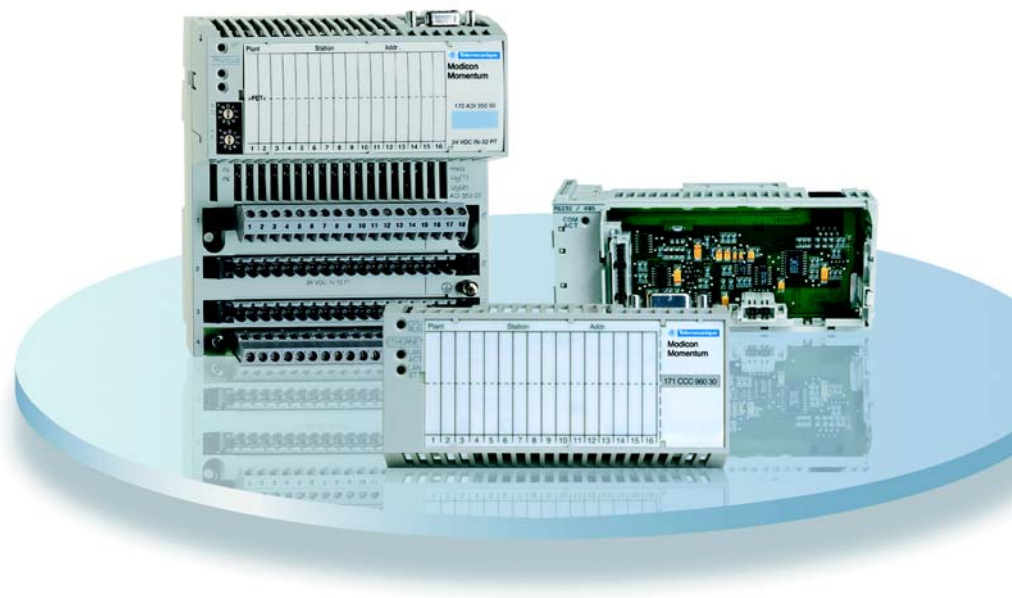
Distributed I/O and Control
Modicon Momentum

Catalog
July
05



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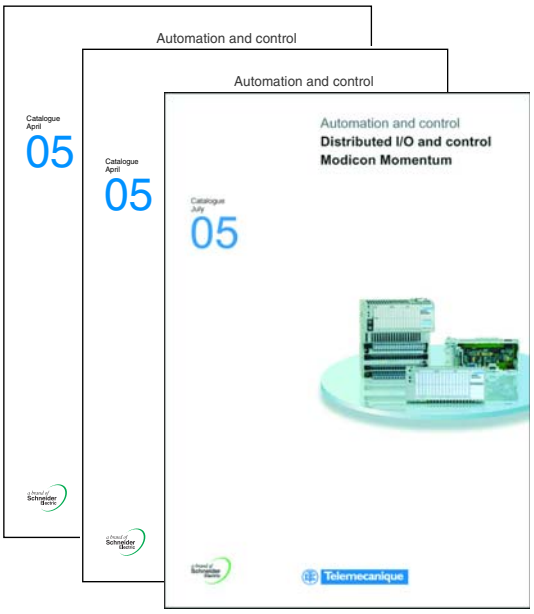


Automation

N° 807861
MKTED205061EN

Detection

Global Detection Electronic and electromechanical sensors
N° 54752 - MKTED203031EN

Limit switches
Proximity sensors
Photo-electric and ultrasonic sensors
Pressure switches
Rotary encoders

Software
Safety mat configuration software

Automation

Modicon Momentum distributed I/O and control
N° 807861 - MKTED205061EN

Automation platform Modicon Quantum and Unity - Concept Proworx software
N° 802621 - MKTED204071EN

Automation platform Modicon Premium and Unity - PL7 software
N° 802625 - MKTED204072EN

Automation platform Modicon TSX Micro and PL7 software
N° 70984 - MKTED204012EN

PLCs, PC based control
Distributed I/O
Communication

Automation and relay functions
N° 70455 - MKTED204011EN

Plug-in relays
Electronic timers
Control relays
Counters
Smart relays

Software
PLCs and safety controllers programming software

Operator dialog

Control and signalling components
N° 805911 - MKTED205021EN

Control and signalling units
Cam switches
Beacons and indicator banks
Control and pendant stations
Controllers
Front panels, mounting kits
Emergency stops
Foot switches

Human/Machine interfaces
N° 96949 - MKTED2040401EN

Operator interface terminals, industrial PCs, Web servers, HMI and SCADA PC-based software

Software
Operator terminal software

Motor control

Motor starter solutions Control and protection components
N° 27501 - MKTED201001EN

Contactors
Circuit-breakers, fuse carriers
Thermal relays
Combinations, motor controllers

Mounting solutions
Motor starter mounting kits

Soft starters and variable speed drives
N° 802660- MKTED204091EN

Software,
Variable speed drives

Software
Motor control programming software

Not all products shown in this catalogue are available in every country.
Check individual country's web site or Sales Office for product availability.
See on: www.schneider-electric.com

..... all Automation & Control functions

Motion control

Motion control Lexium 17D
N° 806381 - MKTED205031EN

Twin Line Motion control
N° 061233 - DIA7ED2030902EN

Servodrives and brushless motors
Motion control modules
Modicon Premium and Modicon Quantum

Software
Software for drives and motors

Power supplies

Interfaces, I/O splitter boxes and power supplies
N° 70263 - MKTED203113EN

Switch mode power supplies

Filtered rectified power supplies and transformers

Machine safety

This catalogue contains Automation and Control function products relating to Safety

Safety solutions using Preventa
N° 67341 - MKTED203111EN

Safety monitors and controllers on AS-Interface

Switches, light curtains, mats

Emergency stops, control stations, enabling switches, foot switches, beacons & indicator banks

Optimum and universal controllers

Switch disconnectors, thermal-magnetic motor circuit breakers, enclosed D.O.L. starters

Interfaces & I/O

Interfaces, I/O splitter boxes and power supplies
N° 70263 - MKTED203113EN

Plug-in relays
Analog converters
Discrete interfaces
Pre-wired interfaces
IP67 Splitter boxes

Connectors
Cable ends, terminal blocks

IP 20 distributed inputs/ outputs Advantys STB
N° 804818 - MKTED204101EN

Modules for automation island
Network interface,
power distribution, digital I/O, analogs and application-specific

Software
Software to design and install AS-Interface system, safety monitors and controllers on AS-Interface programming software

STB configuration software

AS-Interface

This catalogue contains Automation and Control function products relating to the AS-Interface cabling system

