

SERIES 500

contrec

# FLOW COMPUTER

Model 515

STEAM FLOW  
NATURAL GAS FLOW  
PROCESS CONTROL  
and MORE.



## Features

- Two configurable frequency inputs
- Four configurable analog inputs
- Four logic inputs
- Selectable protocols on serial ports including Modbus RTU
- Infra-red communications port on front panel
- Isolated 4-20mA outputs for retransmission
- Isolated pulse outputs for retransmission
- Pulse width and scaling of pulse output
- Up to four relay outputs
- Real Time Clock logging and printer output
- Front panel adjustment of 8-24V DC output voltage
- Backlit display
- LCD backup



The model 515 is a flow computer with full rate-totalizing functions suitable for complex applications such as Natural Gas, Steam and Process Control.

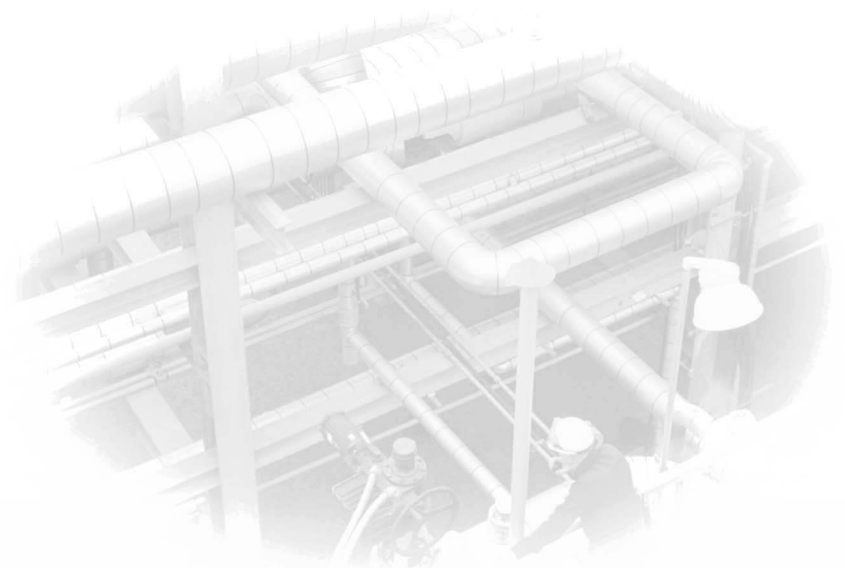
## General Overview

The 515 is the advanced model in the 500 series. It has more inputs and outputs of higher accuracy giving it greater capabilities and configurability to suit a wide range of applications.

There are multiple frequency and analog inputs which make it suitable for applications that require extra external sensors for temperature, pressure, density, level devices and so on.

The Model 515 is capable of operating in a wide temperature range and its "plug and play" option card makes enhancements easy without reprogramming. The behaviour of the instrument is determined by the instrument software which is selected from an increasing list of applications in the 500 Series Program Manager.

A snap-in front panel strip with front key functions is available to suit the particular type of application, such as rate totalising or batch controlling.



Accuracy • Quality • Performance

## 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.

## Displayed Outputs

The front panel display shows the current values of the input variables and the results of the calculations.

The instrument can be supplied with a real-time clock for data logging of over 1000 entries of the variables as displayed on the main menu.

## Communications

There are three communication ports available as follows:

- RS-232 serial port (standard)
- RS-485 port (advanced option)
- Infra-red port (on front panel)

These ports are available for remote meter reading, printer connection and for initial application loading of the instrument.

## Isolated Outputs

The opto-isolated outputs can retransmit any main menu variable. The type of output is determined by the nature of the assigned variable. Totals are output as pulses and rates are output as 4-20mA signals. One output is standard, a second output is available as an option.

## Relay Outputs

The relays can be used for general alarms or specific functions such as valve and pump control. Alarm relays can be assigned to any of the main menu variables of a rate type. The alarm can be fully configured including hysteresis. Two relays are standard with an additional two available in the advanced option.

