6 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 :	
	40mA max. voltage output mode 60mA 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 W75mm x D42mm
Country of origin	UK

Product Codes

IO-DIM6

Converts 6 VFC inputs or 6 24Vac/dc inputs to a 0-10Vdc or 4-20mA output signal, to be monitored by a single input channel.

Technical Overview

The IO-DIM6 is intended for use the BMS controllers to expand their input capacity, by multiplexing 6 digital signals or 6 24Vac/dc inputs into a single analogue controller input. Each combination of input states corresponds to an analogue value from the IO-DIM6, which can be decoded into 6 digital status bits.

Installation

1. The IO-DIM6 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-DIM6.

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

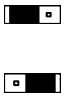
4. When mounting the IO-DIM6 care should be taken not to stress the PCB when fitting to the DIN rail. If it is necessary remove the module from the DIN rail, be sure to use a flat bladed screwdriver to release the DIN clips.

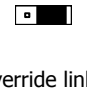
5. The IO-DIM6 is designed to operate from a 24Vac/dc supply (so that power can be drawn from a 24Vac transformer used for other purposes if a 24Vdc supply is not available). In either case one side of the supply is common to the signal ground from the BEMS controller.

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

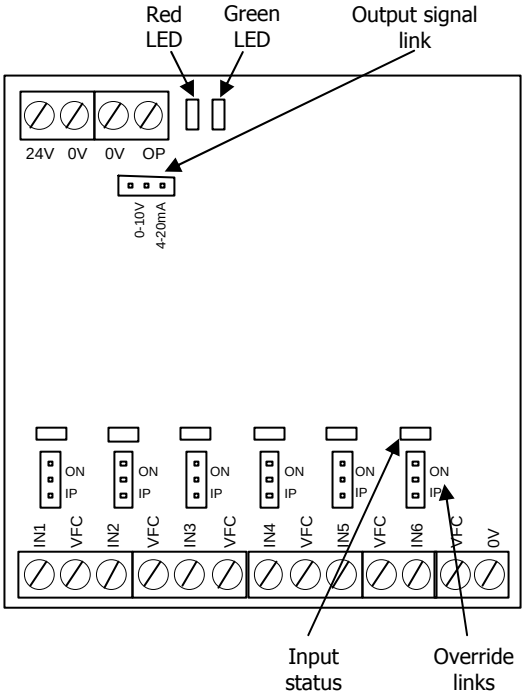

4-20mA Input signal

Override links:


On

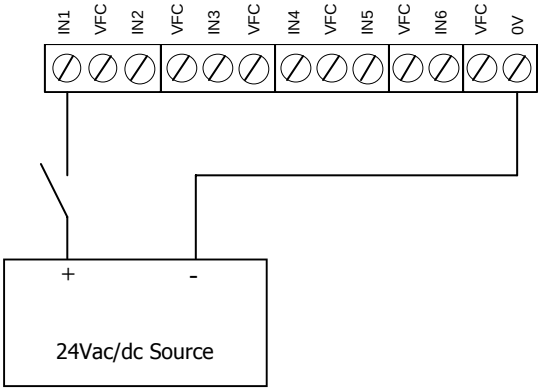

Off

Connections

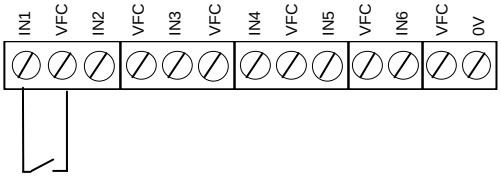


Connection Examples

24V Switching:



VFC Switching:



