Model: XDF1
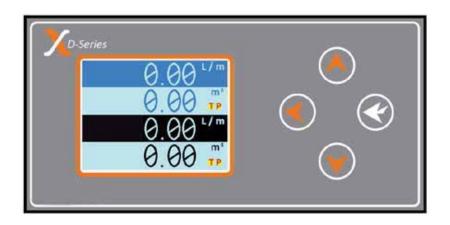
The DIN Panel series

ISOIL INDUSTRIA — *Le soluzioni che contano*

KEY FEATURES:

- o DIN Panel Mount Design
- o Pulse / Analogue Input versions
- o Displays Instantaneous Flow Rate, Total, Press, Temp, Freq.
- o Dual input version available
- o Mass calculations for Steam & Gas
- o ABS Panel mount enclosure with rugged tactile buttons.
- o Fully programmable K-Factors
- o Linearisation curve
- o Universal input without the need for amplifiers or signal converters
- o Pulse / Alarm transistor output
- o Passive 4-20mA Analogue output
- o Simple & intuitive to program and use
- o Engineering units selectable without needing to adjust K-Factor
- o Retro upgrade: Extra Features can be unlocked with a password
- o Intelligent digital filter

Your Process In-View

The **XDF1** is a DIN panel mount display range that is an advanced solution for flow / mass measurement and control applications that require high accuracy and reliability, combined with an extremely compact panel mount enclosure, industrial grade performance and low maintenance.

The XDF1 has an innovation and revolutionary software design which allows certain features to be purchased after sale and installation by just the addition of a software key to unlock the required feature. This allows for redundancy in a display so show the system in which it is used be expanded or advanced then this is a low cost solution to an advanced upgrade.

Model: XDF1

The **XDF1** *is part of the 'DIN Panel Series'* offered this series covers a wide range of flow measurement needs and is available in **Advanced** version only.

The core hardware of the XDF1 is different from model to model, and options can be chosen to define whether the display will have features like Dual computer, linearisation or alarm outputs. This enables the customer to have an intelligent display that can offer features like fuel consumption monitoring or batch control, without having to pay for the extra features which they might not require.

VERSIONS AVAILABLE

ADVANCED

Features included in this version:

Universal input
Pulse: Accepts open drain/collector NPN/PNP, Reed switch, Dry-contact, Coils, almost any wave and logical signals even down to 1 x pulse every 5mins.
Analogue: 4-20mA input signal which can be passive or active. Suitable for Linear input or square root extraction.

Enclosure / Display
Industry standard IP65/NEMA 4x ABS case with stainless steel screws. 1 x M16 and 2 x PG9 cable gland entries. Rugged Polyester membrane with 3 x embossed tactile buttons.

High visibility liquid crystal display (LCD) with high contrast across the entire temperature range.
Fully programmable K-Factor & outputs via 3 x buttons. When selecting different units the K–Factor changes automatically.
All settings and Totals are safely stored in a non-volatile memory.

Power supply
Choice of power supplies:
DC: 12 - 36VDC
DC + Sensor supply: 12 - 36VDC with 10VDC 20mA sensor supply.
AC: 85 – 264 VAC

Intelligent Digital Filtering (IDF)
Automatic filtering of instantaneous flow rate and analogue output which ensures stability of readings but can still rapidly adjust for dynamic changes in flow.

Analogue output
Passive 4-20mA output
12 Bit / fully scaleable
9.5 – 36 VDC Max 250 ohm

Pulsed output
Isolated without polarity
100 VDC, 70 VAC / 100mA
Scaleable pulse rate relative to Total
Max 500Hz with self-adjusting width

Includes all of the features of the BASIC version plus the extra features below:

Linearisa on

For enhanced accuracy and rangeability, XDF1 accepts calibra on tables with up to 10 points of data. The operator can quickly switch between single KFACTOR opera on and the programmed flow curve of up to 10 points.

Alarms

Open drain 100V/100mA output that can be programmed to work as a rate alarm, high or low, with +/- 1 % hysteresis,
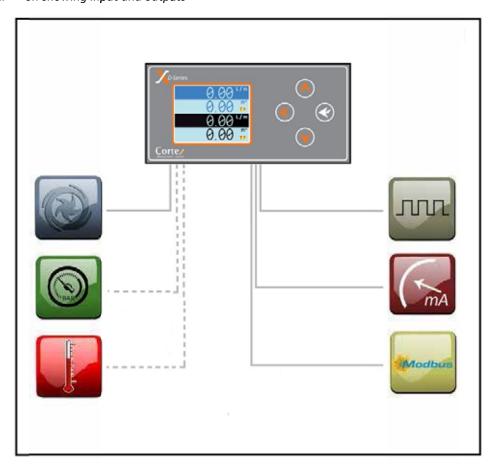
APPLICATION

Datalogger

Regardless of the output type chosen the XDF1 has a 64 bit datalogger which can log total volume in every 24hr period over 64 days.

