

Технические характеристики на преобразователи сигналов Moore Industries MIX & MIT

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72
Брянск (4832)59-03-52
Вологда (8172)26-41-59
Иваново (4932)77-34-06
Калининград (4012)72-03-81
Киров (8332)68-02-04
Курск (4712)77-13-04
Москва (495)268-04-70
Нижний Новгород (831)429-08-12
Орел (4862)44-53-42
Пермь (342)205-81-47
Самара (846)206-03-16
Смоленск (4812)29-41-54
Тверь (4822)63-31-35
Тюмень (3452)66-21-18
Челябинск (351)202-03-61

Астана +7(7172)727-132
Владивосток (423)249-28-31
Воронеж (473)204-51-73
Ижевск (3412)26-03-58
Калуга (4842)92-23-67
Краснодар (861)203-40-90
Липецк (4742)52-20-81
Мурманск (8152)59-64-93
Новокузнецк (3843)20-46-81
Оренбург (3532)37-68-04
Ростов-на-Дону (863)308-18-15
Санкт-Петербург (812)309-46-40
Сочи (862)225-72-31
Томск (3822)98-41-53
Ульяновск (8422)24-23-59
Череповец (8202)49-02-64

Белгород (4722)40-23-64
Волгоград (844)278-03-48
Екатеринбург (343)384-55-89
Казань (843)206-01-48
Кемерово (3842)65-04-62
Красноярск (391)204-63-61
Магнитогорск (3519)55-03-13
Набережные Челны (8552)20-53-41
Новосибирск (383)227-86-73
Пенза (8412)22-31-16
Рязань (4912)46-61-64
Саратов (845)249-38-78
Ставрополь (8652)20-65-13
Тула (4872)74-02-29
Уфа (347)229-48-12
Ярославль (4852)69-52-93

Description

Featuring a very narrow installation footprint, miniMOORE™ Signal Isolators, Converters, Boosters and Splitters combine multiple analog signal channels in a rugged, easy-to-install signal conditioner.

Reliable and very economical, the miniMOORE multi-channel family includes the model MIX 2-wire (loop) and the model MIT 4-wire (line/mains) powered models. The complete family delivers cost-effective solutions for an expansive range of signal interface applications.

- **Isolate Signals** to stop erratic measurements caused by ground loops.
- **Convert Signals** from 0-5V, 1-5V or 0-10V to 4-20mA so field instruments can interface directly with an indicator, recorder, DCS, PLC or PC-based SCADA system.
- **Boost Signals** so more instruments can be added to an overburdened loop.
- **Split Signals** to allow one primary measurement to be sent to two, or up to four, separate systems.
- **Protect Equipment and Signals (Area Isolation)** by eliminating common electrical paths.
- **Solve “Bucking” Power Supplies** by stopping a conflict caused by a 4-wire transmitter and a DCS both trying to power the same process loop.

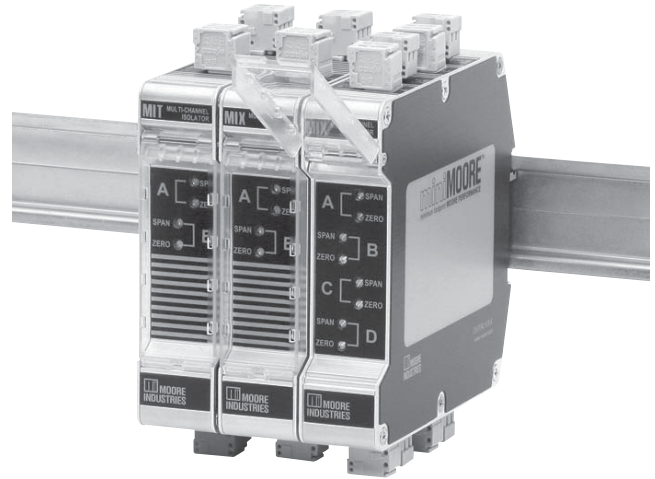
Choose from Model MIX 2-Wire (Loop-Powered) and Model MIT 4-Wire (Line/Mains-Powered):

Model	Page
MIX 2-Wire, Output-Loop Powered	
• 2-Channel, Switch-Selectable Input/4-20mA Output	2-5
• 4-Channel, Fixed 4-20mA Input/4-20mA Output	
MIT 4-Wire, Line/Mains Powered	6-7
• 2-Channel, Switch-Selectable Input/4-20mA Output	

UL **Underwriter's Laboratories:** General Location

cCSAus (US/Canada), Non-Incendive –
Class I, Division 2, Groups A, B, C, D
Suitable for use in General Locations and Hazardous
'Classified' Locations when mounted in suitable
protective enclosures.