Output Tables

Input Status						Nominal Output	
IN1	**IN2**	**IN3**	**IN4**	**IN5**	**IN6**	Vdc	mA
OFF	OFF	OFF	OFF	OFF	OFF	0.08	4.12
ON	OFF	OFF	OFF	OFF	OFF	0.23	4.38
OFF	**ON**	OFF	OFF	OFF	OFF	0.39	4.62
ON	**ON**	OFF	OFF	OFF	OFF	0.55	4.88
OFF	OFF	**ON**	OFF	OFF	OFF	0.70	5.12
ON	OFF	**ON**	OFF	OFF	OFF	0.86	5.38
OFF	**ON**	**ON**	OFF	OFF	OFF	1.02	5.62
ON	**ON**	**ON**	OFF	OFF	OFF	1.17	5.88
OFF	OFF	OFF	**ON**	OFF	OFF	1.33	6.12
ON	OFF	OFF	**ON**	OFF	OFF	1.48	6.38
OFF	**ON**	OFF	**ON**	OFF	OFF	1.64	6.62
ON	**ON**	OFF	**ON**	OFF	OFF	1.80	6.88
OFF	OFF	**ON**	**ON**	OFF	OFF	1.95	7.12
ON	OFF	**ON**	**ON**	OFF	OFF	2.11	7.38
OFF	**ON**	**ON**	**ON**	OFF	OFF	2.27	7.62
ON	**ON**	**ON**	**ON**	OFF	OFF	2.42	7.88
OFF	OFF	OFF	OFF	**ON**	OFF	2.58	8.12
ON	OFF	OFF	OFF	**ON**	OFF	2.73	8.38
OFF	**ON**	OFF	OFF	**ON**	OFF	2.89	8.62
ON	**ON**	OFF	OFF	**ON**	OFF	3.05	8.88
OFF	OFF	**ON**	OFF	**ON**	OFF	3.20	9.12
ON	OFF	**ON**	OFF	**ON**	OFF	3.36	9.38
OFF	**ON**	**ON**	OFF	**ON**	OFF	3.52	9.62
ON	**ON**	**ON**	OFF	**ON**	OFF	3.67	9.88
OFF	OFF	OFF	**ON**	**ON**	OFF	3.83	10.12
ON	OFF	OFF	**ON**	**ON**	OFF	3.98	10.38
OFF	**ON**	OFF	**ON**	**ON**	OFF	4.14	10.62
ON	**ON**	OFF	**ON**	**ON**	OFF	4.30	10.88
OFF	OFF	**ON**	**ON**	**ON**	OFF	4.45	11.12
ON	OFF	**ON**	**ON**	**ON**	OFF	4.61	11.38
OFF	**ON**	**ON**	**ON**	**ON**	OFF	4.77	11.62
ON	**ON**	**ON**	**ON**	**ON**	OFF	4.92	11.88
OFF	OFF	OFF	OFF	OFF	**ON**	5.08	12.12
ON	OFF	OFF	OFF	OFF	**ON**	5.23	12.38
OFF	**ON**	OFF	OFF	OFF	**ON**	5.39	12.62
ON	**ON**	OFF	OFF	OFF	**ON**	5.55	12.88
OFF	OFF	**ON**	OFF	OFF	**ON**	5.70	13.12
ON	OFF	**ON**	OFF	OFF	**ON**	5.86	13.38
OFF	**ON**	**ON**	OFF	OFF	**ON**	6.02	13.62
ON	**ON**	**ON**	OFF	OFF	**ON**	6.17	13.88
OFF	OFF	OFF	**ON**	OFF	**ON**	6.33	14.12
ON	OFF	OFF	**ON**	OFF	**ON**	6.48	14.38
OFF	**ON**	OFF	**ON**	OFF	**ON**	6.64	14.62
ON	**ON**	OFF	**ON**	OFF	**ON**	6.80	14.88
OFF	OFF	**ON**	**ON**	OFF	**ON**	6.95	15.12
ON	OFF	**ON**	**ON**	OFF	**ON**	7.11	15.38
OFF	**ON**	**ON**	**ON**	OFF	**ON**	7.27	15.62
ON	**ON**	**ON**	**ON**	OFF	**ON**	7.42	15.88
OFF	OFF	OFF	OFF	**ON**	**ON**	7.58	16.12
ON	OFF	OFF	OFF	**ON**	**ON**	7.73	16.38
OFF	**ON**	OFF	OFF	**ON**	**ON**	7.89	16.62
ON	**ON**	OFF	OFF	**ON**	**ON**	8.05	16.88
OFF	OFF	**ON**	OFF	**ON**	**ON**	8.20	17.12
ON	OFF	**ON**	OFF	**ON**	**ON**	8.36	17.38
OFF	**ON**	**ON**	OFF	**ON**	**ON**	8.52	17.62
ON	**ON**	**ON**	OFF	**ON**	**ON**	8.67	17.88
OFF	OFF	OFF	**ON**	**ON**	**ON**	8.83	18.12
ON	OFF	OFF	**ON**	**ON**	**ON**	8.98	18.38
OFF	**ON**	OFF	**ON**	**ON**	**ON**	9.14	18.62
ON	**ON**	OFF	**ON**	**ON**	**ON**	9.30	18.88
OFF	OFF	**ON**	**ON**	**ON**	**ON**	9.45	19.12
ON	OFF	**ON**	**ON**	**ON**	**ON**	9.61	19.38
OFF	**ON**	**ON**	**ON**	**ON**	**ON**	9.77	19.62
ON	**ON**	**ON**	**ON**	**ON**	**ON**	9.92	19.88

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-DIM6 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.)

Trend Scaling

0-10Vdc Output:		4-20mA Output:	
Trange	257	Trange	247
Brange	-255	Brange	-372
Upper	228	Upper	248
Lower	-256	Lower	-373
Exponent	3	Exponent	4

Trend Scaling (continued)

Characterise scaling:

0-10Vdc:

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

Input 1 = 0.23 Output 1 = 4
Input 2 = 9.92 Output2 = 253

4-20mA:

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

Input 1 = 4.12 Output 1 = 3.5
Input 2 = 19.88Output2 = 253

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-DIM6, and assumes function 1 is used as the A/D (i.e. alarm byte 141) .

IO-DIM6 Input	Alarm Bit
IN1	141.2
IN2	141.3
IN3	141.4
IN4	141.5
IN5	141.6
IN6	141.7