EXi

Ex~i Flow Measurement Ltd

Designers of flow measurement equipment for the oil and gas industry

SFC3000 FLOW COMPUTER

**Complete flow computer
for all measuring applications**
MULTISTREAM • LIQUID • GAS

Web and network enabled
AUDIT • ALARM • DATA LOGGING

INTRODUCTION

The SFC3000 is far more than just a dedicated flow computer. It can operate on a number of levels from a supervisory machine to a stand alone flow computer or as a system component. With its touch screen, VGA display and extensive processing capabilities, combined with simple to use controls and unique operating software it can function as a complete station supervisor integrated into a flow computer housing.

Designed specifically to meet the needs of the world wide liquid hydro - carbon and gas measurement markets, the SFC3000 is intended to positively contribute to both management and conservation of the world's dwindling energy resources by providing both versatile and accurate measurement and incorporating state of the art designs and components.

TECHNOLOGY

- Multiple 32 bit μProcessors
- Surface Mount technology :
    - BGA components
    - Multiple Layer circuit boards
- Colour Full VGA 5.7" Display Screen
- Touch Screen incorporating full QWERTY keyboard
- 360° Navigation control

- Expandable SD card memory
- Multiple high speed Ethernet connections :
    - Web enabled
    - Modbus over TCP I/P
- Front Panel high speed USB connection :
    - Local configuration & downloading
    - Simple to use Windows® based software
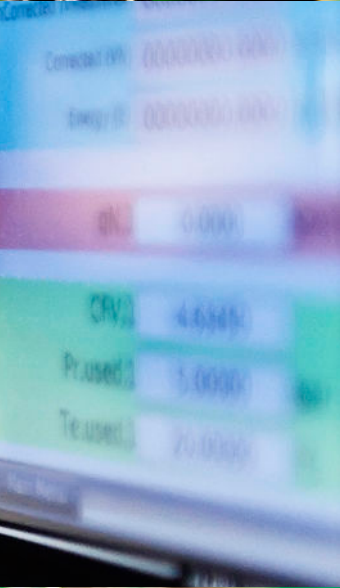
CAPABILITY

- The versatile Stream I/O Board versions fit all measurement application types and supports the use of standard meters such as Ultrasonic, Turbine, Orifice and Coriolis.
- The Stream I/O Card provides the complete capability for a single stream fiscal flow measurement with redundant inputs and a two stream capability for non fiscal applications.
- Up to 5 I/O cards can be fitted in the SFC3000 chassis providing a 5 stream fiscal capability.
- As well as a high speed 32 bit central microprocessor unit to perform all the display and calculation tasks, the SFC3000 has individual high speed 32 bit processors on each plug in card to perform the measurement, communication and input/output functions.

- The SFC3000 maintains the highest accuracy and uses double precision (64 Bit) floating point numbers throughout for all calculations. It also boasts an impressive true half second cycle time.
- Local configuration and data downloading is achieved using the supplied Windows® software, through the dedicated front panel high speed USB communication port.
- Remote communication is via the communication card or Dual Ethernet card, with RS232/485 serial capability and Ethernet 10/100 connectivity. Multiple communication cards can be installed.
- The Stream Switch I/O Board supplements the number of available Digital Inputs and Outputs for Prover applications where a large number of Valves may be required.
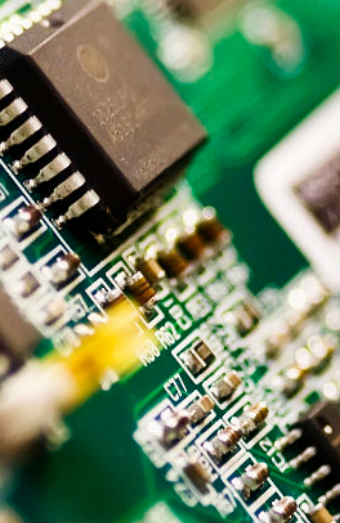
FUNCTIONALITY

Measurement conforming to AGA, ISO, API standards of :