AS-Interface cabling system
N° 804961 - MKTED204121EN

IP20/IP67 interfaces, cables, repeaters, addressing and adjustment terminals

Control stations, keypads, beacons & indicator banks

Master modules for PLCs

AS-Interface power supplies

Motor controllers, enclosures, variable speed drives

Networks & communication

Ethernet TCP/IP Transparent Ready
N° 802731 - MKTED204073EN

Connecting Ethernet devices

Web-enabling PLCs on Ethernet

Application protocols and field buses

Contents

Distributed I/O and control Modicon Momentum

M1/M1E processor adapters and option adapters

Ethernet cabling system

Programming software *(for M1/M1E processor adapters)*

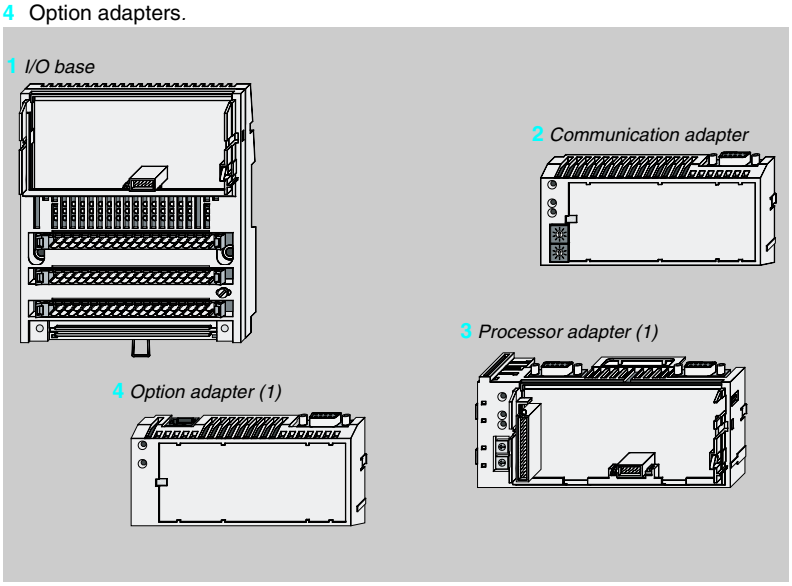
Additional products and services

Modicon Momentum automation platform
Introduction

A modular concept with four easy pieces

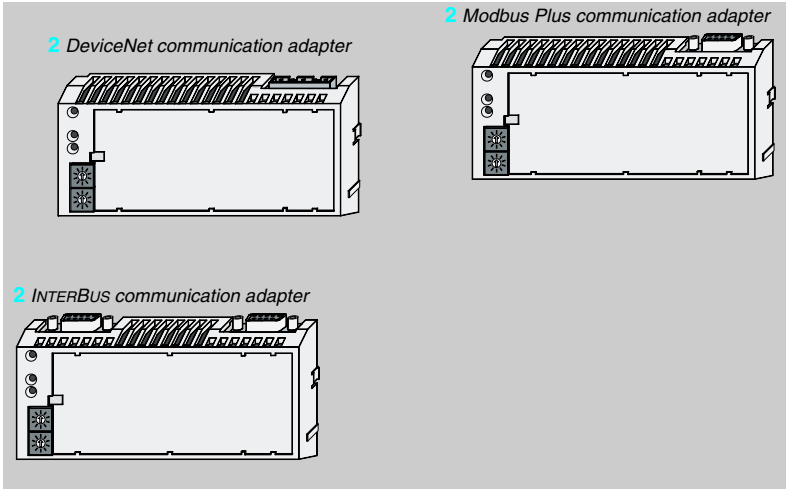
The Momentum I/O system comprises 4 fundamental components that easily snap together in various combinations to form versatile distributed I/O system.

The four pieces are:
1 I/O bases
2 Communication adapter
3 Processor adapters
4 Option adapters.



Momentum communication adapters 2

Momentum's design separates the communications from the I/O base 1, thus creating a truly open I/O system that can be easily adapted to any field-bus network. When a Momentum I/O is coupled with a communication adapter 2, the two form a remote I/O drop that connects directly to virtually any standard field-bus I/O network. Together, Momentum I/O supports control systems based on personal computers, distributed control systems, programmable controllers and Momentum processors.

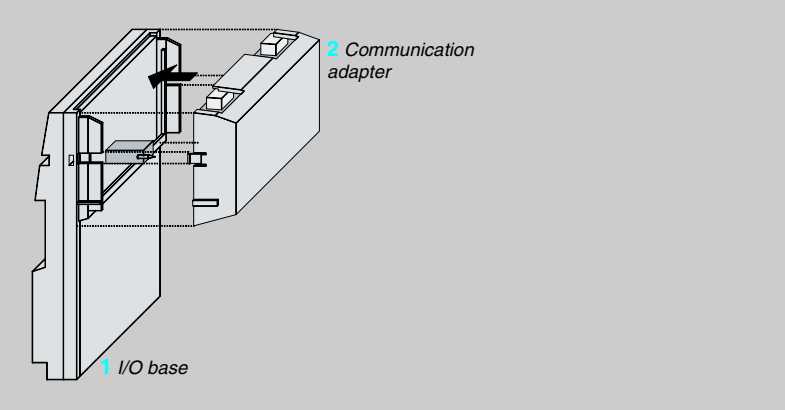


(1) The processor adapters 3 are only compatible with the Concept or ProWORX software.

Modicon Momentum automation platform
Introduction

Momentum I/O bases 1

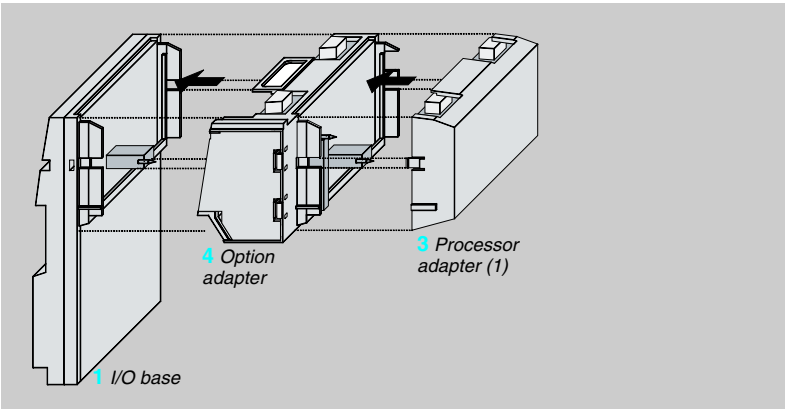
Specialized Momentum I/O bases support the rest of the control system. The communication adapters 2, processor adapters and option adapters all snap onto the I/O bases 1. A selection of I/O base modules are available, including analog I/O, discrete I/O, multi-function analog and bi-directional discrete bases. In addition, Momentum I/O bases offer simple plug-in terminal strips, as well as standard 35 mm DIN rail or panel mounting for ease of maintenance and installation.



Momentum processor adapters 3 and option adapters 4 *(1)*

When local distributed intelligence is required at the point of control, Momentum has the answer. Momentum M1 processor adapters 3 are full fledged PLCs containing a CPU, RAM and Flash memory. They are based on the popular Modicon family of PLCs (i.e., directly compatible with Quantum, Compact and 984 PLCs), and snap onto the Momentum I/O bases 1, just like the communication adapters 2.

The option adapter 4 provides the processor adapters with additional networking capabilities, a time-of-day clock, and a battery back-up. The option adapters also snap onto the I/O base; in the figure below, the processor adapter is stacked on top.



Optional conformal coating

If your control system needs to operate in a corrosive environment, selected Momentum modules can be ordered with a conformal coating applied to components of the product. Conformal coating will extend its life and enhance its environmental. performance capabilities.

See pages 94 and 95.

Enhanced grounding system

Due to new INTERBUS standards for electrical noise immunity, a number of Momentum products have been updated to include the enhanced grounding system, which is required to meet the revised electrical noise immunity standard (ability to pass a 2.2 kV electrical fast transient burst test).

See page 96 for a list of Momentum products that currently have been updated to include the new grounding system.

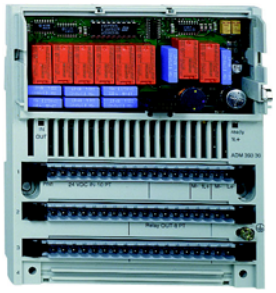
(1) The processor adapters are only compatible with the Concept or ProWORX software.

