file executed).

File Load Date/Time: The last date and time the IsaGraph file was loaded.

File Load Size: The size of the IsaGraph file.

As on the General page, most of the items on the System I/O Counts page are read-only. The I/O Board Failure Alarm field displays the status of the I/O board failure alarm, where 0 is alarm clear and 1 is alarm active. This page also displays the following system information:

- Number of I/O boards installed
- Types of inputs and outputs
- Number of dynamic and static RAM pages, Flash, and EEPROM pages
- Number of communication ports

Additionally, you can view the size of historical and audit/alarm logs. Select the log you want, and the file size is displayed.

o Refresh A	pply	Неір 💇	
General		System I/O Co	ounts
I/O Board Failure Alarm	0	# Dynamic RAM pages	0
Num IO Board Installed	0	# Static RAM pages	0
Num of Analog Input	0	# FLASH pages	0
Num Smart Xducer Input	0	# EEPROM pages	0
Num Honeywell DE Inputs	0	Num Serial Ports	0
Num Accumulator Inputs	0	Num USB Host Ports	0
Num Discrete Inputs	0	Num USB Slave Ports	0
Num Analog Outputs	0	Num Ethernet Ports	0
Num Discrete Outputs	0		
Historical Log Data Log #	1	Historical Aud/Alm Log Data Log	#1
File Size :	0	File Size :	0

Figure 6–2. System I/O Counts page

# System Control (Table #31)

On the System Control table, you can set up basic system parameters.

tem Control	1		
Auto Refresh Refresh	Apply	Help	
System Date	03/05/10	IsaGraph Exe. Cntrl	0
System Time	15:37:15	IsaGraph Load Cntrl	0
Display Scroll Time	3 Seconds	Host Comm Address	1
Daylight Savings Time	Disabled 🗸	Host Comm Baud Rate	9600 🔽
Saving Time Month	January	Host Comm Data Bit	8 Bits 👻
Saving Time Sunday	1st Sunday	Host Comm Parity	None
Exit Saving Time Month	January	Host Comm Stop Bit	1
Exit Saving Time Sunday	1st Sunday	Host Comm RTS Delay	0
Configuration Exe. Cntrl	0	Host Comm Handshake	None 👻
Configuration Load Cntrl	0	Host Comm Protocol	Modbus RTU 🚽
I/O Rescan	Rescan	Host Comm Option	0
Date Display Format	MM/DD/YY	Restart to BootLoader	0
LCD Display Contrast	0	Cold Start	0
Time Set Deadband	0	Validation Key	1E In Hex
Display Blanking	Disabled	Group Key	559 In Hex
Hardware Lockout	Disabled 🚽	Target Printer	USB 💽
Lockout Status	Locked	Printer IP Address	
		Printer IP Port	9100
		Battery Alarm Limit	11.5



System Date/Time: The current system date and time.

**Display Scroll Time:** Set how long the display will show each item in the display scroll list. Enter the time in seconds.

**Daylight Savings Time:** Enable or disable the Daylight Savings Time (DST) adjustment, where 0 = disable and 1 = enable.

**Saving Time Month:** Set the month that the software should begin adjusting for DST.

**Saving Time Sunday:** Select which Sunday of the month the software should begin adjusting for DST.

**Exit Saving Time Month:** Set the month that the software should stop adjusting for DST.

**Exit Saving Time Sunday:** Select which Sunday of the month the software should stop adjusting for DST.

**Configuration Exe Cntrl:** This field controls the creation and loading of configuration files from the AutoCONFIG application. This field should not be written to by the user.

**Configuration Load Cntrl:** This is the command used to load the current running configuration into an internal data storage location that can be accessed by the software for retrieval and storage on a PC. This command is automatically utilized when a user selects to Upload Configuration from RTU from the Files menu or clicks the corresponding icon on the toolbar.

**I/O Rescan:** You can force the software to rescan the I/O boards to establish an I/O point count. This is typically performed after you have installed a new I/O board.

**Date Display Format:** Select how you want the software to display the date (MM/DD/YY, DD/MM/YY, YY/MM/DD).

LCD Display Contrast: You can adjust the contrast of the LCD from the front panel of the instrument or from this field. Increase the number to increase the contrast.