- Dry and Wet Natural Gas
- Hydrocarbon Liquids
- Other Gases e.g. Nitrogen
- Other Liquids e.g. Water
- Using Meter types :
    - Pulse generating flow meters
    - Most common Ultrasonic flow meters
    - DP transmitters with Orifice or Venturi measurements
- Individual stream I/O boards, 1 to 5 fiscal streams
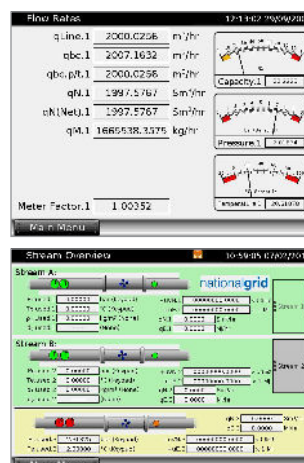
FEATURES

- Stand alone flow computing function
- Flow Computing combined with supervisory function
- Optional 2GByte SD memory card for alarm, audit and data logging.
- Interfaces to most types of metering equipment and all popular GC's

- Freely Configurable Display :
    - System diagrams
    - Trending and graphical displays
    - Language options
- Easy Installation and interfacing
- Extremely accurate

SPECIFICATION

OVERALL

Chassis
- Industry Standard Half Width 3U High 19" construction
- Panel or Chassis mount
- Dimensions H × W × D = 130 × 210 × 240 mm
- Weight approximately 2.0 Kg / 4.5 Lbs.
- Accommodates up to 6 User plug in cards
- Up to five measurement streams in same chassis
- Mixture of metering types in same chassis

Power Supply
- Supply voltage 24 +/- 10% DC 30W 3.15A fuse
- Auxiliary Outputs 24V 500mA

Operating
- Approval Operating Temperature Ranges
  -10°C to 55°C (15°F to 130°F) Analogue Inputs
  -25°C to 55°C (-15°F to 130°F) Hart® Inputs
- Storage Temperature
  -20°C to 70°C (0°F to 160°F)
- Operating Humidity to 90% Non-Condensing
- Environmental Classes M2/E2

FRONT PANEL

Display
- High Res. 5.7" VGA Colour Screen with Touch Panel
- 360° Rotary Control for Menu Navigation
- High Brightness Indicator LED's
- Front Panel USB connection
  - Configuration and programming
  - Local Data Downloading and Diagnostics

REAR PANEL

Field Connections PSU and I/O

Security Mode switches and SD Memory Card

APPROVALS

MID 2004/22/EC Gas Meter Conversion Devices
- EN12405-1:2005

MID WELMEC 8.8 Liquids other than water
- OIML R117-1:2007

EMC Directive 2004/104/EC

LVD Directive 2006/95/EC
- EN61010-1:2001(2nd Edition)

METER TYPES

Turbine/Rotary/Positive Displacement
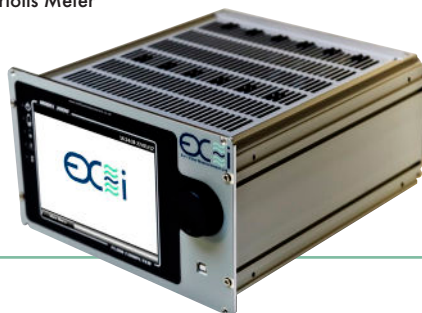- High & Low Frequency pulses
- Encoder type

Ultrasonic Meter
- Pulse Counting type
- Serial Communication interface

Differential Pressure Measurement
- Orifice, Venturi, V Cone and Nozzles

Coriolis Meter

CALCULATIONS

Dry And Wet Natural Gas
- ISO 5167, AGA 3, EN12213-2 (AGA 8), AGA 10
- ISO 6976, PTZ, NX19, EN12213-3(SGERG)
- Measured Density
- ISO 20765