## Terminal Designations

Terminal Label		Designation		Comment
1	FINP	1+	Frequency Input 1+	
2	FINP	2+	Frequency Input 2+	
3	SG	-	Signal ground	
4	EXC V	1+	Excitation Term 1+	For AINP1 RTD input For AINP2 RTD input
5	EXC V	2+	Excitation Term 2+	
6	EXC V	3+	Excitation Term 3+	
7	AINP1	+	Analog input ch 1 (+)	
8		-	Analog input ch 1 (-)	
9	AINP2	+	Analog input ch 2 (+)	
10		-	Analog input ch 2 (-)	
11	AINP3	+	Analog input ch 3 (+)	
12		-	Analog input ch 3 (-)	
13	AINP4	+	Analog input ch 4 (+)	
14		-	Analog input ch 4 (-)	
15	Vo	+	8-24 volts DC output	Overload protected
16	G	-	DC Ground	
17	Vi	+	DC power input	DC power in 12-28V
18	SH	E	Shield terminal	
19	RS485	+	RS485 data in (+)	Advanced option
20		-	RS485 data out (-)	
21		G	RS485 ground	
22	LOGIC INPUTS	1+	Switch 1	
23		2+	Switch 2	
24		3+	Switch 3	
25		4+	Switch 4	
26		C-	Signal ground	
27	OUT 1	+	Output ch 1 (+)	
28		-	Output ch 1 (-)	
29	OUT 2	+	Output ch 2 (+)	Advanced option
30		-	Output ch 2 (-)	
31	RELAYS	RC	Relay common	
32		R1	Relay 1	
33		R2	Relay 2	
34		R3	Relay 3	Advanced option
35		R4	Relay 4	
E	AC MAINS	E	Mains ground	AC power in 95-135V or 190-260V
N		N	Mains neutral	
A		A	Mains active	
RS232 port		9-pin serial port		

# Specifications

## General

### Operating Environment

#### PCB Protection - Conformal Coating

Temperature	-20°C to +60°C
Humidity	0 to 95% non condensing

#### PCB Protection - None

Temperature	+5°C to +40°C
Humidity	5% to 85% non condensing

#### Power Supply

95 to 135 volts AC or  
190 to 260 volts AC or  
12 to 28 volts DC

#### Power Cons.

Typically 6W

#### Protection

Sealed to IP65 (Nema 4X) when panel mounted

#### Dimensions

147mm (5.8") width  
74mm (2.9") height  
166mm (6.6") depth

#### Keypad

5 embossed tactile keys

### Display

#### Type

LCD with 7-digit numeric display and  
11-character alphanumeric display

#### Digits

15.5mm (0.6") high

#### Characters

6mm (0.24") high

#### LCD Backup

Last data visible for 15min after power down

#### Update Rate

0.3 second

### Approvals

#### Interference

CE compliance

#### Enclosure

ATEX, FM, CSA and SAA approved enclosures  
available for hazardous areas

## Inputs

### Frequency Input (General)

#### Number of inputs

2 configurable inputs

#### 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

### Logic Inputs

#### Signal Type

CMOS, TTL, open collector, reed switch

#### Number of inputs

4 inputs

### Analog Input (General)

#### Number of inputs

4 configurable inputs

#### Overcurrent

100mA absolute maximum rating

#### Update Time

< 1.0 sec

#### Configuration

4-20mA, 0-5V, 1-5V (AINP1 to AINP4)  
RTD (AINP1 and AINP2 only)

#### Non-linearity

Up to 20 correction points (flow inputs only)

### RTD Input (AINP1 and AINP2 only)

#### Sensor Type

PT100 & PT500 to IEC 751

#### Connection

Four Wire

#### Range

-100°C to 300°C

#### Accuracy

0.1°C typical

### 4-20 mA Input (AINP1 to AINP4)

#### Impedance

100ohms (to common signal ground)

