NUFLO™

Scanner® 1140

Electronic Flow Measurement
Remote Telemetry Unit (RTU)

Scanner 1140C

Scanner 1140T

- Economical
- Easy to install and use
- Field configurable
- Low power operations
- Now featuring the Barton DPE+ multi-variable transducer, offering higher accuracy and broader pressure ranges

Cameron's Measurement Systems Division, manufacturer of Barton® Chart Recorders, the most rugged and reliable chart recorders in the world, continues to lead the way in accurate and easy to use measurement and control instrumentation. The Scanner 1140 is a single and dual stream measurement RTU designed specifically to provide flow monitoring and control for oil and gas gathering and production operations.

Featuring a full range of operator configurable pressure-compensated and temperature-compensated liquid and natural gas algorithms, the Scanner 1140 simplifies the process of collecting, processing and transmitting data.

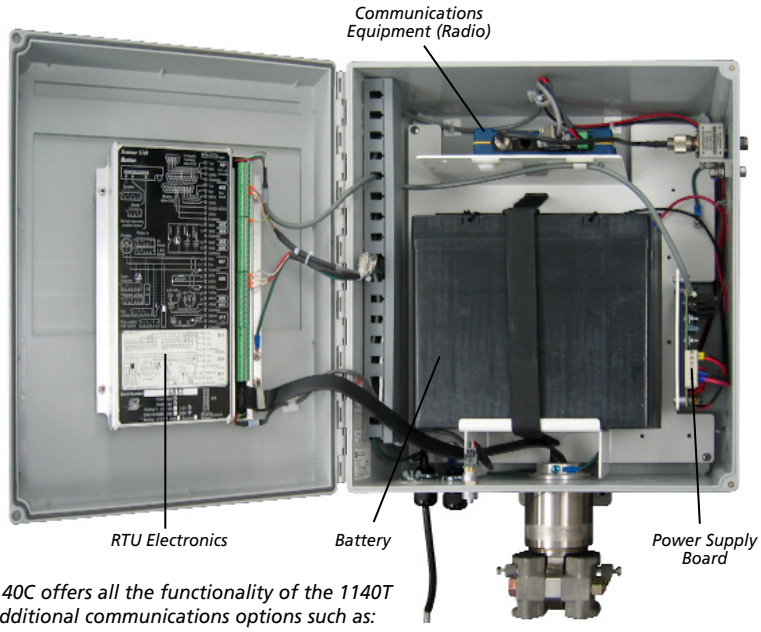
Built-In Features

- Stores up to 60 days (hourly and daily) flow history with an audit trail of all events, alarms and user changes. (API Chapter 21 Compliance)
- Can be configured on-site or remotely using step-by-step menus in a familiar Windows™ environment. The ability to save configuration files to disk and then 'restore' the file to other units in the field simplifies commissioning and reduces human error.
- Data can be downloaded on-site or transmitted via radio, dial-up modem, cellular modem, or satellite to a central location. Any Div. 2-certified radio or modem can be used with the Scanner 1140. Contact factory for details.
- While capable of accepting inputs from low power transmitters, RTDs and pulse-producing devices, a direct interface to a DPE+ multi-variable transducer provides low cost measurement for both static and differential pressure in a single device. Hardware integration lowers capital and installation costs.
- A field-retrofittable expansion board provides additional inputs/outputs and an extra serial port for communications to the NuFlo MVX®-II Multi-Variable Transmitter for dual stream applications.

Production Optimization Tools

Using simple menus, operators can configure the RTU for throttling and on/off control through the use of status input/outputs and/or an analog output making the Scanner 1140 ideal for:

- Proportional and integral control with second variable override
- Emergency shut down
- Run switching
- Well de-watering
- Nomination control
- Plunger lift control
- Pig launching



The 1140C offers all the functionality of the 1140T with additional communications options such as: integral radio, cellular modem, and dial-up modem capabilities.

Application Flexibility

- Supports all common primary devices:
  - Differential Producers – orifice fitting, pitot sensor (annubar), cone, wedge, nozzle
  - Linear Pulse Output Meters – turbine, positive displacement, ultrasonic
- Natural gas algorithms follow North American (AGA) and International (ISO) Standards:
  - AGA3-92, 5, 7, 8-94,(Detailed and Gross Methods), Redlich-Kwong, Standing-Katz, and a 5x5 pressure vs. temperature "Z" matrix method
  - ISO 5167-1, 12213-1, -2, -3, and SGERG
- Liquid algorithms follow API Manual of Petroleum Measurement Standards (MPMS)
  - API 2540 Table 34, 53A, 53B, 54A and 54B
  - MPMS Chapter 11.2.1(M), 11.2.2(M), 11.2.3(M)
- Communications protocols
  - ScanCom (ADEPT)
  - Modbus (Gould and Enron implementation)
  - BSAP (Bristol Babcock)