Enclosure

DIN 72 x 72mm Ultra compact panel mount ABS case supplied complete with detachable screw kit for ease of installa on and ul mate display on.

Fig.1.0. Appli on showing input and outputs

CHARACTERISTICS

Parameter	Conditions	Min	Typical	Max	Units
Power supply	-20 °C to +70 °C	12		36	V DC
Input					
Voltage for the sensor	-20 °C to +70 °C, max 10 mA, Note 1		10		V DC
Threshold, low	Wave or logical signal (CMOS, TTL etc.)		1		V DC
Threshold, high	Wave or logical signal (CMOS, TTL etc.)		1.4		V DC
Coil voltage	Symmetrical signal from the coil (sine, triangle, saw etc)	20			mVpp
NAMUR, low threshold	-20 °C to +70 °C, Powered by XNF, Note 2		1		mA DC
NAMUR, high threshold	-20 °C to +70 °C, Powered by XNF, Note 2		2.1		mA DC
Reed switch current	-20 °C to +70 °C, Powered by XNF, Note 2			3.5	mA DC
Frequency	Note 7		5000		Hz
Analog Output					
Power supply	-20 °C to +70 °C, Note 3	7.2		36	V DC
Resolution	-20 °C to +70 °C, 7.2 – 36 V		4		uA
Error	250 ohm load, 24 V, 25 °C, Note 4			0.05	% FS
Power supply error	7.2 - 36V, no load, output disabled, 25 °C			0.5	uA/V
Temperature coefficient	-20 °C to +70 °C, 24 V		35		ppm/°C
Current, output disabled	SET20 = 0.0, 24 V DC supply, 25 °C		3.85		mA
Digital Output					
Output ON resistance	-20 °C to +70 °C, 100 mA			8	ohm
Output OFF leakage	-20 °C to +70 °C, 100 V DC			5	nA
'Low', pulse rate	Note 5			480	p/min
'Low', pulse duration	Note 5		62.5		ms
'Low', pause duration	Note 5	62.5			ms
'High', pulse rate	Note 6			30,000	p/min
RS485, 2 wire					
Load	1/8 of the standard RS485 driver load		1/8		

Note 1: When powering a 3 wire sensor like open drain/collector pnp/npn sensor. For 2 wire sensors the current is automatically limited when powered by XDF.
Note 2: If the 2 wire sensor uses external power, the external voltage must be 10 V DC or less.
Note 3: The minimum voltage for the 4-20 mA output to operate is $V = 7.2 + R \text{ load [ohm]} * 0.020$ [V DC]
For an XNF with a load of 250 ohm, the minimum voltage would be 12.2 V DC.
Note 4: The parameter includes all errors, non-linearity and noise at constant voltage and temperature.
Note 5: Pulse output has been programmed to be 'low' – low pulse rate for metering pumps applications. Pulse and pause widths are fixed.
Note 6: Pulse output has been programmed to be 'high' – high pulse rate for SCADA, PLCs etc. Pulse and pause have equal widths.

MAXIMUM RATINGS *

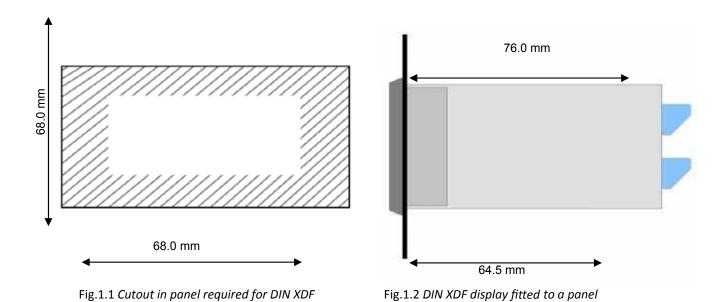|	
Operating temperature	-20 °C to +70 °C
	The electronics system is industrial (-40 °C to +85 °C) and higher grade
	The Liquid Crystal Display (LCD) limits the operable temperature range.
Output current	100 mA DC
Output voltage	100 VDC
Supply voltage ("S" to "-")	40 VDC

NOTICE: Stresses above these ratings will cause permanent damage to the device.

MECHANICAL

The XDF1 has a DIN 142 x 72mm panel mount case with the following features.