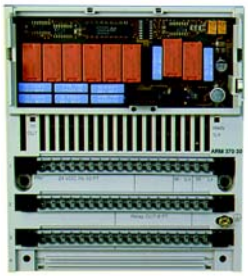
Modicon Momentum automation platform
Discrete I/O bases

Product type		Input modules for direct current		Input modules for alternating current	
					
Type of signal		True high			
Operating voltage and Input voltage		24 VDC		120 VAC	230 VAC
Current consumption		max. 250 mA		max. 125 mA	
Input type		IEC 1131 Type 1+		IEC 1131 Type 2	IEC 1131 Type 1+
Output voltage		–			
Output type		–			
Number of points		1 x 16 In	2 x 16 In	2 x 8 In	
Potential isolation	Point to point	None		None	
	Group to group	None		1780 VAC	
	Field to adapter	500 VAC		1780 VAC	
Current capacity	Per output	–			
	Per group	–			
	Per module	–			
Response time	OFF-ON	2.2 ms		10 ms @ 60 Hz	13.3 ms @ 60 Hz
	ON-OFF	3.3 ms		35 ms @ 60 Hz	13.3 ms @ 60 Hz
Protection against short circuit and overload		–			
Fault reporting	Output fault	–			
	I/O error	–			
	Blown fuse	–			
Type of module		170ADI 34000	170ADI 35000	170ADI 54050	170ADI 74050
Pages		13			

Output modules for direct current		Output modules for alternating current				Relay output module
						
True high						
24 VDC		120 VAC		230 VAC		120 to 230 VDC
max. 250 mA		max. 125 mA		max. 65 mA		125 mA @ 120 VAC 65 mA @ 230VDC
–						
24 VDC		120 VAC		230 VAC		20 to 250 VAC 5 to 30 VDC
Solid state switch		Triac				Relay from “C”
2 x 8 out	2 x 16 out	2 x 4 out	2 x 8 out	2 x 4 out	2 x 8 out	6 out (isolated)
None		None				1780 VAC for 1 mn
None		None				1780 VAC for 1 mn
500 VAC		1780 VAC				1780 VAC for 1 mn
0.5 A	0.5 A	2 A	0.5 A	2 A	0.5 A	5 A
4 A	8 A	4 A	4 A	4 A	4 A	5 A
8 A	16 A	8 A	8 A	8 A	8 A	21 A @ 60 °C 25 A @ 30 °C
< 0.1 ms		max. 1/2 x 1/f				10 ms
< 0.1 ms		max. 1/2 x 1/f				20 ms
Electronically safeguarded		1 fuse per group				–
1 LED/Out	1 LED/4 Out	None				–
to adapter	to adapter	None				–
–	–	1 LED				–
170ADO34000	**170ADO35000**	**170ADO53050**	**170ADO54050**	**170ADO73050**	**170ADO4050**	**170ADO83030**

Modicon Momentum automation platform
Discrete I/O bases

Product type		**I/O modules for direct current**			
					
Type of signal		True high		True low	True high
Input voltage		24 VDC			
Operating voltage		24 VDC			
Current consumption		max. 250 mA			max. 250 mA + sensor current
Input type		IEC 1131 Type 1+			
Output voltage		24 VDC			
Output type		Solid state switch			
Number of points		1 x 16 In, 2 x 8 Out			4 x 4 In, 2 x 4 Out
Potential isolation	Point to point	None			
	Group to group	None			
	Field to adapter	500 VAC			
Current capacity	Per output	0.5 A			2 A
	Per group	4 A			8 A
	Per module	8 A			16 A
Response time	OFF-ON	2.2 ms In, < 1 ms Out	60 µs in, < 1 ms Out	2.2 ms In, < 1 ms Out	
	ON-OFF	3.3 ms In, < 1 ms Out	80 µs in, < 1 ms Out	3.3 ms In, < 1 ms Out	
Protection against short circuit and overload		Electrically safeguarded outputs			Electrically safeguarded outputs and 4 electronically safeguarded sensor supply group
Fault reporting	Output fault	1 LED/Out			
	I/O error	to adapter			
	Blown fuse	–			
Type of module		**170ADM35010**	**170ADM35011**	**170ADM35015**	**170ADM37010**
Pages		15			16

I/O modules for direct current		I/O modules for direct and alternating current		
				
True high				
24 VDC	12, 24, 48 VDC	24 VDC		120 VAC
24 VDC	12, 24, 48 VDC	24 VDC	120 VAC	
max. 180 mA	500 mA @ 12 VDC 250 mA @ 24 VDC 125 mA @ 48 VDC	max. 250 mA		max. 160 mA
IEC 1131 Type 1+, monitored		IEC 1131 Type 1+		IEC 1131 Type 2
24 VDC	12, 24, 48 VDC	24…230 VAC or 20…115 VDC		120…132 VAC
Solid state switch		Relay (normally open)		Triac
1 x 16 In, 1x 8 Out and 1 x 4 Out	1 x 16 In, 1 x 16 Out	1 x 10 In, 2 x 4 Out		1 x 10 In, 1 x 8 Out
None None 500 VAC	None None 707 VDC	None None 500 VAC	1780 VAC 1780 VAC 500 VAC	None None 1780 VAC
0.5 A 4 A group 1, 2 A group 2 6 A	0.5 A – 8 A @ 50 °C, 7 A @ 60 °C	2 A ohmic load 8 A ohmic load 16 A ohmic load		0.5 A 2 A 4 A
2.2 ms In, < 1 ms Out 3.3 ms In, < 1 ms Out	2.2 ms In, < 2.5 ms Out 3.3 ms In, < 2.5 ms Out	2.2 ms In, < 10 ms Out 3.3 ms In, < 10 ms Out		max 1/2 x 1/f max 1/2 x 1/f
Electronically safeguarded outputs	Electrically safeguarded outputs	None	Varistor in parallel with each contact	1 internal fuse per group (not against overload)
1 LED/In, 1 LED/Out to adapter –	1 LED/Out to adapter –	None None –		None None 1 LED/fuse
170ADM39010	**170ADM85010**	**170ADM39030**	**170ARM37030**	**170ADM69051**
15	16	17		18

Modicon Momentum automation platform
Discrete I/O bases

Presentation

The Momentum Automation Platform products are modular. Communication Adapters and Processor Adapters are designed to work as functional modules when they are snapped onto a Momentum I/O base. An I/O base requires some type of Momentum Adapter assembled on it before it can be functional.

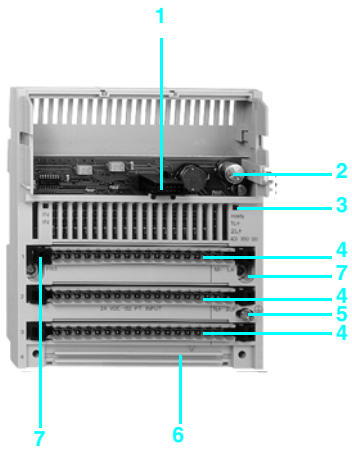
The I/O bases fit into compact standard housings that can be mounted on a DIN rail or on panels in a cabinet. They read information from field sensing devices and control discrete and analog field actuating devices. Terminal blocks and bus bars are available for use with the bases so that they can be used to support 2-, 3-, and 4-wire field devices.

The I/O field devices and the power supply to the module are connected via three 18-pin terminal blocks and an optional 1-, 2-, or 3-row busbar. The terminal connectors are electrically connected to the module; the optional busbars not.

Busbars provide a common connection for the field devices and serve as protective distribution connectors. Depending on the I/O base and the type and number of field devices to which it is connected, a 1-, 2-, or 3-row busbar may be used.

Terminal blocks and busbars are ordered separately, and are not shipped with the Momentum I/O bases. They are available in either screw-in or spring-clip versions.

Description



170AD● discrete I/O base units comprise on the front panel:

1 An internal interface connector for the communication module or processor module.
2 A locking and earth contact for the communication module or processor module.
3 LED status indicators (the number of indicators will depend on the number of channels).
4 Up to three connectors for the removable terminal blocks (Modbus dependent).
5 An grounding screw.
6 A slot for the power strip.
7 Two holes for panel mounting.

