PROGRAMMABLE CONTROLLERS

METASYS® CONTROLLERS

IOM

INPUT/OUTPUT MODULES

The IOM Series expansion I/O modules have integral RS-485 MS/TP communications and integrate into the web-based *Metasys*® system.

IOMs can serve in one of two capacities, depending on where they are installed in the *Metasys* system. When installed on the Sensor/Actuator (SA) Bus of an Advanced Application Field Equipment Controller (FAC), Field Equipment Controller (FEC), or VAV Modular Assembly (VMA) controller, the IOM expands the point count of these controllers. When installed on the Field Controller (FC) Bus, IOMs can be used as I/O point multiplexors to support monitoring and control from a Network Automation Engine (NAE) or Network Control Engine (NCE). The point multiplexor can also be useful for sharing points between other field controllers on the FC Bus using peer-to-peer connectivity.

Note: At Controller Configuration Tool (CCT) Release 10.1 and later, FACs, FECs, and VMAs can communicate by using either the BACnet® or the N2 field bus networking protocol. The operation of the IOM Input/Output Module is not affected by the selection of the BACnet or the N2 protocol in the host controller.

All IOM expansion modules are BACnet Testing Laboratory (BTL) listed and certified.

FEATURES

- **Ability to Reside on the FC Bus or SA Bus –** Provides application flexibility.
- **Standard BACnet Protocol –** Provides interoperability with other Building Automatcion System (BAS) products that use the widely accepted BACnet standard.
- **BACnet Testing Laboratories (BTL) Listed and Certified –** Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **Standard Hardware and Software Platform –** Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows; also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **Universal Inputs and Configurable Outputs –** Allows multiple signal options to provide input/output flexibility.
- **32-bit Microprocessor –** Ensures optimum performance and meets industry specifications.
- **BACnet Automatic Discovery –** Supports easy controller integration into a *Metasys* BAS.
- **Pluggable Communications Bus and Supply Power Terminal Blocks –** Expedites installation and troubleshooting.
- **Wireless Connectivity through the ZFR1800 Series or the WNC1800/ZFR182x Pro Series Wireless Field Bus Systems in MS/TP Controllers –** Enables wireless mesh connectivity to supervisory controllers, facilitating easy initial location and relocation.
- **Bluetooth® Wireless Commissioning –** Provides an easy-to-use connection to the configuration and commissioning tool.
- **End-of-Line (EOL) Switch in MS/TP Field Controllers –** Enables field controllers to be terminating devices on the communications bus.

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ORDERING INFORMATION

IOM SERIES MODEL (INCLUDING POINT TYPE COUNTS)

	IOM 1711	IOM 2711	IOM 2721	IOM 3711	IOM 3721	IOM 3731	IOM 4711	IOM 2723	IOM 3723	IOM 3733
Communication Protocol	BACnet MS/TP									
Engines	All Model types. Some NIE models support MS/TP and N2 devices. *Refer to the Network Engines Product Bulletin (LIT-12012138) for details.*									
Modular Jacks	6-pin SA Bus Modular Port supports one communicating sensor. **Or** you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.									
	6-pin FC Bus for tool support									
Point Types Signals Accepted										
Universal Input (UI)										
Analog Input, Voltage Mode, 0–10 VDC										
Analog Input, Current Mode, 4–20 mA										
Analog Input, Resistive Mode, 0–2 kOhm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k Type L, 2.252k Type 2)	2	8	4				6	8		
Binary Input, Dry Contact Maintained Mode										
Binary Input (BI)										
Dry Contact Maintained Mode										
Pulse Counter/Accumulator Mode (High Speed), 100 Hz	4				16	8	2		16	8
Analog Output (AO)										
Analog Output, Voltage Mode, 0–10 VDC										
Analog Output, Current Mode, 4–20 mA			2				2	2		
Binary Output (BO) [1]										
24 VAC Triac						8	3			8