#### Accuracy

0.05% full scale (20°C)  
0.1% (full temperature range, typical)

### 0-5 or 1-5Volts Input (AINP1 to AINP4)

#### Impedance

10Mohms (to common signal ground)

#### Accuracy

0.05% full scale (20°C)  
0.1% (full temperature range, typical)

## Outputs

### Relay Output

#### No. of Outputs

2 relays plus 2 optional relays

#### Voltage

250 volts AC, 30 volts DC maximum  
(solid state relays use AC only)

#### Current

3A maximum

### Communication Ports

#### Ports

RS-232 port  
RS-485 port (optional)  
Infra-red port

#### Baud Rate

2400 to 19200 baud

#### Parity

Odd, even or none

#### Stop Bits

1 or 2

#### Protocols

ASCII, Modbus RTU, Printer (RS232)

### Transducer Supply

#### Voltage

8 to 24 volts DC, programmable

#### Current

70mA @ 24V DC, 120mA @ 12V DC max

#### Protection

Power limited output

### Isolated Output

#### No. of Outputs

1 configurable output (plus 1 optional)

#### Configuration

Pulse or 4-20mA output

### Pulse Output

#### Signal Type

Open collector

#### Switching

200mA, 30 volts DC maximum

#### Saturation

0.8 volts maximum

#### Width

Programmable: 10, 20, 50, 100, 200 or 500ms

### 4-20mA Output

#### Supply

9 to 30 volts DC external

#### Resolution

0.05% full scale

#### Accuracy

0.05% full scale (20°C)  
0.1% (full temperature range, typical)

### Real Time Clock (Optional)

#### Battery Type

3 volts Lithium button cell (CR2032)

#### Battery Life

5 years (typical)

*Important: Specifications are subject to change without notice.*

# Product Codes

Model	Supplementary Code	Description
515	-	
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	4 logic inputs, 1 isolated output, 2 relays (only relay type 1 is available), RS232 (DB9) communication port
	1	4 logic inputs, 2 isolated outputs, 4 relays, real-time clock data logging, RS232 (DB9) and RS485 communication ports
	2/3	4 logic inputs, 2 isolated outputs, 4 relays, real-time clock data logging, RS232 (DB9) and Ethernet/RF communication ports (not yet available)
Relay Type	1	2 electromechanical relays only
	2	2 electromechanical and 2 solid state relays
	3	Solid state relays only (not yet available)
Power Supply	E	For 220/240 VAC
	A	For 110/120 VAC
	D	For DC power only 12-28 VDC
Display Panel Option	F	Fully optioned (with backlight, LCD backup and Infra-Red comms port)
PCB Protection	C	<b>Conformal coating</b> - required for maximum environmental operating range. Recommended to avoid damage from moisture and corrosion.
	N	<b>None</b> - suitable for IEC standard 654-1 Climatic Conditions up to Class B2 (Heated and/or cooled enclosed locations)
Application Pack Number	XXnn	Defines the application software to be loaded into the instrument

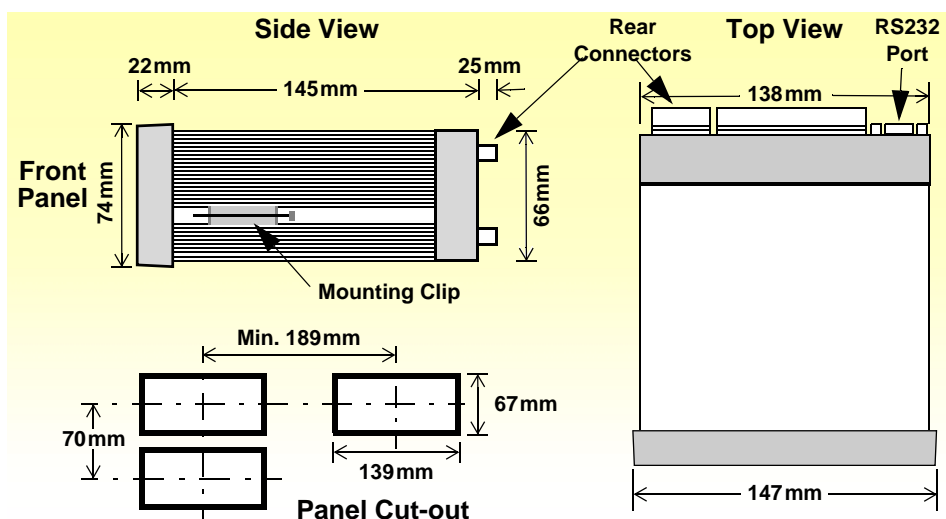
Example full product part number is 515.111EFC-XXnn (This is the number used for placing orders).