Connectors to be ordered separately:
- removable screw or spring terminals **170XTS00●00**
- 1 to 3-row screw or spring bus bar **170XTS00●01**.

Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete input bases

Type of input base unit			170ADI34000	170ADI35000	170ADI54050	170ADI74050
Number of inputs			1 x 16	2 x 16	2 x 8	
Input voltage		**V**	24 DC		120 AC	230 AC
Operating voltage		**V**	24 DC		85 to 132 AC (@ 47 to 63 Hz)	164 to 253 AC (@ 47 to 63 Hz)
Internal current		**mA**	250 (@ 24 VDC)		125 (@ 120 VAC)	125 (@ 230 VAC)
Input voltage range		**V**	- 3 to 30 DC		0 to 132 AC	163 to 253 AC
	ON voltage	**V**	+ 11 to 30 DC		74 AC minimum	164 AC minimum
	OFF voltage	**V**	- 3 to + 5 DC		20 AC maximum	40 AC maximum
Input current	ON	**mA**	2.5 minimum		10.0 minimum	
	OFF	**mA**	1.2 maximum		2.0 maximum	
Input resistance		**kΩ**	4		9.5 @ 50 Hz 7.5 @ 60 Hz	9 @ 50 Hz 7.5 @ 60 Hz
Type of signal			True High			
Response time	On-off maximum	**ms**	3.3		35.0 @ 60 Hz	13.3 @ 60 Hz
	Off-on maximum	**ms**	2.2		10.0 @ 60 Hz	13.3 @ 60 Hz
Potential isolation	Input to input		None		None	
	Group to group	**V**	None		1780 AC	
	Field to communication interface	**V**	500 AC		1780 AC	
Power dissipation		**W**	3 typical, 5 maximum	5.5 typical, 8.5 maximum	–	
Agency approvals			UL, CE, CSA, FM Class I, Div. II	UL, CE, CSA	UL, CE, CSA, FM Class I, Div. II	UL, CE, CSA

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Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete output bases

Type of output base unit			170ADO34000	170ADO35000	170ADO83030	
Number of outputs			2 x 8	2 x 16	1 x 6	
Type of output			Solid state switch		Relay form “C”	
Output voltage		**V**	24 DC		20 to 250 AC, 5 to 30 DC	
Operating voltage		**V**	24 DC		120 to 230 AC	
Internal current		**mA**	250 @ 24 VDC		125 @ 120 VAC, 65 @ 230 VAC	
Current	Point maximum	**A**	0.5	0.5	5	
	Group	**A**	4	8	5	
	Module	**A**	8	16	21 @ 60 °C, 25 @ 30 °C	
Min. output current		**mA**	–		50	
Leakage current		**mA**	< 1 @ 24 VDC		< 0.1 @ 120 VAC	
Surge current		**A**	5 for 1 ms		20 for 10 ms	
On State Voltage drop		**V**	< 0.5 DC @ 0.5 A		< 0.2 @ 30 VDC	
Protection (short-circuits, overloads)			Outputs electronically protected		Via external 315 mA fast-blow fuse	
Response time	On-off maximum	**ms**	< 0.1		20 @ 60 Hz	
	Off-on maximum	**ms**	< 0.1		10 @ 60 Hz	
Potential Isolation	Output to output	**V**	None		1780 AC for 1 minute	
	Output group to output group	**V**	None		1780 AC for 1 minute	
	Field to communication interface	**V**	500 AC		1780 AC for 1 minute	
Power dissipation		**W**	3.5 typical 4.5 maximum	6.0 typical 7.5 maximum	2.5	
Agency approvals			UL, CE, CSA, FM Class I, Div. II	UL, CE, CSA	UL, CE, CSA, FM Class I, Div. II	

Type of output base unit			170ADO53050	170ADO54050	170ADO73050	170ADO74050
Number of outputs			2 x 4	2 x 8	2 x 4	2 x 8
Type of output			Triac			
Output voltage		**V**	120 AC		230 AC	
Operating voltage		**V**	120 AC (300 for 10 s, 400 for 1 cycle)		230 AC (300 for 10 s, 400 for 1 cycle)	
Internal current		**mA**	125		65	
Current	Point maximum	**A**	2	0.5	2	0.5
	Group	**A**	4			
	Module	**A**	8			
Min. output current		**mA**	5	30	5	30
Leakage current		**mA**	1.9 @ 120 VAC		2.5 @ 230 VAC	2.4 @230 VAC
Surge current		**A**	Point: 15 (1 cycle), 10 (2 cycles), 5 (3 cycles)			
On State Voltage drop		**V**	< 1.5 AC @ 2 A	< 1.5 AC @ 0.5 A	< 1.5 AC @ 2 A	< 1.5 AC @ 0.5 A
Protection (short-circuits, overloads)			Via internal 5 A slow-blow fuse per group			
Response time	On-off maximum	**ms**	1/2 x 1/f (= 0,5 of one line cycle)			
	Off-on maximum	**ms**	1/2 x 1/f (= 0,5 of one line cycle)			
Potential Isolation	Output to output		None			
	Output group to output group		None			
	Field to communication interface	**V**	1780 AC			
Power dissipation		**W**	6.0 typical 7.5 maximum			
Agency approvals			UL, CE, CSA, FM Class I, Div. II			

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Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete I/O bases

Type of base unit				170ADM35010	170ADM35011	170ADM35015	170ADM39010
Number of inputs				1 x 16			1 x 16
Number of outputs				2 x 8			1 x 8 and 1 x 4
Operating voltage			**VDC**	24			
Internal current			**mA**	250 @ 24 VDC			180 @ 24 VDC
Inputs	Voltage		**VDC**	24			
	Type of signal			True high		True low	True high
	Voltage at 1		**VDC**	+ 11 to + 30		- 3 to + 5	+ 11 to + 30
	Voltage at 0		**VDC**	- 3 to + 5		+ 4 to + 30	- 3 to + 5
	Input current		**mA**	2.5 min. at state 1 (6 mA at c 24 V),1.2 max. at state 0			
	Input voltage range		**VDC**	- 3 to + 30			
	Input resistance		**kΩ**	4			
	Response time	Off to on	**ms**	2.2	0.06	2.2 In, < 1 Out	
		On to off	**ms**	3.3	0.08	3.3 In, < 1 Out	
	Fault sensing			–			Broken wire detection
Outputs	Voltage		**VDC**	24, 30 max.			
	Type			Solid state switch			
	Type of signal			True high		True low	True high
	Current capacity		**A**	0.5 per point 4 per group 8 per module			0.5 per point 4 per group 1 2 per group 2 6 per module
	Leakage current		**mA**	< 1 @ 24 VDC			< 1 @ 24 VDC
	Peak current		**A**	5 for 1 ms			–
	On state voltage drop		**VDC**	< 0.5 @ 0.5 A			–
	Error indication			Output overload for at least one output to communication adapter			Output overload for at least one output to communication adapter
	Response time	Off to On	**ms**	< 0.1			
		On to Off	**ms**	< 0.1			
Potential isolation	Input to input			None			
	Output to output group			None			
	Input to output group			None			
	Field to communication interface		**V**	500 AC			
Power dissipation	Typical		**W**	6.0			6.5
	Maximum		**W**	8.0			10.0
Agency approvals				UL, CE, CSA			UL, CE, CSA, FM Class I, Div. II

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Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete I/O bases

