

Thermo Scientific AutoPILOT PRO

One-to-Six Run Gas Flow Computer for Production

The Thermo Scientific™ AutoPILOT™ PRO System is built on an innovative, field-proven technology platform. Applications include production, custody transfer and well head.

- Per second flow calculation on up to six meter runs simultaneously
- Customizable software screens to view specific parameters
- Interfaces with differential and linear signal devices
- Expandable model features built-in, self-tuning plunger life algorithms
- Full USB support and high speed Ethernet connectivity



Thermo Scientific AutoPILOT PRO



Single Run or Expandable System

The next-generation Thermo Scientific AutoPILOT PRO gas flow computer is available as a single run measurement device, making it ideal for chart replacement, or as an expandable system capable of measuring up to six runs. Simply add input/output (I/O) as needed with no upgrades required to meet changing measurement and control requirements. With fewer instruments to monitor and maintain, less maintenance is required overall.

Accurate and Powerful

Quantifying product with greater specificity during custody transfer ensures profits stay where they belong. The API 21.1 compliant AutoPILOT PRO system is engineered to enhance flow measurement and enables faster AGA calculations for rapid, accurate data capture. Built-in high-speed Ethernet connectivity and full USB support expedite and simplify data downloads to a PC or a memory stick. The AutoPILOT PRO system also easily integrates into corporate networks, facilitating data access by office-based staff.

Easy to Configure and Use

An electronic flow computer and remote telemetry unit in one, the AutoPILOT PRO system is simple to configure and requires no programming. User-configurable screens in the Thermo Scientific™ AutoCONFIG Software simplify initial set-up, enabling staff to focus on other activities.

Rugged and Durable Design

Thermo Scientific gas flow computers are built to endure the most extreme environmental conditions. All boards are engineered and tested to withstand more than 120 consecutive, indirect lightning strikes, measuring up to 6,000 volts/3,000 amps each. In addition, temperature cycling from -40°C to +85°C (-40°F to +185°F) is conducted, ensuring reliable communication of valuable flow data from remote, unmanned locations.

Thermo
SCIENTIFIC

Plunger Lift - Well Optimization Software

Maximizing well production is the key to maximizing profits. AutoPILOT PRO system users can automatically increase well production by as much as 20 percent by capitalizing on built-in Thermo Scientific plunger lift software. Once the software's plunger lift algorithm learns the flow characteristics of the well, advanced self-optimizing methods take effect to ensure maximum results are achieved over time. The robust system is capable of simultaneous multi-plunger support and control and provides real-time production data and troubleshooting information via remote monitoring to minimize system downtime and maximize staff productivity. It also reduces capital expenditures by eliminating a costly secondary control system as well as lowers well maintenance costs and ensures fewer remedial treatments, providing long term cost benefits in addition to increased well potential.



Thermo Scientific - AutoCONFIG

System Files Tools Options Colors Help

Navigation Bar

Physical Data Point(s)

- 15-Text
- 16-Physical Analog Input
 - Analog Input#1
 - Analog Input#2
 - Analog Input#3
 - Analog Input#4
 - Analog Input#5
 - Analog Input#6
 - Analog Input#7
 - Analog Input#8
- Calculation(s)
 - 32-Calculation Thread Allocation
 - 38-Differential Pressure Flow
 - DP Flow Calc#1
 - DP Flow Calc#2
 - DP Flow Calc#3
 - DP Flow Calc#4
 - 65-Plunger Lift
 - PLG Calc#1
 - PLG Calc#2
 - PLG Calc#3
 - PLG Calc#4
 - 128-Gas Quality Data
- Communication(s)
- ISA Graph
- Miscellaneous

Flow Plunger Cfg

Auto Refresh Refresh Apply

Calculation Enabled ID 65001
 Descriptor PLG Calc#1 Force to Default

Config Inst Flow Rate History Data Off Time Hist Data Tub Cast Hist Data History Summary Hist Data

Flow Control Method: Original

Control Command: Original, Load Factor, Timer, No Pit, Timer No Pit, Manual, Intermittent

TRM	1.2	Dec Load	0
TRM Inc.	0.02	Min. Load	0.1
TRM Dec.	0.01	Max. Load	1
Max. TRM	1.2		
Min. TRM	0.8		