68.0 mm

68.0 mm

Fig.1.1 *Cutout in panel required for DIN XDF*

76.0 mm

64.5 mm

Fig.1.2 *DIN XDF display fitted to a panel*

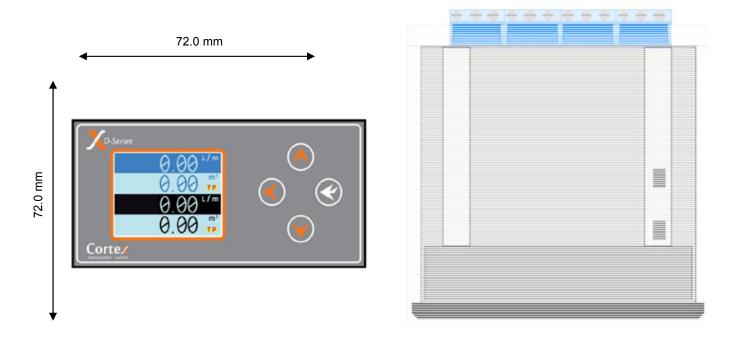**NOTE**: The cables may need additional space in the panel at the back of the XDF

72.0 mm

72.0 mm

Fig.1.3 XDF DIN display – Front view

Fig.1.4 XDF DIN display – Elevated view

WIRING EXAMPLES

Typical wiring diagram is shown below.

NOTE: There is no isolation between any input and the digital output. Terminals 2, 4 and 7 are shorted inside the device. It is the user's responsibility to consider this fact and implement appropriate wiring in the user's specific application.
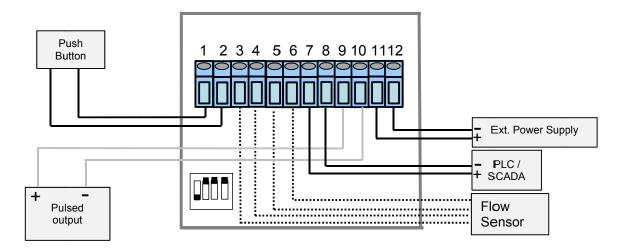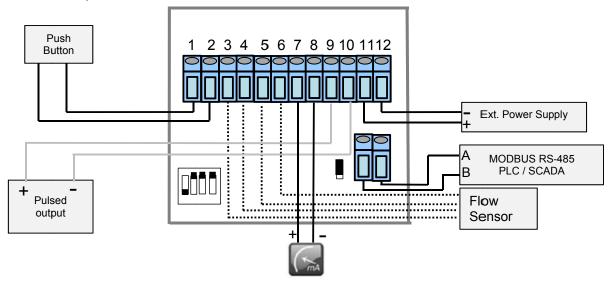

Fig.1.5 Wiring diagram with standard inputs and outputs.

 1 – Push button plus
 2 – Push button minus
 3 – Power for the sensor, plus
 4 – Signal / Coil
 5 – Power for the sensor, minus
 6 – Coil, only
 7 – Analog output, plus
 8 – Analog output, minus
 9 – Analog output, plus
10 – Analog output, minus
11 – Power supply, plus
12 – Power supply, minus

The device has optional Modbus RS-485 communications and to be wired as follows:

NOTE: When an external loop power supply provides the power, the three devices have to be connected in series, as in the diagram above.

Fig.1.6 Wiring diagram with standard inputs and outputs.

ORDERING

For ordering please use the following part numbers:

	X	D	F	1	_	-	_	_	_	_

Casing

Economy (IP65 Rated)	E
DIN Panel	D
Superior (IP65 Rated)	S
Nano Panel	N
Field & Meter Mount (IP67 Rated)	F

Type

Flow	F
Level	L
Pressure	P
Temperature	T

Function

Flow Rate / Totaliser	1
Batch Controller	2
Fuel Consumption (only with XEF0, XEF2)	3
Liquid Temperature Correction (only with XE, XD, XS)	4
Gas Flow Computer (only with XD, XS)	5
Steam Flow Computer (only with XD, XS)	6
Level (only with XF)	7
Pressure (only with XF)	8
Temperature (only with XF)	9

Model

Advanced	2
Advanced Dual Computer (only with XD, XS)	3

Input Type

Pulse Standard	PS
Analogue Standard	AS
Pulse Low Frequency	PL
Analogue Loop Powered	AL

Power Options

10 - 36VDC	0
Battery Powered (only with XE, XF)	1
10 - 36VDC with DC sensor excitation	2
24VAC with DC sensor excitation	3
86 - 260 VAC (only with XE, XD, XS, XF)	4

Communications

No Communication	NC
Modbus RS485	MB

Output Type

Pulse / Alarm / Batch Transistor + Analogue Passive	PA
Relay outputs, 250VAC / 5Aamp Max (Only with XD, XS)	PR
Analogue Isolated (only with XD, XS)	AI

Example: X D F 1 2 - AS 4 NC PA

NOTE:

Ensuring the XDF1 unit is powered with the correct power supply is critical for it service life and warranty validation.