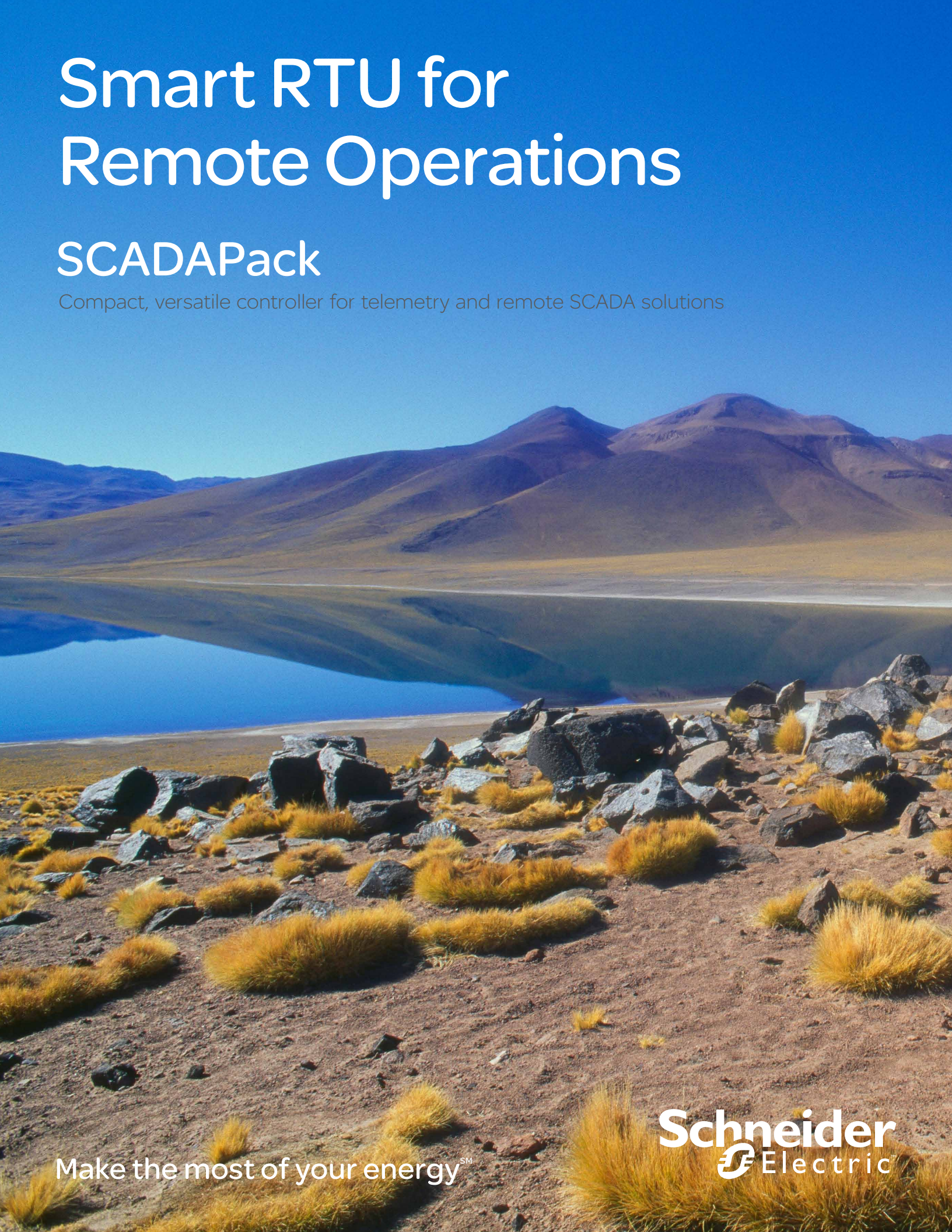
Smart RTU for Remote Operations

SCADAPack

Compact, versatile controller for telemetry and remote SCADA solutions



Make the most of your energy℠

Schneider Electric

Smart RTU for Challenging Applications

A SCADA system requires reliable data collection, monitoring, and control. However, this is difficult when your assets are remotely dispersed and multiple communications paths are used. The result is that the operator worries about data accuracy, if the data can be retrieved after communications loss, and vulnerability to cyber attack. To make matter worse, these systems also have:

High cost of engineering and operations

It's a fact. SCADA systems tend to expand. The engineering and equipment costs of this expansion are obvious. However, the cost of maintaining these systems is more difficult to determine, especially when the asset is remote and you factor in variable fuel costs. Finding a remote terminal unit (RTU) with very few maintenance requirements is critical.

Operating in challenging environments

RTUs are typically situated in hard-to-access remote locations; subject to extremes in weather conditions and harsh industrial environments.

With energy costs on the rise, alternate sources such as solar power are being increasingly exploited. Solar power requires minimal processing power, 12 VDC I/O, and optimal communications. Traditional PLC/PAC controllers are not designed for this. But, our Smart RTU was created just for this environment.

Increased pressure from security threats and regulatory requirements

As a result of several high-profile cyber-attacks and environmental disasters, public and governmental awareness is at its highest level. The result is a dynamic environment of regulatory evolution. Waiting for this to settle can be costly and leave you vulnerable. Why wait? We can provide data encryption and secure authentication of critical commands today. You will know that your data is protected and that commands come from valid sources.

