



Ex~i Flow Measurement Ltd

**Designers of flow measurement
equipment for the gas and
liquid industry**

**COMPANY OVERVIEW
SFC3000 FLOW COMPUTER
SFC3000 EXTRAS**

**Flow computers for all
measuring applications**

MULTISTREAM • LIQUID • GAS



INTRODUCTION

At Ex~I Flow Measurement Ltd, we specialise in researching, developing, and manufacturing products for the gas and liquid measurement industry, with a focus on continuous project development and enhancement. The future of gas and liquid measurement and flow control is innovation through a continuous process of evolution, not revolution.

ABOUT EX~I

Ex~I Flow Measurement was founded in 2007 with the aim of taking the combined 60+ years of experience in the gas and liquid flow measurement industry within the engineering team to develop a new flow computer, this became the SFC3000 flow computer.

The development of the SFC3000 moved from concept to finished product in less than two years. Since then, we have continued to improve and add to the functionality of the SFC3000 to stay up to date with the current needs of our customers, through both software and hardware developments.

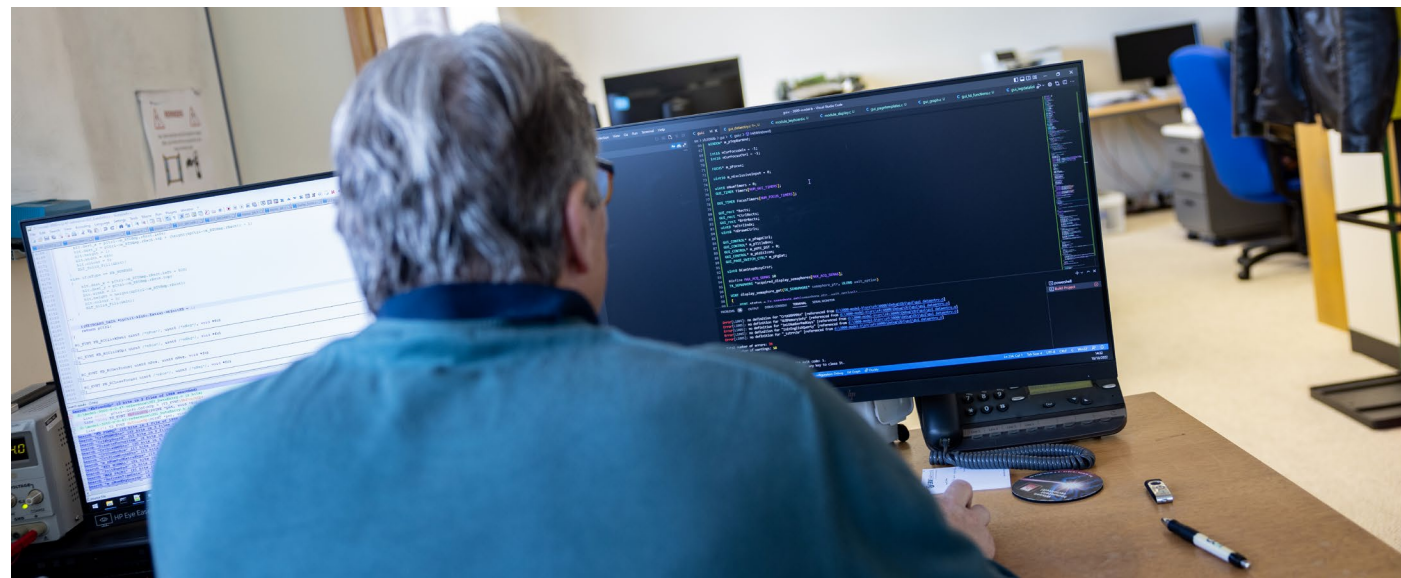
While our product range is based around the SFC3000, we continue to explore and develop parallel projects. Over the years, these projects have included several customer specific products. The Ex~I product range and customer specific products are designed, developed, supported, and manufactured at our facilities on the south coast of the United Kingdom.



DESIGN AND SUPPORT

The Ex~I product range and customer specific products are designed and supported by our in-house engineering department. We have a mix of software, electronic and mechanical engineers, each with specialist skill sets, but all working together to provide the best possible product and customer support. We can help support customer projects from concept and design, through realisation, to FAT and SAT.

