4 Channel Digital To Analogue Converter

Features

- Fault finding LED indication
- Input status indication
- Input status simulation
- Expands controller input capacity
- Calibrated output
- Compatible with Trend characterise scaling

Specification

Inputs	VFC or 24Vac or 24Vdc (>17.5V = ON, <7.5V = OFF)
Outputs:	
	0-10Vdc into 2kΩ impedance
	4-20mA into 500Ω max.
Power supply:	
0-10Vdc	24Vac ±15% @ 50Hz or
	24Vdc +15% -6%
4-20mA	24Vdc +15% -6%
Current :	
	35mA max. voltage output mode
	55mA max. current output mode
LED indication:	
	Supply OK
	Supply voltage low
	Supply voltage high
	Current output(4-20mA output only)
Manual override	On/Auto for each input
Electrical Terminals	Rising cage connectors for 0.5-2.5mm² cable
Ambient range:	
Temperature	-10°C to +50°C
RH	0-80% non-condensing
Dimensions	H75mm x W55mm x D42mm
Country of origin	UK

Product Codes

IO-DIM4

Converts 4 x VFC inputs or 4 x 24Vac/dc inputs to a 0-10Vdc or 4-20mA output signal, to be monitored by a single input channel

CE

Technical Overview

The IO-DIM4 is intended for use the BMS controllers to expand their input capacity, by multiplexing 4 digital signals or 4 24Vac/dc inputs into a single analogue controller input. Each combination of input states corresponds to an analogue value from the IO-DIM4, which can be decoded into 4 digital status bits.

Installation

1. The IO-DIM4 should only be installed by a competent, suitably trained technician, experienced in installation with hazardous voltages. (>50Vac & <1000Vac or >75Vdc & 1500Vdc)

2. Ensure that all power is disconnected before carrying out any work on the I0-DIM4.

3. Maximum cable is 2.5mm², care must be taken not to over tighten terminals.

4. When mounting the IO-DIM4 care should be taken not to stress the PCB when fitting to the DIN rail. If it is necessary remove the module from the DIN rail, be sure to use a flat bladed screwdriver to release the DIN clips.

5. The IO-DIM4 is designed to operate from a 24Vac/dc supply (so that power can be drawn from a 24Vac transformer used for other purposes if a 24Vdc supply is not available). In either case one side of the supply is common to the signal ground from the BEMS controller.

6. The output of the module is pre-calibrated and no adjustment is required. The output is also self-calibrating, to ensure that the output is always correct.

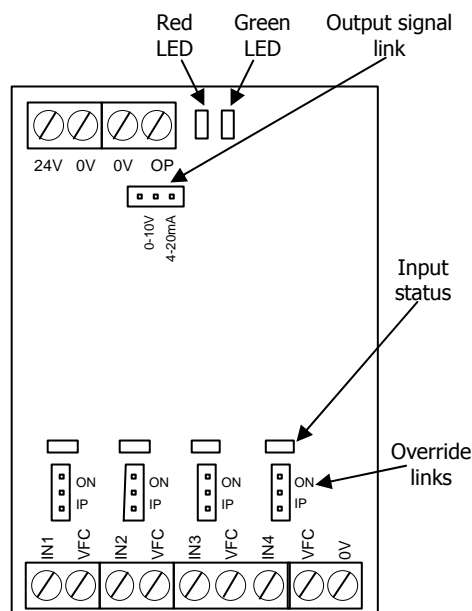## Jumper Settings

Input signal link:

0-10Vdc Input signal
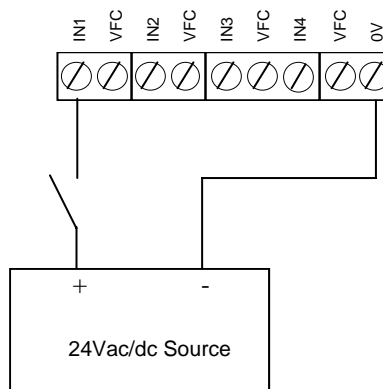

4-20mA Input signal

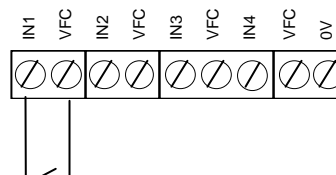Override links:

On

Off

Connections

Connection Examples

24V Switching:

VFC Switching:

LED Status

Power supply

Normal:

The green LED indicates the supply power condition. If the power supply is normal (between 22V and 40V) the green LED is ON continuously, showing that the IO-DIM4 is powered correctly.

