

ControlWave[®] Micro Mixed I/O Modules

The Mixed I/O module provides the ControlWave[®] Micro with the ability to monitor and control various analog field signals, digital field signals, and high-speed pulse inputs. This reduces configuration time and maintenance costs by providing multiple I/O options on a single module.

The Mixed I/O module provide a total of six individually field configurable digital inputs/outputs (DI/O), four analog inputs (AI), two high-speed counter inputs (HSC), and one optional analog output (AO).

Digital Inputs/Outputs

You can configure each of the six DI/O channels as a digital input (DI) or digital output (DO). Surge suppression and signal conditioning is provided for each DI channel. The module provides internally sourced DI operation for dry contacts pulled internally to 3.3 Vdc when the field input is open. DI filtering is 15 ms.

DO circuits consist of an open drain MOSFET and surge suppression.

Analog Inputs

You can configure the four AI channels for 4 to 20 mA or 1 to 5 Vdc externally sourced, single-ended operation. The module channels each AI signal through signal conditioning circuitry that provides a 2 Hz low pass filter for noise rejection.

High-Speed Counters

The module provides two HSC inputs. Each HSC input is capable of pulse inputs of up to 10 kHz. You can configure the two HSC inputs for use with contact debounce circuitry enabled or disabled. You can also configure the HSC inputs for 2 mA or 200 μ A (low power) operation. The module provides HSC inputs with surge suppression. Field inputs can be driven voltage inputs or relay contacts.

Analog Outputs

One externally powered (11 to 30 Vdc) AO is optional on the Mixed I/O module.

Local or Remote Terminations

The Mixed I/O module is available factory configured for either local terminations that consist of two 10-point terminal block assemblies or remote terminations that consist of two 14-pin mass termination headers. Terminations are pluggable and accept a maximum wire size of 14 AWG (American Wire Gauge).

Remote terminations provide a convenient alternative to the standard direct connect termination and allow a concentration of electrical connections from one or more controllers to be located in a single area, such as the rear of a 19-inch cabinet. For more information on remote terminations, refer to *Product Data Sheet CWMICRO*.



Mixed I/O Module

ControlWave Micro Mixed I/O Module

Field Wiring Terminals



Terminal Block 1	Definition
1	Digital Input/Output 1
2	Digital Input/Output 2
3	Digital Input/Output 3
4	Digital Input/Output 4
5	Digital Input/Output 5
6	Digital Input/Output 6
7	Ground
8	High-Speed Counter 1 Set
9	High-Speed Counter 1 Reset
10	Ground

Terminal Block 2	Definition
1	High-Speed Counter 2 Set
2	High-Speed Counter 2 Reset
3	Analog Input 1
4	Analog Input 2
5	Analog Input 3
6	Analog Input 4
7	Ground
8	Analog Output (optional)
9	External Voltage
10	Ground

Inputs

Analog Inputs	Quantity	Four channels	
	Type	Single-ended, externally sourced, jumper configurable as 1 to 5 Vdc or 4 to 20 mA	
	Resolution	14-bit	
	Impedance	1 to 5 Vdc Inputs	1 MΩ
		4 to 20 mA Inputs	250 Ω
	Reference Accuracy (after calibration) at 25°C (77°F)	±0.1% of span	
	Accuracy Over Operating Temperature Range [-40 to 70°C (-40 to 158°F)]	±0.2% of span	
	Input Filter	500 ms to 99.9% of input signal	
	Conversion Time	10 μs per channel	
	Surge Suppression	30 Vdc transorb between signal and ground Meets C37.90-1978 and IEC 801-5 specifications	

Digital Inputs	Quantity	Six, individually configurable as either DI or DO channels	
	Type	Internally sourced, non-interrupting dry contact	
	Input Voltage	3.3 Vdc internally sourced dry contact per point	
	Input Current	Selectable 66 μA or 2 mA	
	On-State Voltage	< 1.0 Vdc	
	Off-State Voltage	> 2.0 Vdc	
	Surge Suppression	31 Vdc transorb between signal and isolated ground	
	Input Filtering	15 ms time constant (contact bounce)	