Secure

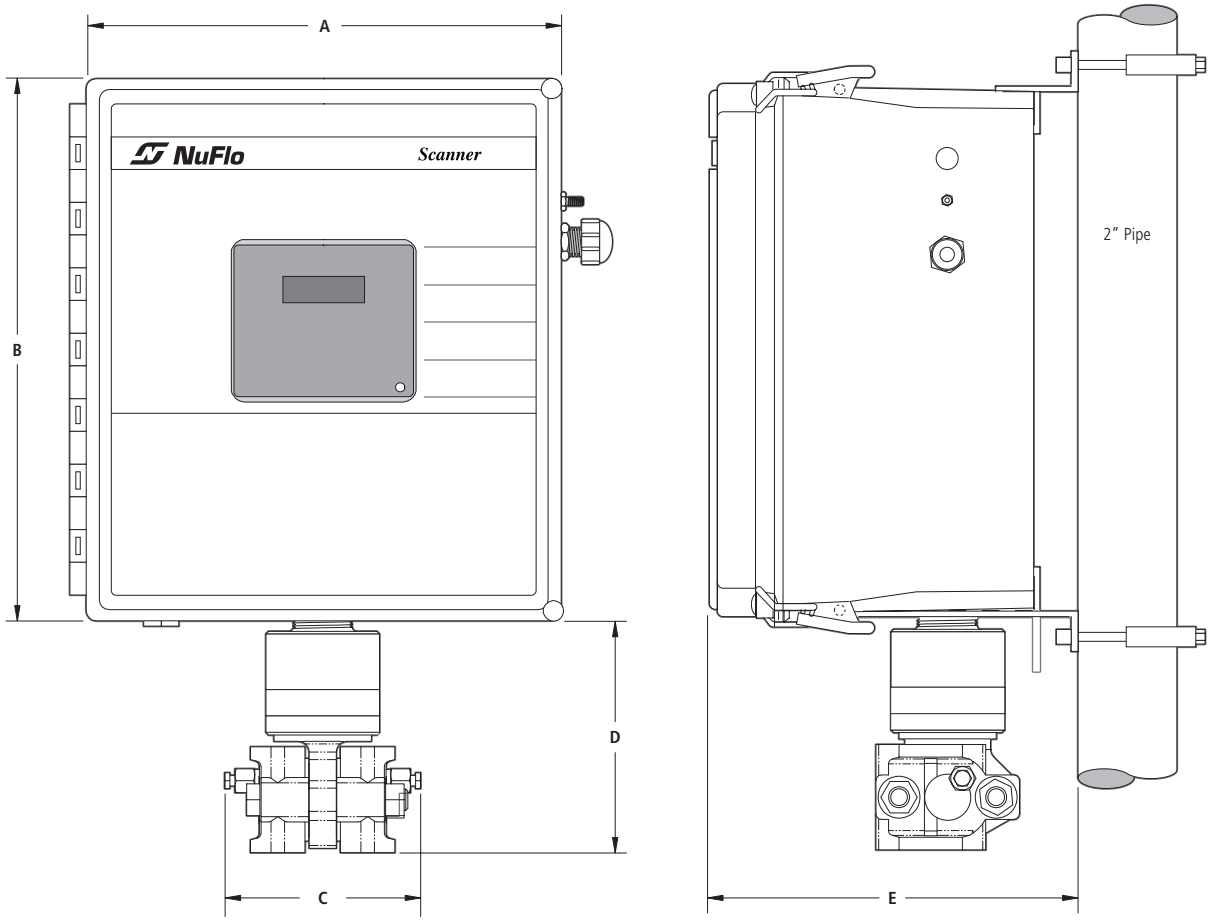
- Five configurable levels of security
- Selectable display options
- On-board lithium battery powers real time clock and maintains historical data against primary power failure for a minimum of one year
- Environmentally tested as completed assembly prior to shipment

Energy Efficient

- Sophisticated power management system optimizes low power operations, communications, and end devices
- Display powers down when not in use
- 'Heartbeat' timer periodically triggers internal processor operations
- Configurable end device sampling and calculation frequencies

Scanner 1140 Models

- The Scanner 1140T is a 6VDC EFM rated for Class I, Div.1 applications. The device is housed in a fiberglass-reinforced plastic enclosure and has no integral communications.
- The Scanner 1140C offers all the features of the Scanner 1140T, plus the following added features:
  - Class I, Div. 2 non-sparking certification
  - 12 VDC battery/charge controller (up to 55 amp-hours)
  - a power supply for powering a communication device
  - an optional lightning arrestor
  - optional radio, dial-up modem, or cellular modem
- The Scanner 1140L has many of the features of the Scanner 1140C. However, it has a metal enclosure and a 32-amp-hour battery.
- The Scanner 1140G features a standard Scanner 1140T main board, but has no integral enclosure with a battery. It is ideal for installing in another enclosure or panel mounting.