CE **CE Conformant - EMC Directive 2004/108/EC EN61326;**
Low Voltage Directive - 2006/95/EC EN61010



The miniMOORE's rugged metal construction delivers superior RFI/EMI protection and stands up to the daily rigors of demanding process and factory automation applications.

Features

- **High-density, 2- and 4-channel configurations.** At only 25.4mm (1 inch) wide, delivers up to four low cost I/O at 0.25 inch (6.35mm) per channel to substantially reduce panel space, installation and instrument costs.
- **Switch-selectable current/voltage inputs.** The 2-channel miniMOORE models provide DIP switches for selecting input types of 4-20mA, 0-5V, 1-5V or 0-10V for each channel.
- **2-wire (loop) and 4-wire (line/mains) powered.** Versatile choices allow you to match miniMOORE to the type of AC or DC power available at each location.
- **Superior signal isolation.** Industrial-strength input-to-output and channel-to-channel protection (up to 1000Vrms) stops ground loops, motor noise, and other electrical interferences from affecting process signals.
- **Universal AC/DC power input.** The 4-wire miniMOORE model automatically accepts any power input range between 20-125VDC and 90-250VAC.
- **RFI/EMI Protection.** miniMOORE provides an effective barrier against the unpredictable, harmful effects of radio frequency and electromagnetic interference.

MIX 2-Wire (Loop-Powered) Signal Isolators/Converters

The miniMOORE MIX 2- and 4-channel models draw their operating power from the loop output side where power is typically made available by the receiving device, such as a DCS or PLC.

The 4-channel MIX can take the place of four individual 4-20mA/4-20mA isolators (Figure 1). The 2-channel MIX provides conveniently-located DIP switches for selecting input types of 4-20mA, 0-5V, 1-5V or 0-10V for each channel (Figure 2).

Figure 1. The MIX 4-channel model saves panel space, installation and instrument costs by providing four independent input/output channels in a single instrument.

