

SOLARPack 410

Solar-Powered Single Run Flow Computer

Features:

- Accurate gas measurement
- API 21.1, BLM#5, EUB#17
- Single Seal Compliance Certification under ANSI/ISA – 12.27.01 *
- Low power consumption
- Configurable power management
- Local *Bluetooth*® wireless communications
- Integrated SCADAWave Ultra and FreeWave, or 3rd-party radio options
- 3 year warranty (parts and labor)

Say goodbye to obsolete chart recorder technology and bulky multi-component flow computers with the SOLARPack 410 solar-powered single run flow computer, an evolution in gas measurement technology. Designed for use in remote locations where solar is the only power and technician access is less than ideal, the SOLARPack 410 incorporates a dedicated single run flow computer, solar/battery power supply and communication system within an all-in-one, compact, easy-to-install package.

Single Run Flow Computer

Using the same powerful 32-bit ARM-7 processor that is found in the SCADAPack 300 series controllers, the SOLARPack 410 provides fast, dedicated gas measurement calculations according to API 21.1.

Sensor readings are taken each second, allowing the user to measure any anomalies that may have occurred such as compressor pulsations on the flow line or plunger movement within a well.

Configuration of the product's single flow run is accomplished using the RealFLO™ software application. Since the flow computer is incorporated in the product, the need for costly programming tools and integration effort is reduced or eliminated.

With integrated Bluetooth wireless technology the 410 becomes the ultimate in walk-up SCADA, and when used in conjunction with a spread spectrum radio

and ClearSCADA's custom EFM object the SOLARPack 410 becomes a complete electronic flow measurement system.

Chart Recorder Replacement

Gone are the days of low-accuracy, high-maintenance analog pen recorders, whose data charts need collection and replacement on a regular basis. The SOLARPack 410 offers a cost-effective solution for natural gas producers and gatherers to replace their chart recorders.

The product boasts a number of important advantages over traditional chart recorders, including:

- Paperless data recording. No more pens and charts!
- Increased accuracy through the use of high precision pressure and temperature sensors and more frequent sensor readings.
- Less frequent trips to the site.

Walk-up and Wireless SCADA

With the SOLARPack 410, retrieval of accurate and accountable flow measurement data is as easy as one, two, three:

1. Drive or walk up to the site,
2. Connect through a local *Bluetooth* connection,
3. Upload all events, alarms and accumulated flow readings to a laptop computer.



At sites with minimal access, SCADA hosts such as ClearSCADA and RealFLO can make use of an optional integrated 900MHz spread-spectrum or other third-party radio. Now part of a network, the SOLARPack 410 becomes an integral part of a complete EFM SCADA system.

Power Saving

Keeping power consumption to a minimum is critical for solar-powered installations. With low power draw, configurable power management and intelligent battery-charging features, the SOLARPack 410 delivers full sensor and flow computer operation, and managed communications, even in the most demanding of environments.

Innovative All-In-One Design

Leveraging years of experience in the design of compact RTUs and flow computers, Control Microsystems has incorporated many innovative features within the product's single enclosure, including a digital backlit LCD, integrated spread-spectrum radio and Bluetooth wireless technology enabled interface.

* With maximum working pressures up to 21MPa (3000PSI). External sensor version only.



The corrosion resistant aluminum enclosure is rated Type 3RX and can be installed on a standard 2" pipe. It can also be mounted on a wall, installed with optional Unistrut hardware or supported on the pipeline infrastructure by the sensor itself. For added flexibility, the pressure sensor can be mounted directly on the bottom of the enclosure or remotely, at a distance from the enclosure.

Accurate Sensor

The stainless steel/silicone fluid pressure sensor is highly accurate: $\pm 0.05\%$ of Span for Spans $\geq 10\%$ of URL, and stable: Long-Term Drift less than $\pm 0.05\%$ of URL per year over a 5-year period. It's available in a low-profile process connection configuration and supports a wide range of differential and absolute pressures.

