Compact, Low Cost, Modular Signal Conditioners

Shown with 16-channel backplane (sold separately).

OM5 Series

MADE IN USA · 1 YEAR WARRANTY · CE · UL

- **Rugged, Compact Economical Signal Conditioning**
- **Modular Design for Mix and Match Capability**
- **Analog Input Modules for Direct Interface to Sensors and Analog Voltage and Current**
- **Convenient Connection to User Equipment**

The OM5 Series modular signal conditioners provide a low cost, high performance method of interconnecting real-world analog signals with data acquisition, monitoring or control systems.

They are designed to interface directly to analog inputs such as thermocouples, RTDs, strain gages and voltage or process current signals. Individual OM5 modules convert these inputs to standardized analog outputs compatible with high-level analog I/O systems. An output module converts a high-level analog output to a process current signal.

The OM5 is designed to provide easy and convenient solutions to signal conditioning problems of both designers and end users in measurement and control applications.

Typical uses include mini- and microcomputer-based measurement systems, standard data acquisition systems, recorders, and dedicated control systems.

The OM5 is ideally suited to applications where monitoring and control of temperature, pressure, flow and other analog signals is required.

Isolated Voltage Input Models

Designed for either low-level millivolt or high level voltage inputs, these modules can accept from ±10 mV to ±10V full scale input, with either a 0 to 5V or ±5V output. Standard modules have a 4 Hz bandwidth, while for interfacing to dynamic signals, the OM5-WV and OM5-WMV modules feature a 10 kHz bandwidth.

Current Input Models

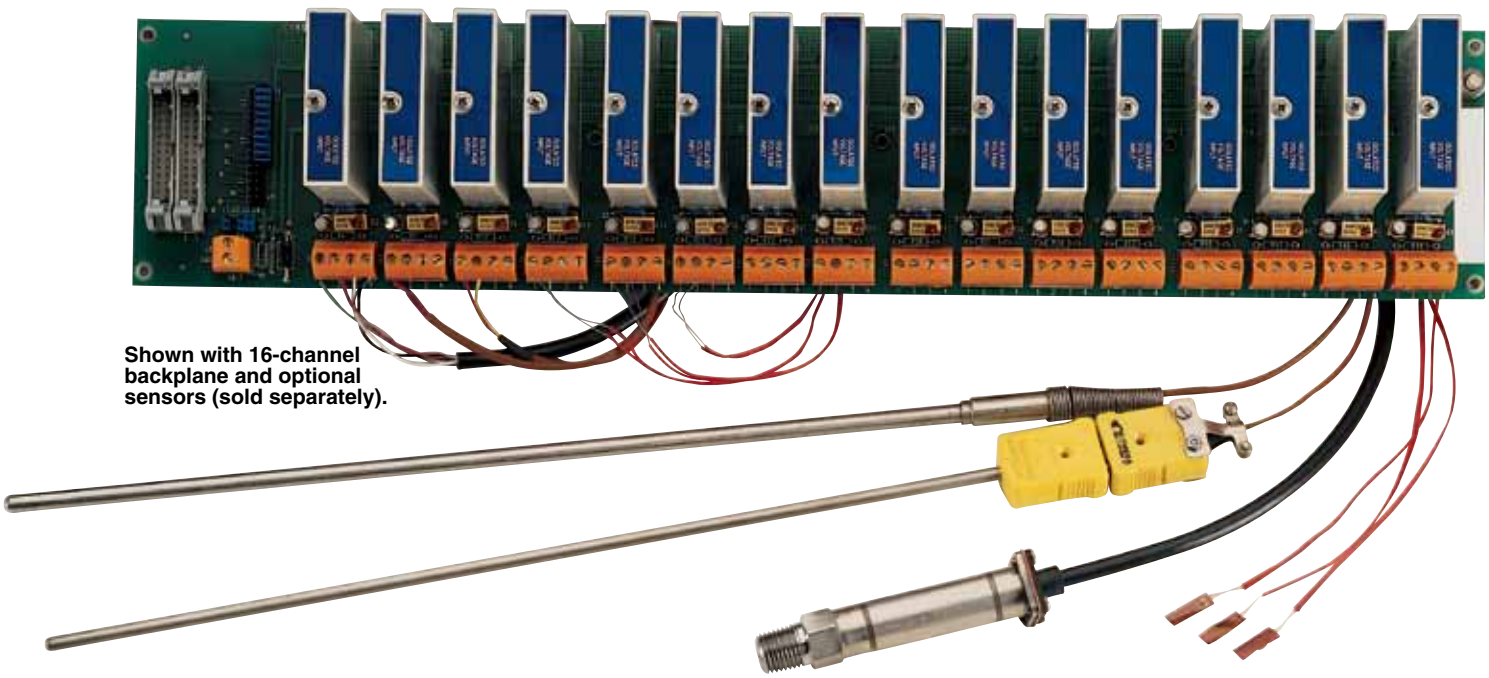
These modules accept process current signals. A sensing resistor of 20 Ω is used to convert the signal current to a voltage. The resistor is installed as a separate assembly, to facilitate replacement in the event of inadvertent connection of the power line.

