

Differential Input Sensor Conditioner - MODcxy

Features

- Ratiometric signal conditioner for differential output sensors.
- High precision supply output.
- Good temperature stability.
- Rugged epoxy-filled enclosure, small size.
- Watertight mini sure-seal[®] connector.

Description

The MODcxy conditions differential output sensors and amplifies or divides their signal to output a single-ended 0-5V signal. The module also provides the power to the sensor. The module has four flying leads connecting to the sensor: Excitation+, Excitation-, Signal+ and Signal-. The module is available in different configurations for adequate sensor excitation: unregulated-100mA, 5.000V ±5mV - 30mA, 7.500V ± 5mV-30mA, 5.0V ±5% - 100mA or 8.0V ±5% - 100mA.

Building the Part Number: MODcxy-GAIN

c: Conditioning type.

A	Amplifies the differential input.
D	Divides the differential input

x: Power supply to the sensor.

U	Unregulated supply
R	Regulated 5.0V-100mA±5%
S	Regulated 8.0V-100mA±5%
P	Precision 5.000V-30mA±5mV
Q	Precision 7.500V-30mA±5mV

y: Sensor signal output type.

B	Differential bipolar (Amplifier version only)
U	Differential, single polarity

GAIN: Signal amplification.

$$MODAxB: (V_{Signal+} - V_{Signal-}) * GAIN + 2.500$$

$$MODAxU: (V_{Signal+} - V_{Signal-}) * GAIN$$

$$MODDxU: (V_{Signal+} - V_{Signal-}) / GAIN$$



The bipolar module offsets the voltage by 2.500V±5mV which allows Signal+ to be greater or smaller than Signal -. For sensors where Signal+ is always greater than Signal-, the single polarity module will work best.

The desired gain must be selected to amplify or divide the differential input to 0-5V single-ended output.

Installation

- Connect the Red wire (Excitation+), the Black wire (Excitation-), the Green wire (Signal+) and the White wire (Signal-) to the sensor.
- Connect the module to an analog input of the system: A, B or C. Carefully align indexing rib when mating mini sure-seal[®] connectors.
- Do not expose the module to temperatures outside -40°C to 85°C.
- Route the sensor cable away from sources of interference, such as ignition coils, plug leads, electronic modules or antennas.
- Verify that the cable is not pinched or stretched by moving parts.
- Do not bend the cable with curvature radius smaller than 1.60" [40 mm].

Calibration

For best performance, it is recommended to calibrate the sensor and the module together using the Real-Time calibration wizard. For more information, refer to *ISAAC User's Manual*.

Specifications

	Symbol	Min	Typ	Max	Units
Supply Voltage	V_{in}	10		30	V
Supply Current (Signal+=0V and Signal-=0V)	I_{in}	8		$8+I_{Excitation}$	mA
Output Voltage swing	V_{Out}	0		5.00	V
Output Voltage when $V_{Signal+}=V_{Signal-}$					
Bipolar Input	V_{offset}	2.495		2.5005	V
Single Polarity Input	V_{offset}		1.00	10.00	mV
Input Voltage					
MODAxB	$V_{Signal+}$	0		5.00	V
	$V_{Signal-}$	0		5.00	V
	$V_{MAXSignal+}-V_{MINSignal+}$	2.500/GAIN		2.500/GAIN	V
	$V_{MAXSignal-}-V_{MINSignal-}$	2.500/GAIN		2.500/GAIN	V
MODAxU	$V_{Signal+}$	0		5.00	V
	$V_{Signal-}$	0		5.00	V
	$V_{MAXSignal+}-V_{MINSignal-}$	0		5.00 / GAIN	V
MODDxU	$V_{Signal+}$	0		$V_{MAXSignal+}/GAIN$	V
	$V_{Signal-}$	0		5.00	V
	$V_{MAXSignal+}-V_{MINSignal-}$	0		$V_{MAXSignal+}/GAIN$	V
Supply voltage to sensor Unregulated	$V_{Excitation+unreg}$ $I_{Excitation+unreg}$		$V_{in} - 0.35$	100	V mA
5.0V-100mA	$V_{Excitation+5V100}$ $I_{Excitation+5V100}$	4.75		5.25 100	V mA
8.0V-100mA	$V_{Excitation+8V100}$ $I_{Excitation+8V100}$	7.6		8.4 100	V mA
5.000V-30mA	$V_{Excitation+5V30}$ $I_{Excitation+5V30}$ $TDev_{Excitation+5V30}$	4.995	10	5.005 30	V mA ppm/°C
7.500V-30mA	$V_{Excitation+7.5V30}$ $I_{Excitation+7.5V30}$ $TDev_{Excitation+7.5V30}$	7.495	10	7.505 30	V mA ppm/°C
Gain (Configured when ordered)	GAIN	1		1000	V/V
Temperature coefficient	T_{GAIN}		30		ppm/°C
Operating temperature	T_{oper}	-40		85	°C
Weight	W		50 1.76		Grams oz

Suggested part number with given sensor output

Sensor Output mV	Part number	Sensor Output mV	Part number
-25...25	MODAxB-101	0...25	MODAxU-401
-50...50	MODAxB-051	0...50	MODAxU-101
-100...100	MODAxB-250	0...100	MODAxU-051
-250...250	MODAxB-100	0...250	MODAxU-400
-500...500	MODAxB-050	0...500	MODAxU-100
-1000...1000	MODAxB-010	0...1000	MODAxU-050
0...10000	MODDxU-020	0...5000	MODAxU-010
0...40000	MODDxU-040	0...50000	MODDxU-050