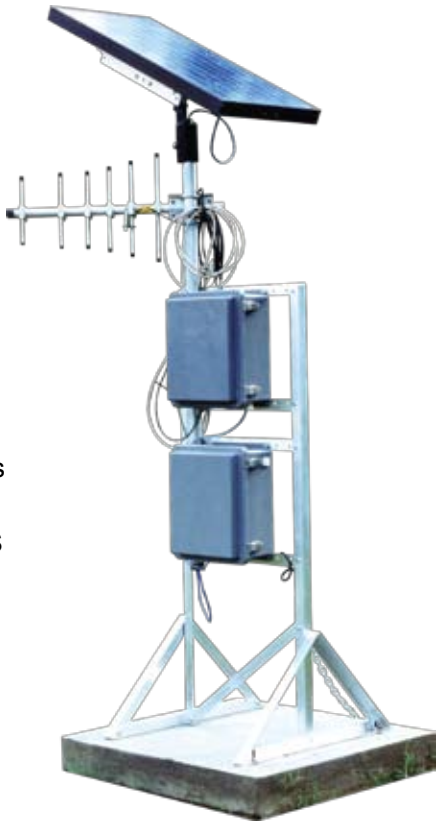
Weatherford®

Production Optimization

EXS-1000™ Remote Terminal Unit



Weatherford's *EXS-1000* remote terminal unit (RTU) series is for use in automating oil and gas production wells, and other general purpose applications requiring small to medium input/output (I/O) point counts. The *EXS-1000* electronic circuit boards are conformally coated for protection in extremely corrosive, humid and temperate environments.

The RTU's design is based on over 25 years of experience in providing process controllers for use in harsh environments along with quality controlled manufacturing practices. This design provides high reliability for even the most extreme conditions.

Weatherford's *EXS-1000* RTU is a cost effective production automation controller designed for simple applications as a stand-alone unit, or for more complex applications that involve control, communications, and alarming.

Start-up is easy using the keypad/liquid crystal display or Windows® based configuration management software. No special programming knowledge is required to apply the automatic alarm based control functions.

The RTU is designed for easy communications to host computers and DCS systems using either Modbus™ RTU, Modbus ASCII or 8500 protocol.

The basic unit measures 8 x 7.5 x 2.5 in. (*20.32 x 19.05 x 6.35 cm*) and may be mounted stand-alone on any control panel or optionally packaged in a NEMA 4 enclosure for outdoor service.

Low power requirements make the *EXS-1000* RTU ideal for solar power applications. Base unit power consumption is 2.5 watts @ 12 Vdc.

Applications

- Electric Submersible Pumps
- Gas Lift Systems
- Steam Injection
- Water/CO_2 Injection (WAG)
- Remote Terminal Units
- Variable Speed Motor Drive Control
- Data Logger

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EXS-1000 Remote Terminal Unit

Features

- Flexible SCADA interface options
- Low power consumption
- Multiple artificial lift applications available on common hardware
- Eight digital inputs/eight digital outputs
- Eight analog inputs/two analog outputs
- Two RS-232 serial ports expandable to four or six
- AGA3 1992 Gas Flow Calculations for one meter run with AGA8 1992 Gross Method 2 Supercompressibility
- Controls up to two PID loops
- Automatic alarm based control
- Eight channel data logger with up to 250 records per channel
- RTD signal conditioning provided for one analog input
- Totalizer for accumulating flow
- User programmable via Automatic Control Logic (ACL)
- Cellular Digital Packet Data (CDPD) compatible

Certifications

- FCC Part 15, Subpart B, Class A
- Electro Magnetic Compatibility (EMC Directive)
  - EN 55011:1998
  - EN 61326:1997
  - IEC 1000-4-2:1995
  - IEC 1000-4-3:1995
  - IEC 1000-4-4:1995
  - IEC 1000-4-5:1995
  - IEC 1000-4-6:1996
  - IEC 1000-4-11:1994
- FM Class I, Division 2, pending

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EXS-1000 Remote Terminal Unit

Specifications

Software Specifications	
Control	Two PID control loops, output calculated every second
Serial communication interface	Two RS232 asynchronous serial ports expandable up to four or six
Communications protocols	Modbus ASCII, Modbus RTU or 8500
Communications options	Bell model 103, 202 or 212 modem, digital radiio with integral modem (450 or 900 MHz)

Hardware Specifications	
Analog inputs	Eight (one analog input can be jumpered for direct 100 Ohm platinum RTD input)
Range	Nominal 0 to 5 Vdc, 1 to 5 Vdc, 0 to 25 mA or 4 to 20 mA (jumper selectable)
Resolution	12-bit, unipolar
Accuracy	Current inputs ±0.1% of full scale, voltage inputs ±0.1% of full scale (including linearity, hysteresis, repeatability and resolution)
Temperature coefficient	±0.01% of full scale/degree F
Analog outputs	Two
Range	0 to 25 mA or 4 to 20 mA
Resolution	12-bit, unipolar
Accuracy	±0.1%, firmware calibrate to ±0.1% (including linearity, hysteresis, repeatability and resolution)
Digital inputs	Eight inputs at 4 to 32 Vdc, 2 Hz maximum, 2 mA current limited (firmware filtered)
	Optional: Turbine meter prescaler accepts up to 5 KHz signals from turbine meter
Digital outputs	Eight outputs at 0.5 Amp continuous, 6 Amp pulsed, 32 Vdc maximum
Real-time clock	Accurate to within ±1 minute/month over operating temperature range
Data ports	Two RS232 asynchronous serial ports (one for MMI, one for 300 to 19.2 KBaud telecommunications)
	Expansion ports provide RS232 or RS485 interface to external instruments and/or controllers
Operating range	-40 to 185°F (*-40 to 85°C*), 0 to 95% relative humidity (non-condensing)
Power requirements	8 to 32 Vdc at 2.5 Watts average
Options	110 Vac, 50/60 Hz input with one day battery (12 Vdc) backup, 32 to 140°F (*0 to 60°C*) operation (assumes 1 Amp maximum load) 24 Vdc battery charging and backup for AC or solar powered units 12/24 Vdc DC to DC converter, used for 4 to 20 mA transmitters when battery backup is 12 Vdc 220 Vac, 50/60 Hz operation for AC input units
Local display	2 x 24 LCD, -4 to 158°F (*-20 to 70°C*), optional with 20-key keypad
Overvoltage/transient protection	All I/O and power supply devices provided with surge protection to ANSI/IEEE C37-90.1-1989 (IEEE Std. 472-1974)

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