Thermocouple Input Models

The isolated thermocouple models incorporate cold junction compensation circuitry which provides 0.5°C accuracy. Open sensor detection is standard.

RTD Input Models

The OM5-IP, OM5-IC and OM5-IN are designed for 100Ω PT, 10Ω Cu and 120Ω Ni RTDs respectively. The modules have 3 wire compensation and may be used with 2- or 3-wire RTDs. The OM5-IP4 features 4-wire compensation for 100Ω PT RTDs.



Shown with 16-channel backplane and optional sensors (sold separately).

Strain Gage Input Models

Designed for 300 to 10 KΩ full or half strain gage bridge for dynamic signals. Bandwidth is 10 kHz. Integral 10V excitation is also provided.

Output Models

Isolated modules that accept process voltage inputs from the system connector and provide an isolated process current signal as output.

Potentiometer Input Models

For use with 3-wire potentiometers and 2-wire slidewire with up to 10 KΩ resistance. The input signal is filtered, isolated and amplified to a high level analog output voltage.

Excitation is provided by two matched current sources which cancels lead resistance effects in 3-wire potentiometers. The excitation current is small (less than 1.0 mA) to minimize self-heating error.

Displacement Transducer Input Modules

The displacement transducer input modules can interface to DC displacement transducers and other devices which require a precision excitation voltage. The transducer excitation is provided from the module by a stable isolated 10V source.

Two-Wire Transmitter Interface Modules

The OM5-TX are ideal for connecting to 2-wire loop power transmitters. The modules accept 4 to 20 mA process current input and provide an isolated output voltage. The module features an isolated 20 Vdc regulated power supply to provide power to the transmitter. A precision 20 Ω current conversion resistor is supplied with each module.

SYSTEM CONFIGURATION

The OM5 system is fully modular, for maximum user flexibility. When designing a system, in addition to selecting input and output modules, both a backplane and power supply are required.

The OM5-BP-16 is a 16-position plane with pinouts on system connector that are compatible with the OM3 system; this allows an OM5 to interface to plug-in cards for IBM PCs. Also available for single channel applications is the OM5-BP-SKT single channel backplane.

Two power supplies are available for OM5 systems. The OMX-955 has 1A capacity, and can be used with up to 16 input modules. For systems with larger requirements, the OMX-976 has 3A capacity, and can drive a full complement of 16 output modules.

The OMX-1315 cable mates directly to the OM5-BP-16, and may be connected to the OMX-1324 adaptor. The OMX-1324 provides screw terminations for the high level voltage output from the system connector.

How to Order

To Assemble a Complete OM5 System, Order:

1. Desired input and output modules
2. Backplane
3. Power Supply: calculate system power requirements
4. Voltage I/O cables and connectors
5. Rack or Surface Mount Kit

Specifications

Input Ranges: See ordering tables
Common Mode Voltage, Input to Output: 1500 Vrms maximum
Non-Linearity: 0.02% span
Bandwidth:
OM5-II, OM5-IMV, OM5-ITC, OM5-IV, OM5-IP/IC/IN, OM5-LTC, OM5-PT: 4 Hz
OM5-WBS, OM5-WMV, OM5-WV: 10 KHz
OM5-TX: 100 Hz
OM5-DT: 1 KHz
OM5-IVI: 400 Hz
OMF-FR: See ordering table
Input (Field) Protection: 240 Vrms maximum
Output Range: See ordering table
Output Resistance (Input Modules): 50Ω
Output Current limit (Input Modules): ±14 mA maximum
Operating Temperature Range: -40 to 85°C (-40 to 185°F)
Module Dimensions: 58 x 57 x 15 mm (2.28 x 2.26 x 0.60")