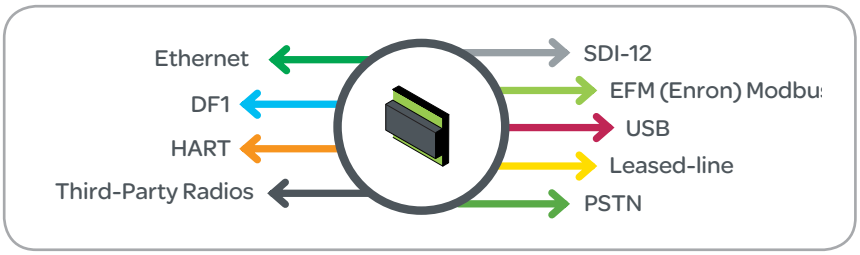
SCADAPack Smart RTUs combine the monitoring and communications capabilities of remote terminal units (RTU) with the processing power of programmable controllers (PLC/PAC), providing superior functionality wherever remote processes require automatic supervision and autonomous control.

Optimize your resources.

The product line is designed for use in environments with extreme temperatures and humidity, integrates easily with various field devices and networks, and operates under low or restricted power conditions.

SCADAPack Smart RTUs offer an array of flexible connectivity and programming features that reduce design and implementation time:

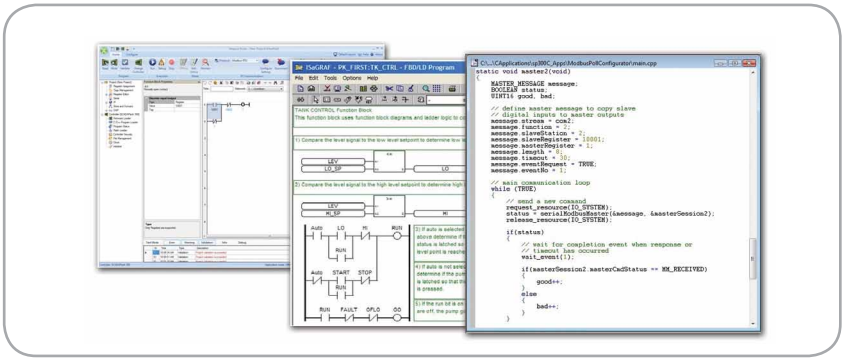
- Wide range of connectivity options: Easily retrofit into legacy systems, or expand current systems.
- Integrated Trio data radios: Extend operational range without affecting control panel footprint.
- Open protocols: Interface to many third-party SCADA infrastructure.
- Flexible programming options: Easily use various multi-language tools.



Flexible connectivity options

Built-in radio

Open communication protocols



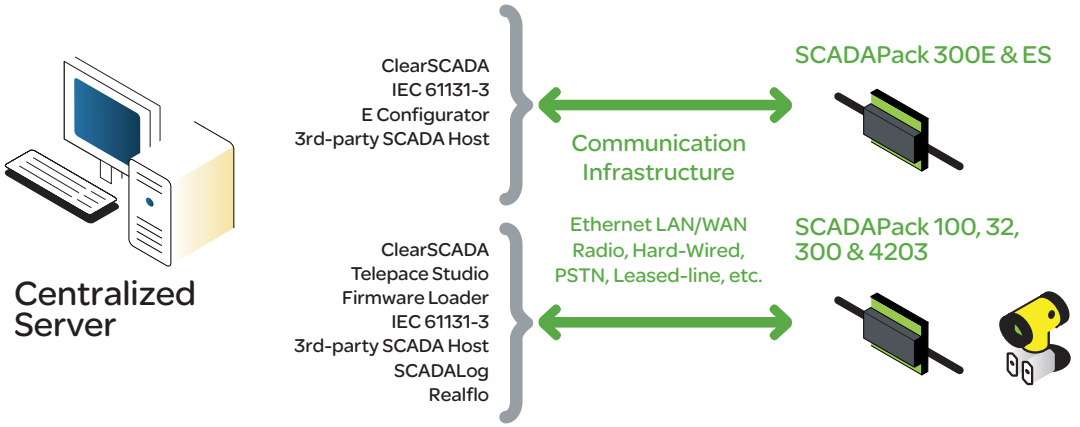
A choice of C, ladder, or IEC 61131 programming environments

Control costs of operation and maintenance.

SCADAPack Smart RTUs offer a standard feature set that allows you to exploit alternate energy sources, increase system efficiency, and reduce the frequency of costly on-site visits.

SCADAPack Smart RTUs help to reduce total cost of deployment with:

- Gas flow metering (O&G) or pump control (W&WW) combined with data logging, PLC control, and RTU communication in one device
- An integrated data-logger with enhanced capabilities that lowers cost
- Remote configuration and diagnostics features executing system deployment and maintenance tasks from a centralized location over existing communication infrastructure
- Low-power models which can achieve significant cost savings due to the smaller solar panel/battery size required to power the unit



Configure remotely from central location

Smart RTU and sensor in one package

Help to enhance security and reliability of data from field to control room.

SCADAPack Smart RTUs provide tools which help to ensure that remote communication links are not compromised by malicious intent or interference from other communication networks:

- Encryption for DNP3 protocol (AGA12) and DNP3 secure authentication help to mitigate effects of interference with data monitoring and control commands.
- Time-stamped event logging provides audit trail of operational data changes and other key data reliability indicators.

Oil & Gas

SCADAPack Smart RTUs are the foundation for a range of solutions offering specific software and configuration tools to enhance performance in oil and gas and water/wastewater applications.