Note

1 The IOM2723, IOM3723, and IOM3733 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

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ORDERING INFORMATION

CODES	DESCRIPTION	CE MARKED
MS-IOM1711-0	4-Point IOM with 4 BI, FC Bus and SA Bus Support	■
MS-IOM2711-2	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC.	■
MS-IOM2721-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support	■
MS-IOM2723-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support	■
MS-IOM3711-2	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC.	■
MS-IOM3721-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support	■
MS-IOM3723-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support	■
MS-IOM3731-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support	■
MS-IOM3733-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support. Binary Outputs (BOs) on MS-IOM3733 controllers do not supply power for the outputs; the BOs require external low-voltage (<30 VAC) power sources.	■
MS-IOM4711-0	17-Point IOM with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, FC and SA Bus Support	■

ACCESSORIES

CODES	DESCRIPTION
TL-CCT-0	*Metasys* Controller Configuration Tool (CCT) software
MS-FCP-0	*Metasys* Field Controller Firmware Package Files for CCT Mobile Access
Portal (MAP) Gateway	*Refer to the Mobile Access Portal Gateway Catalog Page (LIT-1900869) to identify the appropriate product for your region.* **Note:** The MAP Gateway serves as a replacement for the the BTCVT, which is no longer available for purchase, but continues to be supported.
ZFR1800 Series Wireless Field Bus System	This system is used for installations that only support BACnet MS/TP. *Refer to the WNC1800/ZFR182x Pro Series Wireless Field Bus System Product Bulletin (LIT-12012320) for a list of available products.*
ZFR-USBHA-0	ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled FEC, FAC, IOM, and VMA16 controllers. Also allows use of the ZFR Checkout Tool (ZCT) in CCT.
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
Y65T42-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Hub Mount (Y65SP+), 8 in. Primary Leads and Secondary Screw Terminals, Class 2
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10)
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10)
AP-TBK3PW-0	Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10)
AS-CBLTSTAT-0	Cable adapter for connection to 8-pin TE-6700 Series sensors
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router

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TECHNICAL SPECIFICATIONS (PART 1/3)

Codes	
MS-IOM1711-0	4-Point IOM with 4 BI, FC Bus and SA Bus Support
MS-IOM2711-2	6-Point IOM with 2 UI, 2 UO, 2 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC
MS-IOM2721-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support
MS-IOM2723-0	10-Point IOM with 8 UI, 2 AO, FC Bus, and SA Bus Support
MS-IOM3711-2	12-Point IOM with 4 UI, 4 UO, 4 BO, FC Bus, and SA Bus Support. Relays are rated for 240 VAC
MS-IOM3721-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support
MS-IOM3723-0	16-Point IOM with 16 BI, FC Bus, and SA Bus Support
MS-IOM3731-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support
MS-IOM3733-0	16-Point IOM with 8 BI, 8 BO, FC Bus, and SA Bus Support
MS-IOM4711-0	17-Point IOM with 6 UI, 2 BI, 3 BO, 2 AO, 4 CO, FC and SA Bus Support
Power Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	14 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum), depending on the IOM model.
Ambient Conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing
Storage	-40 to 80°C; 5 to 95% RH noncondensing
Addressing	DIP switch set; valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid IOM addresses).
Communications Bus	BACnet MS/TP, RS-485 3-wire FC Bus between the supervisory controller and expansion modules (for MS/TP bus communications at 38,400 baud) 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices. Includes a lead source 15 VDC supply power (from controller or expansion module) to bus devices (for MS/TP bus communications at 38,400 baud). **Note:** For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034)
Processor	
MS-IOM1711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-2, MS-IOM3731-0, MS-IOM4711-0	H8SX/166xR Renesas® 32-bit microcontroller
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	RX631 Renesas 32-bit microcontroller

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TECHNICAL SPECIFICATIONS (PART 2/3)