Tubing ID 1.995

PID Loop

Early Arrival Time	00 : 00 : 00
Fast Arrival Time	00 : 06 : 00
Slow Arrival Time	00 : 15 : 00
Min Off Time	01 : 00 : 00
PIT Delay	00 : 00 : 00
On Time	01 : 00 : 00
Mand. Off Time	03 : 00 : 00
Hi Sales Pressure	300
Max Cont. No Arr.	2

Solenoid Type 2 - Wire
 Open Point Close
 Close Point Close
 A Abort Status Closed
 B Abort Status Closed

Plunger Sensor	0	Meter PT	38-Differential Pressure Flow - Entry #1 - Field #0
Tubing Press.	200	Casing Press.	450
Cycles < Maintain	9999	MIN Shut-in Time	100
PID Set Point	100	Ang Fail Time	0
PID Cutoff	1	Max Build Time	15
Flow Alarm Flag	Disabled	Casing Applied	Enabled
A Close - B Open	Enabled	Max Con Early Arr.	0
Sale Leak Check?	Disabled	Plunger Battery	12
		Battery Voltage Setting	10.5

AutoPILOT PRO LCS: Cost-Effective, Single-Run Measurement

Built for measurement only, the highly accurate, easy-to-use Thermo Scientific™ AutoPILOT PRO LCS gas flow computer is a cost-effective choice for chart replacement. The LCS model is optimized for simple, single-run measurement and is engineered to provide superior accuracy, ensuring no loss of natural gas. All input/output is pre-configured at the factory, including:

- Two digital outputs to pulse a sampler or odorizer
- Three analog inputs to trend tubing and casing pressures
- Two pulse inputs to measure and trend liquids
- An RS232/485 communications port to communicate with tanks.

In addition to being pre-configured, software wizards make setup quick and easy. Once powered up, full high-speed Ethernet connectivity and superior built-in lightning protection ensure data is captured.

Pre-Wired AutoPILOT PRO XL Unit Simplifies Installation

The Thermo Scientific™ AutoPILOT PRO XL EFM/RTU is an ideal solution for high point-count systems. This comprehensive unit encompasses the same functionality and features as the AutoPILOT PRO EFM/RTU along with the following features and benefits:

- Built-in integrated wire management system simplifies setup
- No third party termination boxes helps reduce costs and facilitate installation
- Up to two safety interface barriers (SIB) can be added to connect up to six Thermo Scientific™ AutoMITTER PRO smart multi-variable transmitters

The XL unit is offered with two options, including a NEMA Type 4 metal enclosure and a case-less version that allows for it to be installed in an existing cabinet or larger enclosure.



Thermo Scientific™ AutoPILOT PRO XL Unit

AutoPILOT PRO Input/Output (I/O) Boards: Built-In and Optional

	Board	Discrete Inputs (DI)	Discrete Outputs (DO)	Pulse Inputs	Analog Inputs (AI)	Analog Outputs (AO)	Communication Ports
Built-In*	Motherboard	2 contact inputs, internal +5 VDC wetting voltage	2 open-drain MOSFETs, externally powered, Rate: +30 VDC max, 250 mA max	2 pulse inputs configurable for slot sensor, magnetic pick-up or dry contact inputs, 10 KHz max	3, 1-5 VDC AI plus one 100 ohm RTD input		1 local RS232 port; 1 selectable RS232/RS485 port
Optional**	Analog Input <i>(up to 4 boards)</i>				4 1-5 VDC AI		
	Serial Expansion <i>(up to 4 boards)</i>						2 ports (both selectable RS232/RS485, synchronous/asynchronous)
	MEB-2-DI/DO <i>(up to 4 boards)</i>	2 contact inputs, internal +5 VDC wetting voltage	2 open-drain MOSFETs, externally powered. Rated: +30 VDC max, 250 mA max				
	MEB-2-Pulse Input <i>(up to 2 boards)</i>			2 pulse inputs configurable for slot sensor, magnetic -up or dry contact inputs, 5 KHz max			
	MEB-2-D/A <i>(up to 2 boards)</i>					2 outputs, 1-5 VDC or 4-20 mA, powered by battery or external +24 VDC	
	MEB-4-DI <i>(up to 4 boards)</i>	4 contact inputs, internal +5VDC wetting voltage					
	MEB-4-DO <i>(up to 4 boards)</i>		4 open-drain MOSFETs, externally powered. Rated: +30 VDC max, 250 mA max				

*Built-In: Standard for LCS & Expandable Models. **Optional: Expandable Models Only