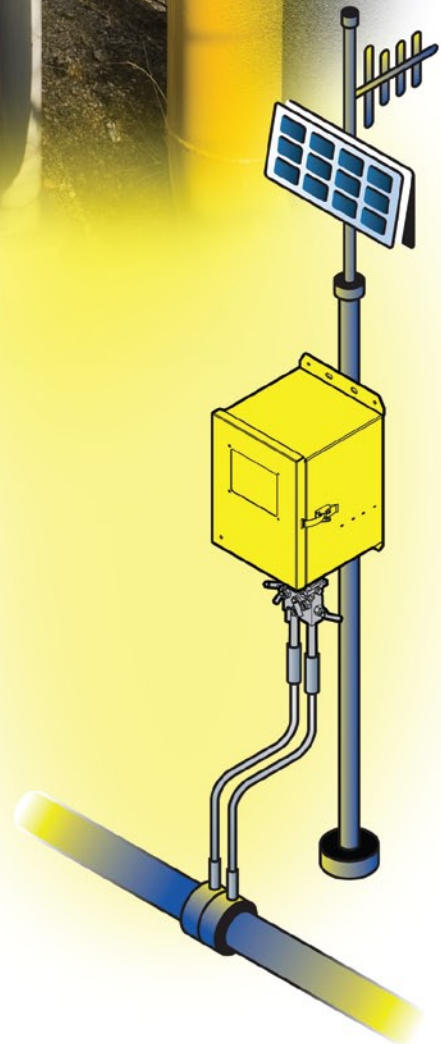
Flexibility

For installations where gas flow calculations are not enough, the SOLARPack 410 provides extra I/O: a turbine input that accumulates flow such as water condensate production, and a flow-proportional digital output that can trigger a third-party gas sampler.

The product is rated for use in Class I, Division 2 Groups A, B, C and D Hazardous Locations and has cCSAus approval.

A wide range of option packages makes the SOLARPack 410 a flexible choice for EFM installations:

- Integrated or remote sensor
- Variety of batteries
- Selection of solar panels
- Variety of optional radios
- Turbine flow meter input
- Gas sampler trigger output



Specifications

Functional	
Flow Calculations	AGA-3 1992/2000 orifice plate and V-Cone
Density Calculations	AGA-8, 1992 (detailed) and NX-19
Event/Alarm/History Logs	35 days hourly history, 35 days daily history, 700 events and 300 alarms API 21.1, BLM Onshore Order #5 and EUB Directive 17
Features	
Configuration Interface	RealFLO 6.40 and newer
Protocols	COM2 and COM3: Modbus RTU/ASCII
Temperature Measurement	Terminations for one: RTD input, 100 ohm platinum 0.385 ohms/°C, 3 and 4 wire, auto detection and compensation. RTD accuracy: ±0.14°C (±0.25°F) This does not include RTD uncertainties, which are additive.
Counter Input	One: Turbine Meter, jumper-selectable for use with turbine meter amplifiers or dry contact closure
Gas Sampler Output	One: selectable as sourcing or sinking Configurable Pulse Width, 0.1s to 5.0s in 0.1s increments
Communication Ports	Com 1: Direct to internal sensor or RS-485, 2-wire, half duplex to external sensor Com 2: Defaults to optional internal spread spectrum radio until external device is detected on the RJ-45 modular jack and the jack is enabled for RS-232 Com 3: Integrated <i>Bluetooth</i> wireless technology
Bluetooth Communication	General: Radio modem compatible with <i>Bluetooth</i> wireless technology enabled products. Frequency hopping, spread-spectrum. Encryption, PIN identification and Error Correction. Frequency: 2.402 to 2.48 GHz. Distance: <i>Bluetooth</i> Class 1. Up to 100m (330 ft.) (when communicating with another Class 1 device) Antenna: Integrated chip antenna
Radio	Optional SCADAWave Ultra KR30 900 MHz Spread Spectrum, FreeWave FGR09CSU 900MHz spread-Spectrum or third-party radio connected to Com2
Processors	One: 32-bit ARM microcontroller, 32MHz clock, integrated watchdog timer Two: microcontroller co-processors
Memory	4MBytes CMOS RAM, non-volatile, lithium battery retains contents for 2 years with no power 16MBytes Flash ROM, 1kBytes EEPROM
Battery Charger	Solar Panel Power: 32W max. Shunt regulation, temperature compensated. Battery type: DIP switch-selectable for Cyclon Pure Lead or VRLA, [Valve Regulated Lead Acid]. VRLA types include: Gelled Electrolyte [Gel] or Absorbed Glass Mat [AGM] Charge voltage: DIP switch-selectable for 14.4V or 13.8V (VRLA only) Float voltage: DIP switch-selectable for 13.8V or 13.5V (VRLA only)
Display	Backlit LCD, 2 lines X 20 characters, indication of flow data, charging states (Battery test, Charge and Float)
LEDs	Tx (Com2), Rx (Com2), Run, Status, Force
Enable Input	Non-contacting wake-up switch, power management
Sensor Performance	
Accuracy	Differential pressure ranges 200 to 840 inH2O ±0.05% of Span for Spans ≥10% of URL Differential pressure range 30 inH2O ±0.10% of Span for Spans ≥10% of URL Absolute pressure ranges 30 inH2O ±0.05% of Span for Spans ≥10% of URL
Stability	Long-Term Drift less than ±0.05% of URL per year over a 5-year period
Ambient Temperature Effect:	Total effect for a 28°C (50°F) change within Normal Operating Condition Limits is ±(0.03% URL + 0.06% Reading); Differential pressure for 30 inH2O is ± (0.18% URL + 0.025% Reading). For Absolute pressures in 3000psi range the effect is ± (0.02% URL +0.06% Reading). For Absolute pressures in 5300 psi range effect is ± (0.15% URL +0.06% Reading).