Accuracy

Model No.	Description	Accuracy
OM5-DT	Displacement Input	±0.1% span ±10µV RTI[1]
OM5-II	Current Input	±0.05% span +0.05%(/-I_z[2])
OM5-IFI	Frequency Input	±0.05% span
OM5-IP/IC	RTD Input	See ordering table
OM5-ITC	Non-linearized Thermocouple	±0.05% span ±10µV RTI[1]
OM5-IVI	Current Output	±0.05% span
OM5-LTC	Linearized Thermocouple	See ordering table
OM5-PT	Potentiometer Input	±0.08% span
OM5-TX	Transmitter Input	±0.05% span ±4µV RTI[1]
OM5-WBS	Strain Input	±0.08% span ±10µV RTI[1]
OM5-WMV OM5-IMV	Millivolt Input	±0.05% span ±10µV RTI[1] ±0.05% (V_z[3])
OM5-WV OM5-IV	Voltage Input	±0.05% span ±0.2mV RTI[1] ±0.05% (V_z[3])

(1) RTI = Reference to input
(2) I_z is the current input that results in 0V output
(3) V_z is the voltage input that results in 0V output

Module Power Requirements

Module	Current	Module	Current
OM5-IMV	30 mA	**OM5-WBS**	200 mA
OM5-IV	30 mA	**OM5-IVI**	170 mA
OM5-II	30 mA	**OM5-WMV**	30 mA
OM5-IP	30 mA	**OM5-WV**	30 mA
OM5-ITC	30 mA	**OM5-LTC**	30 mA

DC Displacement Transducer Input, Isolated, ±5 Vdc Output, 10 Vdc Excitation

To Order	
Model No.	**Input Range**
OM5-DT-1-C	±1 Vdc
OM5-DT-2-C	±2 Vdc
OM5-DT-3-C	±3 Vdc
OM5-DT-4-C	±4 Vdc
OM5-DT-5-C	±5 Vdc
OM5-DT-6-C	±6 Vdc
OM5-DT-7-C	±7 Vdc
OM5-DT-8-C	±8 Vdc
OM5-DT-9-C	±9 Vdc
OM5-DT-10-C	±10 Vdc

Thermocouple Input Linearized, Isolated, Output Range 0 to 5V

Model No.	Input Range	Thermocouple Type	Accuracy
OM5-LTC-J1-C	0 to 760°C	J	±0.61°C
OM5-LTC-J2-C	100 to 300°C	J	±0.32°C
OM5-LTC-J3-C	0 to 500°C	J	±0.36°C
OM5-LTC-K1-C	0 to 1000°C	K	±0.80°C
OM5-LTC-K2-C	0 to 500°C	K	±0.38°C
OM5-LTC-T1-C	-100 to 400°C	T	±0.80°C
OM5-LTC-T2-C	0 to 200°C	T	±0.25°C
OM5-LTC-E-C	0 to 1000°C	E	±1.0°C
OM5-LTC-R-C	500 to 1750°C	R	±1.3°C
OM5-LTC-S-C	500 to 1750°C	S	±1.3°C
OM5-LTC-B-C	500 to 1800°C	B	±2.0°C

**Does not include CJC accuracy.*

Thermocouple Input Non-Linearized, Isolated, Output Range 0 to 5V

Model No.	Input Range	Thermocouple Type
OM5-ITC-J-C	-100 to 760°C	J
OM5-ITC-K-C	-100 to 1350°C	K
OM5-ITC-T-C	-100 to 400°C	T
OM5-ITC-E-C	0 to 900°C	E
OM5-ITC-R-C	0 to 1750°C	R
OM5-ITC-S-C	0 to 1750°C	S
OM5-ITC-B-C	0 to 1800°C	B
OM5-ITC-C1-C	350 to 1300°C	C
OM5-ITC-N1-C	-100 to 1300°C	N

RTD Input, Isolated, Output Range 0 to 5V

To Order			
Model No.	**Input Range**	**Description**	**Accuracy**
OM5-IP-N100-C	-100 to 100°C	Pt100Ω RTD, 2 or 3 wire, α = 0.00385	±0.46°C
OM5-IP-100-C	0 to 100°C	Pt100Ω RTD, 2 or 3 wire, α = 0.00385	±0.36°C
OM5-IP-200-C	0 to 200°C	Pt100Ω RTD, 2 or 3 wire, α = 0.00385	±0.46°C
OM5-IP-600-C	0 to 600°C	Pt100Ω RTD, 2 or 3 wire, α = 0.00385	±0.88°C
OM5-IC-120-01-C	0 to 120°C	Copper, 10Ω, 0°C, 2 or 3 wire	±0.24°C
OM5-IC-120-02-C	0 to 120°C	Copper 10Ω, 25°C, 2 or 3 wire	±0.24°C
OM5-IN-300-C	0 to 300°C	Nickel 120Ω, 2 or 3 wire	±0.40°C
OM5-IP4-N100-C	-100 to 100°C	Pt100Ω RTD, 4 wire, α = 0.00385	±0.46°C
OM5-IP4-100-C	0 to 100°C	Pt100Ω RTD, 4 wire, α = 0.00385	±0.36°C
OM5-IP4-200-C	0 to 200°C	Pt100Ω RTD, 4 wire, α = 0.00385	±0.46°C
OM5-IP4-600-C	0 to 600°C	Pt100Ω RTD, 4 wire, α = 0.00385	±0.88°C

Contact Engineering for custom configurations.