Memory	
MS-IOM1711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-2, MS-IOM3731-0, MS-IOM4711-0	512 KB Flash Memory and 128 KB RAM
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	4 MB External Serial Flash Memory and 768 KB internal flash and 128 KB internal RAM
Input and Output Capabilities	
MS-IOM1711-0	4 – Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
MS-IOM2711-2	2 – Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 – Universal Outputs: Analog Output: Voltage Mode, 0-10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4-20 mA 2 – Relay Outputs: (Single-Pole, Double-Throw) **EN 60730:** 6 (4) A N.O. or N.C. only, 240 VAC
MS-IOM2721-0, MS-IOM2723-0	8 – Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 – Analog Outputs: Defined as 0–10 VDC or 4–20 mA
MS-IOM3711-2	4 – Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 4 – Universal Outputs: Analog Output: Voltage Mode, 0-10 VDC; Binary Output Mode: 24 VAC/DC FET; Analog Output: Current Mode, 4-20 mA 4 – Relay Outputs: (Single-Pole, Double-Throw) **EN 60730:** 6 (4) A N.O. or N.C. only, 240 VAC
MS-IOM3721-0, MS-IOM3723-0	16 – Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
MS-IOM3731-0, MS-IOM3733-0	8 – Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 8 – Binary Outputs: Defined as 24 VAC Triac (Require external low-voltage power source) **Note:** Binary Outputs (BOs) on MS-IOM3733-0 models do not supply power for the outputs; the BOs require external low-voltage (< 30 VAC) power sources.
MS-IOM4711-0	6 – Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 – Binary Inputs: Defined as Dry Contact Maintained or Pulse/Counter Accumulator Mode 3 – Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 – Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO 2 – Analog Outputs: Defined as 0–10 VDC or 4–20 mA
Analog Input/Analog Output Resolution and Accuracy	
MS-IOM1711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-2, MS-IOM3731-0, MS-IOM4711-0	**Analog Input:** 16-bit resolution **Analog Output:** 16-bit resolution and ±200 mV in 0–10 VDC applications
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	**Analog Input:** 15-bit resolution **Analog Output:** ±200 mV in 0–10 VDC applications

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TECHNICAL SPECIFICATIONS (PART 3/3)

Terminations	
MS-IOM1711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-2, MS-IOM3731-0, MS-IOM4711-0	Input/Output: Fixed Screw Terminal Blocks SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks SA/FC Bus Port: RJ-12 6-Pin Modular Jacks
MS-IOM2723-0, MS-IOM3723-0, MS-IOM3733-0	Input/Output: Fixed Screw Terminal Blocks **Note:** There are no labels on I/Oterminal blocks. The labels are above/below the terminal blocks on theIOM packaging. SA/FC Bus and Supply Power: 4-wire and 3-wire Pluggable Screw Terminal Blocks
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing	Enclosure material: ABS and polycarbonate UL94 5VB; self-extinguishing, Plenum-rated protection class: IP20 (IEC529)
Dimensions (Height x Width x Depth)	
MS-IOM1711, MS-IOM2711 models	150 x 120 x 53 mm including terminals and mounting clips
MS-IOM2721-0, MS-IOM2723-0, MS-IOM3721-0, MS-IOM3723-0, MS-IOM3731-0, MS-IOM3733-0 models	150 x 164 x 53 mm including terminals and mounting clips
MS-IOM3711-0, MS-IOM4711-0 models	150 x 190 x 53 mm including terminals and mounting clips
	Note: Mounting space for all field controllers requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	0.5 kg maximum
CE Compliance	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive. Declared as Independently Mounted, Intended for Panel Mounting, Operating Control Type 1.B, 4kV rated impulse voltage, 100.7°C ball pressure test.
BACnet International	**MS-IOM1711-0, MS-IOM2711-2, MS-IOM2721-0, MS-IOM3711-2, MS-IOM3731-0, MS-IOM4711-0:** BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC) **MS-IOM2723-0, MS-IOM3723-0, and MS-IOM3733-0:** BACnet Testing Laboratories (BTL) Protocol Revision 15 listed and certified BACnet Smart Actuator (B-SA)

Note

The MS-IOM2723-0, MS-IOM3723-0, and MS-IOM3733-0 models are only available in certain regions. Contact your local Johnson Controls representative for more information.

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