Table 1.1—MC-III EXP Specifications

Electrical Safety Classification	Approved by CSA for US and Canada Class I, Div. 1, Groups B, C, D (explosion-proof) Type 4 enclosure T6 temperature class Approved by SIRA to ATEX 10ATEX 1264X IECEx SIR10.0127X ⟨Ex⟩ II 2 GD Ex d IIC T6 Gb (-40°C to 70°C) or Ex tD A21 IP66 T85°C (-40°C to 70°C)
System Power	Internal power supply • 3.6 VDC, D-size lithium battery (2-year typical life) • Alkaline battery pack containing 3 C-size industrial-grade batteries (CSA only) External power supply (6 to 30 VDC) with internal battery backup (reverse polarity protected) Loop-powered (4-20 mA) with internal battery backup (reverse polarity protected) Loop power: 8 to 30 VDC Load resistance: 1100 ohms @ 30 VDC; 200 ohms @ 12 VDC
Operating Temperature	Lithium-Powered: -40°C to 70°C (-40°F to 158°F) Alkaline-Powered (CSA only): -18°C to 55°C (0°F to 130°F) LCD contrast is reduced below -20°C (-4°F)
LCD Display	8-digit Total (volume) display (7-segment characters) 6-digit Rate display (11-segment characters for easy-to-read prompts) 0.3" character height Adjustable contrast and update period User-selectable units of measurement (Total): • Preprogrammed units: BBL, GAL, LIT, M^3, CF, SCF, any unit x 1000 • User-defined units User-selectable units of measurement (Rate): • Preprogrammed units: BBL, GAL, LIT, M^3, CF, SCF (per DAY, HR, MIN, SEC), any unit x 1000 (per DAY, HR, MIN, SEC) • User-defined units
Keypad	6-key membrane switch
Communications/ Archive Retrieval	RS-485 Modbus® communications with transfer speeds up to 115.2K (allows full download in less than 1 minute)
Logging	384 daily logs 768 hourly logs 345 event logs

Table 1.1—MC-III EXP Specifications

Inputs	Turbine Meter Input Configurable sensitivity adjustment via front panel Sensitivity adjustment range: 20 mV P-P to 40 mV P-P Frequency range: 0 to 3500 Hz Remote Reset Input Optically isolated 3.0 to 30 VDC Pulse duration > 3 seconds to reset Explosion-Proof Reset Switch (option) Press and hold > 3 seconds, then release to reset total Press and hold < 1 second, then release to view daily log data Pulse Input Optically isolated 3.0 to 30 VDC Frequency range: 0 to 3500 Hz
Outputs	Analog Output 4-20 mA, loop-powered (two-wire) 16-bit resolution Accuracy: 0.1% of full scale @ 25°C, 50 PPM/°C temperature drift Loop power: 8.0 to 30 VDC Zero and full-scale engineering values configurable from front panel RS-485 Communications Baud rates: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and up to 115.2K Volumetric Pulse Output Solid-state relay Output rating: 60 mA max. @ 30 VDC, on-state drop = 1.4 VDC @ 50 mA, 0.25 VDC @ 10 mA Configurable pulse width (duration): 10 to 60,000 ms Amp & Square (Flowmeter Frequency) Output Open-drain transistor output of turbine meter input signal Output rating: 50 mA @ 30 VDC, on-state drop = 0.3 VDC @ 50 mA, 0.1 VDC @ 10 mA (Analog output and amp & square outputs cannot be used simultaneously.)
Modbus®	RTU mode Modbus® supports 16-bit and 32-bit holding registers. For more information, see *Appendix D, page D-1.*
Enron Modbus®	Flow log parameters (time stamp, period total, period run time, and supply voltage) and download method are Enron-compatible.

Table 1.1—MC-III EXP Specifications

System Requirements	Operating System - Windows XP, Windows Vista®, or Windows 7 Computer/Processor - 1 GHz or faster Pentium-compatible CPU Memory - 128 MB of RAM Hard Disk Space - 21 MB for program files, 30 MB for Adobe Reader, adequate space for data files Drive - CD-ROM for install Display - 800 x 600 (SVGA), 16-bit (thousands of colors) color display or greater Browser - Internet Explorer 6 or later Internet Connection - for web links, tech support Communications Port - physical or virtual RS-232 compatible serial port

Key Product Features

This section presents an overview of key features of the MC-III EXP. Many of these features are discussed in more detail in *Section 3, page 35,* and *Section 4, page 45* (configuration procedures) and *Section 5, page 79* (flow log archival).

Key features discussed here include:

- LCD display
- keypad
- interface software
- power supply
- calibration options
- input options
- output options
- flow log archival
- password-protected security

LCD Display

The liquid crystal display (*Figure 1.4, page 12*) provides a simultaneous indication of accumulated total (top readout) and flow rate (bottom readout). The eight-digit total display uses 7-segment characters to form numbers and letters, which results in a combination of uppercase and lowercase letters. The six-digit flow rate display uses 11-segment characters to form numbers and letters for improved readability. When the keypad is used to calibrate the MC-III EXP, the name of the menu option selected appears in the lower (rate) display, and settings are entered in the top (total) display.

Flow volume can be measured in barrels, gallons, liters, cubic meters, cubic feet, standard cubic feet or other user-defined units. A multiplication factor is also available for indicating flow volume in terms of 1,000 units. The unit of measure for the Total readout and the decimal point position are selected by the operator during calibration. If a user-defined unit is used, none of the preprogrammed volume units will be visible on the display during operation.

Flow rate can be measured in a wide variety of preprogrammed units, or other user-defined units. The flow rate unit of measure is selected in two steps: (1) a volume unit is chosen and (2) a time-base unit (per day, per hour, per minute, or per second) is chosen. Users can choose any combination of preprogrammed volume and time units in establishing the flow rate engineering unit (for example, gallons per hour, gallons per day, or