Scanner Model	Dimension "A" in. (mm	Dimension "B" in. (mm)	Dimension "C" in. (mm)	Dimension "D" in. (mm)	Dimension "E" in. (mm)
1140T	10.5 (267)	11.1875 (284)	4.635 (118)	5.3125 (135)	7.375 (187)
1140C	14.55 (370)	16.52 (420)	4.635 (118)	5.3125 (135)	9.75 (248)
1140L	12.05 (306)	12.00 (305)	4.635 (118)	5.3125 (135)	8.125 (206)

Scanner 1140 Specifications

General

Environmental	Operating temperature	-40°F to +140°F (-40°C to +60°C)
	Process (cell) temperature	-40°F to +176°F (-40°C to +80°C)
	Relative humidity	0-95%, non-condensing
	Enclosure	CSA Type (NEMA) 3,metal enclosure CSA Type (NEMA) 4, fiberglass reinforced plastic (NEMA 4X option)
Hazardous Area Approvals	Scanner 1140T with DPE+ Transducer	CSA Intrinsically Safe, Class I, Div. 1, Groups C & D (intrinsically safe barrier module required) CSA Non-Incendive, Class I, Div. 2, Groups A, B, C & D ANSI 12.27 Single Seal certified for pressure ranges up to and including 3000 psi
	Scanner 1140C or 1140L with integral communications device	CSA Non-Incendive, Class I, Div. 2, Groups A, B, C & D ANSI 12.27 Single Seal certified for pressure ranges up to and including 3000 psi

Main Circuit Board

Computer Section	Program memory	768 Kbyte FLASH memory
	Scratchpad memory	Up to 96 Kbyte of static RAM
	Non-volatile memory	Up to 192 Kbytes of battery backed static RAM
	Real time clock	Battery-backed real time clock/calendar
	Backup battery	Single cell lithium battery
	Data retention	1 year minimum (unpowered) including clock
A/D System	Resolution	16 bits
	Linearity error	±0.015% typical
	Throughput	All inputs converted in less than 1.0 second
Display / Keypad	Display	Standard 2 line x 16 character alphanumeric LCD Optional 4 line x 20 character alphanumeric LCD
	Keypad	Standard none – display is operated from a light-sensitive diode on faceplate Optional 28-button numeric keypad
Serial Communications Ports	Quantity	2
	Port #1	RS-232C
	Port #2	RS-232C with optional RS422/485 switch selection
	Baud rates	110, 150, 300, 600, 1200, 2400, 4800, 9600, or 19,200 baud, software selectable
	Parity	Even, odd, or none, software selectable
	Stop bits	1 or 2, software selectable
Pulse Inputs	Quantity	1 (Optional)
	Pulse signal types	Preamplified square wave, open collector, contact closure, inductive proximity sensor, or turbine magnetic pickup coil, configured via on board DIP switch
	Over-voltage protection	±40 VDC
Status In/Status Out/ Pulse Outputs	Quantity	4 (user selectable)
	Maximum voltage status/pulse out	±40 VDC
	Maximum on-state current	100 mA
	Maximum pulse output rate	8 counts/second @ 50% duty cycle

Analog Inputs	Quantity	2
	Type	1-5 VDC
	Accuracy	±0.050% of span max. error @ 25°C (75°F)
	Average temperature effect	±0.015% of span/°C max.
	Impedance	> 10 KΩ
	Over-voltage protection	±40 VDC steady state over-voltage, plus 300W surge for 1 msec
RTD Inputs	Quantity	1
	Type	100Ω 2 or 3-wire
	Range	-50 °F to +250 °F (-45 °C to +120 °C), expandable to 410°F (210°C)
	Accuracy	±0.25°C @25°C ambient (±0.5°F @ 75°F) including RTD linearization
	Average temperature effect	±0.01°C/°C ambient change (±0.007°F/°F change)
	Over-voltage protection	±40 VDC steady state overvoltage, plus 300W surge for 1 msec
	Sensor assembly (optional)	12-inch probe with 1/2 in. NPT compression fitting and 10 ft. armored leads (other lengths available on request)
Analog Outputs	Quantity	1 (Optional)
	Type	Optically isolated, externally powered
	Accuracy	±0.1% of full scale max. error @ 25°C (75°F) (after factory calibration)
	Temperature effect	±1% of full scale max. error over temperature
	Liftoff Voltage	< +10.0 VDC