Thermo Scientific AutoPILOT PRO EFM/RTU for Production

General Specifications

Processor	32-bit, 60 MHz MCU
Program Memory	4 MB of flash memory
Data Storage Memory	SRAM, 2 MB, battery-backed
CPU Board Communication Port	1 RS232, 1 RS232/RS485, 1 10Base-T Ethernet port, 1 USB slave port
Input Power	10 VDC to 30 VDC
Output Power	9 VDC/80 mA
Historical Data Storage	User configurable, defaulting to 65 days of daily, 35 days of hourly per meter run
Audit Trails	200 audit events, 60 different types of audits
Alarm Log Storage	200 alarm events, 15 different types of alarms

Environmental Specifications

Operating Temperature	-40°C to +85°C (-40°F to +185°F)
Operating Humidity	0-95% RH, non-condensing
Enclosure Rating	NEMA 4X/IP65
Certifications	CSA/C-US Class I, Div 2, Groups C and D (provides intrinsically safe circuits to AutoMITTER PRO for use in Class I, Div 1, Groups C and D hazardous locations); ambient temperature range of -40°C to +85°C (-40°F to +185°F), temperature code T3C; type 4X enclosure CE – Electromagnetic compatibility (EMC); CE – II 3 G Ex nL nA IIB T4; -40°C to +85°C (-40°F to +185°F); ATEX Zone 2 (Cat 3) FCC Compliant – FCC 47CFR Part 15, Class A; Measurement Canada – AG-0564C

Physical Specifications

Keypad	4 x 4 (16-key) input
Display	4 x 16 character LCD; User programmable scroll list and menus

Natural Gas Calculations

Supercompressibility	(Fpv) AGA 8 Gross-1992; AGA 8 Detail-1992; AGA 8 Short-1988; NX-19; NX-19 Analysis; GERG
Differential Meters	(DP, Orifice) AGA 3/ANSI/API 2530-1992 Method 2; AGA 3/ANSI/API 2530-1985; ISO 5167; Cone meters; Annubar; GOST
Linear Meters	(Turbine) AGA 7; AGA 9; AGA 11
Energy	AGA 5; GPA 2172; ISO 6976
Diagnostic	AGA 10 SoS
Additional Factors/Equations	Fwv (manual, partial or full); Fws
Turbine Meter Linearization	10 Point Frequency/K-factor Table

Liquid Calculations

API Tables	Table A (generalized crude oils); Table B (generalized products); Table C (thermal expansion properties); Old Table (NGL, LPG SG range 0.425 to 0.650); Table 23/24 E (NGL, LPG); VCF (CH 11.1 2004); Propylene (CH 11.3.3.2); Ethylene (API 2565/CH 11.3.2.1); Ethylene (NBS 1045)
Volume Correction Factor (VCF)	Consistent with API 2540/ASTM D1250-80/IP 200; 5/6 A/B; 23/24 A/B; 53/54 A/B; 6/24/54 C; CH 11.1 2004; Note: natural gas liquids (NGL) and liquefied petroleum gases (LPG): OLD 23/24, OLD 53/54; Table E is new standard to replace OLD 23/24.
Correction for Effect of Pressure on Liquid	Ch 11.2.1/Ch 11.2.2; Ch 11.2.1M/Ch 11.2.2M (compressibility factors for hydrocarbons), equilibrium pressure
Propylene Density	API Ch 11.3.3.2
Ethylene Density	API 2565 (Ch 11.3.2.1); Ethylene NBS 1045
Live Density Input	Thermo Scientific Sarasota liquid density meter, Solartron, UGC, 4-20 mA

For more information, visit our website at thermoscientific.com

© 2014 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details. This product is manufactured in a plant whose quality management system is ISO 9001 certified.

USA
1410 Gillingham Lane
Sugarland, TX 77478
Ph: (800) 437-7979
Fax: (713) 272-4573
support.process.us@thermofisher.com

Europe
Ion Path, Road Three,
Winsford, Cheshire CW73GA UK
Ph: +44 1606 548700
Fax: +44 1606 548701
sales.pid.winsford@thermofisher.com

China
+Units 702-715, 7th Floor
Tower West, Yonghe
Beijing, China 100007
+86 10 84193588
info.eid.china@thermofisher.com

India
C/327, TTC Industrial Area
MIDC Pawane
New Mumbai 400 705, India
Ph: +91 22 4157 8800
india@thermofisher.com

Thermo
SCIENTIFIC

A Thermo Fisher Scientific Brand