2-Wire Transmitter Interface Modules, Isolated 20 Vdc Loop Power

Model No.	Input Range	Output
OM5-TC-1-C	4 to 20 mA	1 to 5 Vdc
OM5-TC-2-C	4 to 20 mA	2 to 10 Vdc

Potentiometer Input, Isolated, 0 to 5 Vdc Output

Model No.	Input Range
OM5-PT-100-C	100 Ω
OM5-PT-1000-C	500 Ω
OM5-PT-1K-C	1K Ω
OM5-PT-10K-C	10K Ω

Strain Gage Input, Isolated, ±5 Vdc Output

Model No.	Input Range	Description
OM5-WBS-1-C	±30 mV @ 10V Exc.	Full bridge 300-10 kΩ, 10 kHz bandwidth
OM5-WBS-2-C	±20 mV @ 10 V Exc.	Full bridge 300-10 kΩ, 10 kHz bandwidth
OM5-WBS3-C	±30 mV @ 10 V Exc.	Half bridge 300-10 kΩ, 10 kHz bandwidth

Voltage Input, Isolated

Model No.	Input Range	Output Range
OM5-IV-1A-C	±1 V	±5 Vdc
OM5-IV-5A-C	±5 V	±5 Vdc
OM5-IV-10A-C	±10 V	±5 Vdc
OM5-IV-1B-C	±1 V	0-5 Vdc
OM5-IV-5B-C	±5 V	0-5 Vdc
OM5-IV-10B-C	±10 V	0-5 Vdc
OM5-IV-20A-C	±20 Vdc	±5 V
OM5-IV-40A-C	±40 Vdc	±5 V
OM5-IV-20B-C	±20 Vdc	0 to 5 V
OM5-IV-40B-C	±40 Vdc	0 to 5 V

Frequency Input, Isolated, 0 to 5 Vdc Output

Model No.	Input Range	Response Time
OM5-IFI-500-C	0 to 500 Hz	300 mS
OM5-IFI-1K-C	0 to 1 KHz	300 mS
OM5-IFI-3K-C	0 to 3 KHz	170 mS
OM5-IFI-5K-C	0 to 5 KHz	90 mS
OM5-IFI-10K-C	0 to 10 KHz	90 mS
OM5-IFI-25K-C	0 to 25 KHz	20 mS
OM5-IFI-50K-C	0 to 50 KHz	20 mS
OM5-IFI-100K-C	0 to 100 KHz	20 mS

Millivolt Input, Isolated

Model No.	Input Range	Output Range
OM5-IMV-10A-C	±10 mV	±5 Vdc
OM5-IMV-50A-C	±50 mV	±5 Vdc
OM5-IMV-100A-C	±100 mV	±5 Vdc
OM5-IMV-10B-C	±10 mV	0 to 5 Vdc
OM5-IMV-50B-C	±50 mV	0 to 5 Vdc
OM5-IMV-100B-C	±100 mV	0 to 5 Vdc