Digital Oil Field Solutions

Electronic Flow Measurement

Schneider Electric offers a flexible electronic flow measurement (EFM) solution that tightly integrates Smart RTU, multi-variable sensor and gas flow computer algorithm, and configuration GUI.

With the Realflo gas flow measurement software, SCADAPack Smart RTUs can become a fully functional gas flow computer with up to 10 gas flow runs available on select models. EFM functionality works concurrently with the Smart RTU's logic code for maximum flexibility.

The SCADAPack 4203 combines a modbus multivariable sensor with a Smart RTU to function as a highly integrated gas flow computer. A second flow run may be accessed with the addition of a 4102 modbus multivariable sensor.

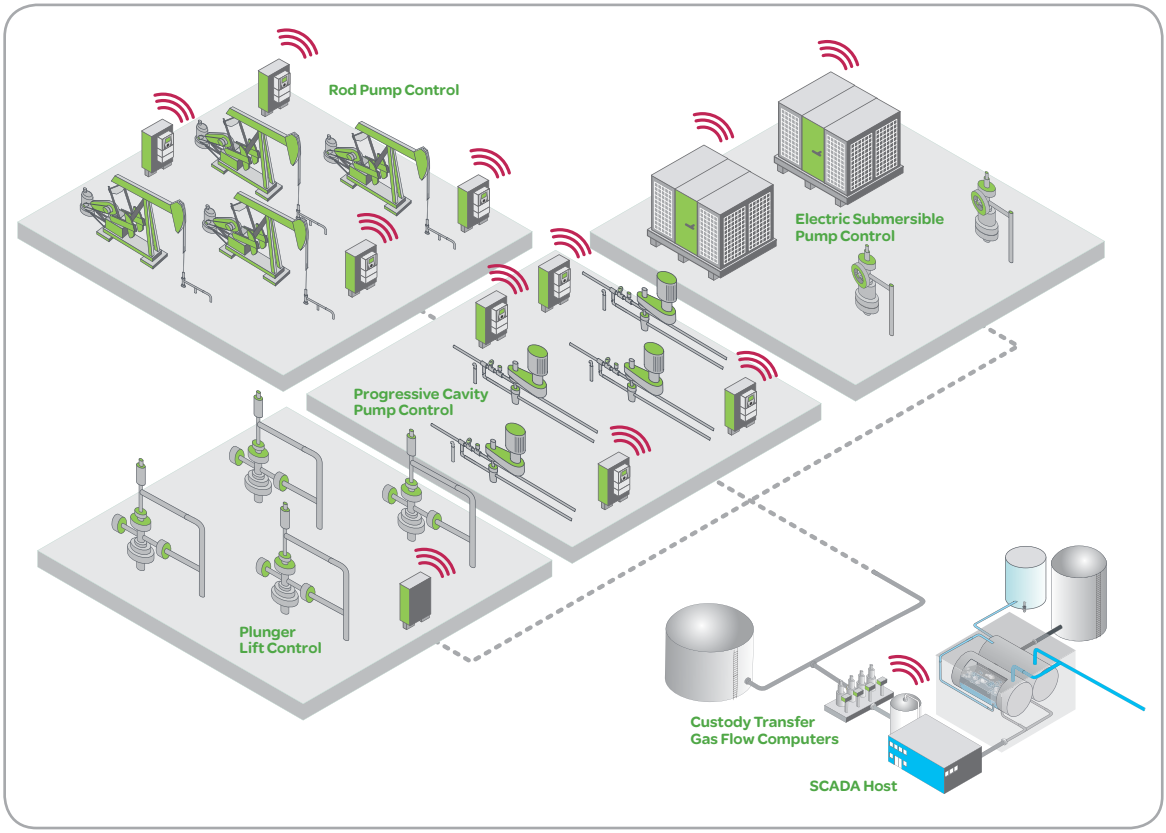
The SolarPack 410 is a cost-effective, out-of-the-box, single-run flow computer designed for use in installations where solar is the only power source and operator access is difficult.

Well Production Optimization

While electronic flow measurement is critical, so is well pad optimization. Our partners have developed, tested, and installed solutions for a variety of applications. These include solutions for gas well, liquid well, production pad, tank farms, and others. Whether you are looking for plunger lift or truck ticketing, your Schneider Electric™ representative can put you in contact with the correct partner for your situation.

SCADAPacks offer Class I, Division 2 hazardous area rating and include (EFM) with a three-year warranty.

Realflo is compliant with API21.1 custody transfer and AGA3, AGA7, AGA8, NX 19 gas flow calculation standards.



Water/Wastewater

Expanded Solutions for Water/Wastewater

Optimized for Remote Pumping Networks

SCADAPack E Smart RTUs offer the same features and benefits as the SCADAPack Smart RTU, with the added capabilities of DNP3 and IEC 60870-5. They have an embedded historian allowing time-stamped event logging and data sampling for extended periods of time.

IEC60870-5 and distributed network protocol (DNP3) provide flexible communications between devices.

Our DNP3 and IEC60870-5 implementations use on-board time stamping for all events. These events are retained until a successful communication has occurred. Therefore, a proper sequence of events can be recovered after a communications loss. The storage of data allows for bandwidth optimization with no loss of data.