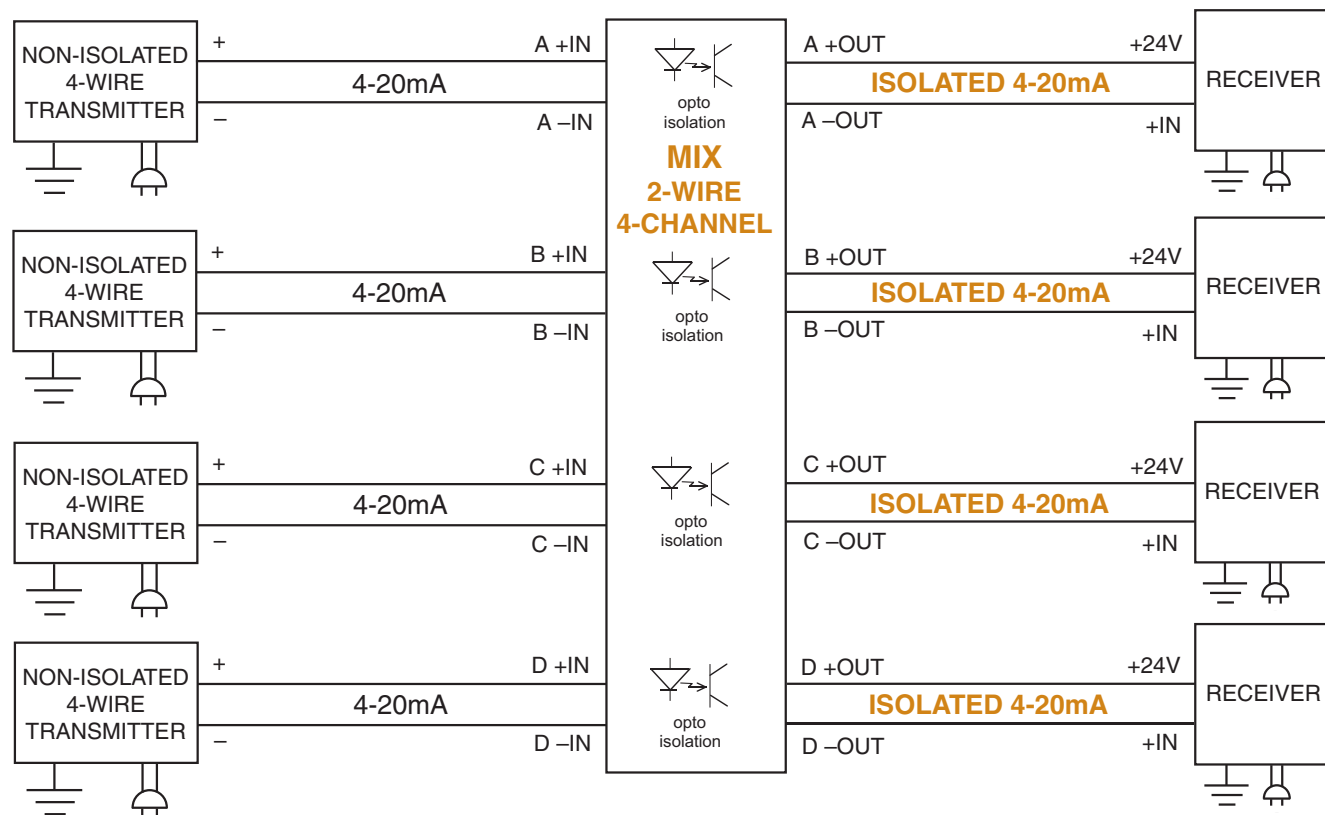
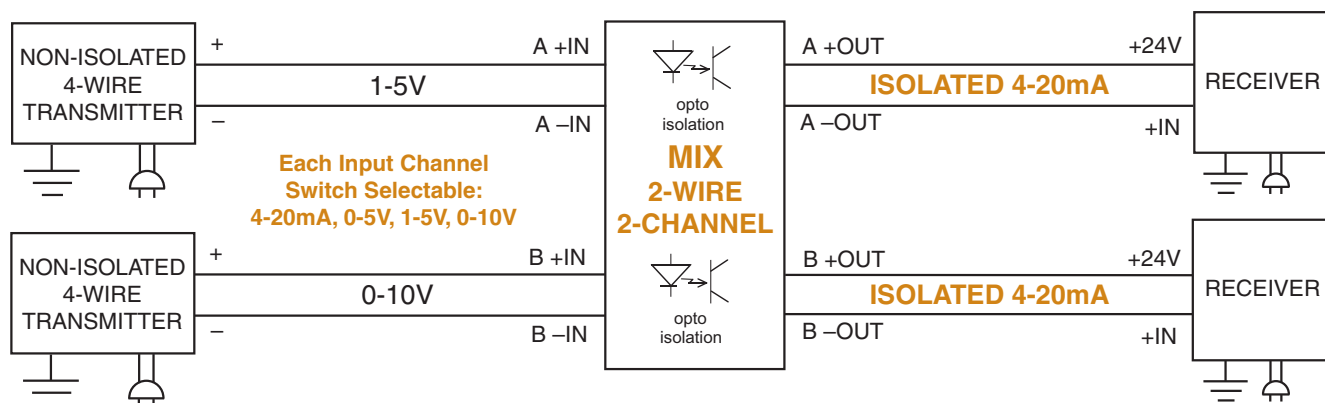


Figure 2. The MIX 2-channel model features switch-selectable input type for isolating and converting process signals.



Differences in potential between a grounded transmitter and a grounded receiving device may result in unpredictable ground loop problems, which can lead to signal drift. Use the mini**MOORE** model MIX to break the galvanic path between the field instrument and receiving device (Figure 3).

When two devices (such as a 4-wire transmitter and a DCS) are trying to source power to a loop, the result is a non-functioning loop. When neither device can be eliminated, the solution is the MIX. It can operate with powered inputs from both sides, thus restoring normal operations to the loop (Figure 6).

The diagram illustrates a 2-wire isolated transmitter-receiver system. On the left, a **NON-ISOLATED TRANSMITTER** is connected to a **POWER SUPPLY** and an **ISOLATED 4-20mA** block. The transmitter's output is labeled **4-20mA**. The power supply provides **+24V** and **-** rails. The **ISOLATED 4-20mA** block, which includes an **MIX 2-WIRE** section and **opto isolation**, is connected to the transmitter and the receiver. The receiver is labeled **RECEIVER** and is connected to the **ISOLATED 4-20mA** block. The receiver's output is labeled **+24V** and **+IN**. The diagram also shows **GROUND** connections for the transmitter, power supply, and receiver. A note **BREAKS THE GALVANIC PATH** is placed between the transmitter and the receiver, indicating the isolation provided by the opto-isolation block.

