Model 505

Application FC01

Single Channel Flow Computer

for Volumetric Frequency Flowmeter

Features

- **Tailored for volumetric frequency flow input**
- **Versatile "user value" available on main menu**
- **Selection of second language and user tags**
- **RTC logging with up to 100 entries at user-specified scheduled times**
- **Programmable pulse width and scaling of pulse output**
- **4-20mA retransmission**
- **RS-232 and RS-485 (optional) serial ports**
- **Modbus RTU, Printer and other serial port protocols**
- **Front panel adjustment of 8-24V DC output voltage**
- **Backlit display**

CE

Overview

The 505 FC01 application pack is a rate totaliser for the measurement of fluid. It uses the frequency output from a volumetric flowmeter and it can accept a frequency or pulse input from a wide range of flowmeters.

The flow computer displays the flow rate, resettable total and the accumulated total in the units of measure according to the purchase order.

The instrument is compatible with a wide range of flowmeter frequency outputs, including millivolt signals, reed switches, Namur proximity switches and pulse trains via its smart front-panel program selection.

A freely programmable "user value" on the main menu can serve as a setpoint for the 4-20mA output or as an operator identifier to be logged.

Calculations

The volume total and flowrate are derived from accurately measured frequency and the number of received pulses.

volume = pulses / k-factor

volume flow = frequency / k-factor

Frequency Input

Volumetric Flowmeter   **Flow**

A c c u r a c y • Q u a l i t y • P e r f o r m a n c e
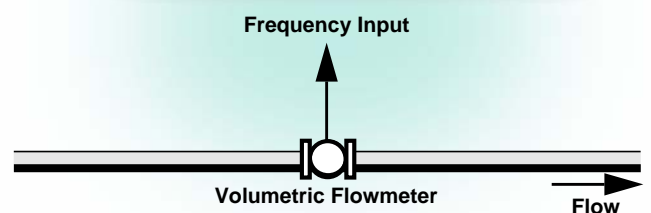
Displayed Information

The front panel display shows the current values of the input variables and the results of the calculations. A list of the variables for this application and their type (total or rate) is shown at the end of this document.

The instrument can be supplied with a real-time clock for data logging of up to 100 entries of the variables as displayed on the main menu.

Communications

There are two communication ports available as follows:

- RS-232 port
- RS-485 port

The ports can be used for remote data reading, printouts and for initial application loading of the instrument.

Retransmission Outputs

The instrument can re-transmit any main menu variable. The digital outputs can re-transmit totals as pulses. If the instrument has the advanced option, it outputs rates as a 4-20 mA signal.

Relay Outputs

The relay alarms can be assigned to any of the main menu variables of a rate type. The alarms can be fully configured including hysteresis. Two relays are standard.

Software Configuration

The instrument can be further tailored to suit specific application needs including units of measurement, custom tags, second language or access levels. A distributor can configure these requirements before delivery.
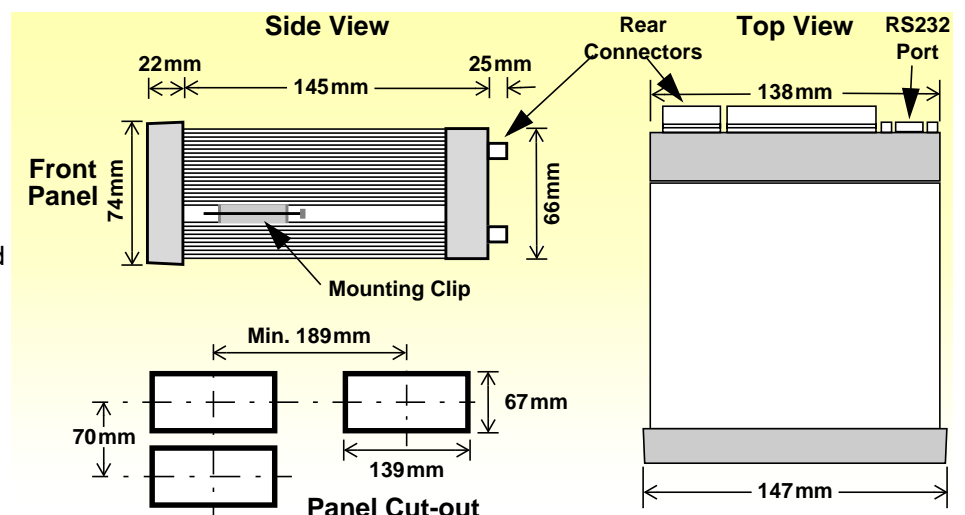
Instrument parameters including units of measurement can be programmed in the field, according to the user access levels assigned to parameters by the distributor.

All set-up parameters, totals and logged data are stored in non-volatile memory with at least 30 years retention.