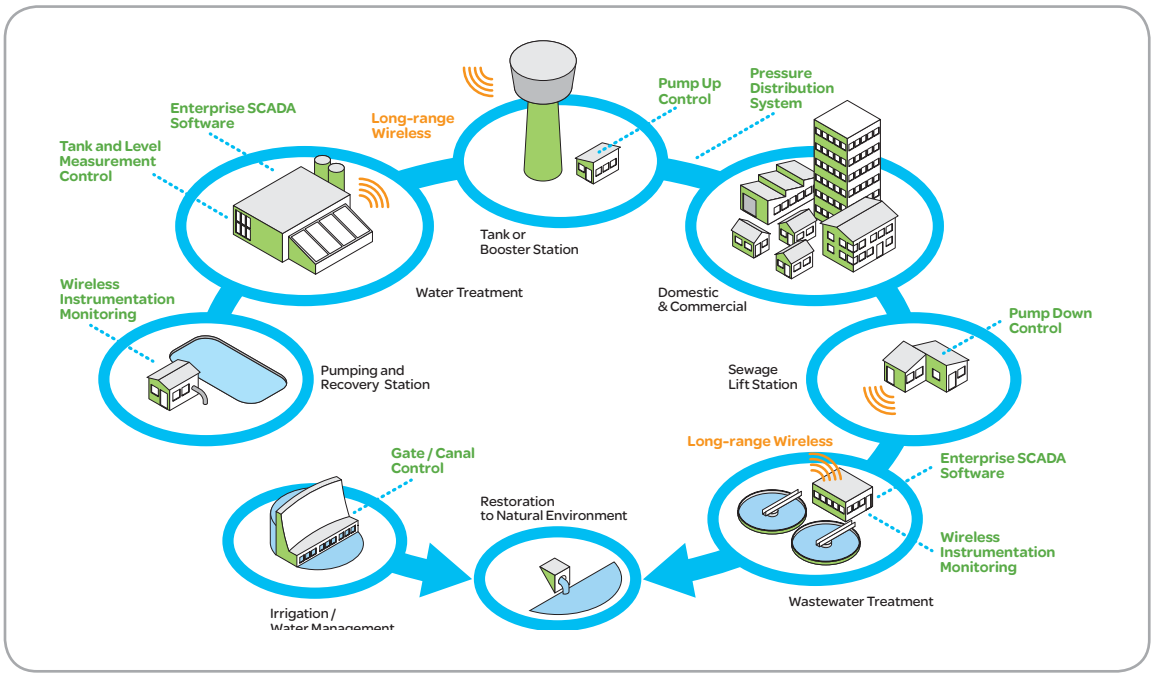
With advanced features such as peer-to-peer communication, remote diagnostics, point object alarm handling, time profiles, and point quality reporting, SCADAPack E Smart RTUs are ideally suited for a wide range of demanding water and wastewater applications such as pumping station active overflow mitigation, energy optimization, and asset management. When used with ClearSCADA infrastructure remote management software, centralized SCADAPack E configuration and management integration can provide significant savings in total cost of ownership for geographically distributed water and wastewater assets.

Furthermore, DNP3 may be fitted with options that help increase remote communication security. The encryption option (AGA12) helps to protect DNP3 data transmission, using unique encryption keys, and to provide data confidentiality and integrity for revenue metering data and other operations.

The secure authentication option helps to add further security to data transfer with automatic challenges by the SCADAPack E RTU to incoming control commands, requiring additional DNP3 master identification information before processing the command.

Lift Station Control

FlowStation is a complete pump station controller ideal for use in storm and wastewater lift stations and pump-up applications. This economical, convenient control solution manages power usage and related costs while minimizing energy consumption during peak-demand periods. FlowStation supports custom functionality, allowing for the creation of simple or feature-rich web pages viewable from a local touch screen, BlackBerry®, or other remote web browser.



Oil & Gas Applications

SCADAPack 100, 300, and 32

- Modbus core database, DNP3 level 2 layer, optional DF1 support
- Programming and configuration: TelePACE Studio, IEC61131-3, C/C++
- O&G-focused apps: Realflo and Well Optimization

