

The next-generation Thermo Scientific AutoPILOT PRO is built on an innovative, field-proven technology platform. This accurate, easy-to-use EFM/RTU features high speed data connectivity and is scalable from one to six runs, enabling expansion of a single platform to reduce capital expenditures and heighten productivity.

## Thermo Scientific AutoPILOT PRO

Six-Run Gas Flow Computer and Remote Telemetry Unit



### Scalable and Versatile

Easily expandable with no upgrades required, the next-generation Thermo Scientific AutoPILOT PRO gas flow computer is designed to scale from a single run measurement application to six runs with full station control. Simply add input/output (I/O) as needed to build the system to meet changing measurement and control requirements. With fewer instruments to monitor and maintain, staff consolidation and a reduction in spare parts inventory enable greater cost control.

### Accurate and Powerful

Quantifying product with greater specificity during custody transfer ensures profits stay where they belong. The API 21.1 compliant AutoPILOT® PRO 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 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 is simple to configure and requires no programming. As soon as the system is powered up, it automatically measures flow, alarms, I/O and more, enabling your staff to focus on increasing production and profits.

### 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.

### Applications

- Production
- Transmission
- Processing
- Custody transfer





### System Features

- Expands from a simple, single run application to six-runs with full measurement and control
- Per second flow calculation on up to six meter runs simultaneously
- Full USB support and high speed Ethernet connectivity
- Built-in, self-tuning plunger lift algorithms
- Easy to install, configure and use
- Interfaces with multiple input devices:
  - Differential signal devices: orifice, stacked orifice, V-cone and Verabar
  - Linear signal devices: turbine, auto-adjust turbine and ultrasonic
- Superior lightning protection built into each board
- Processor operates at the widest temperature range in the industry: -40°C to +85°C (-40°F to +185°F)
- Available in fiberglass or stainless steel

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

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

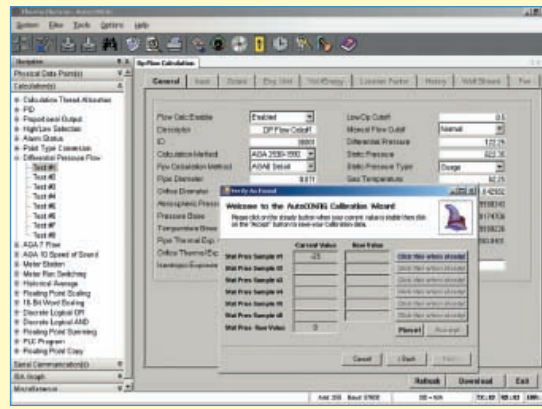
**AutoCONFIG™ Software Facilitates Setup**

Thermo Scientific AutoCONFIG software for Microsoft® Windows® provides ease-of-use for the integrator or operator. A graphical user interface and built-in wizards enable inexperienced technicians to setup Thermo Scientific flow computers in minutes. Additional benefits include:

- Complete integrated support for all Thermo Scientific flow computers
- Multiple, simultaneous views
- User-configurable Microsoft® Outlook™-like tree view
- Remote communications via serial, TCP, radio, satellite, etc.
- High-contrast monochrome mode for use in direct sunlight.

**Expedite Data Downloads with AutoSCAN®**

Move data rapidly from the most remote field location to your local network with the Thermo Scientific AutoSCAN host system. It enables the AutoPILOT PRO to communicate directly with any SCADA system that uses MODBUS or native protocol to facilitate data downloads. Consisting of Poller, Viewer, Vox and Export, the system consolidates data to simplify management of measurement applications and can easily be configured to automatically save, print and/or email reports in a variety of formats. With the ability to optimize displays, reports, exports and scan parameters, the system enables users to efficiently manage electronic flow measurement.