The diagram illustrates a 2-wire isolated transmitter and receiver system. On the left, an **ISOLATED 2-WIRE TRANSMITTER** is connected to a **RECEIVER** block. The transmitter's positive terminal is connected to the receiver's **+24V** supply, and its negative terminal is connected to the receiver's **+IN** input. This connection is labeled **INPUT LOOP**. Below the transmitter, there is a **MIX 2-WIRE** block containing an **opto isolation** symbol (a diode and a transistor). The positive terminal of the mixer is connected to the **+24V** supply, and its negative terminal is connected to the **+IN** input of a second **RECEIVER** block. This connection is labeled **OUTPUT LOOP ISOLATED 4-20mA**. Both receiver blocks are shown with a ground symbol and a light bulb symbol, indicating they are powered by a 24V supply.

The diagram illustrates a 2-wire transmitter and indicator circuit. It features two circular components on the left: a '2-WIRE TRANSMITTER' and a '2-WIRE LOOP INDICATOR'. The transmitter's positive terminal (+) is connected to a '+24V' supply and a '250 ohms' resistor, which then connects to the '+IN' of a 'RECEIVER'. The transmitter's negative terminal (-) is grounded. The indicator's positive terminal (+) is connected to a '+24V' supply and a '115 ohms' resistor, which then connects to the '+IN' of a 'RECEIVER'. The indicator's negative terminal (-) is connected to a '50 ohms' resistor, which then connects to the '+IN' of a 'RECEIVER'. The indicator's negative terminal (-) is also connected to the negative terminal of the 'MIX 2-WIRE' component. The 'MIX 2-WIRE' component is an opto-isolation circuit, represented by a triangle and a diode symbol. Its positive terminal (+) is connected to a '+24V' supply and a '4-20mA into 600 ohms' resistor, which then connects to the '+IN' of a 'RECEIVER'. The 'MIX 2-WIRE' component's negative terminal (-) is connected to the negative terminal of the '2-WIRE LOOP INDICATOR'. The 'RECEIVER' components are represented by rectangular boxes with a ground symbol and a light bulb symbol.

The diagram illustrates a 4-wire transmitter and receiver system connected via a 2-wire interface. On the left, the **4-WIRE TRANSMITTER** is shown with two power inputs: **+24V** and **-**. It outputs a **4-20mA** signal. This signal is connected to the **MIX 2-WIRE** block, which contains an **opto isolation** symbol. The **MIX 2-WIRE** block also receives a **+24V** input and provides a **4-20mA** output to the **RECEIVER**. The receiver's input is labeled **+IN** and **-**. Both the transmitter and receiver are grounded, indicated by ground symbols at the bottom.