	314	330	334	350	357	32P	32 P4	32 P4A	32 P4B	100
Analog Inputs[1]										
0 – 20 mA /4 – 20 mA / 0 5 V / 1 – 5 V/0 – 10 V	8	–	8	5	8	–	–	–	8	–
0 – 20 mA /4 – 20 mA or 0 – 5 / 1 – 5 / 0 – 10 V	–	–	–	–	5	–	–	8	–	–
0 – 20 / 4 – 20 mA or 0 – 5/1 – 5V	–	–	–	–	–	–	8	–	–	–
0 – 20/4 – 20 mA / 0 – 5 / 1 – 5 V	–	–	–	–	–	–	–	–	–	3
0 – 32.7 VDC	–	–	–	1	1	–	–	–	–	1
Analog Outputs[1] (0 – 20 mA /4 – 20 mA)										
Optional	2	–	2	2	2 or 4	–	2	2	2	–
Digital Inputs[1]										
12 / 24 V, 48 V, 115 / 125 /240 V	16	–	16	–	32	–	–	–	32	–
12 / 24 / 120 / 220 V	–	–	–	–	–	–	16	–	–	–
24 VAC / 30 VDC, shared with counter inputs	–	–	–	–	–	3	3	3	3	–
30 V interrupt	–	–	–	–	–	1	1	1	1	–
Dry contact, shared with output points	–	–	–	8	8	–	–	32	–	–
Selectable as input or output	–	–	–	–	–	–	–	–	–	6
Digital Outputs[1]										
Dry contact	–	–	–	–	16	–	12	–	16	–
Dry contact or solid state	10	–	10	–	–	–	–	–	–	–
Dry contact shared with inputs	–	–	–	–	–	–	–	32	–	–
Open drain, shared with input points	–	–	–	8	8	–	–	–	–	–
Controller status output	–	–	–	–	–	1	1	1	1	–
Selectable as input or output	–	–	–	–	–	–	–	–	–	6
Counter Inputs[1]										
0 – 10 Hz / 0 – 5kHz (dry contact)			1			–	–	–	–	–
0 – 6 kHz (turbine or dry contact inputs)	–	–	–	–	–	–	–	–	–	1
0 – 10 kHz (turbine or dry contact inputs)			2			–	–	–	–	–
0 – 500 Hz, interrupt input	–	–	–	–	–			1		–
0 – 5k Hz, shared with digital inputs	–	–	–	–	–			3		–
Communication and Configuration Ports										
Serial port – RS232	–	1		1	–	–	–	–	–	–
Serial port – RS485	–	–	–	1	–	–	–	–	–	–
Serial port – RS232/ 485		2		1	–	–	–	–	–	–
USB ports – (peripheral, host)	(1,0)	(1,1)			–	–	–	–	–	–
Ethernet – (10BaseT, 10 / 100BaseT)			(0,1)					(1,0)		–
Applications										
EFM flow runs			4					10		1
Programming Software										
TP Studio (Ladder), Workbench (IEC-61131-3)					Yes					
C language					C/C++					C
Protocols										
Master/Slave: Modbus RTU, Modbus ASCII					Yes					
Master/Slave: Modbus/ TCP, Modbus UDP					Yes					–

(1) The amount of I/O may be expanded for any SCADAPack using expansion I/O modules (refer to individual product data sheets for detailed specifications)

Water Applications

SCADAPack 300E & SCADAPack ES

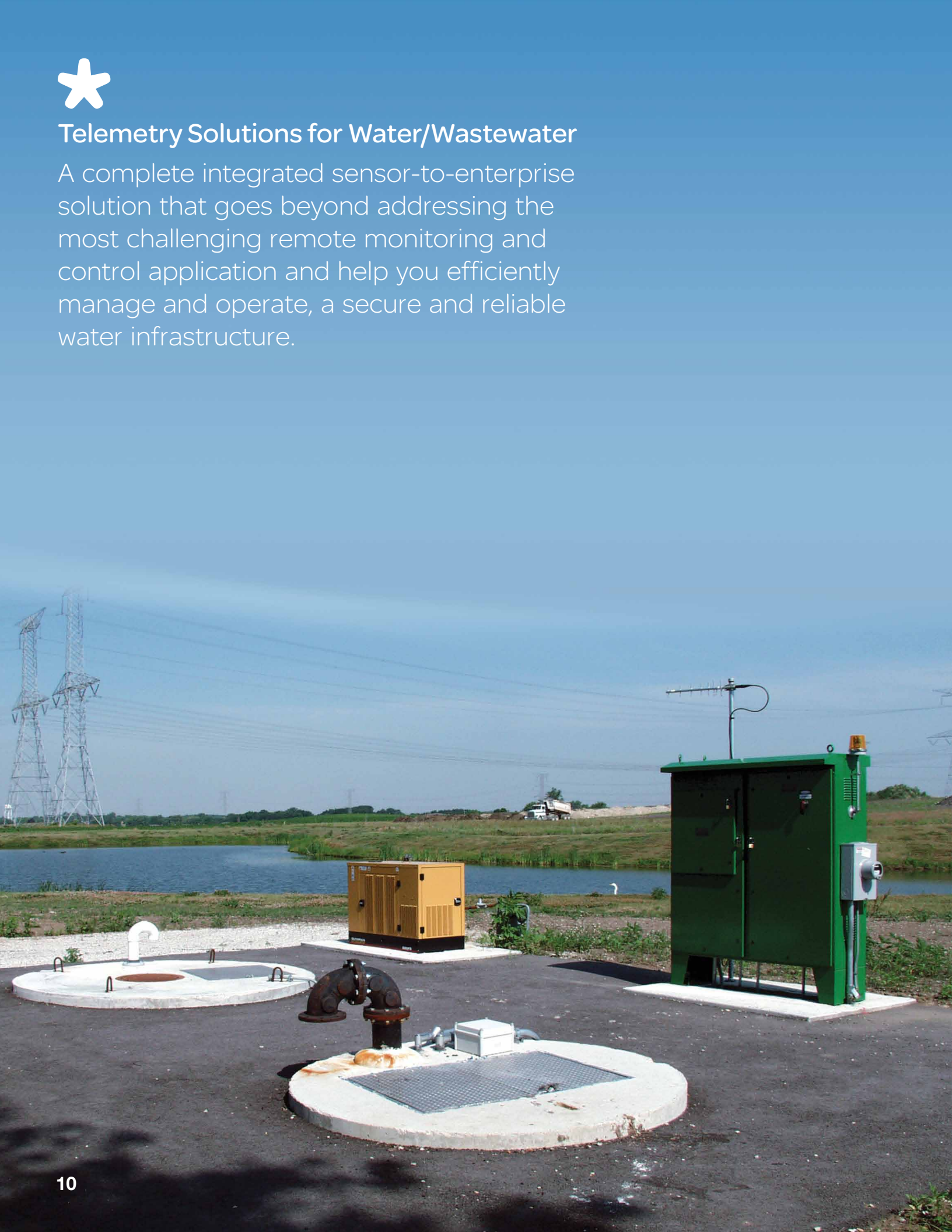
- For SCADA fitted with IEC 60870-5-101/104, DNP3, or modbus protocols
- Master protocols supported: DNP3, modbus, IEC 60870-5-103 or DF1
- IEC61131-3 programming languages
- DNP3 secure authentication and IEEE 1711 (AGA12) encryption for DNP3