Type of base unit				170ADM 3701	170ADM 85010
Number of points	**Inputs**			4 x 4	1 x 16
	Outputs			2 x 4	1 x 16
Operating voltage			**VDC**	24	12, 24, 48 (10 to 60)
Internal current			**mA**	250 @ 24 VDC (plus current for sensors)	500 @ 12 VDC 250 @ 24 VDC 125 @ 48 VDC
Inputs	Voltage		**VDC**	24	12, 24, 48
	Type of signal			True high	
	Voltage at 1		**VDC**	+ 11 to + 30	> 7.5 @ 12 VDC > 11 @ 24 VDC > 30 @ 48 VDC
	Voltage at 0		**VDC**	- 3 to + 5	< 2.5 @ 12 VDC < 5 @ 24 VDC < 10 @ 48 VDC
	Input current		**mA**	2.5 min. at state 1 (6 mA at c 24 V), 1.2 max. at state 0	2.3 @ 12 VDC 2.7 @ 24 VDC 2.9 @ 48 VDC
	Input voltage range		**VDC**	- 3 to + 30	10 to 60 V
	Input resistance		**kΩ**	4	–
	Response time	Off to On	**ms**	2.2 In, < 1 Out	2.2 In, < 2.5 Out
		On to Off	**ms**	3.3 In, < 1 Out	3.3 In, < 2.5 Out
	Fault sensing			–	
Outputs	Voltage		**VDC**	24, 30 max.	12, 24, 48, 60 max.
	Type			Solid state switch	
	Type of signal			True high	
	Current capacity		**A**	2 per point 8 per group 16 per module	0.5 per point 8 per group @ 50 °C 7 per module @ 60 °C
	Leakage current		**mA**	< 1 @ 24 VDC	< 1 @ 60 VDC
	Peak current		**A**	2.8 for 1 ms	5 for 1 ms
	On state voltage drop		**VDC**	–	< 1 @ 0.5 A
	Error indication			Output overload for at least one output or short-circuit or overload on one of the 4 encoder supply groups, to communication adapter	Output overload for at least one output to communication adapter
	Response time		**ms**	< 0.1 Off to On, < 0.1 On to Off	
Potential isolation	Input to input			None	
	Output to output group			None	
	Input to output group		**V**	None	707 DC
	Field to communication interface		**Vrms**	500 AC	707 DC
Power dissipation	Typical		**W**	6.5	6.0 + (0.144 x nb of input points) + (0.25 x nb of output points)
	Maximum		**W**	10.0	–
Agency approvals				UL, CE, CSA	UL, CE, CSA, FM Class I, Div. II

Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete I/O bases (continued)

Type of base unit			170ADM39030	170RM37030
Number of points	**Inputs**		1 x 10	
	Outputs		2 x 4	
Operating voltage		**V**	24 DC	120 AC (47 to 63 Hz)
Internal current		**mA**	250 @ 24 VDC	5 minimum load current
Inputs	Voltage	**V**	24 to 230 AC 20 to 115 DC	
	Signal type		True High	
	On voltage minimum	**VDC**	+ 11 to + 30	
	Off voltage maximum	**VDC**	- 3 to + 5	
	Input current	**mA**	2.5 minimum On, 1.2 maximum Off	
	Input voltage range	**VDC**	- 3 to + 30	
	Input resistance	**kΩ**	4	
	Response time	**ms**	2.2 Off to On, 3.3 On to Off	
Outputs	Voltage	**V**	24 to 230 AC, 20 to 115 DC	
	Type		Relay normally open	
	Current capacity 24 VDC	**A**	> 0.005 (new contacts), ohmic load 2 A maximum, inductive load 1 A maximum (LR ⩽ 40 ms)	
	Current capacity 115 VDC	**A**	Ohmic load 0.5 A maximum (switching current ⩽ 1.5 A), inductive load 0.15 A maximum (LR ⩽ 40 ms)	
	Current capacity VAC	**A**	2 A maximum (switching current ⩽ 1.5 A) cosφ = 1, 1 A maximum cosφ = 0.5	2 A per point, 8 A per group, 16 A per module
	Leakage current	**mA**	< 1 @ 230 VAC	–
	Error indication		None	
	Response time	**ms**	10 @ 60 Hz Off to On, 10 @ 60 Hz On to Off	
	Max. number of switching circuits		> 30 x 10^6 (mechanical), > 1 x 10^5 (inductive load with external protection circuit)	
	Protection against short circuit and overload		None	Varistor in parallel with each contact
Potential isolation	Input to Input		None	
	Output group to output Group	**V rms**	None	1780 AC
	Input to output group	**V rms**	None	1780 AC
	Field to communication interface	**V rms**	500 AC	
Fusing	Internal		None	
	External operating voltage		315 mA fast-blow	4 A fast-blow
	External input voltage		max. 4 A fast-blow	None
	External output voltage		According to the supply of the connected actuators not to exceed 8 A slow-blow/group	None
Power dissipation	Typical	**W**	5.5	
	Maximum	**W**	8.5	
Agency approvals			UL, CE, CSA	UL, CE, CSA, FM Class I, Div. II

Description: page 12 | References: page 19 | Dimensions, mounting: pages 20 | Connections: pages 21 to 25

Modicon Momentum automation platform
Discrete I/O bases

Characteristics of discrete I/O bases (continued)

Type of base unit			170ADM69051
Number of points	**Inputs**		1 x 10
	Outputs		1 x 8
Operating voltage		**VAC**	120 (47 to 63 Hz)
Internal current		**mA**	160 (@ 120 VAC)
Inputs	Voltage	**VAC**	120
	Signal type		True high
	On voltage minimum	**VAC**	74
	Off voltage maximum	**VAC**	20
	Input current	**mA**	6.0 minimum at state 1, 2.6 maximum at state 0
	Input voltage range	**VAC**	74 to 132
	Input resistance	**kΩ**	4
	Response time	**ms**	Maximum 1/2 x 1/f Off to On, maximum 1/2 x 1/f On to Off
Outputs	Voltage	**VAC**	120 to 132 (@ 47 to 63 Hz)
	Type		Triac
	Current capacity		0.5 A per point maximum, 30 mA per point minimum, 2 A per group, 4 A per module
	Leakage current	**mA**	< 1.3 (@ 120 VAC)
	Signal type		True High
	On state voltage drop	**VAC**	< 1.5 (@ 0.5 A)
	Error indication		None
	Response time	**ms**	1/2 x 1/f maximum from state 0 to state 1, 1/2 x 1/f maximum from state 1 to state 0
	Maximum switching cycles		3000 hr for 0.5 A inductive load
Potential Isolation	Input to input		None
	Output group to output group		None
	Input to output group		None
	Field to communication interface	**Vrms**	1780 AC
Power dissipation	Typical	**W**	6
	Maximum	**W**	8
Protection	Internal fuses	**A**	2 x 2.5 slow-blow fuses
Agency approvals			UL, CE, CSA

Modicon Momentum automation platform
Discrete I/O bases


170ADI●●0●0


170ADO●●0●0


170ADM●●0●●


170XTS00200


170XTS00401


170XTS00801


170XTS00601


CER001


170BSM01600

Discrete input bases

Type of current		Modularity (no. of points)	Conformity EC 1131-2	Reference	Weight kg
DC	24 V	16 (1 x 16)	Type 1	**170ADI34000**	0.190
		32 (2 x 16)	Type 1	**170ADI35000**	0.200
AC	120 V	16 (2 x 8)	Type 2	**170ADI54050**	0.284
	230 V	16 (2 x 8)	Type 2	**170ADI74050**	0.284

Discrete output bases

Type of current	Output voltage	Modularity (no. of points)	Current per output	Reference	Weight kg
DC solid state protected	24 V	16 (2 x 8)	0.5 A	**170ADO34000**	0.210
		32 (2 x 16)	0.5 A	**170ADO35000**	0.210
DC/AC relay form "C"	5…24 VDC 24…230 VAC	6 isolated	5 A	**170ADO83030**	0.260
AC triac protected, 1 fuse per group	120 V	8 (2 x 4)	2 A	**170ADO53050**	0.320
		16 (2 x 8)	0.5 A	**170ADO54050**	0.284
	230 V	8 (2 x 4)	2 A	**170ADO73050**	0.320
		16 (2 x 8)	0.5 A	**170ADO74050**	0.284