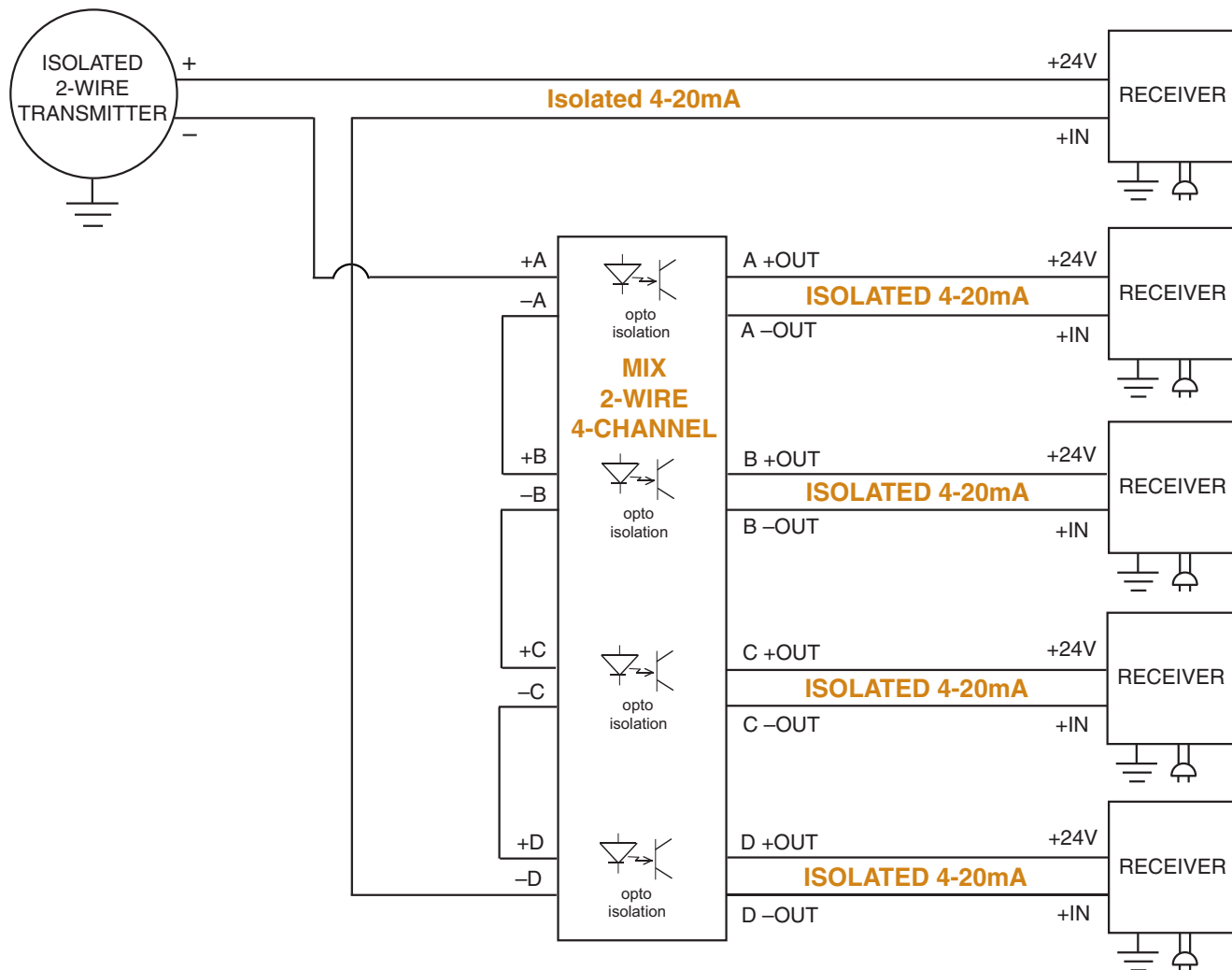
MIX & MIT Multi-Channel Signal Isolators and Converters

Share or Split a Process Signal

The model MIX miniMOORE is capable of accepting one input and splitting the signal to two separate signals (2-channel model) or up to 4 separate signals (4-channel model). This is valuable when multiple receivers must monitor one process signal, such as

in custody transfer, where two parties require identical information for accountability or billing purposes (Figure 7). Maintenance of one loop does not disrupt the integrity of the other.

Figure 7. The MIX 4-channel model can be used to split one 4-20mA signal into up to four proportional 4-20mA signals.



Specifications (MIX 2-Wire, 2- and 4-Channel)

<p>Performance</p> <p>Accuracy: ±0.1% of span (includes input accuracy, output accuracy, and the combined effects of linearity, hysteresis and repeatability)</p> <p>Stability: ±0.2% of reading per year</p> <p>Isolation: 1000Vrms between inputs and outputs and channel to channel</p> <p>Output Response Time: 100msec maximum to 99% of output change; 50msec to 90% output change</p> <p>DC Input Resistance: 50 ohms for current; 1 Mohm for voltage</p> <p>Ripple: <10mV peak-to-peak maximum measured across a 250 ohm resistor</p> <p>Over-Voltage Protection: 42V maximum on output; 42V reverse polarity protection on output</p>	<p>Performance (continued)</p> <p>Maximum Input Over Range: Current inputs, 100mA Voltage inputs, 150% of full scale</p> <p>Load Capability: $\frac{V_s - 12V_{dc}}{0.02A} = \text{ohms}$</p> <p>Output Current Limiting: 25mA typical; 30mA maximum</p> <p>Ambient Conditions</p> <p>Operating Range: -40°C to +70°C (-40°F to +185°F) @ 12V-30V; -40°C to +55°C (-40°F to +131°F) @ 12V-42V</p> <p>Storage Range: -40°C to +85°C (-40°F to +185°F)</p>	<p>Ambient Conditions (continued)</p> <p>Ambient Temperature Effect: ±0.007% of span/°C typical; ±0.015% of span/°C maximum</p> <p>Relative Humidity: 0-95% non-condensing</p> <p>RF/EMI Protection: 80%AM at 1KHz, 10V/m@20-1000MHz per IEC 61000-4-3</p> <p>Common Mode Rejection: Exceeds 95dB@60Hz with a limit of 500Vrms</p> <p>Adjustments</p> <p>Type: Front panel potentiometers</p> <p>Span: ±10%</p> <p>Zero: ±5% (non-interactive when span is set first)</p> <p>Weight</p> <p>MIX 2-Channel, 230 g (8.1 oz) MIX 4-Channel, 241 g (8.5 oz)</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Ordering Information