Terminal Designations

Terminal	Label		Designation	Comment
1	RS485	+	RS485 (+)	
2		-	RS485 (-)	
3		G	Comms ground	
4	RS232	Tx	RS232 data out	Same RS232 port as DB9 connector
5		Rx	RS232 data in	
6		C	CTS (Clear to send)	
7	Io	+	4-20 mA output	Advanced option
8	SG	-	Signal Ground 0 V	
9	Li	+	Logic input	
10	D OUT	1+	Open collector o/p 1	Digital outputs
11		2+	Open collector o/p 2	
12	Ii	+	4-20 mA input	Not used
13	SG	-	Signal Ground 0 V	
14	Fi	+	Frequency input	Volumetric flow
15	Vo	+	8-24 volts DC output	70 mA power limited
16	G	-	DC Ground	
17	Vi	+	DC power input	DC power in 12-28 V
18	SH	E	Shield terminal	
19	RELAYS	R1	Relay 1	
20		RC	Relay Common	
21		R2	Relay 2	
E	AC MAINS	E	Mains ground	AC power in 95-135 V or 190-260 V
N		N	Mains neutral	
A		A	Mains active	
RS232 port			9-pin serial port	

Dimension Drawings

Part Number

505.XXXXXX-FC01
see **Product Codes** to select required features

Default Application software:
505-FC01-000000

Side View / Rear Connectors / Top View / RS232 Port

22mm / 145mm / 25mm / 138mm

Front Panel / 74mm / 66mm

Mounting Clip

Min. 189mm / 67mm

70mm / 139mm

Panel Cut-out / 147mm

Specifications

Operating Environment

Temperature	0°C to +60°C (conformal coating) +5°C to +40°C (no coating)
Humidity	0 to 95% non condensing (conformal coating) 5% to 85% non condensing (no coating)
Power Supply	95...135 V AC or 190...260 V AC or 12...28 V DC
Consumption	6W (typical)
Protection	Sealed to IP65 (Nema 4X) when panel mounted
Dimensions	147mm (5.8") width 74mm (2.9") height 167mm (6.6") depth

Display

Type	LCD with 7-digit numeric display and 11-character alphanumeric display (backlit optional)
Digits	15.5mm (0.6") high
Characters	6mm (0.24") high
LCD Backup	Last data visible for 15min after power down (optional)
Update Rate	0.3 second

Non-volatile Memory

Retention	> 30 years
Data Stored	Setup, Totals and Logs

Approvals

Interference	C€ compliance
Enclosure	ATEX, FM, CSA and SAA approved enclosures available for hazardous areas

Real Time Clock (Optional)

Battery Type	3 volts Lithium button cell (CR2032)
Battery Life	5 years (typical)

Frequency Input (General)

Range	0 to 10kHz
Overvoltage	30V maximum
Update Time	0.3 sec
Cutoff frequency	Programmable
Configuration	Pulse, coil or NPS input
Non-linearity	Up to 10 correction points

Pulse

Signal Type	CMOS, TTL, open collector, reed switch
Threshold	1.3 volts

Coil

Signal Type	Turbine and sine wave
Sensitivity	15mV p-p minimum

NPS

Signal Type	NPS sensor to Namur standard

Remote Key Input

Signal Type	CMOS, TTL, open collector, reed switch
Configuration	One input set as one of front five keys

Relay Output

No. of Outputs	2 relays
Voltage	250 volts AC, 30 volts DC maximum
Current	3A maximum

Communication Ports

Ports	RS-232 port RS-485 port
Baud Rate	2400 to 19200 baud
Parity	Odd, even or none
Stop Bits	1 or 2
Data Bits	8
Protocols	Modbus RTU, Printer*

Transducer Supply

Voltage	8 to 24 volts DC, programmable
Current	70mA @ 24V, 120mA @ 12V maximum
Protection	Power limited output

Pulse/Digital Output

Signal Type	Open collector, non-isolated
Switching	200mA, 30 volts DC maximum
Saturation	0.8 volts maximum
Pulse Width	Programmable: 10, 20, 50, 100, 200 or 500ms

4-20mA Output (Optional)

Supply	24 volts DC internal, non-isolated
Resolution	0.05% full scale
Accuracy	0.05% full scale (20°C) 0.1% (full temperature range, typical)

*Important: Specifications are subject to change without notice.
Printer protocol is available only if RTC option is installed.*

Ordering Information

Product Codes

Model	Supplementary Code						Description
505 .						- FC01	
Enclosure	1						Panel mount enclosure
	2						Field mount enclosure (not yet available)
	3/5						Explosion proof Ex410 with metric glands (5 specifies heater version)
	4/6						Explosion proof Ex410 with NPT glands (6 specifies heater version)
Output Options		0					**Basic** - RS232 and RS485 serial ports, 2 relays, 2 pulse outputs, rear key input
		1					**Advanced** - also includes 4-20mA o/p and Real-time clock for printer output and logging (100 logs)
Extra Options			2				9 way DB connector for RS232 serial port
Power Supply				E			For 220/240 VAC
				A			For 110/120 VAC
				D			For DC power only 12-28 VDC
Display Panel Options					S		Standard (no backlight & LCD backup)
					F		Fully optioned (with backlight & LCD backup)
PCB Protection						C	**Conformal coating** - required for maximum environmental operating range. Recommended to avoid damage from moisture and corrosion.
						N	**None** - suitable for IEC standard 654-1 Climatic Conditions up to Class B2 (Heated and/or cooled enclosed locations)
Application Pack Number						FC01	Defines the application software to be loaded into the instrument

Example full product part number is 505.112EFC-FC01 (this is the number used for placing orders).

Main Menu Variables

Main Menu Variables	Default Units	Preferred Units	Variable Type
Volume	L		Total
Volume Flowrate	L/min		Rate
User Value	- - -		Rate

500 Series in Ex410 Enclosure