Our engineering department can provide customer training on our product range. This training is session specific and can be provided online, or in person at either our facilities or on-site at the customers.

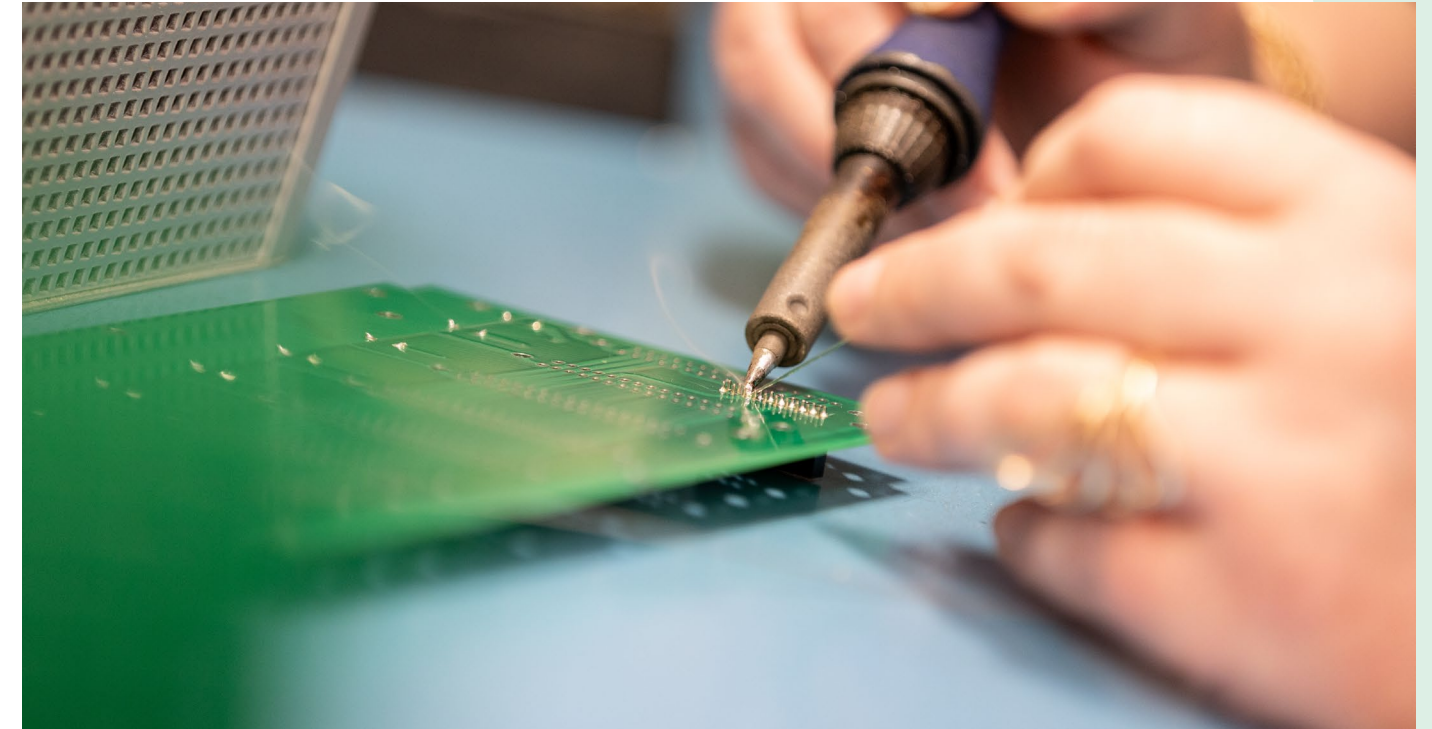


MANUFACTURING

Within our production facility at Ex~I, we perform 100% of the programming, testing, calibration, and final assembly to customer orders for all our products. The assemblies requiring surface mounted components are contracted out to carefully selected CEM to maintain quality control and all electronic assemblies are heat soak tested for a minimum of two weeks, to ensure the highest quality product.

We typically hold stock for a minimum of 50 machines at any one time, with capacity to supply up to 100 per month. Our packing area allows room for palletisation of customer orders for larger orders, or we can arrange scheduled / call-off orders.