High-Speed Counter Inputs	Quantity	2	
	Type	3.3 V internally sourced dry contact. Individually jumper selectable input current of 180 μ A or 2.2 mA.	
	Input Frequency	10 kHz max	
	Input Filtering	20 μ s, 1 ms	
	Surge Suppression	31 Vdc transorb between signal and ground. Meets ANSI/IEEE C37.90-1978.	
	On-State Voltage	< 1.0 Vdc	
	Off-State Voltage	> 1.8 Vdc	
Outputs			
Analog Output (optional)	Quantity	One channel	
	Type	Single-ended, jumper configurable as 1 to 5 Vdc or 4 to 20 mA	
	Resolution	12-bit	
	Maximum Overload Voltage	\pm 24 Vdc continuous	
	Impedance	10 M Ω typical (without scaling resistor)	
	Over Range	0.8 to 5.2 Vdc or 3.2 to 20.8 mA	
	Accuracy Over Operating Temperature Range [-40 to 70°C (-40 to 158°F)]	Current Output	\pm 0.3% of span
		Voltage Output	0.3% + (0.057 x Iload in mA)% of span
	Current Mode Compliance	650 Ω	
	Maximum Load Current	5 mA (voltage mode)	
	Isolation	500 Vdc channel to bus	
	Surge Suppression	16 Vdc transorb (meets IEEE 472-1978)	
	Digital Outputs	Quantity	Six, individually configurable as either DI or DO channels
Type		Open drain, externally powered	
Maximum Load Current		100 mA @ 31 Vdc	
Surge Suppression		31 Vdc transorb between signal and ground	
Power			
Consumption	Analog Input	0.021 W	
	Analog Output	0.021 W	
	External Loop Power @ 24 Vdc	0.73 W	

Digital Inputs/Outputs	All Inputs On, 66 μ A Sourced	0.016 W	
	All Inputs On, 2 mA Sourced	0.05 W	
	All LEDs	Add 0.05 W	
High-Speed Counter Inputs	No Active Channels	6.8 mA	
	Additional Current Per Input	Per Active Channel	200 μ A or 2.2 mA per Input (ON State)
		Per Active LED	2 mA

Physical

Dimensions	8.64 cm W x 15.24 cm H x 14.7 cm D (3.4 in W x 6.0 in H x 5.8 in D)		
Weight	139 g (4.9 oz)		
Terminations	Local	Two 10-point terminal block assemblies	
	Remote	Two 14-pin mass termination headers	
Wiring	Up to size 14 AWG at the removable terminal blocks		
LEDs	16 status indicators. DI 1 through 6, DO 1 through 6, HSC 1 and 2.		

Environmental

Same as the ControlWave Micro in which it is installed

Approvals

Same as the ControlWave Micro in which it is installed

Headquarters:

Emerson Process Management

Remote Automation Solutions
6005 Rogerdale Road
Houston, TX 77072 U.S.A.
T +1 281 879 2699 | F +1 281 988 4445
www.EmersonProcess.com/Remote

Europe:

Emerson Process Management

Remote Automation Solutions
Emerson House
Kirkhill Drive Kirkhill Industrial Estate
Aberdeen UK AB21 OEU
T +44 1224 215700 | F +44 1224 215799
www.EmersonProcess.com/Remote

North American/Latin America:

Emerson Process Management

Remote Automation Solutions
6005 Rogerdale Road
Houston TX USA 77072
T +1 281 879 2699 | F +1 281 988 4445
www.EmersonProcess.com/Remote

Middle East/Africa:

Emerson Process Management

Remote Automation Solutions
Emerson FZE
P.O. Box 17033
Jebel Ali Free Zone – South 2
Dubai U.A.E.
T +971 4 8118100 | F +971 4 8865465
www.EmersonProcess.com/Remote

Asia-Pacific:

Emerson Process Management

Remote Automation Solutions
1 Pandan Crescent
Singapore 128461
T +65 6777 8211 | F +65 6777 0947
www.EmersonProcess.com/Remote

© 2004-2012 Remote Automation Solutions, a business unit of Emerson Process Management. All rights reserved.

Bristol, Inc., Bristol Canada, BBI SA de CV and Emerson Process Management Ltd, Remote Automation Solutions (UK), are wholly owned subsidiaries of Emerson Electric Co. doing business as Remote Automation Solutions, a business unit of Emerson Process Management. FloBoss, ROCLINK, Bristol, Bristol Babcock, ControlWave, TeleFlow and Helicoid are trademarks of Remote Automation Solutions. AMS, PlantWeb and the PlantWeb logo are marks of Emerson Electric Co. The Emerson logo is a trademark and service mark of the Emerson Electric Co. All other marks are property of their respective owners.

The contents of this publication are presented for informational purposes only. While every effort has been made to ensure informational accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. Remote Automation Solutions reserves the right to modify or improve the designs or specifications of such products at any time without notice. All sales are governed by Remote Automation Solutions' terms and conditions which are available upon request. Remote Automation Solutions does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Remote Automation Solutions product remains solely with the purchaser and end-user.