	312E	313E	314E	330E	333E	334E	337E	350E	357E	ES
Analog Inputs[1]										
0 – 20 mA, 4 – 20 mA, 0 – 5 V, 0 – 10 V	4	4	8	–	4	8	8	–	8	–
0 – 10 V / 0 – 40 mA, 0 – 5 V / 0 – 20 mA, 1 – 5 V / 4 – 20 mA	–	–	–	–	–	–	–	5	5	–
1 – 5 V / 4 – 20 mA	–	–	–	–	–	–	–	–	–	6 or 12
0 – 32.7 V	–	–	–	–	–	–	–	1	1	–
Analog Outputs[1]										
4 – 20 mA	–	–	–	–	–	–	–	–	–	2 or 4
0 – 20 mA / 4 – 20 mA	–	2		–	2				2 or 4	–
Digital Inputs[1]										
12 / 24 V	12	16	–	–	16	–	32	–	–	–
12 / 24 / 48 / 115 / 125 / 240 V	–	–	16	–	–	16	–	–	32	–
10 – 30 V	–	–	–	–	–	–	–	–	–	16 or 32
Dry contact, shared with output points	–	–	–	–	–	–	–	8	8	–
Digital Outputs[1]										
Dry contact	6	10	–	–	10	–	16	–	16	–
Dry contact or solid state	–	–	10	–	–	10	–	–	–	–
Open drain, share with input points	–	–	–	–	–	–	–	8	8	–
DPDT relay, (NO / Common / NC)	–	–	–	–	–	–	–	–	–	8 or 16
Counter Inputs[1]										
0 – 10 Hz	–	–	–	–	–	–	–	1		–
0 – 10 Hz / – 05 kHz (dry contact)				1				–	–	–
0 – 10 kHz (turbine inputs)					2					–
0 – 1 kHz, shared with digital inputs	–	–	–	–	–	–	–	–	–	4
Communication and Configuration Ports										
Serial port – RS232	–	–	–				1			3
Serial port – RS485	–	–	–	–	–	–	–	1		–
Serial port – RS232/ 485				2				1		–
Serial ports – RS232/422/ 485	–	–	–	–	–	–	–	–	–	2
USB ports					1					–
Ethernet ports (10 / 100BaseT)	–	–	–				1			2
Logic control										
IEC61131 programming languages	Option		Yes		Option	Yes				
Protocols										
Modbus slave, IEC60870-5 slave, DNP3 slave, PPP, ftp, DNP3 master	Yes									
Modbus master	Option		Yes		Option	Yes				
DF1 master	Option		Yes		Option	Yes				
IEC 60870 – 103 master	–	–	Yes		–	Yes	–	Yes		
DNP3 secure authentication	Option									
Encryption for DNP3 (AGA12)[2]	Option									

(1) The amount of I/O may be expanded for any SCADAPack E using expansion I/O modules (refer to individual product data sheets for detailed specifications)
(2) Subject to export restrictions, please contact your TRSS business development representative for more details

Telemetry Solutions for Water/Wastewater

A complete integrated sensor-to-enterprise solution that goes beyond addressing the most challenging remote monitoring and control application and help you efficiently manage and operate, a secure and reliable water infrastructure.



