

## Product Data Sheet

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# Micro Motion® Model 7950 and Model 7951 Signal Converters

Micro Motion® Model 7950 and Model 7951 signal converters are the perfect complement to Micro Motion gas and liquid density and viscosity meters. These devices convert the meter output signals into accurate process measurements. Because they are easy to use, you can quickly set up and configure the signal converters to meet your individual process needs.



7950

Wall-mount  
signal converter

7951

Panel-mount  
signal converter

- Receives inputs from Micro Motion gas density, specific gravity, liquid density, and liquid viscosity meters
- Provides high accuracy readings of density, specific gravity, viscosity, and process variables
- Outputs readings in multiple formats such as  $\text{kg/m}^3$ ,  $\text{g/cm}^3$ , °API, °Brix, and % concentration
- Easy-to-use, four-line, backlit configurable display
- Wide-ranging I/O capabilities, with the option to increase the quantity of inputs/outputs available
- Supports wide application range, including interface detection, fuel density, and quality control



# Micro Motion® Model 7950 and Model 7951 Signal Converters

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The Micro Motion® Model 7950 and Model 7951 signal converters has been specifically designed to operate with the Micro Motion gas density, specific gravity, liquid density, and viscosity meters. These signal converters are powerful tools that convert live input values from density and viscosity meters into usable process variables.

**Installation flexibility.** The 7950/7951 signal converter accepts inputs from Micro Motion gas density, liquid density, and viscosity meters. Additionally, it can accept inputs from other meters and transmitters, such as temperature and pressure transmitters. A wall-mount (7950) or panel-mount (7951) version of the signal converter is available, providing additional installation flexibility.

**Simple-to-use interface.** The simple-to-use menu-driven keyboard provides complete access to all database variables and configuration, with password/keyswitch protection if required.

**Total processing capability.** A comprehensive range of calculations are available as standard, and you can configure special functions to meet virtually every need.

**Communications.** You can configure the 7950/7951 signal converter for both analog or digital communications (RS-232/RS-485 and Modbus), and can interface directly to RTUs, PLCs, and DCSs.

**Remote configuration.** The signal converter can be easily configured remotely using PC\_Config software, which is available from Micro Motion. This software supports the configuration of and datalogging from the signal converter via Modbus, even during normal plant operation.

**Gas and liquid applications software.** The 7950/7951 signal converter software supports liquid and gas applications.

- The 1020 gas applications software is suitable for dual-channel applications. Each channel can accept an input from a Micro Motion gas density meter or a Micro Motion gas specific gravity meter, a pressure transmitter, and a temperature transmitter.
- The 2010 liquid applications software accepts single inputs from a Micro Motion liquid density or viscosity meter, a pressure transmitter, and temperature transmitter.

The software features available are:

- Density measurement via the sensor input(s) of a Micro Motion liquid or gas density meter
- Specific gravity measurement via the sensor inputs of a Micro Motion gas specific gravity meter
- Viscosity measurement via the sensor input of a Micro Motion liquid viscosity meter
- Temperature measurement via RTD or 4–20 mA
- Pressure measurement via 4–20 mA (liquid/gas density applications only)

Additionally, guided setups within the software help you configure your gas or liquid applications quickly and simply.

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# Inputs

## Density, base density, and viscosity inputs

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Available inputs	4 inputs available — to receive density, base density, and viscosity measurements. The exact quantity of inputs depends on the software fitted to the signal converter.
Sensor frequency	100 $\mu$ s to 5000 $\mu$ s
Sensor frequency accuracy	$\pm$ 6 ppm typical
Input trigger level	0.5 V (maximum input level: 30 V)
Resolution	1 ns at 1.5 Hz for 1 second sampling
Input impedance	10 k $\Omega$ nominal