Time Set Deadband: This deadband is used when synchronizing the unit's internal clock with a host system's clock. If the time difference is within the deadband, the unit will not set its internal clock automatically. For instance, if the deadband is set to 60 seconds, the unit will not automatically synchronize its internal clock with the host clock unless the time difference is more than one minute.

**Display Blanking:** If enabled, the unit will not scroll data on the LCD unless a password is entered through the keypad. If disabled, the unit will scroll data whenever a cable is plugged into the local port or a key is pressed on the keypad.

Hardware Lockout: The user has the ability to lock out any user parameter changes based on the status of Digital Input #1. This is achieved by using the Hardware Lockout and Lockout Status parameters. When the Hardware Lockout parameter is set to Enable, and Digital Input #1 is "On" (as indicated by the Lockout Status parameter changing to Locked), the unit does not allow changes to any parameters. This includes changes attempted via any serial port, Ethernet, and the keypad. Note that when this feature is enabled, Digital Input #1 is reserved for this function and thus is not available for general use. This feature was designed specifically to meet the Measurement Canada requirement for sealing the flow computer. If this feature is not desired, leave the Hardware Lockout parameter set to Disabled, the default setting. In this case, Digital Input #1 is then available for general use.

Lockout Status: See Hardware Lockout.

IsaGraph Exe Cntrl: This field controls the creation and loading of configuration files from the IsaGraph. This field should not be written to by the user.

IsaGraph Load Cntrl: This field is for future development.

Host Comm Address: Enter the host address. This entry will override the entry made in the address field of Table #96 (Communications Ports).

Host Comm Baud Rate/Data Bit/Parity/Stop Bit: Set the communications parameters for the host port. These entries will override the entry made in the address field of Table #96 (Communications Ports).

Host Comm RTS Delay: Enter the time in milliseconds that the instrument should wait after raising a Request to Send on the host port before transmitting a message. This entry will override the entry made in the address field of Table #96 (Communications Ports).

Host Comm Handshake: Select the method by which data is transferred from the modem to the communications port. This entry will override the entry made in the address field of Table #96 (Communications Ports). Options are: None (no handshaking) and RTS/CTS (Request To Send/Clear To Send handshaking).

Host Comm Protocol: If necessary, select the slave mode protocol format (Modbus ASCII or Modbus RTU).

Host Comm Option: This field is for future development.

**Cold Start:** This field provides another way to perform a cold start. Enter **12345.0** and click Apply.

Validation Key and Group Key: These keys are used together to enable software features that are purchased separately from the hardware. For example, if an AutoPILOT PRO flow computer is originally purchased with the plunger lift function, these keys will be entered at the factory, and the unit will arrive with plunger lift available. If the plunger lift function is purchased after the original order of the unit, you will receive Validation and Group keys that must be entered here to enable the function.

**Target Printer:** To print reports on a printer that is connected via a USB port, select **USB**. If the connection is through an Ethernet connection, select **Ethernet**.

Printer IP Address: Enter the printer IP address. You can usually find the IP address by going to the Windows Start menu and selecting Printers and Faxes.

Printer IP Port: The IP port for the printer.

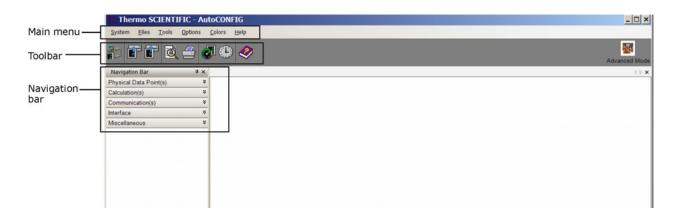
**Battery Alarm Limit:** If the system battery falls to the voltage value entered here an alarm will be logged.

# Chapter 7 AutoCONFIG Software & the Help System

# Using the Software

The AutoCONFIG software is a powerful tool, and with the meter run calculations configured and running, you can explore the software's other capabilities.

There are three ways to navigate through the software: the main menu, the toolbar, and the navigation bar. These items are explained in the AutoCONFIG software help system.



#### Figure 7–1.

## Using the Help System

The help system includes information on the tools, calculations, and features in the AutoCONFIG software.

You can open the help system by clicking the Knowledge Base icon on the toolbar.