Lift Station Solutions

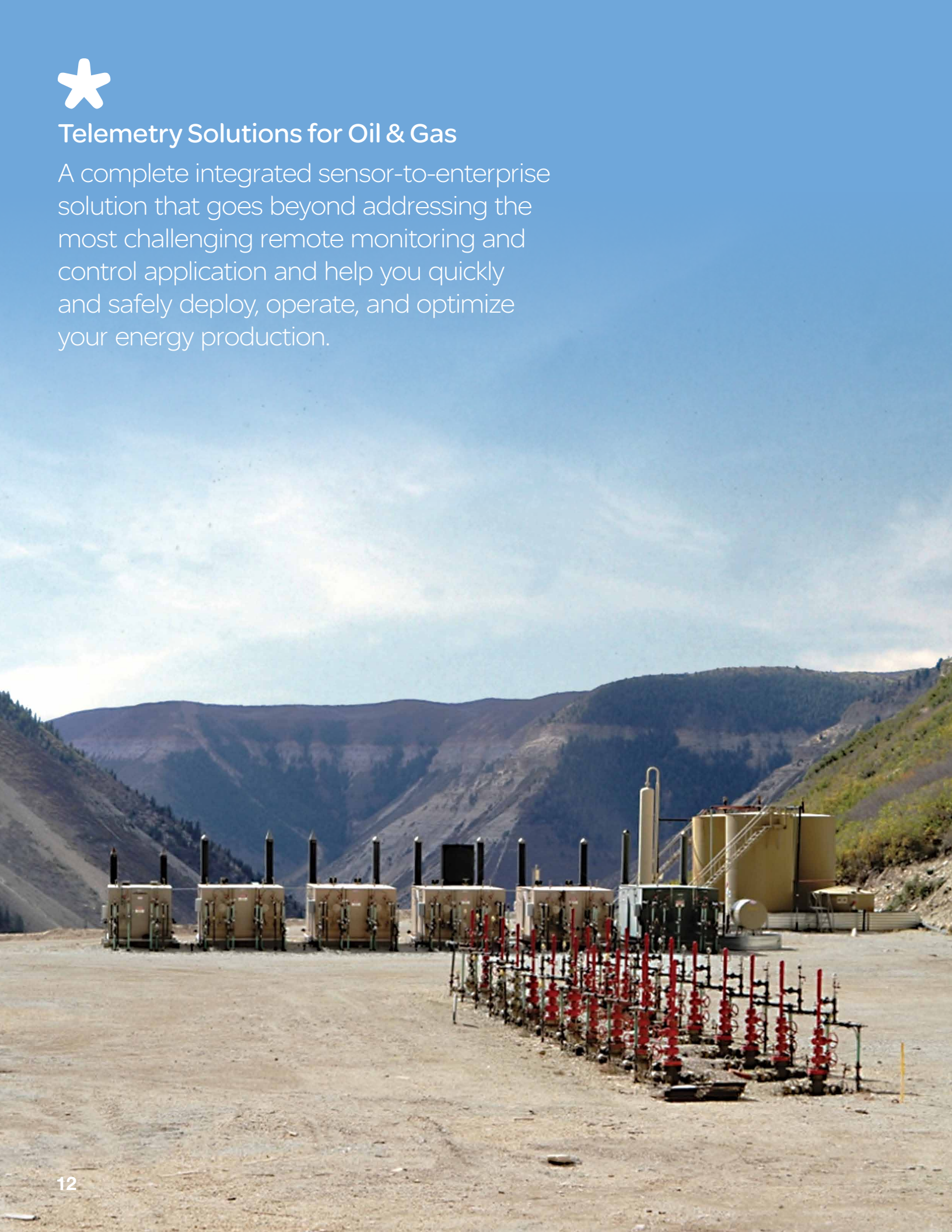
FlowStation

The FlowStation is a lift station pump controller for up to three Pumps with web browser interface and alarming via SMS and email.

	FlowStation
Pump Controller	
Pumps supported	1, 2, or 3 (lead, lag, standby)
Control modes	Pump-down (lift station), pump-up (reservoir)
Pump alternation	Automatic or fixed
SMS and e-mail	Alarm reporting and acknowledgement (requires optional GPRS modem)
Event logs	Operator, event type, time, and date of event
BlackBerry interface	BlackBerry Bold hand-held browser for viewing and alarm acknowledgement (GPRS modem required)
Extensibility	I/O modules, user logic programming using TelePace Studio, custom web interface content
Web server	Web interface for configuration, monitor, and control
Alarms	Logging and assignable alarm priorities
Level control	Level sensor or float switch-based
Level transducer signal input	4 – 20 mA, 0 – 20 mA, 1 – 5 V
Serial ports	3: for connection to SCADA Radios, local smart sensors and auxiliary devices such as motor protection relays or remote I/O
Ethernet	1: 10/100BaseT for web browser access to local touch screen, laptop, or Ethernet radio to corporate WAN
Communication protocols	SCADA-ready with Modbus and Modbus/TCP
GPRS modem	1: optional
Web/LAN security	User logon authentication, and friendly IP list
USB memory stick	FlowStation auto-configuration, event and alarm log recording
Commissioning	I/O simulation and test modes
Flush valve operation	Support for automatic or controller-based
Setpoints	Pump down/up, configurable in three groups for operation during wet/dry season, or minimizing of peak power consumption
Lift station maintenance	Fat-ring reduction and pump-down sludge removal algorithms to reduce frequency of wet well cleaning
Pump performance monitoring	Pump start statistics, run time accumulations and history logs; pump current monitoring (optional)
ClearSCADA enhanced integration	ClearSCADA host software provides pre-configured lift station templates for rapid rollout of new installations
Operating environment	FlowStation 110 -40 °F to 158 °F (40 °C to 70 °C) Touch Screen 32 °F to 113 °F (0 °C to 45 °C) GPRS Modem -22 °F to 158 °F (-30 °C to 70 °C)
Certifications	Hazardous locations North America Suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations Temperature code T4 per CSA Std C22.2 No. 213-M1987 / UL1604 UL listed and CSA certified to the following standards: • CSA Std. C22.2 No. 213-M1987 - hazardous locations • CSA Std. C22.2 No. 142-M1987 - process control equipment • UL Std. No. 1604 - hazardous (classified) locations • UL Std. No. 508 - industrial control equipment Europe ATEX II 3G, Ex nA IIC T4 per EN 60079-15, protection type n (Zone 2) Does not include wireless versions Australia ECEx, Ex nA IIC T4 per IEC 60079-15, protection type n (Zone 2) Does not include wireless versions (pending)

Telemetry Solutions for Oil & Gas

A complete integrated sensor-to-enterprise solution that goes beyond addressing the most challenging remote monitoring and control application and help you quickly and safely deploy, operate, and optimize your energy production.



Electronic Flow Measurement

SCADAPack Transmitters

SCADAPack Transmitters combine a modbus multivariable transmitter with an integrated SCADAPack Smart RTU to help creating a complete gas flow computer for Class I, Division 1 hazardous areas. The multivariable transmitter is also available separately (model 4102) allowing it to used with any choice of SCADAPack for multiple flow run installations.