Unit	Input	Output	Power	Options	Housing
MIX miniMOORE 2-Wire (Output Loop-Powered) Isolator and Converter	2XPRG 2-channels, individually DIP switch selectable input range of 4-20mA, 0-5V, 1-5V or 0-10V	2X4-20mA Two 4-20mA output channels	12-42DC	None	DIN Universal DIN-style housing mounts on 32mm G-type (EN50035) and 35mm Top Hat (EN50022) rails
	4X4-20mA 4-channels, fixed for 4-20mA	4X4-20mA Four 4-20mA output channels			

When Ordering Specify: Unit / Input / Output / Power / Housing
Model Number Example: MIX / 2XPRG / 2X4-20mA / 12-42DC [DIN]
MIX / 4X4-20MA / 4X4-20MA / 12-42DC [DIN]

MIT 4-Wire (Line/Mains-Powered) Signal Isolators/Converters

The miniMOORE MIT 2-channel model features a **universal line/mains power supply**, allowing it to be powered from any 20-125VDC or 90-250VAC source. The power input wire terminal is a different color (orange) that the input/output terminals (gray) to reduce wiring errors.

Stop Ground Loop Noise

Differences in potential between a grounded transmitter and a grounded receiving device may result in unpredictable ground loop problems, which can lead to signal drift. Use the MIT to break the galvanic path between the field instrument and receiving device (Figure 8).

Convert Signals

The 4-Wire, 2-Channel MIT takes one or two separate process signal types (such as 1-5V and 0-10V) and converts them to standard isolated 4-20mA signals, allowing devices with incompatible signal types to interface with one another (Figure 9).

Share or Split a Process Signal

The MIT is capable of accepting one input and splitting the signal to two separate signals. This is valuable when multiple receivers must monitor one process signal, such as in custody transfer, where two parties require identical information for accountability or billing purposes (Figure 10). Maintenance of one loop does not disrupt the integrity of the other.

Figure 8. Input/output loop isolation.

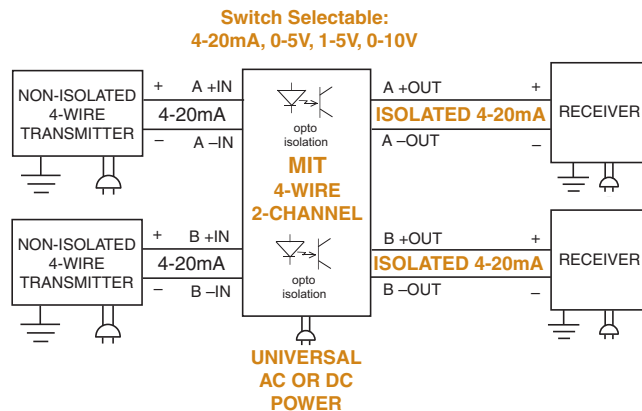


Figure 9. Input/output loop isolation and signal conversion.

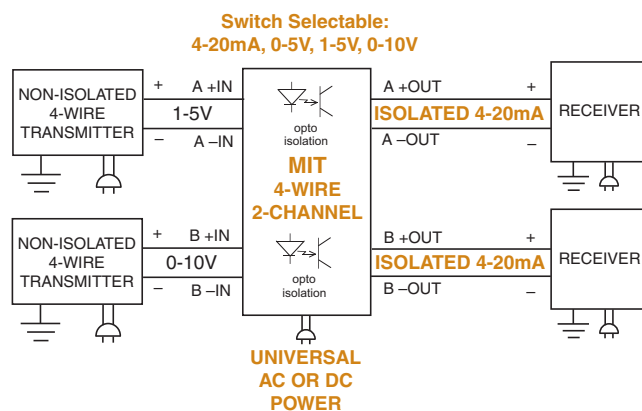
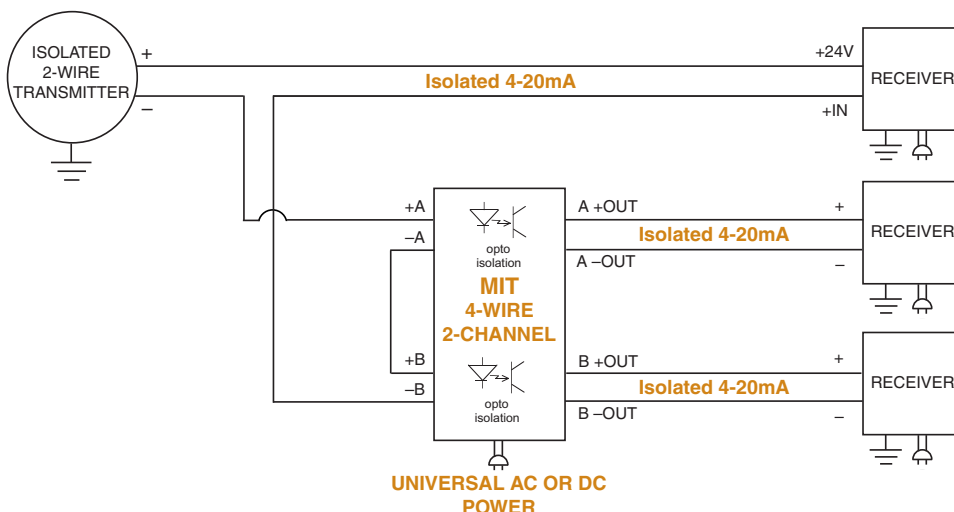