Discrete I/O bases

Type of output current	Input voltage	Output voltage	Modularity		Reference	Weight kg
			Input	Outputs, current		
DC solid state	24 VDC Type 1+	24 VDC protected	16 I (1 x 16)	16 O (2 x 8) 0.5 A	**170ADM35010**	0.200
			16 I, fast (1 x 16)	16 O (2 x 8) 0.5 A	**170ADM35011**	0.200
			16 I (1 x 16)	16 O (2 x 8) 0.5 A	**170ADM35015**	0.200
			16 I, wiring check (1 x 16)	12 O (1 x 8 and 1 x 4) 0.5 A	**170ADM39010**	0.260
			16 I (4 x 4)	8 O (2 x 4) 2 A	**170ADM37010**	0.220
DC relay	12…60 VDC	12…60 VDC	16 I (1 x 16)	16 O (1 x 16) 0.5 A	**170ADM85010**	–
AC or DC relay	24 VDC Type 1+	24/230 VAC 20/115 VDC	10 I (1 x 10)	8 O (2 x 4) 2 A	**170ADM39030** *(1)*	0.260
					170ARM37030 *(2)*	0.260
AC triac	100…120 VAC Type 2	120 VAC	10 I (1 x 10)	8 O (1 x 8) 0.5 A protected by 1 fuse	**170ADM69051**	0.220

Accessories

Description	Composition	Type of connection	Reference	Weight kg
Terminal blocks for I/O base connection Set of 3 connectors	1 row	Screw	**170XTS00100**	–
		Spring	**170XTS00200**	–
Bus Bar	3 rows	Screw	**170XTS00401**	–
		Spring	**170XTS00301**	–
	2 rows	Screw	**170XTS00501**	–
		Spring	**170XTS00801**	–
	1 row	Screw	**170XTS00601**	–
		Spring	**170XTS00701**	–
Cable grounding rail	Used to connect the cable shielding	–	**CER001**	–
High vibration environment clips	Kit containing 5 sets of clips	–	**170XTS12000**	–
Dummy base unit	Used to prewire the I/O base units Requires screw or spring connection terminals		**170BDM09000**	–
Discrete input simulator	16 channels, 24 VDC	–	**170BSM01600**	–

Replacement parts

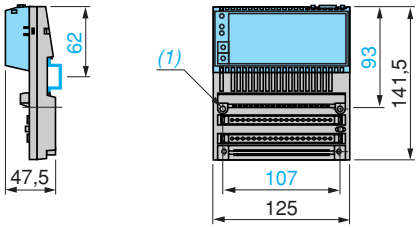
Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170XTS10000**	–
Cable coding part kit	For screw or spring connection terminals	**170XCP20000**	–

(1) Operating voltage 24 VDC.
(2) Operating voltage 120 VAC.

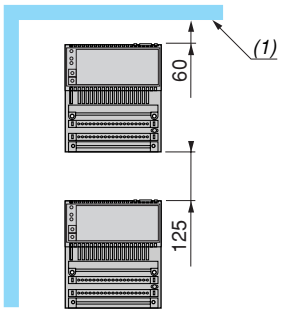
Description: page 12
Characteristics: pages 13 to 18
Connections: pages 21 to 25

Modicon Momentum automation platform
Discrete I/O bases

Dimensions, mounting
170AD●, rail or panel mounting



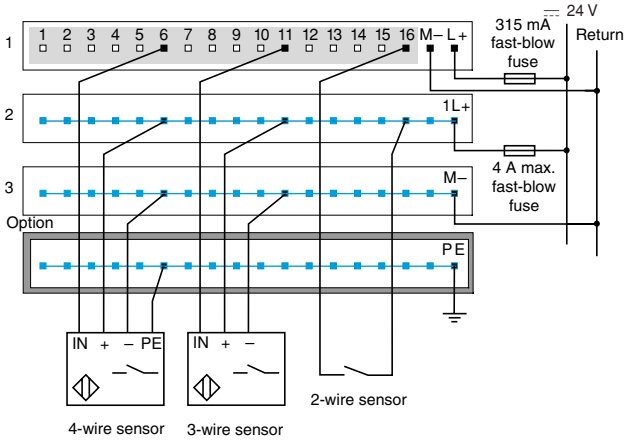
(1) 2 holes for M4 screws, for panel mounting



(1) Equipment or enclosure

Connections of discrete input bases

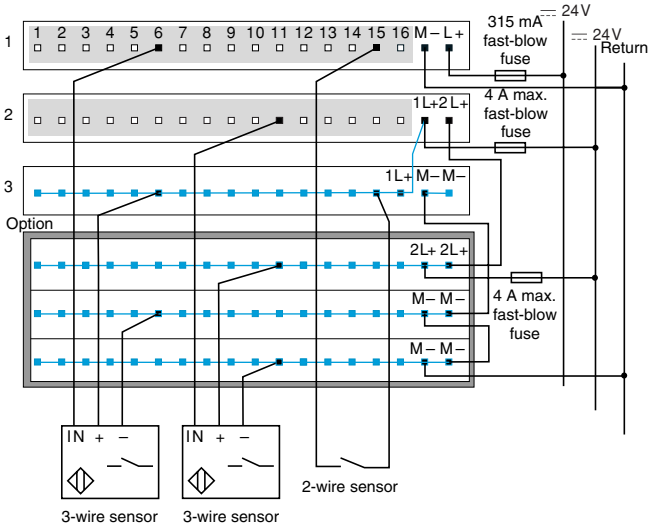
170ADI34000
Example of external wiring of 2, 3 and 4-wire sensors



Group of channels

Internal wiring

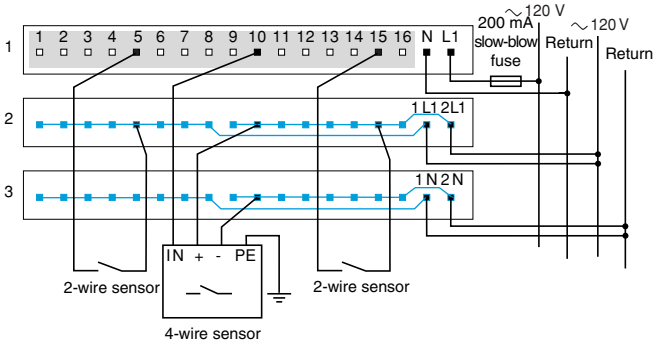
170ADI35000
Example of external wiring of 2 and 3-wire sensors



Group of channels

Internal wiring

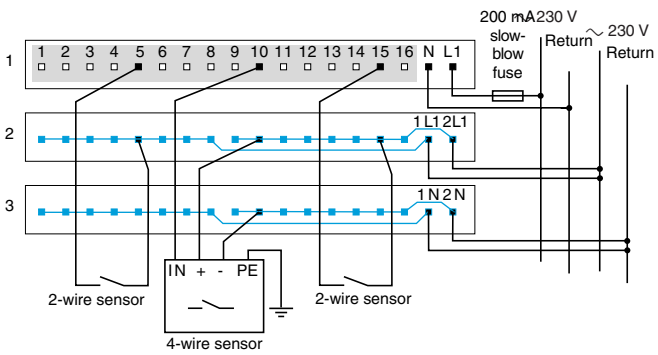
170ADI54050
Example of external wiring of 2 and 3-wire sensors



