

## Model 5M64

### DC Voltage & 20ma Conditioner Module



The **Model 5M64** is a DIN Mount, wide-range general-purpose instrument for conditioning the signal received from a *DC-to-DC LVDT, potentiometer-type sensor, Hall-Effect device, photocell, current shunt, or other external DC and 4-20ma sources.*

The **5M64** delivers filtered analog output of **±5 VDC, ±10 VDC or 4-20 ma**, user selectable.

The DC input may be either differential (floating) or grounded (single-ended). *Exceptional signal stability and accuracy over an unusually wide range of voltage input levels and grounding configurations are achieved through*

- **precisely regulated excitation**
- **chopper-stabilized low-drift amplification**
- **selectable low-pass active filtering**
- **front panel setup configuration & calibration**
- **wide input range from 50 mv to 50 Vdc FS & 4-20ma**

#### DIFFERENTIAL INPUTS AND GENEROUS COMMON-MODE RANGE ELIMINATE GROUND-COUPLING ERRORS NORMALLY ASSOCIATED WITH OFF-GROUND SIGNAL SOURCES

A very stable excitation of ±5 VDC is provided for DC-to-DC LVDT's, potentiometer-type sensors, and other transducers that may require it. With an externally powered transducer, input isolation yields an operating common-mode range of up to 50 V (when using the regulated excitation provided by the 5M64 module, see the table on the other side).

For steady indication and smooth, dependable control action, the 5M64 can provide a true average value of the measured variable, even in the face of substantial dynamic content.

A high level, noise-free analog output is provided. For the 5M64, the output amplitude is switch selectable from ±5 VDC, ±10 VDC or 4-20 ma giving the unit the features necessary for a wide range of applications with a simple setup operation. Other features include:

- **Powerful low-pass active filtering,** Front panel selectable filter cutoffs at 10 Hz, 100 Hz or 1 KHz remove unwanted high-frequency measurement components and the elimination of aliasing errors, if the module's output is subsequently sampled

- **High input impedance on all ranges** to eliminate cable resistance as a source of error (allowable cable length has virtually no practical limits)
- **High noise rejection,** eliminating errors from common-mode pickup and ground-loops.
- **Internal stable shunt for 4-20 ma inputs** for re-transmission, re-scaling or conditioning of low current inputs

## FRONT PANEL - MANUAL CONTROLS ALLOW SIMPLE SETUP AND CALIBRATION WITHOUT THE NEED OF COMPUTER PROGRAMMING KNOWLEDGE

To calibrate a 5M64, use a known input from the measurement source or simulator to specify the desired relationship between the module's measured engineering units and its  $\pm 5$ -VDC,  $\pm 10$ -VDC or 4-20 ma output.

Set the desired input Range switch(s) per the table below. With the known input to the 5M64 Module at full-scale, adjust the Course Span control to set the approximate gain for the analog output signal, utilizing the Fine Span for precision. Once completed, bring the known input signal to a Zero or Balance value.

With the known Zero input established, adjust the Course Zero and Fine Zero controls

for the desired analog output of the 5M64. Repeat Span and Zero for output signal precision.

This method of calibration is referred to as "two-point" calibration or "dead-weight" calibration since it calibrates the 5M64 at its Span and Zero points with known input values.

*module accuracy is dependent on the known calibration input of the "two-points".*

## Specifications

**Housing:** DIN mount housing, non-removable screw terminals

**Dimensions:** 114.5 mm D x 22.5 mm W x 99.0 mm H

**Power Requirements:** 11-28 VDC; 3.6 watts max.

**ESD Protection:** per EN61000-4-2

**Operating Temperature Range:**  $-10^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $158^{\circ}\text{F}$ )

**Operating Relative Humidity:** 5% to 95%, noncondensing

**Transducer Types:** Virtually any transducer producing DC output, either externally powered or with power requirement of 10 V @ 80 mA or less (see diagram, below, for typical cabling)