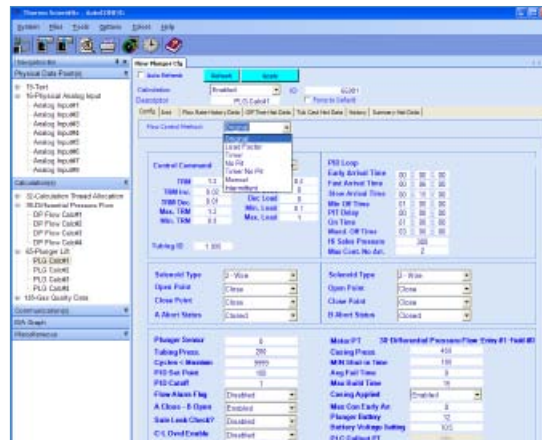


**AutoMITTER PRO — Smart Multi-Variable Transmitter**

Achieve effective, cost-efficient data transmission to your AutoPILOT PRO by integrating a Thermo Scientific AutoMITTER PRO smart multi-variable transmitter on each meter run. This next-generation transmitter integrates seamlessly into the AutoPILOT PRO's motherboard, eliminating an external card. It uses an RS-485 signal to rapidly communicate static pressure, differential pressure and temperature and can be connected directly to the AutoPILOT PRO without using any valuable analog inputs. This user-friendly device enables capital expenditure reduction, provides highly accurate, repeatable measurements to increase process efficiency, and has very low power requirements to keep operating costs down. It also mounts remotely and is compact and lightweight, making installation fast and easy.

**Plunger Lift — Well Optimization Software**

Maximizing well production is the key to maximizing profits. AutoPILOT PRO 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 AutoPILOT PRO

### 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	65 days of daily, 35 days of hourly
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

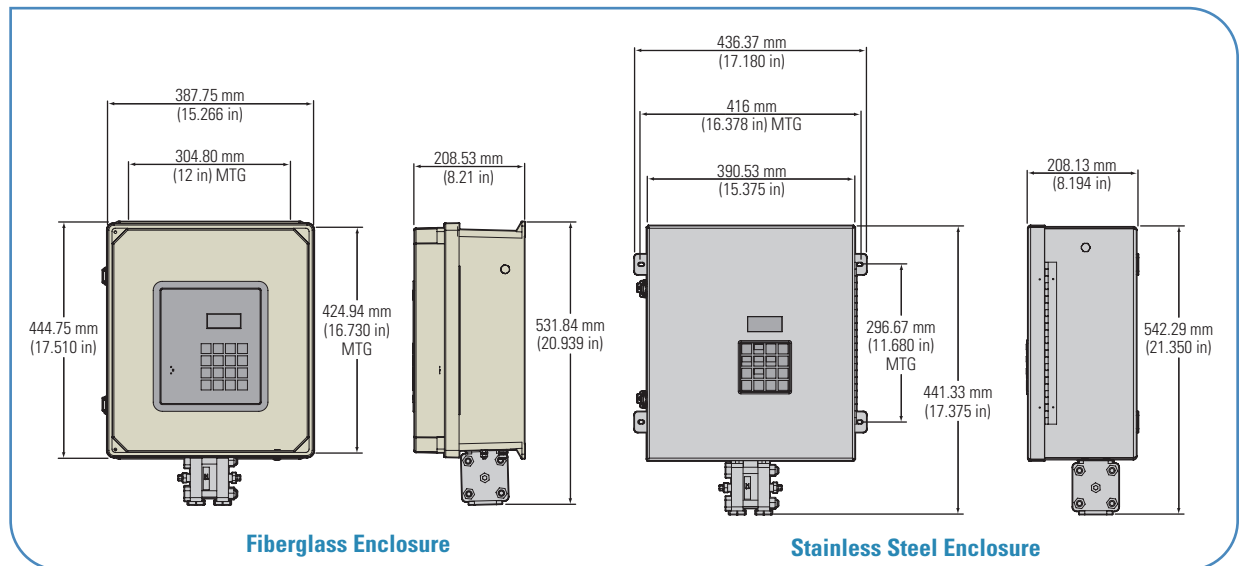
### Physical Specifications

Keypad	4 x 4 (16-key) input
Display	4 x 16 character LCD

### 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
Energy	AGA 5
Diagnostic	AGA 10 SoS
Additional Factors/Equations	Fww (manual, partial or full); Fws
Turbine Meter Linearization	10 Point Frequency/K-factor Table

### AutoPILOT PRO Dimensional Diagram



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