Group of channels

Internal wiring

170ADI74050
Example of external wiring of 2 and 3-wire sensors



Group of channels

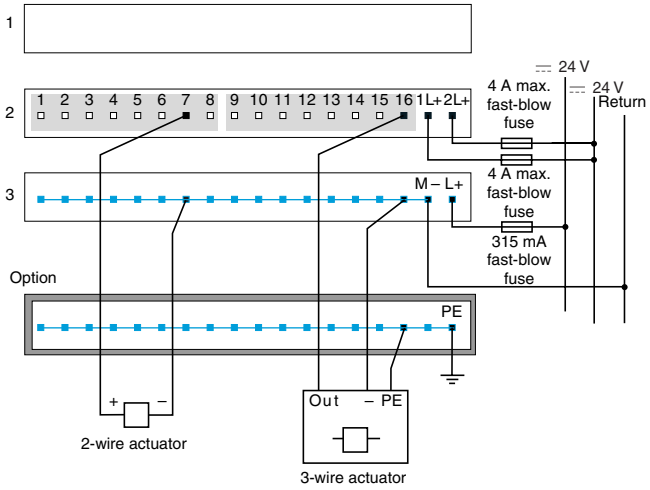
Internal wiring

Description: page 12
Characteristics: pages 13 to 18

Connections of discrete output bases

170ADO34000

Example of external wiring of 2 and 3-wire actuators

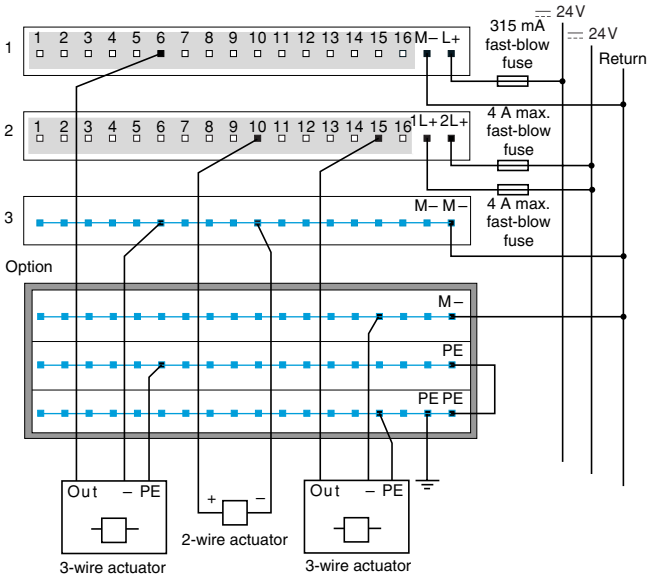


Group of channels

Internal wiring

170ADO35000

Example of external wiring of 2 and 3-wire actuators

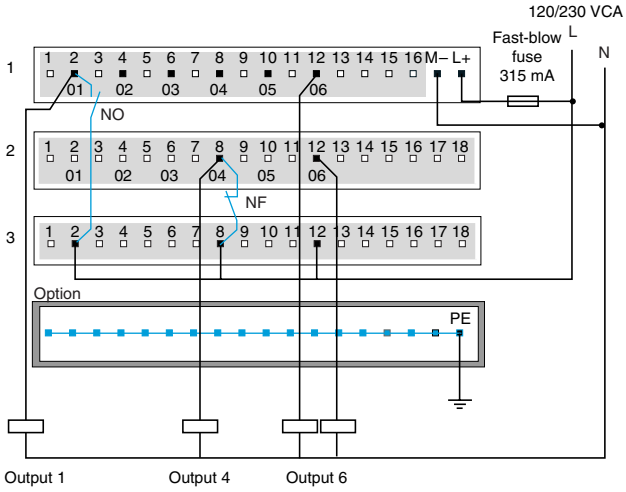


Group of channels

Internal wiring

170ADO83030

Example of external wiring

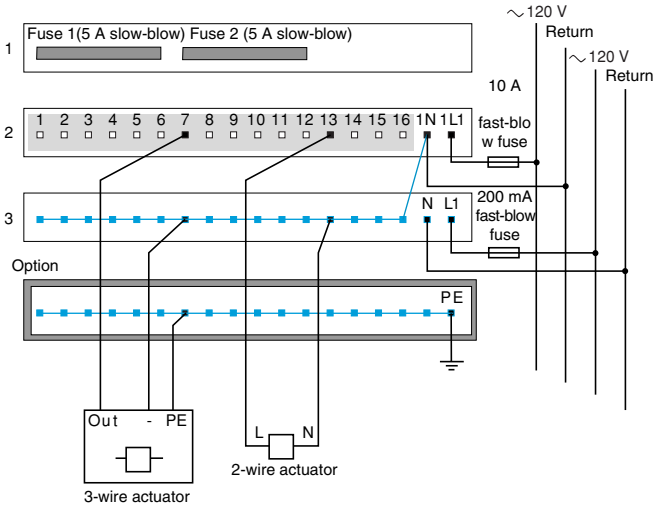


Internal wiring

Connections of discrete output bases (continued)

170ADO53050 / ADO54050

Example of external wiring of 2 and 3-wire actuator

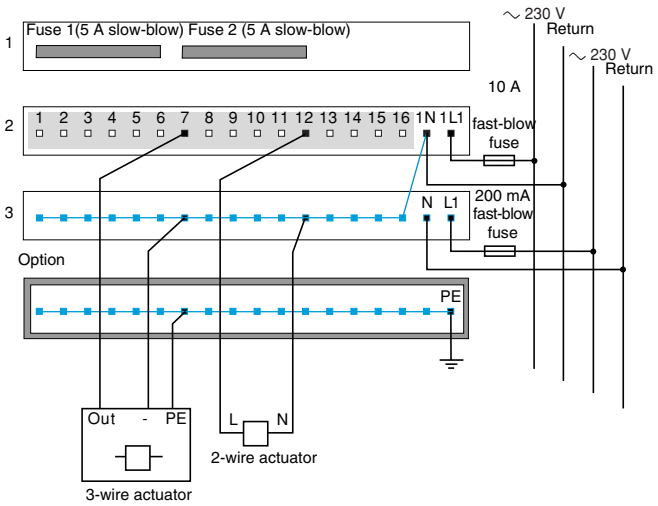


Group of channels

Internal wiring

170ADO73050 / ADO74050

Example of external wiring of 2 and 3-wire actuators



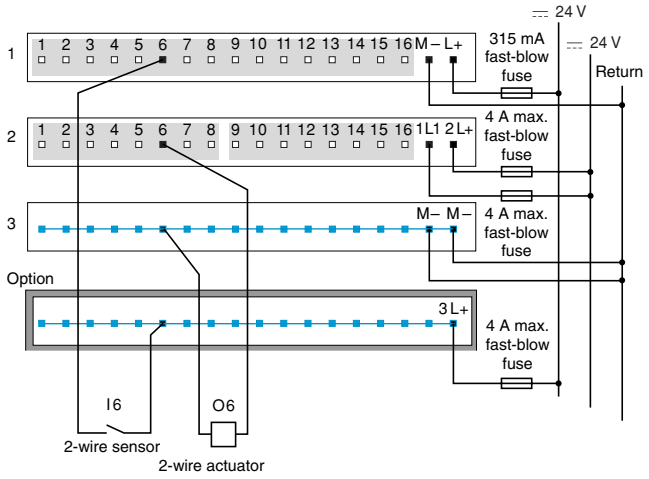
Group of channels

Internal wiring

Connections of discrete I/O bases

170ADM35010 / ADM35011 / ADM35015

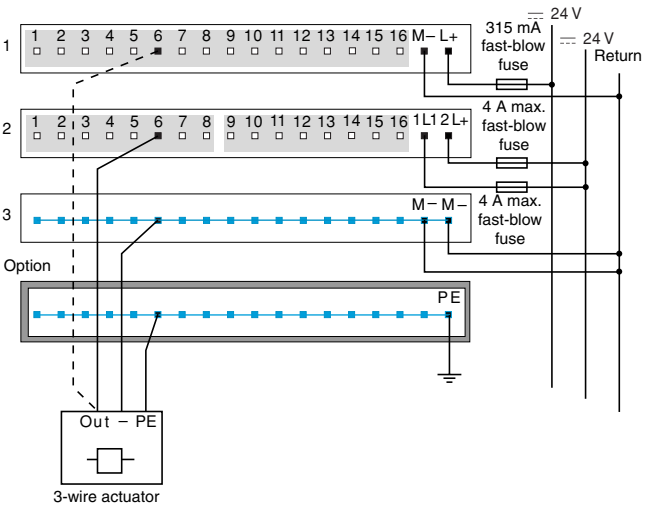
Example of external wiring of a 2-wire sensor/actuator