In 2023, more than 750 SFC3000 flow computers were manufactured and delivered to our customers.



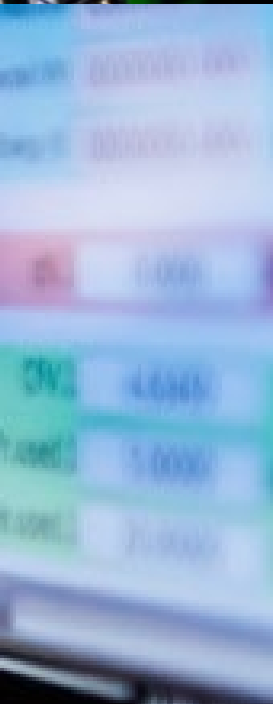
QUALITY

Our quality management approval by BSI to ISO9001:2015 covers all areas of the company's operation, specifically the fields of product development and manufacturing.

The quality system is subject to monthly management audits, an annual internal audit and annual management reviews, as well as the annual audit by BSI. Key performance indicators for all aspects of the quality management system, including customer feedback, staff training, results of internal and external audits and reviews, are continuously evaluated by company management with the results being used to identify areas for improvements to the overall quality of the products and services offered by Ex~I Flow Measurement.

Specific reporting methods and documentation have been jointly developed with certain clients to supply them with the necessary reports and quality assurance documentation to cover the goods and services supplied.





INTRODUCING THE SFC3000

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

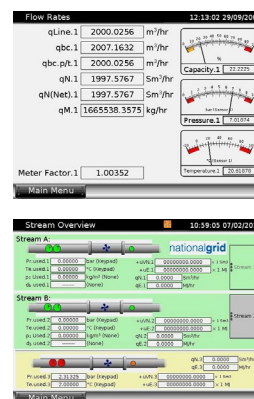
- Multiple 32 bit μ Processors
- Surface Mount technology :
 - BGA components
 - Multiple Layer circuit boards
- Colour Full VGA 5.7" Display Screen
- Touch Screen incorporating full QWERTY keyboard
- 360° Navigation control
- Expandable SD card memory
- Multiple high speed Ethernet connections :
 - 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 2GB 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 x W x D = 130 x 210 x 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) PRT Inputs
 - 25°C to 55°C (-15°F to 130°F) Hart® and 4-20mA 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 • 360° Navigation control

REAR PANEL

Field Connections PSU and I/O and Communications Security Mode switches and SD Memory Card

APPROVALS

MID 2014/32/EU Gas Meter Conversion Devices

- EN12405-1:2018

MID WELMEC 8.8 Liquids other than water

- OIML R117-1:2007

EMC Directive 2004/108/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 (BS8609), Hydrogen

Liquids

- API 11.2.1, API 11.2.2
- API 12.2.5.3 54A, ASTM D1250 53/54, 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



OPTION BOARDS

I/O DIGITAL STREAM BOARD (3000-314)

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 DPtransmitters
- Use with Multivariable transmitter types

1 Direct PRT (4 wire) Input

5 Digital Outputs

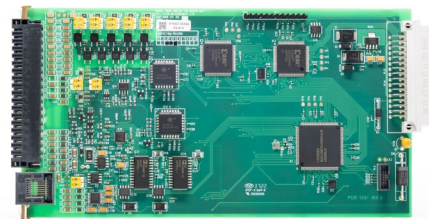
- Optically isolated Open Collector, 30V max,10mA
- Alarm indication, Telemetry or Valve Control

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 CutMeters
- Turbine Meter Encoder



I/O DIGITAL 2 STREAM BOARD (3000-319)

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

3 Pulse Counting/ Frequency measurement inputs

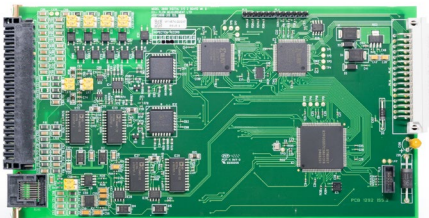
1 Switch / Valve Status input

2 HART® transmitter loops

6 Digital Outputs

4 Analogue Outputs

1 Serial Communication connection



I/O ANALOGUE STREAM BOARD (3000-316)