## Part Number

515.XXXXXX-XXnn  
see Product Code to select required features

Default Application software:  
515-XXnn-000000

## Dimension Drawings



[www.contrec.com.au](http://www.contrec.com.au)

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## Available 500 Series Applications

This table contains the applications available across both the 515 and 505 models. For further details on a listed application, please request or refer to the application pack brief by model and pack number. i.e. 515-CR01. A similar application list with PDF datasheets is available on the website. [www.contrec.com.au](http://www.contrec.com.au)

Pack No.	Description	Comments	Model Type	NEW
<b>BATCH</b>	<b>Batch Controllers</b>		<b>515/505</b>	
BC01	Dual Stage Batch - Volumetric Frequency Flow		505	
BC02	Dual Stage Batch - Volumetric Analog Flow		505	
BC03	Dual Stage Batch - Mass Frequency Flow		505	
BC04	Dual Stage Batch - Mass Analog Flow		505	
BS01	Secure Batch Controller- Volumetric Frequency Flow	ID-Tag Interface	515	NEW
	<b>Batch/Flow Controllers</b>			
BF01	Dual Stage Batch & Flow Control - Volumetric Frequency Flow	PI Flow Control	515	
BF02	Dual Stage Batch & Flow Control - Volumetric Analog Flow	PI Flow Control	515	
BF03	Dual Stage Batch & Flow Control - Mass Frequency Flow	PI Flow Control	515	
BF04	Dual Stage Batch & Flow Control - Mass Analog Flow	PI Flow Control	515	
BR01	Dual Stage Batch & Ratio Control - Volumetric Frequency Flow	PI Flow Control	515	
BR02	Dual Stage Batch & Ratio Control - Volumetric Analog Flow	PI Flow Control	515	
BR03	Dual Stage Batch & Ratio Control - Mass Frequency Flow	PI Flow Control	515	
BR04	Dual Stage Batch & Ratio Control - Mass Analog Flow	PI Flow Control	515	
<b>CONTROL</b>	<b>Control Computers</b>			
CR01	Blending/ratio - Volumetric Frequency Flow, Analog Control	PI Flow Control	515	
CR02	Blending/ratio - Volumetric Analog Flow, Analog Control	PI Flow Control	515	
CB01	Batch Based Blending - Volumetric Frequency Flow, DCV Control	Control for Digital Valves	515	
<b>FLOW</b>	<b>Flow Computers</b>			
FA01	Add or Subtract Flow - 2 Input, Freq or Analog (Volumetric)	Flow1 +/- Flow2	515	
FA02	Add or Subtract Flow - 2 Input, Freq or Analog (Mass)	Flow1 +/- Flow2	515	
FA03	Add or Subtract Flow - 2 Input, Freq or Analog (Energy)	Flow1 +/- Flow2	515	
FC01	Single Channel - Volumetric Frequency Flow		505	
FC02	Single Channel - Volumetric Analog Flow		505	
FC03	Single Channel - Mass Frequency Flow		505	
FC04	Single Channel - Mass Analog Flow		505	
FG01	Generic Flow - Frequency Flow, Analog Input	Multifunctional Analog Input	505	NEW
FO01	Open Channel - Frequency Velocity, Analog Level	Flow = Velocity x Area	505	
FP01	Petroleum Consumption - 2 Channel Frequency Flow	ASTM D1250, Flow1 - Flow2	515	
FP02	Petroleum Consumption - 2 Channel Analog Flow	ASTM D1250, Flow1 - Flow2	515	
FP03	Petroleum Flow - Quadrature Input, Temperature Correction	ASTM D1250, ISO 6551, LPG	515	
FN01	Net Oil (Water Cut) - Mass Frequency Flow	ASTM D1250-04	515	
PP01	Pressurised Petroleum Flow - Quadrature Input	ASTM D1250-04, ISO 6551	515	

