

IO-DIM6

6-Channel, Digital to Analogue Converters



Features:

- Input status indication
- Calibrated output
- DIN Rail mounting

Benefits:

- Expands controller input capacity
- Fault finding LED indication
- Relay status LED indication

Technical Overview

The IO-DIM6 module is intended for use the BMS controllers to expand their input capacity, by multiplexing 6 digital signals or 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.

Specification:

Part Codes:

Inputs	VFC or 24Vac or 24Vdc (>17.5V = ON, <7.5V = OFF)
Outputs:	0-10Vdc into 2k Ω impedance 4-20mA into 500 Ω max.
Power supply:	
0-10Vdc	24Vac \pm 15% @ 50Hz or 24Vdc +15% -6%
4-20mA	24Vdc +15% -6%
Current:	
Voltage output	35mA max.
Current output	55mA max.
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- 2.5mm ² cable
Ambient range:	
Temperature	-10 to +50°C (14 to 122°F)
RH	0 to 80% non-condensing
Dimensions (H x W x D):	75 x 75 x 42mm (2.95 x 2.95 x 1.65")
Country of origin	UK

IO-DIM6
6 x VFC or 24Vac/dc inputs



Installation:



Antistatic precautions must be observed when handling these modules. The PCB contains circuitry that can be damaged by static discharge.

1. The IO-DIM6 should only be installed by a competent, suitably trained technician, experienced in installation with hazardous voltages. ($>50V_{ac}$ & $<1000V_{ac}$ or $>75V_{dc}$ & $1500V_{dc}$)
2. Ensure that all power is disconnected before carrying out any work on the IO-DIM.
3. Maximum cable is $2.5mm^2$, 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 $24V_{ac/dc}$ supply (so that power can be drawn from a $24V_{ac}$ transformer used for other purposes if a $24V_{dc}$ supply is not available). In either case one side of the supply is common to the signal ground from the BEMS controller.
6. The outputs of the modules are pre-calibrated and no adjustment is required. The output is also self-calibrating, to ensure that the output is always correct.

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-DIM is powered correctly.

Low Supply Voltage:

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

*_*_*_*_*_*_*_*_*_*_*_*_*_*_*_**

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;

*_*_*_*_*_*_*_*_*_*_*_**

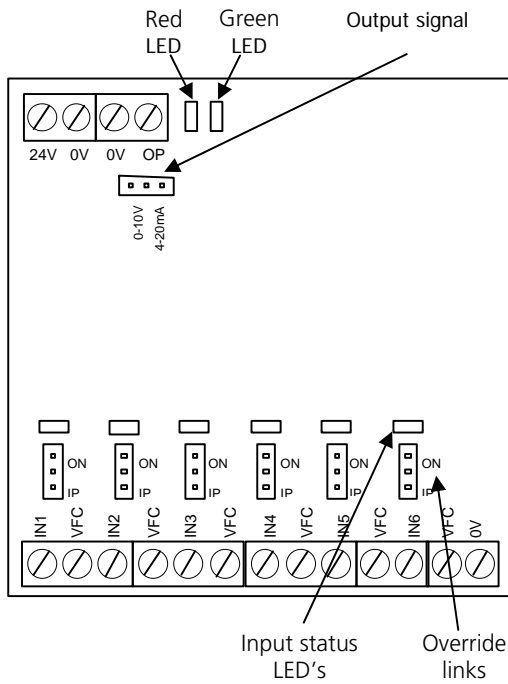
The PCB tries to maintain the correct output.

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 .)

Connections & Jumper Settings:




Input signal link:

0-10Vdc Input signal 

4-20mA Input signal 

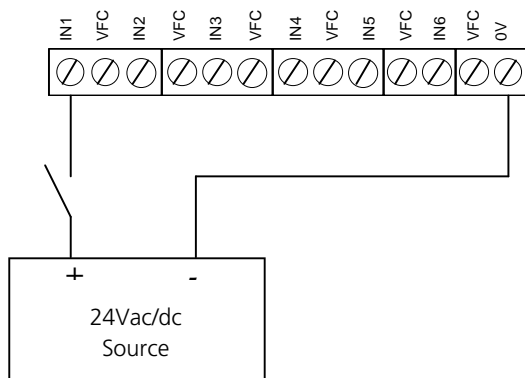
Override links:

On 

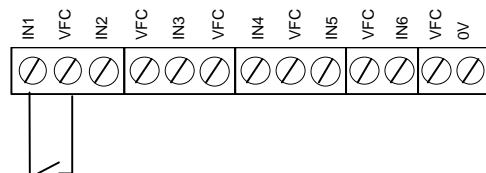
Off 

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

Scaling & Type 18 Function Module (Trend Controls only):

Non-characterise scaling:

0-10Vdc Output:

Trange	257
Brange	-255
Upper	228
Lower	-256
Exponent	3

4-20mA Output:

Trange	247
Brange	-372
Upper	248
Lower	-373
Exponent	4

Characterise scaling:

0-10Vdc output:

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

4-20mA output:

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

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

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

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

Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

Tel: +44 (0)1732 861200. - **E-mail:** sales@sontay.com. - **Web:** www.sontay.com.

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