Other Gases
- Nitrogen, Steam, CO2 Emission Calculations

Liquids
- API 11.2.1, API 11.2.2
- API 12.2.5.3 54A, ASTM D1250 54, API 12 :2004
- GPA TR25, GPA TR27 24E, 54E, 60E, OIML R022
- Multiple Products
- ISO 6578 for LNG and LPG

Provers
- Bi-Directional and Uni-Directional Ball Provers
- Small Volume Provers
- Master Meter
- Dual Chronometry

SUPERVISORY FEATURES
- Alarm/Event/Data Logging and Recording
- Printer Report Generation
- System Diagram Display
- Network Communication
- Station Controller Functions
- Valve Control and Remote Operation
- Maintenance Functions
- Stream Summation
- PID/Sampler Functions
- Batch loading

CIRCUIT BOARDS

I/O DIGITAL STREAM BOARD (3000-304)

3 Pulse Counting/ Frequency measurement inputs
- DC to 5KHz
- ISO 6551 or API Chapter 5.5

Applications include
- Turbine/Rotary/positive displacement meters
- Density and Relative Density meters
- Status and detector inputs

2 Switch / Valve Status inputs

2 HART® transmitter loops
- Up to 3 transmitters for each loop
- Individual Pressure Temperature or DP transmitters
- Use with Multivariable transmitter types

1 Direct PRT (4 wire) Input

5 Digital Outputs
- Optically isolated Open Collector, 30V max, 10mA
- Alarm indication, Telemetry or Valve Control

2 Analogue Outputs
- 0-20mA or 4-20mA
- 16 bit max error 0.15%
- Telemetry or PID Control

1 Serial Communication connection
- RS232/RS485, speeds up to 38400 baud
- Modbus Master/Slave communication to
- Ultrasonic and Coriolis meters
- Stream Gas Chromatograph & Water Cut Meters
- Turbine Meter Encoder

I/O DIGITAL 2 STREAM BOARD (3000-309)

Specification and use as in I/O Digital STREAM BOARD with the following Inputs and Outputs
3 Pulse Counting/ Frequency measurement inputs
1 Switch / Valve Status input
2 HART® transmitter loops
6 Digital Outputs
4 Analogue Outputs
1 Serial Communication connection

I/O ANALOGUE STREAM BOARD (3000-306)

Specification and use as in I/O Digital STREAM BOARD with the following Inputs and Outputs
3 Pulse Counting/ Frequency measurement inputs
2 Switch / Valve Status input
1 HART® transmitter loop
3 Analogue 4-20mA Inputs
1 Selectable Analogue 4-20mA Input or Digital Output
1 Direct PRT (4 wire) Input
3 Digital Outputs
2 Analogue Outputs
1 Selectable Analogue 0-20mA or 4-20mA Output or Digital Output
1 Serial Communication connection

I/O SWITCH STREAM BOARD (3000-307)

Specification and use as in I/O Digital STREAM BOARD with the following Inputs and Outputs

3 Pulse Counting/ Frequency measurement inputs
3 Switch / Valve Status inputs
6 Digital Outputs
6 Selectable Digital Status Inputs or Digital Outputs
1 Serial Communication connection

COMMUNICATION BOARD (3000-305)

3 Serial Communication ports
- RS232 or RS485, speeds up to 38400 baud
- RS485 Termination network
- Galvanically isolated
- RJ 45 style Connectors
- Fully user programmable and configurable
- Applications such as
- Modbus Master/Slave ASCII/RTU
- Supervisory, DCS or RTU systems
- Serial Printer with handshaking

Ethernet Port
- 10/100 MHz LAN port
- Fully user configurable and programmable
- RJ 45 style connector with integrated indicators
- Modbus master and slave over TCP/IP communication
- Remote operation with diagnostics and configuration
- Web Server functions
- Network Time Protocol
- Network to other SFC3000 machines
- Network to other measurement devices
- Network Printing

DUAL NETWORK BOARD (3000-308)

Specification and use as in COMMUNICATION BOARD with the following Inputs and Outputs

3 Serial Communication ports
2 Ethernet Ports

bsi. ISO
9001
Quality
Management

FM 552113