DPE+ Multi-Variable Transducer

Quantity	1 (optional)
Operating temperature	-40°F to +158°F (-40°C to +70°C)
Process (cell) temperature	-40°F to +176°F (-40°C to +80°C)
Accuracy	±0.05% of full scale
Long-term drift	±0.05% of URL per year over a 5-year period
Temperature effect	±0.25%/100°F (40°C)
Static pressure effect-zero	±0.1%/2500 psig (17238 kPa)
Cell material	316 SS
Process cover material	316 SS

Table 1—Pressure Ranges, Safe Working Pressures and Bolt Specifications

Static Pressure /SWP	Differential Pressure	Max. Overrange Pressure	Standard Bolts	NACE Bolts
100 psia	30 in. H_2O	150 psia	B7 or 316 SS	B7M
300 psia	200 in. H_2O	450 psia	B7 or 316 SS	B7M
300 psia	840 in. H_2O			
500 psia	200 in. H_2O	750 psia	B7 or 316 SS	B7M
1500 psia	200 in. H_2O	2250 psia	B7 or 316 SS	B7M
1500 psia	300 in. H_2O			
1500 psia	400 in. H_2O			
1500 psia	840 in. H_2O			
3000 psia	200 in. H_2O	4500 psia	B7 or 316 SS	Inconel
3000 psia	300 in. H_2O			
3000 psia	400 in. H_2O			
3000 psia	840 in. H_2O			
5300 psia	200 in. H_2O	7420 psia	B7	Inconel
5300 psia	300 in. H_2O			
5300 psia	400 in. H_2O			
5300 psia	840 in. H_2O			

Input/Output Expansion Board

Expansion card can be retrofitted to existing unit or ordered on new unit with listed I/O combinations.

Available Input / Output Combinations							
Serial Port	0	0	1	1	1	1	1
Pulse In	1	1	0	0	1	1	0
Analog Out	1	0	0	0	1	0	1
Digital I/O	2	4	0	4	0	2	2

Serial Communications	Quantity	1 (maximum)
	Interface	Switch selectable as RS-232C / RS-422 / RS-485
	Baud rates	110, 150, 300, 600, 1200, 2400, 4800, or 9600 baud, software selectable
	Parity	Even, odd, or none, software selectable
	Stop bits	1 or 2, software selectable
	Function	Printer, remote console, or gas chromatograph port
	Protection	Surges to 300 W @ 1 msec. plus DC overload to ±40 V
Analog Outputs	Quantity	1 (maximum)
	Type	Optically isolated, externally powered
	Signal type	4-20 mA current loop, externally powered
	Allocation	User-selectable
Status / Pulse Outputs	Quantity	4 (maximum)
	Count rate (pulse mode)	0 to 8 Hz, 50 % duty cycle maximum
	Max on-state current	100 mA
	Max off-state voltage	40 VDC
	Function	User-assignable
Pulse Input	Quantity	1 (maximum)
	Pulse signal types	Preamplified square wave, open collector, contact closure, inductive proximity sensor, or turbine magnetic pickup coil, configured via on board DIP switch.
	Over-voltage protection	±40 VDC

Charge Controllers

6 V, Div. I Controller	Nominal input voltage range	0-30 VDC
	Input isolation	None
	Area rating	CSA Intrinsically Safe, Class I, Div. 1, Groups C & D
	Charge control	Temperature-compensated for 6 volt battery
	Battery	6 Volt, 12 Ahr sealed lead acid gel cell
	Solar panel	5 Watt, 12 Volt panel with mounting hardware 10 Watt, 12 Volt panel optional
12 V, Div. 2 Controller	Nominal input voltage range	0-27.5 VDC
	Input isolation	None
	Area rating	CSA Non-incendive Class I, Div. 2, Groups A, B, C & D
	Charge control	Temperature-compensated for 12 volt battery
	Modem/radio supply control	2.5 A with cutoff voltage at 11.8 V
	Battery	12 Volt, 17 Ahr sealed lead acid gel cell 32 and 55 Ahr batteries optional
	Solar panel	10 watt, 12 volt panel with mounting hardware 20, 30, 40, and 50 watt panels optional

MEASUREMENT SYSTEMS

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