Specifications

Power

System Voltage	13.5V nominal
Under Voltage Lockout	System Off: 10.0V (typical) System On: 11.5V (typical)
Power Consumption	108mW with Integrated sensor interface, gas flow calculations, display for 15 minutes per week and Bluetooth communications for 7.5 minutes per week 130mW with external sensor version, as above Add 80mW with optional integrated SCADAWave KR30 radio receiving 90 minutes per day Add 1.35W with optional integrated SCADAWave KR30 radio receiving 100% of the time Add 9mW with optional integrated SCADAWave KR30 radio transmitting 10 minutes per day Add 3mW with Gas Sampler with one 2A pulse, 0.1seconds duration, and 15 minute period
Power Management	User-configurable for Continuous Wake mode, Enable Input Activation and Scheduled Wake mode

General

I/O Terminations	Screw terminations, 12 to 24 AWG, 20A contacts
Dimensions Internal Sensor Version	10.94 inch [278 mm] wide, 18.62 inch [473 mm] high, 10.55 inch [268 mm] deep All dimensions include mounting tabs, latches and low profile sensor.
Dimensions External Sensor Version	10.94 inch [278 mm] wide, 15.88 inch [403 mm] high, 10.55 inch [268 mm] deep All dimensions include mounting tabs and latches.
Mounting	2 in. pipe, wall, Unistrut, sensor mounting (internal sensor version only)
Packaging	Type 3RX, aluminum with powder coat paint
Environment	SOLARPack 410 (not including the display and battery) 5% RH to 95% RH, non-condensing, -40°C to 55°C [-40°F to 131°F] Display: -20°C to 55°C [-4°F to 131°F]
Warranty	<ul style="list-style-type: none"> • SOLARPack 410 (including sensor): 3 years (parts and labor) • Battery and Solar Panel: Refer to original manufacturer's warranty

Approvals and Certifications

Safety	<ul style="list-style-type: none"> • Electrical Equipment for Use in Class I, Division 2 Groups A, B, C and D Hazardous Locations • cCSAus • Single Seal Compliance Certification under ANSI/ISA – 12.27.01, with maximum working pressures up to 21MPa (3000PSI). External sensor version only. (Internal sensor version meets all requirements; certification is pending.)
Digital Emissions	FCC 47 CFR Part 15, Subpart B, Class A Verification EN61000-6-4: 2001 Electromagnetic Compatibility Generic Emission Standard Part 6-4: Industrial Environment.
Immunity	EN61000-6-2: 2001 Electromagnetic Compatibility Generic Standards Part 6-2: Immunity for Industrial Environments
Declaration	This product conforms to the above Emissions and Immunity Standards and therefore conforms with the requirements of Council Directive 89/336/EEC (as amended) relating to electromagnetic compatibility and is eligible to bear the CE mark. The Low Voltage Directive is not applicable to this product.

