

# IO-DIM4

## 4-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-DIM4 module is intended for use the BMS controllers to expand their input capacity, by multiplexing 4 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-DIM4, which can be decoded into 4 digital status bits.

## Specification:

## Part Codes:

Inputs	VFC or 24Vac or 24Vdc (>17.5V = ON, <7.5V = OFF)
Outputs:	0-10Vdc into 2k $\Omega$ impedance 4-20mA into 500 $\Omega$ 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 <sup>2</sup> 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 55 x 42mm (2.95 x 2.17 x 1.65")
Country of origin	UK

**IO-DIM4**  
 4 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-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 IO-DIM4.
3. Maximum cable is 2.5mm<sup>2</sup>, 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 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

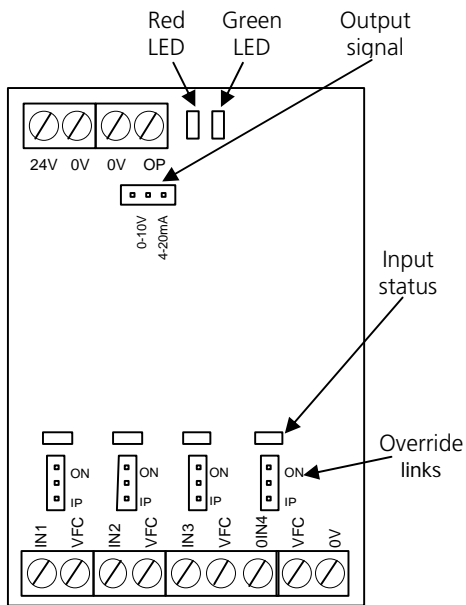
The Red LED is lit when the PCB is in 4-20mA mode and working correctly. For this to be the case, these conditions must be met:

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.)


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


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## Connections & Jumper Settings:





Output signal link:

0-10Vdc output signal 

4-20mA output signal 

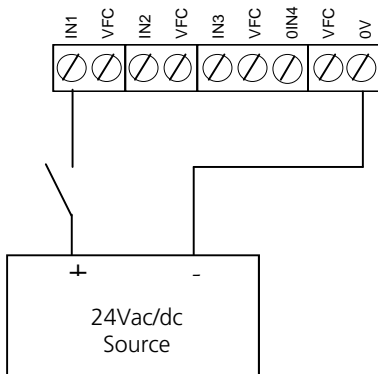
Override links:

On 

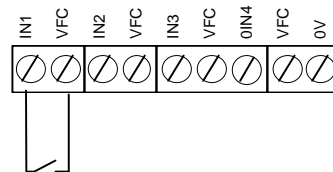
Off 

Examples:

24V switching:



VFC switching



## Switching Sequences:

0-10Vdc output:

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

4-20mA output:

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

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

0-10Vdc Output:

Trange	262
Brange	-265
Upper	263
Lower	-263
Exponent	3

4-20mA Output:

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

0-10Vdc output:

Scaling type	5
Input type	0 (voltage)
sUpper	256
sLower	0.3
Points used	2
Input 1 = 0.30	Output 1 = 12
Input 2 = 9.70	Output 2 = 244

4-20mA output:

Scaling type	5
Input type	2 (current)
sUpper	256
sLower	0
Points used	2
Input 1= 4.50	Output 1= 12
Input 2= 19.50	Output 2= 244

IO-DIM4 Input	Alarm Bit
<b>IN1</b>	141.4
<b>IN2</b>	141.5
<b>IN3</b>	141.6
<b>IN4</b>	141.7

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).

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.

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