Low Supply Voltage:

If power supply falls below about 22V the green LED double flashes twice a second;

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The PCB tries to maintain the correct output but may be unable to achieve the specified voltage or current level.

High Supply Voltage:

If the power supply is above 40V the green LED flashes 6 times a second;

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The PCB tries to maintain the correct output.

Output:

The Red LED is lit when the PCB is in 4-20mA mode and working correctly. For this to be the case, these conditions must be met:

1. The output select jumper must be connected in the 4-20mA position

2. The output terminals must be connected through an impedance of 500Ω or less.

3. The PCB is capable of sourcing the correct output current. (The red LED may flash if the PSU is below 22V or the impedance is more than 500Ω.)

Output Tables

0-10Vdc Output:

Input Status				
IN1	IN2	IN3	IN4	Nominal Output
OFF	OFF	OFF	OFF	0.30Vdc
ON	OFF	OFF	OFF	0.90Vdc
OFF	ON	OFF	OFF	1.60Vdc
ON	ON	OFF	OFF	2.20Vdc
OFF	OFF	ON	OFF	2.80Vdc
ON	OFF	ON	OFF	3.40Vdc
OFF	ON	ON	OFF	4.10Vdc
ON	ON	ON	OFF	4.70Vdc
OFF	OFF	OFF	ON	5.30Vdc
ON	OFF	OFF	ON	5.90Vdc
OFF	ON	OFF	ON	6.60Vdc
ON	ON	OFF	ON	7.20Vdc
OFF	OFF	ON	ON	7.80Vdc
ON	OFF	ON	ON	8.40Vdc
OFF	ON	ON	ON	9.10Vdc
ON	ON	ON	ON	9.70Vdc

4-20mA Output:

Input Status				
IN1	IN2	IN3	IN4	Nominal Output
OFF	OFF	OFF	OFF	4.50mA
ON	OFF	OFF	OFF	5.50mA
OFF	ON	OFF	OFF	6.50mA
ON	ON	OFF	OFF	7.50mA
OFF	OFF	ON	OFF	8.50mA
ON	OFF	ON	OFF	9.50mA
OFF	ON	ON	OFF	10.50mA
ON	ON	ON	OFF	11.50mA
OFF	OFF	OFF	ON	12.50mA
ON	OFF	OFF	ON	13.50mA
OFF	ON	OFF	ON	14.50mA
ON	ON	OFF	ON	15.50mA
OFF	OFF	ON	ON	16.50mA
ON	OFF	ON	ON	17.50mA
OFF	ON	ON	ON	18.50mA
ON	ON	ON	ON	19.50mA

Trend Scaling

0-10Vdc Output:

Trange	262
Brange	-262
Upper	263
Lower	-263
Exponent	3

4-20mA Output:

Trange	257
Brange	-385
Upper	258
Lower	-386
Exponent	4

Characterise scaling:

0-10Vdc Output:

Scaling type	5
Input type	0
Exponent	3
Points used	2
sLower	0.3
sUpper	256

Input 1 = 0.30   Output 1 = 12.00
Input 2 = 9.70   Output 2 = 244.00

4-20mA Output:

Scaling type	5
Input type	2
Exponent	3
Points used	2
sLower	0
sUpper	256

Input 1 = 4.50   Output 1 = 12.00
Input 2 = 19.50 Output 2 = 244.00

Trend Type 18 Function Module Alarm Byte Table

The alarm byte associated with a Trend type 18 function module consists of 8 bits. For example, F1 (function 1) has a default destination of A101 (analogue node 101), which in turn is associated with alarm digital byte 141. The table below shows which bit of the alarm byte is affected by which input of the IO-DIM4, and assumes function 1 is used as the A/D (i.e. alarm byte 141) .

IO-DIM4 Input	Alarm Bit
IN1	141.4
IN2	141.5
IN3	141.6
IN4	141.7

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