Figure 10. The MIT 2-channel isolator and converter can be used to split one 4-20mA signal into up to two proportional 4-20mA signals.



Specifications (MIT 4-Wire, 2-Channel)

<p>Performance</p> <p>Accuracy: $\pm 0.1\%$ of span (includes input accuracy, output accuracy, and the combined effects of linearity, hysteresis and repeatability)</p> <p>Stability: $\pm 0.2\%$ of reading per year</p> <p>Isolation: 1000Vrms between inputs and outputs and channel to channel; 2500Vrms between power supply and input, and power supply and output</p> <p>Output Response Time: 100msec maximum to 99% of output; 50 msec to 90% output change</p> <p>DC Input Resistance: 50 ohms for current; 1 Mohm for voltage</p> <p>Ripple: <10mV peak-to-peak maximum measured across a 250 ohm resistor</p> <p>Over-Voltage Protection: 30V maximum on output; 30V reverse polarity protection on output</p>	<p>Performance (continued)</p> <p>Maximum Input Overrange: Current inputs, 100mA maximum Voltage inputs, 150% of full scale</p> <p>Burden: 1V maximum for current; 1Mohms minimum for voltage</p> <p>Load Capacity: 600ohms max.</p> <p>Output Current Limiting: 25mA typical; 30mA maximum</p> <p>Power Supply: Universal, 20-125VDC or 90-250VAC</p> <p>Power Consumption: AC, 2W, 4VA max.; DC, 2.6W, 24VDC</p> <p>Ambient Conditions</p> <p>Operating Range: -40°C to +70°C (-40°F to +158°F)</p> <p>Storage Range: -40°C to +85°C (-40°F to +185°F)</p>	<p>Ambient Conditions (continued)</p> <p>Ambient Temperature Effect: $\pm 0.007\%$ of span/°C typical; $\pm 0.015\%$ of span/°C maximum</p> <p>Relative Humidity: 0-95% non-condensing</p> <p>RFI/EMI Protection: 80%AM at 1KHz, 10V/m@20-1000MHz per IEC61000-4-3</p> <p>Common Mode Rejection: Exceeds 95dB @60Hz with a limit of 500Vrms</p> <p>Adjustments</p> <p>Type: Front panel potentiometers</p> <p>Span: $\pm 10\%$</p> <p>Zero: $\pm 5\%$ (non-interactive when span is set first)</p> <p>Weight 263 g (9.3 oz)</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