	4102 SCADAPack Transmitter	4203-DR SCADAPack Transmitter	4203-DS SCADAPack Transmitter
Description	**Modbus Multivariable Transmitter**	**Gas Flow Computer with integrated Modbus Multivariable Transmitter**	**Gas Flow Computer with integrated Modbus Multivariable Transmitter**
Sensor types	Process pressure, differential pressure, and temperature	Gas flow plus process pressure, differential pressure, and temperature	Gas flow plus process pressure, differential pressure, and temperature
Internal smart RTU	No	Yes	Yes
Features			
Analog inputs (AI)	n/a	1: internal (supply voltage)	1: internal (supply voltage) 2: external (0 – 5V) inputs
Analog outputs (AO)	1: 0 – 20 mA, optional For use with PID control or as general analog output	1: 0 – 20 mA. For use with PID control or as general analog output	n/a
Turbine meter counter inputs (TI)	n/a	One	1: (point shared with DI/DO)
Counter inputs (CTRI)	n/a	1: (point shared with DI/DO)	1: (point shared with DI/DO)
Digital inputs (DI)	n/a	1: (point shared with CTRI/DO)	2: (points shared with DO/TI & CTRI/DO)
Digital outputs (DO)	n/a	1: (point shared with CTRI/DI)	2: (points shared with DI/TI & DI/CTRI)
Communications			
Serial port	1: RS232/485	2: RS232/485	2: RS232/485
Serial protocol	Modbus RTU	Modbus RTU/ASCII, DNP3, DF1	Modbus RTU/ASCII, DNP3, DF1
Ethernet port	10BaseT, optional	n/a	n/a
Ethernet protocols	Modbus/UDP; modbus RTU in UDP	n/a	n/a
Functional			
Gas flow calculations	n/a	AGA-3 (1992/2000) orifice plate, V-Cone and AGA-7 turbine meter	AGA-3 (1992/2000) orifice plate, V-Cone and AGA-7 turbine meter
Gas compressibility calculations	n/a	AGA-8 (1992) and NX-19	AGA-8 (1992) and NX-19
Event/alarm history logs	n/a	35 days hourly history, 35 days daily history, 700 events, and 300 alarms (as per API 21.1)	35 days hourly history, 35 days daily history, 700 events, and 300 alarms (as per API 21.1)

Electronic Flow Measurement Software

Realflo configuration software is used to add a gas flow computer to any SCADAPack Smart RTU (SCADAPack E excluded).

	Realflo
EFM Software	
Flow calculations	AGA-3 (1985) • AGA-3 (1992/2000) • AGA-7 • V-Cone • Wafer Cone
Density calculations	AGA-8 (1992) NX-19
Measurement update	Once per second; up to 10 gas flow runs
AGA 3, 7, V-cone, wafer cone calculation update	Once per second
Alarm and event log	300/700 (per API 21.1 and measurement Canada)
Hourly history	35 days
Daily history	35 days
Gas quality history	Hourly gas component averaging
Passwords	Four levels with log of user ID during access
Hardware	SCADAPack 100, SCADAPack 32, SCADAPack 300, SCADAPack 4203
Multivariable transmitter	Seamless integration of SCADAPack multivariable transmitter (including configuration and calibration) or any similarly mapped Modbus-based MVT.

Well Pad Optimization Solutions

Schneider Electric offers a variety of gas well optimization solutions that integrate SCADAPack, Trio, and Accutech hardware products with software that results in a configurable solution selected from templates for typical single- and multi-well pad installations.

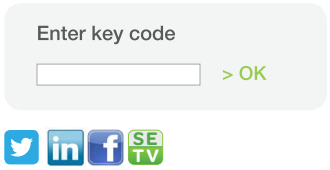
Electronic Flow Measurement

SolarPack 410

The SolarPack 410 is a solar powered single run flow computer in a NEMA 4 enclosure complete with a local interface and intelligent battery charging.

	SolarPack 410
Description	**Flow Computer**
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
Counter input	1: turbine meter
Gas sampler output	1: selectable as sourcing or sinking, configurable pulse width
Communication ports	Com 1: Direct to internal sensor or RS-485, 2-wire, half duplex to external sensor Com 2: For optional internal spread spectrum radio Com 3: Integrated Bluetooth® wireless technology
Bluetooth communication	General : Radio modem compatible with Bluetooth wireless technology enabled products
	Distance: Bluetooth Class 1. Up to 100m (330 ft.) (when communicating with another Class 1 device)
	Antenna: Integrated chip antenna
Radio	Optional integrated Trio K-Series 900 MHz Spread Spectrum or FreeWave FGR09CSU 900MHz spread-Spectrum, or third-party radio connected to Com2
Battery charger	Solar Panel Power: 32W max. Shunt regulation, temperature compensated Battery type: DIP switch-selectable for Cyclon Pure Lead, Gelled Electrolyte (Gel), or Absorbed Glass Mat (AGM)
Display	Backlit LCD, 2 lines X 20 characters, indication of flow data, charging states
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
Power	
System voltage	13.5V nominal
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 130 mW with external sensor version, as above
General	
Environment	SolarPack 410 (not including the display and battery) 5% RH to 95% RH, non-condensing,-40 °F to 131 °F (-40 °C to 55 °C) Display: -4 °F to 131 °F (-20 °C to 55 °C)
Approvals and Certifications	
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 21 MPa (3,000 PSI). external sensor version only	

For more information, visit
www.schneider-electric.com/us
and enter key code **d334u**.



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