Model Code

S410-1Y00-1100 represents a sample code

Model	SOLARPack 410			
S410	SOLARPack 410, Solar-powered Single run flow computer			
Code	Select: Sensor			
0	Internal sensor			
1	External sensor			
Code	Select: Differential & Absolute Pressure Span Limit			
	Differential Pressure Low Profile Sensor		Absolute Pressure (Field Configurable for Gauge)	
U	0.5 to 30 inH2O	(0.12 to 7.5 kPa)	1 to 100 psi	(0.007 to 0.7 MPa)
V	2 to 200 inH2O	(0.50 to 50 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
W	10 to 840 inH2O	(2.5 to 210 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
X	2 to 200 inH2O	(0.50 to 50 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
Z	3 to 300 inH2O	(0.75 to 75 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
Y	10 to 840 inH2O	(2.5 to 210 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
M	2 to 200 inH2O	(0.50 to 50 kPa)	30 to 3000 psi	(0.21 to 21 MPa)
P	3 to 300 inH2O	(0.75 to 75 kPa)	30 to 3000 psi	(0.21 to 21 MPa)
R	10 to 840 inH2O	(2.5 to 210 kPa)	30 to 3000 psi	(0.21 to 21 MPa)
Q	2 to 200 inH2O	(0.50 to 50 kPa)	30 to 5300 psi	(0.21 to 36.5 MPa)
S	3 to 300 inH2O	(0.75 to 75 kPa)	30 to 5300 psi	(0.21 to 36.5 MPa)
T	10 to 840 inH2O	(2.5 to 210 kPa)	30 to 5300 psi	(0.21 to 36.5 MPa)
Code	Select: Integrated Radio with Lightning Protection			
0	None (RS232 serial connection provided for user-supplied radio)			
1	FreeWave FGR-Series Spread Spectrum Wireless Radio			
2	MDS TransNET 900™ 902-928 MHz Integrated Transceiver			
3	MaxStream XTend™ 900 MHz Integrated OEM RF Module			
B	SCADAWave KR30 integrated Spread Spectrum Radio with encryption, 902-928MHz (FCC / IC)			
C	SCADAWave KR30 integrated Spread Spectrum Radio with encryption, 915-928MHz (AUS)			
D	SCADAWave KR30 Integrated Spread Spectrum Radio, 915-928MHz (BRAZIL)			
E	SCADAWave KR30 Integrated Spread Spectrum Radio, 921-928MHz (NZ)			
Code	Reserved			
0	None			
1	Future variants			
Code	Select: RTD			
1	6 foot armored RTD probe (universal depth)			
2	10 foot armored RTD probe (universal depth)			
3	RTD Temp. Sensor c/w: Ex-proof Termination Head (use with conduit), 1.25" U Length Thermowell with 3/4" NPT			
4	RTD Temp. Sensor c/w: Ex-proof Termination Head (use with conduit), 2.5" U Length Thermowell with 3/4" NPT			
Code	Select: Battery			
1	18 Amp-Hour, absorbent glass matt (AGM) included			
2	28 Amp-Hour, absorbent glass matt (AGM) upgrade			
3	35 Amp-Hour, absorbent glass matt (AGM) upgrade			
Code	Select: Solar Panel			
0	None			
1	5-watt with universal mounting bracket and 15ft. (4.57m) cable			
2	10-watt with universal mounting bracket and 15ft. (4.57m) cable			
3	20-watt with adjustable pole-mounting bracket and 15ft. (4.57m) cable			
4	30-watt with adjustable pole-mounting bracket and 15ft. (4.57m) cable			
Code	Reserved			
0	None			
1	Future variants			

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