Pack No.	Description	Comments	Model Type	NEW
<b>GAS</b>	<b>General Gas Computers</b>		<b>515/505</b>	
GC01	General Gas - Single or Quadrature Frequency Flow	Ideal & General Equations	515	
GC02	General Gas - Analog Flow	Ideal & General Equations	515	
GC03	General Gas - Stacked DP Mass Flowmeter	Ideal & General Equations	515	
GC04	General Gas - Stacked DP Meter (ISO 5167/Cones)	Ideal & General Equations	515	
GC06	General Gas - Stacked DP Volumetric Flowmeter	Ideal & General Equations	515	
	<b>Natural Gas Computers</b>			
GN01	Natural Gas (AGA-8) - Single or Quadrature Frequency Flow		515	
GN02	Natural Gas (AGA-8) - Analog Flow		515	
GN03	Natural Gas (AGA-8) - Stacked DP Mass Flowmeter		515	
GN04	Natural Gas (AGA-8) - Stacked DP Meter (ISO 5167/Cones)		515	
GN05	Natural Gas (AGA-8) - Stacked DP Meter (AGA-3)		515	
GN06	Natural Gas (AGA-8) - Stacked DP Volumetric Flowmeter		515	
GN11	Natural Gas (SGERG) - Single or Quadrature Frequency Flow		515	
GN12	Natural Gas (SGERG) - Analog Flow		515	
GN13	Natural Gas (SGERG) - Stacked DP Mass Flowmeter		515	
GN14	Natural Gas (SGERG) - Stacked DP Meter (ISO 5167/Cones)		515	
GN16	Natural Gas (SGERG) - Stacked DP Volumetric Flowmeter		515	
<b>HEAT</b>	<b>Heat/Energy Computers</b>			
HC01	Heat/energy Calculator - Volumetric Frequency Flow	Water & other fluids	515	
HC02	Heat/energy Calculator - Volumetric Analog Flow	Water & other fluids	515	
HC03	Heat/energy Calculator - DP Meter (Mass Span)	Water & other fluids	515	
HC04	Heat/Energy Calculator - DP Meter (ISO 5167/Cones)	Water (IAPWS-IF97)	515	
HC06	Heat/Energy Calculator - DP Meter (Volumetric Span)	Water & other fluids	515	
HC12	Heat/energy Calculator - Mass Analog Flow	Water & other fluids	515	
<b>LEVEL</b>	<b>Level Monitors</b>			
LM01	Single Tank Level Monitor - Analog level	With strapping table	505	
<b>STEAM</b>	<b>Steam Computers</b>			
SC01	Steam Computer - Volumetric Frequency Flow	IAPWS-IF97	515	
SC02	Steam Computer - Volumetric Analog Flow	IAPWS-IF97	515	
SC03	Steam Computer - DP Meter (Mass Span)	IAPWS-IF97	515	
SC04	Steam Computer - DP Meter (ISO 5167/Cones)	IAPWS-IF97	515	
SC05	Steam Computer - DP Meter (AGA-3)	IAPWS-IF97	515	
SC06	Steam Computer - DP Meter (Volumetric Span)	IAPWS-IF97	515	
<b>OTHER</b>	<b>Other Applications</b>			
MP01	Mass Flow - Frequency Input With Master Proving	API Manual, Chapter 4.5	515	