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

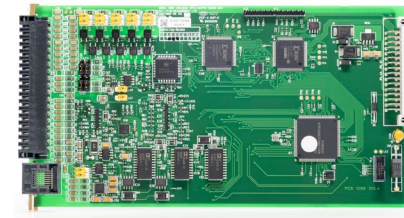
1 Direct PRT (4 wire) Input

3 Digital Outputs

2 Analogue Outputs

1 Selectable Analogue 0-20mA or 4-20mA Output or Digital

Output1 Serial Communication connection



I/O SWITCH STREAM BOARD (3000-317)

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

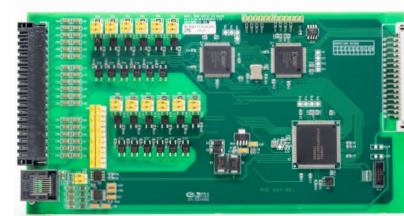
3 Pulse Counting/ Frequency measurement inputs

3 Switch / Valve Status inputs

6 Digital Outputs

6 Selectable Digital Status Inputs or Digital Outputs

1 Serial Communication connection



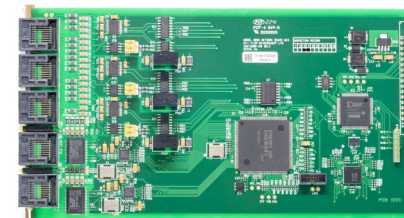
DUAL NETWORK BOARD (3000-318)

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

2 Ethernet Ports

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



EXTRAS

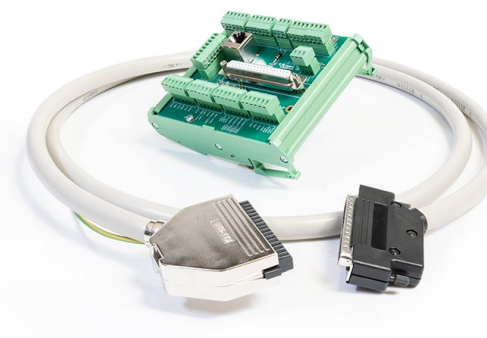
19" RACK OPTION

- Up to 2 SFC3000 can be mounted in a single rack using the M2.5x10 Cap head screws supplied with each SFC3000.
- Quarter panels are also available for use when a single SFC3000 is to be mounted in a rack



I/O BREAK OUT MODULE (3000-503)

- Can be used with Digital IO 3000-314 or 3000-319 with a 3000-054 cable, or an Analogue IO 3000-316 with either a 3000-055 or 3000-056 cable depending on functionality required. Please refer to the manual for more details.
- Alternative cable options are available, for example the back shell can be fitted the other way for different cable routing.



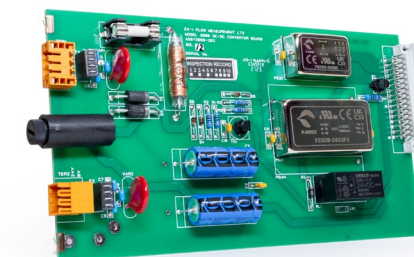
COMMUNICATION CONNECTION MODULE (3000-502)

- Can be used for 5-way RS485 multi-drop, RS232 with and without twist, and ethernet extension. Please refer to the manual for more details.



SPARE PSU BOARD (3000-302)

- Replacement PSU board, as supplied with every SFC3000 flow computer.



COMMUNICATION BREAKOUT

MODULE (3000-506)

- Convert up to 4 RJ45 cable to 5-way screw terminals. Please refer to manual for more details.



SPARE AUXILIARY BOARD (3000-303)

- Only one per flow computer, contains the mode /security switches, backup battery and SD card.





Ex~i Flow Measurement Ltd

Unit 22, Ford Lane Business Park,
Ford Lane, Ford, West Sussex, BN18 0UZ, UK

T +44 (0) 1243 554920

E mail@exiflowmeasurement.co.uk

W www.exiflowmeasurement.co.uk

t <https://twitter.com/ExiFlow>

in [https://www.linkedin.com/company/
exi-flow-measurement](https://www.linkedin.com/company/exi-flow-measurement)

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