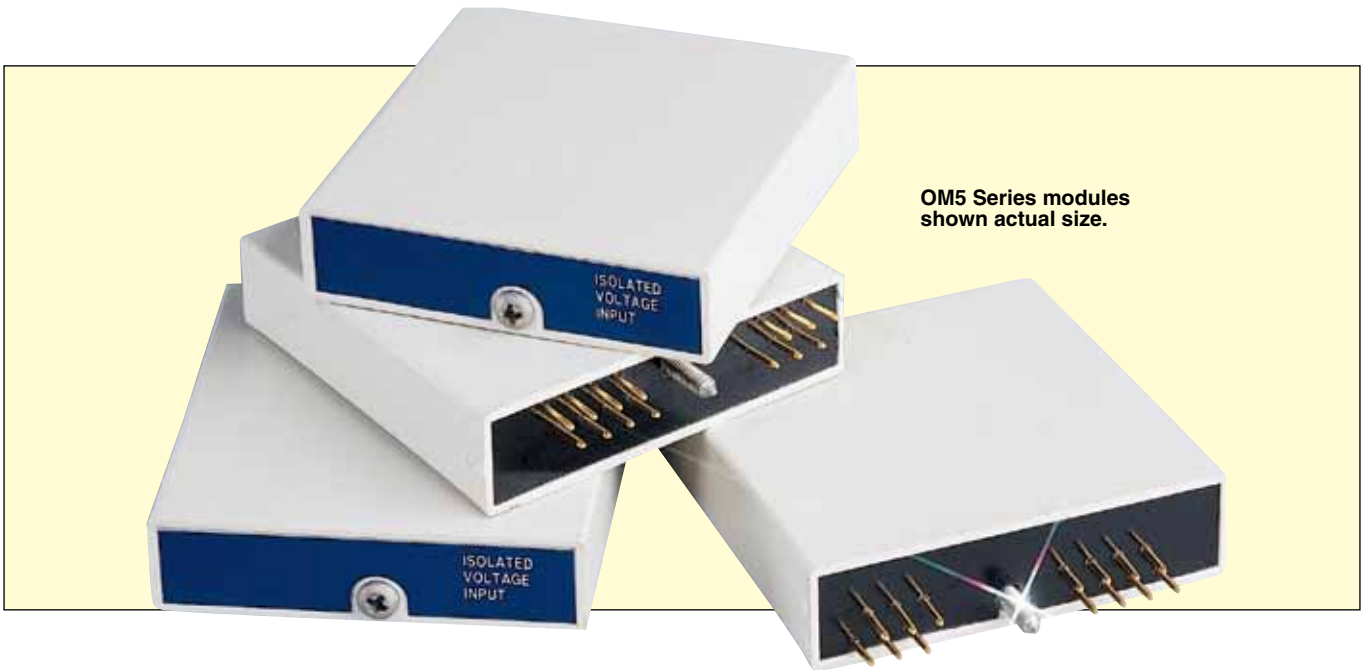
Wideband Millivolt Input, Isolated, 10 kHz Bandwidth

Model No.	Input Range	Output Range
OM5-WMV-10A-C	±10 mV	±5 Vdc
OM5-WMV-50A-C	±50 mV	±5 Vdc
OM5-WMV-100A-C	±100 mV	±5 Vdc
OM5-WMV-10B-C	±10 mV	0 to 5 Vdc
OM5-WMV-50B-C	±50 mV	0 to 5 Vdc
OM5-WMV-100B-C	±100 mV	0 to 5 Vdc

Current Input, Isolated

Model No.	Input Range	Output Range
OM5-II-4/20-C	4 to 20 mA	0 to 5 Vdc
OM5-II-0/20-C	0 to 20 mA	0 to 5 Vdc

Contact Engineering for custom configurations.



OM5 Series modules shown actual size.

Wideband Voltage Input, Isolated, 10 kHz Bandwidth

To Order		
Model No.	**Input Range**	**Output Range**
OM5-WV-1A-C	±1 V	±5 Vdc
OM5-WV-5A-C	±5 V	±5 Vdc
OM5-WV-10A-C	±10 V	±5 Vdc
OM5-WV-1B-C	±1 V	0 to 5 Vdc
OM5-WV-5B-C	±5 V	0 to 5 Vdc
OM5-WV-10B-C	±10 V	0 to 5 Vdc
OM5-WV-20A-C	±20 Vdc	±5 Vdc
OM5-WV-40A-C	±40 Vdc	±5 Vdc
OM5-WV-20B-C	±20 Vdc	0 to 5 Vdc
OM5-WV-40B-C	±40 Vdc	0 to 5 Vdc

Current Output, Isolated

Model No.	Input Range	Output Range
OM5-IVI-B0-C	0 to 5 Vdc	0 to 20 mA
OM5-IVI-A0-C	±5 Vdc	0 to 20 mA
OM5-IVI-B4-C	0 to 5 Vdc	4 to 20 mA
OM5-IVI-A4-C	±5 Vdc	4 to 20 mA

Accessories

Model No.	Description
OMX-1344-C	10 Jumpers (spare), for use with any OM5 module
OMX-1361-C	Cold junction sensor for OM5 T/C modules
OMX-1362-C	Replacement current sense 20Ω resistor for current input modules
OM7-IF	Universal terminal board, requires OM5-CA-04-01 cable
OMX-1363-C	19" rack mount adapter
OM5-BP-16-C	16-Channel OM5 backplane
OM5-BP-2-C	2-Channel OM5 backplane
OM5-BP-SKT-C	1-Channel OM5 backplane
OM5-BP-16-MUX-C	16-Channel multiplexed backplane
OM5-CA-04-01	1 m 26-pin cable with two connectors to connect OM5-BP-16-C to OM7-IF
OM5-PRT-003	3A, 5 Vdc, 120 Vac power supply
PSS-5B	1A, 5 Vdc, 120 Vac power supply