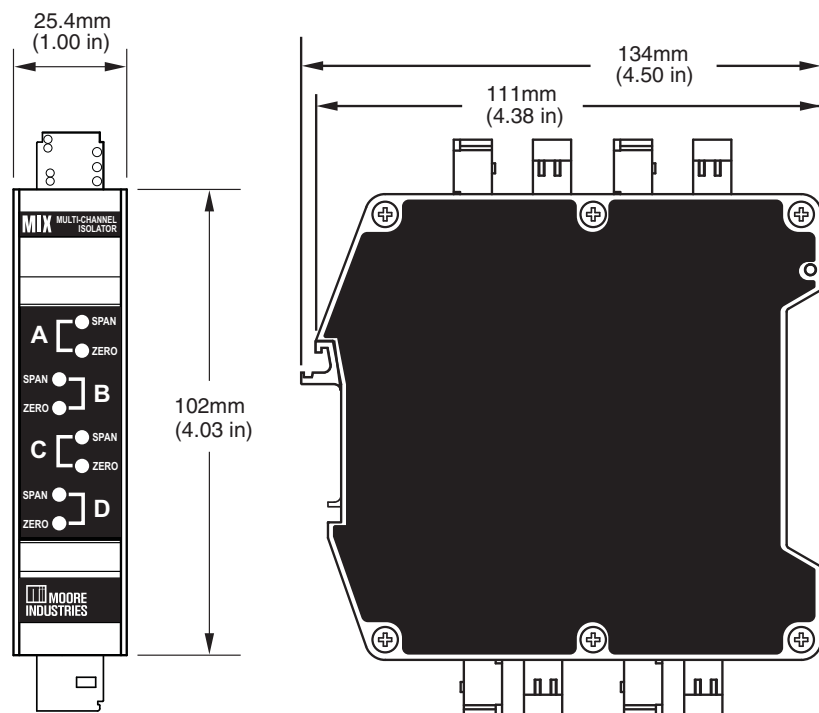
Ordering Information

Unit	Input	Output	Power	Options	Housing
MIT mini MOORE 4-Wire (Line/Mains-Powered) Isolator and Converter	2XPRG 2-channels, individually DIP switch selectable input range of 4-20mA, 0-5V, 1-5V or 0-10V	2X4-20mA Two 4-20mA output channels	U Universal, 4-wire (line/mains) power; accepts power input ranges of 20-125VDC or 90-250VAC	None	DIN Universal DIN-style housing mounts on 32mm G-type (EN50035) and 35mm Top Hat (EN50022) rails

When Ordering Specify: Unit / Input / Output / Power / Housing
Model Number Example: MIT / 2XPRG / 2X4-20mA / U [DIN]

MIX & MIT Multi-Channel Signal Isolators and Converters

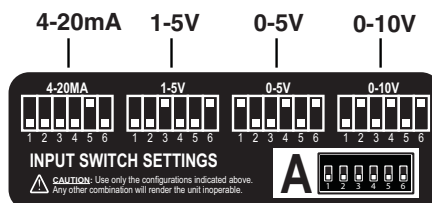
Figure 11. Installation dimensions for miniMOORE MIX 2-wire, 2- and 4-channel and MIT 4-wire, 2-channel models.



NOTES: MIX 2-Wire, 4-Channel Model Shown. All Models Share Identical Height and Width Dimensions.

On the MIT 4-Wire model, the power input wire terminal is a different color (orange) than the input/output terminals (gray) to reduce wiring errors.

Settings for Selectable Input Ranges



**MIX 2-Wire, 2-Channel and
MIT 4-Wire, 2-Channel Models**

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72
Брянск (4832)59-03-52
Вологда (8172)26-41-59
Иваново (4932)77-34-06
Калининград (4012)72-03-81
Киров (8332)68-02-04
Курск (4712)77-13-04
Москва (495)268-04-70
Нижний Новгород (831)429-08-12
Орел (4862)44-53-42
Пермь (342)205-81-47
Самара (846)206-03-16
Смоленск (4812)29-41-54
Тверь (4822)63-31-35
Тюмень (3452)66-21-18
Челябинск (351)202-03-61

Астана +7(7172)727-132
Владивосток (423)249-28-31
Воронеж (473)204-51-73
Ижевск (3412)26-03-58
Калуга (4842)92-23-67
Краснодар (861)203-40-90
Липецк (4742)52-20-81
Мурманск (8152)59-64-93
Новокузнецк (3843)20-46-81
Оренбург (3532)37-68-04
Ростов-на-Дону (863)308-18-15
Санкт-Петербург (812)309-46-40
Сочи (862)225-72-31
Томск (3822)98-41-53
Ульяновск (8422)24-23-59
Череповец (8202)49-02-64

Белгород (4722)40-23-64
Волгоград (844)278-03-48
Екатеринбург (343)384-55-89
Казань (843)206-01-48
Кемерово (3842)65-04-62
Красноярск (391)204-63-61
Магнитогорск (3519)55-03-13
Набережные Челны (8552)20-53-41
Новосибирск (383)227-86-73
Пенза (8412)22-31-16
Рязань (4912)46-61-64
Саратов (845)249-38-78
Ставрополь (8652)20-65-13
Тула (4872)74-02-29
Уфа (347)229-48-12
Ярославль (4852)69-52-93