## Analog inputs

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Available inputs	<b>7950</b>	4 inputs available (standard) or 8 inputs available (optional)
	<b>7951</b>	4 inputs available (standard) For converters with D-type connectors, 10 inputs available (optional) For converters with Klippon connectors, 8 inputs available (optional)
Type		4 to 20 mA or 0 to 20 mA
Span selection		Unlimited (keyboard selectable)
Accuracy		Less than $\pm$ 0.008% full scale
Resolution		20 bit (1 part per million)
Sampling time		50 ms per channel

## Temperature – RTD

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Available inputs	4 inputs available, using the first 4 analog channels
Configuration	4-wire, with the Power return line connected to analog input ground
Temperature range	$-364$ °F to $+428$ °F ( $-220$ °C to $+220$ °C) for 100 $\Omega$ RTD
Limits of error and resolution (100 $\Omega$ RTD calibrated in operating region)	Maximum error: $\pm$ 0.1 °F ( $\pm$ 0.05 °C) Resolution: $\pm$ 0.04 °F ( $\pm$ 0.02 °C)
Sampling cycle time	50 ms per channel

## Status

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Available inputs	<b>7950</b>	8 opto-coupled/fully floating inputs
	<b>7951</b>	For converters with D-type connectors, 10 inputs available (standard) or 18 inputs (optional) For converters with Klippon connectors, 6 inputs available
Input voltage required		3 to 30 V per channel
Update rate		250 ms maximum

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## Inputs *continued*

### Power

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Voltage	<b>7950</b>	21 to 30 VDC or 90 to 265 VAC at 45 to 65 Hz
	<b>7951</b>	21 to 30 VDC
Power consumption	Unloaded: 20 watts (maximum) Loaded: 35 watts (maximum) Maximum startup current: 2 A	

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## Outputs

### Power outputs

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Ancillary supplies	One independent 24 V output at 800 mA One independent voltage switchable to 8 or 16 V at 120 mA
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### Analog outputs

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Available outputs	4 outputs available (standard) or 8 outputs available (optional)
Output type	Current (powered by signal converter)
Power	One 24 V supply with capacity for 8 outputs at 25 mA each
Maximum loop impedance	1 k $\Omega$
Analog range	4 to 20 mA or 0 to 20 mA (selectable)
Zero offset	20% or 0% (keyboard selectable)
Span selection	Unlimited (keyboard selectable)
Accuracy	12 bit ( $\pm 0.075\%$ of full scale)
Resolution	$\pm 0.028\%$
Output impedance	1 M $\Omega$ minimum
Output representation	Any measured or computed value (keyboard selectable)
Update rate	0.1 seconds minimum
Isolation	All analog outputs are galvanically isolated from ground (but not from each other)

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# Outputs *continued*

## Status alarms

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Available outputs	<b>7950</b>	8 outputs available
	<b>7951</b>	For converters with D-type connectors, 9 outputs available (standard) or 17 outputs (optional) For converters with Klippon connectors, 7 outputs available
Type	FET open-drain and 1 off relay (0.5 A DC)	
Rating	250 mA at 24 V	
Switching voltage	24 V	

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## Communications

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Available serial ports	3 serial ports
Type	RS-232 or RS-485 (selectable) (Port 1 is RS-232)
Software protocols	Modbus ASCII, RTU (Master, Slave, and Peer) Data type IEEE 32- and 64-bit Commands 03 and 16
Baud rates	300, 600, 1200, 2400, 4800, 9600, 19200
Stop bits	1 or 2 (selectable)
Parity bits	Even, odd, or none
Number of data bits	7 or 8 (selectable)

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## Display

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Characters per line	20 alphanumeric
Number of lines	4
Display color	Black/yellow (backlit); LCD, continuously powered

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# Microprocessor

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Processor	Motorola	
Clock speed	<b>7950</b>	16 MHz
	<b>7951</b>	24 MHz
Computation resolution	64 bit (IEEE 754), fully floating point math package Embedded OSE real-time operating system	
Program storage	<b>7950</b>	1.0 MByte flash
	<b>7951</b>	2.0 MByte flash
Data storage	<b>7950</b>	768 KByte RAM
	<b>7951</b>	2.0 MByte RAM
Computation accuracy	Less than 1 part in $10^{11}$	
Process data retention	For internal lithium button cell: 24 months (with 7950/7951 signal converter unpowered)	