Knowledge Base icon

When opened, the help system appears as a tri-pane window. The Contents pane is on the left and contains the system's table of contents, index, and search function.

• Table of contents: Provides an outline of the material contained in the help system.



Figure 7–2. Table of contents

- Index: Use the index to find topics for a keyword (or words) that you enter.
- Search: The search function is similar to the index in that you enter a keyword and a list of topics is displayed. It is a broader function, however, and displays every topic in which that keyword is used.
- Glossary: The glossary contains important terms and their definitions.

## **Page Level Help**

The AutoCONFIG software provides page level help. For example, if you have Table #33 open to configure a PID, click the Help button to open the help file for that page only.

			Click here Help for the page opens	
ID - PID Calc# 1				-0
D - PID Calce 1 Auto Refresh Description Calculation Descriptor ID Mode Failure Status Process Variable # Pr	Disabled PID Cale# 1 3300 Manual S Normal S 1 0 0 2 0 3 0 4 0 0 5 0 6 0 7 0 8 0 9 0 0 10 0 0 0 10 0 0 0	Output Mode Analog C		×
			Output Mode: Select whether the end device will be connected to an analog or discrete output. Open / Close Discrete Output: If the PID is using two discrete outputs to control a stepper motor for a valve (as opposed to using an analog output), these two discrete outputs represent the points that activities the openion and closing of the valve.	

Figure 7–3. Getting help for a specific page in the software

# Printing the Help System

There are several ways to print the help system.

- 1. To print the topic that is currently displayed, right click anywhere on the Topic pane and select Print or click the print icon. Note that this method will only print the current topic. It will not print any dropdown text unless you display it first.
- For printer friendly versions and/or to print multiple topics or sections, open the book labeled "Supplemental Material" (in the contents). From there, you can download the desired PDF file to your computer and print it or save it for reference.
- 3. On some topic pages, you will see a printer icon at the top. Click it to open a PDF/printer friendly version of just that topic. This improvement is in ongoing at the time of this release and is not available for all topics.

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# Glossary

- AutoEXEC flow computer The Thermo Scientific hybrid, multi-run flow computer and remote telemetry unit for natural gas and / or petroleum liquids.
- AutoPILOT PRO flow computer The Thermo Scientific six-run gas flow computer and remote telemetry unit.
- **baud** The speed measurement for communication that indicates the number of bit transfers per second.
- chromatograph function Consists of a Modbus master that polls a Danalyzer gas chromatograph for its molar percent components, BTU, and specific gravity.
- CTS Clear to send.
- **CTS wait** Amount of time in milliseconds the program should wait for the CTS signal to be returned from the software's local communications device after raising Request to Send.
- data bits Measurement of the actual data bits in a transmission.
- DP Differential pressure.
- EU Engineering unit
- **Fpv** Supercompressibility factor calculated by using AGA 8.
- **Fpwl** Factor used to correct for the effect of local gravity on the weights of a deadweight calibrator.
- Fwl Local gravitational correction factor.

Fwv See Water Vapor Factor.

- gas components table Table used in AutoCONFIG software to enter gas quality data if a chromatograph is not being used.
- GC Gas chromatograph.
- GQ Gas quality.
- K-Factor The number of pulses per unit volume.
- measurement config wizard A tool that enables you to configure differential pressure meter runs, turbine meter runs, and/or liquid flow runs easily by presenting the screens in a logical order, taking you through each configuration step required.
- RTC Real-time clock.
- RTS Request to send.
- **RTS fall** Amount of time in milliseconds the program should hold the RTS signal as high after sending the last data byte to the RTU.
- **RTS rise** Also referred to as "Radio Key Delay". Amount of time in milliseconds the RTS signal should be raised before the program sends the first data byte to the RTU.
- **RTS wait** Amount of time in milliseconds the program should delay raising an RTS after receiving the last data byte from the RTU.
- SP Static pressure.
- **stop bits** Used to signal the end of communication for a single packet.
- Water Vapor Factor A direct multiplier into the flow equation that compensates for any water vapor in the system.

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Thermo Fisher Scientific 81 Wyman Street P.O. Box 9046 Waltham, Massachusetts 02454-9046 United States

www.thermofisher.com