**Input Ranges (Nominal, Full-Scale):** See table; selectable via the 5M64 front panel range settings.

**Excitation:** 10 VDC (=  $\pm 5$  VDC) @ up to 70 mA

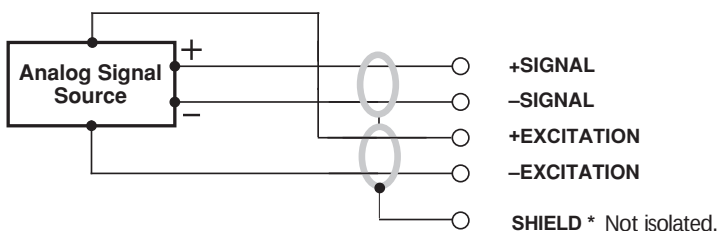
### Front Panel Switch Settings

|                       | Left                 | Right           |
|-----------------------|----------------------|-----------------|
| <b>Output Mode</b>    | Current              | Voltage         |
| <b>Voltage Level</b>  | 10 Vdc               | 5 Vdc           |
| <b>Current Level</b>  | 4 - 12 - 20 mA       | 4 - 20 mA       |
| <b>Filter Setting</b> | 1 kHz                | 100 Hz          |
| <b>Filter Setting</b> | 10 Hz                | 100 Hz          |
| <b>Range</b>          | 0.05 - 0.50 Vdc      | 0.50 - 5.00 Vdc |
| <b>Range</b>          | 5.00 - 50.00 Vdc     | 0.50 - 5.00 Vdc |
| <b>Input Mode</b>     | Current - 4-20 ma    | Voltage         |
| <b>Input Mode</b>     | Current - 4-12-20 ma | Voltage         |

|             | Range<br>(VDC,ma f.s.) | C-M Range<br>(+/- V) |
|-------------|------------------------|----------------------|
| 5M64 Ranges | 0.050 - 0.500          | 5                    |
|             | 0.500 - 5.000          | 50                   |
|             | 5.000 - 50.00          | 50                   |
|             | 4.00 - 20.00 ma        | 50                   |
|             | 4.00 - 12 - 20.00 ma   | 50                   |

### Transducer Field Connector - Voltage Mode

(Non-Removable Screw Terminals)



### Amplifier:

**Common-Mode Range:**  $\pm 50$  V for externally powered transducers; when excitation is provided by the 5M64 module, see table

**Input Impedance:** Greater than 1 M $\Omega$  on all ranges

**Offset:** Initial:  $\pm 0.02\%$  of full scale; vs. temperature:  $\pm 25$  ppm/ $^{\circ}\text{C}$ ; vs. time:  $\pm 10$  ppm/month

**Gain Accuracy:** Limited only by calibration accuracy.

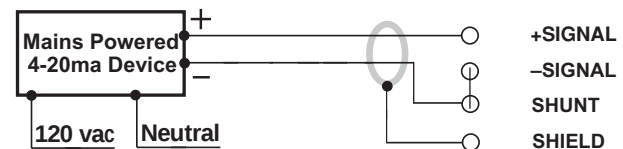
**Gain Stability:** vs. temperature:  $\pm 30$  ppm/ $^{\circ}\text{C}$ ; vs. time:  $\pm 10$  ppm/month

**Analog Filters:** 10, 100, or 1000 Hz, independently switch selectable

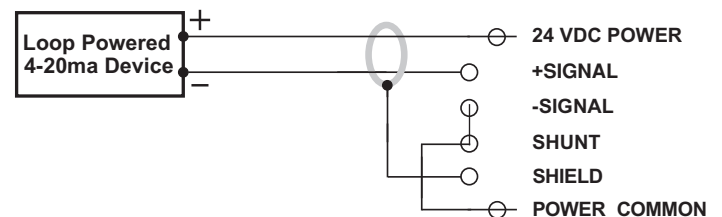
**Analog Outputs:** Selectable, Filtered  $\pm 0$  to 5 VDC or  $\pm 0$  to 10 VDC or 4-20 ma or 4-12-20 ma, with linearity maintained for 20% overrange; on voltage ranges.

**Status Indicator Lights:** Power LED Green. Over-range LED Yellow  
Over-range LED Red - High Common Mode.

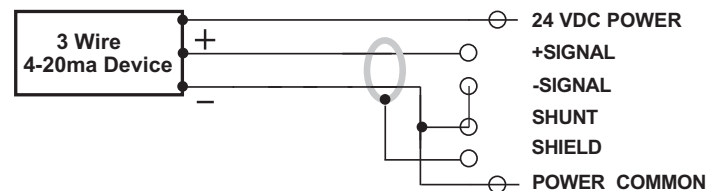
### Transducer Field Connector - Current Mode



### Transducer Field Connector - Current Mode



### Transducer Field Connector - Current Mode



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