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# Real-time clock

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Accuracy	$\pm 0.011\%$
Power	Internal lithium button cell

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# Environment

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Storage temperature	-4 °F to +158 °F (-20 °C to +70 °C)
Operating temperature	+32 °F to +122 °F (0 °C to +50 °C)
Humidity	Up to 90% non-condensing

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# Physical specifications

## 7950 Wall-Mounted Signal Converter

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<b>Weight</b>	9.9 lb (4.5 kg)
<b>Housing</b>	NEMA 4X (IP65) from front panel when mounted
<b>Dimensions</b>	12.6 in (H) x 11.8 in (W) x 5.1 in (D) 320 mm (H) x 300 mm (W) x 130 mm (D)
<b>Vibration</b>	Tested to IEC 60068-2-6, Part II, frequency range 10–150 Hz, maximum acceleration 20 m/s <sup>2</sup>
<b>EMC Emissions and Immunity</b>	EN 61326-1:2006 (IEC 61326-1:2006) Industrial locations

## 7951 Panel-Mounted Signal Converter

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<b>Weight</b>	5.5 lb (2.5 kg)
<b>Housing</b>	IP50 from front panel when mounted
<b>Dimensions</b>	3.98 in (H) x 7.76 in (W) x 10.1 in (D) 101 mm (H) x 197 mm (W) x 257 mm (D)
<b>Vibration</b>	Tested to IEC 60068-2-6, Part II, frequency range 10–150 Hz, maximum acceleration 20 m/s <sup>2</sup>
<b>EMC Emissions and Immunity</b>	EN 61326-1:2006 (IEC 61326-1:2006) Industrial locations

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# Ordering information: 7950 Signal Converter

Code	Product description
7950	Wall-mounted signal converter (for Models 3098, 7812, 7835, 7845, 7847, 7826, 7827 with on-board frequency electronics)
Code	Signal converter
M	Micro Motion signal converter
Code	Status
A	Status
Code	Connector types
A	Klippon connector
Code	Software application
0	Gas applications – 1020 signal converter software
5	Liquid applications – 2010 signal converter software
Z	ETO software – please specify full version and issue number with order
Code	Communication ports
3	3 Serial communication ports
Code	Analog inputs/outputs
4	4 Analog inputs, 4 analog outputs
8	8 Analog inputs, 8 analog outputs
Code	Option boards
N	None
Code	Connector kit
N	None
Code	Configuration method
N	None
B	PC configuration tool and serial communications cable
C	Factory configuration (customer application data required)
<b>Typical model number: 7950MAA034NNN</b>	



# Ordering information: 7951 Signal Converter

Code	Product description
7951	Panel-mounted signal converter (for Models 3098, 7812, 7835, 7845, 7847, 7826, 7827 with on-board frequency electronics)
Code	Signal converter
M	Micro Motion signal converter
Code	Status
A	Status
Code	Connector types
A	Klippon connector
B	D-type connector
Code	Software application
0	Gas applications – 1020 signal converter software
5	Liquid applications – 2010 signal converter software
Z	ETO software – please specify full version and issue number with order
Code	Communication ports
3	3 Serial communication ports
Code	Analog inputs/outputs
4	4 analog inputs, 4 analog outputs
8 <sup>(1)</sup>	8 analog inputs, 8 analog outputs
Code	Option boards
N	None
Code	Connector kit
<b>Available with all Connector types</b>	
N	None
<b>Available with Connector type B only</b>	
5	D-type to Screw Terminal Adapter, 25-way with 1.8 m cable (set of 5)
Code	Configuration method
N	None
B	PC configuration tool and serial communications cable
C	Factory configuration (customer application data required)
<b>Typical model number: 7951MAA034NNN</b>	

(1) If the connector types option is B, then 10 analog input and 8 analog outputs are available.





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