Group of channels

Internal wiring

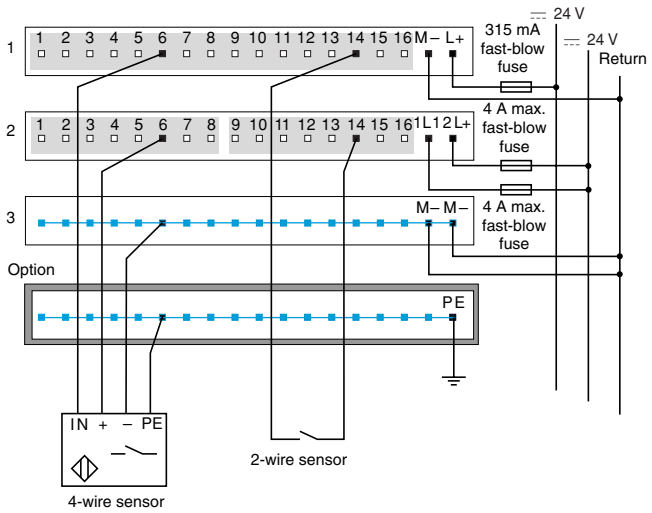
Example of external wiring of a 3-wire actuator with wiring check



Group of channels

Internal wiring

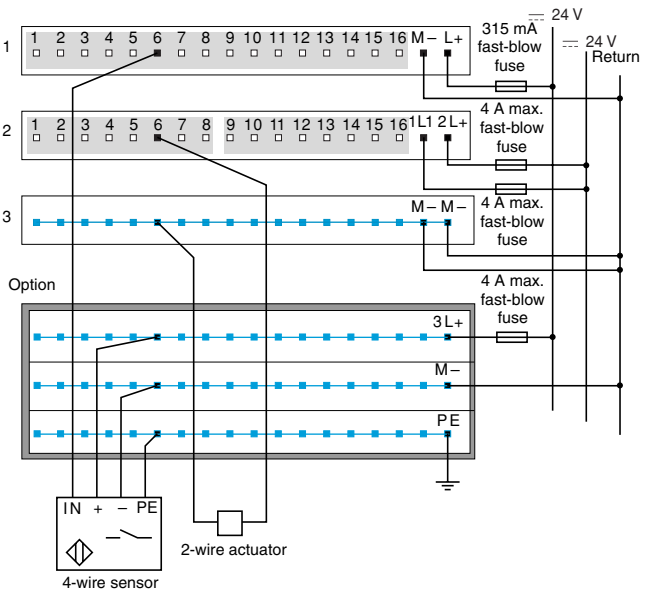
Example of external wiring of a 4-wire sensor activated by an output



Group of channels

Internal wiring

Example of external wiring of a 4-wire sensor/2-wire actuator



Group of channels

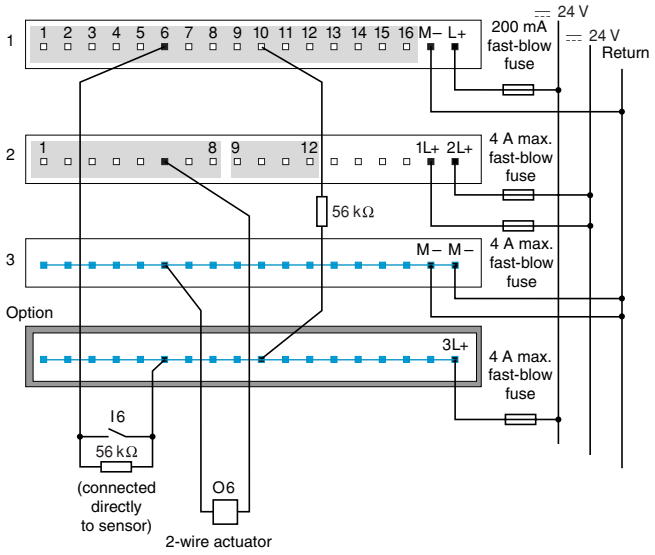
Internal wiring

Modicon Momentum automation platform
Discrete I/O bases

Connections of discrete I/O bases (continued)

170ADM39010

Example of external wiring of 2-wire sensor/actuator

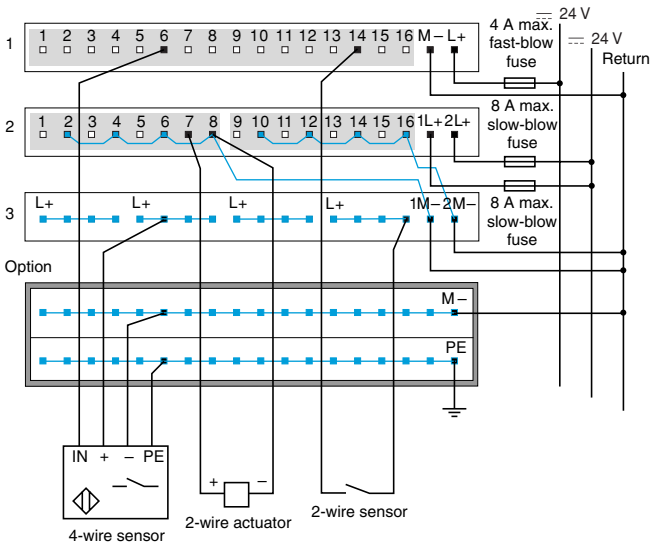


Group of channels

Internal wiring

170ADM37010

Example of external wiring of 2 and 4-wire sensors/2-wire actuator

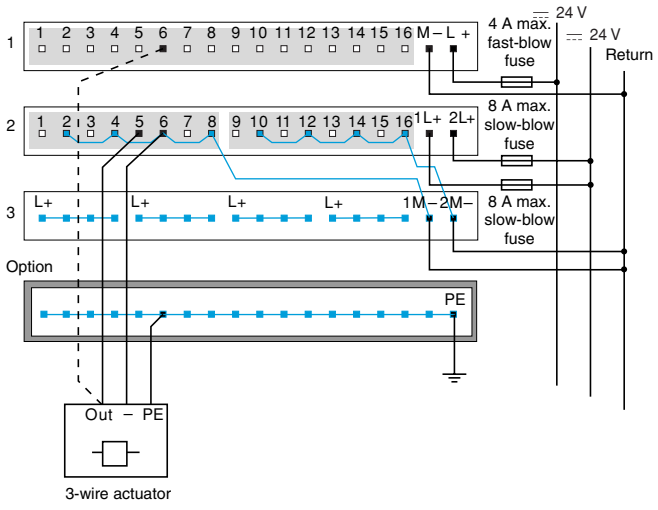


Group of channels

Internal wiring

170ADM37010 (continued)

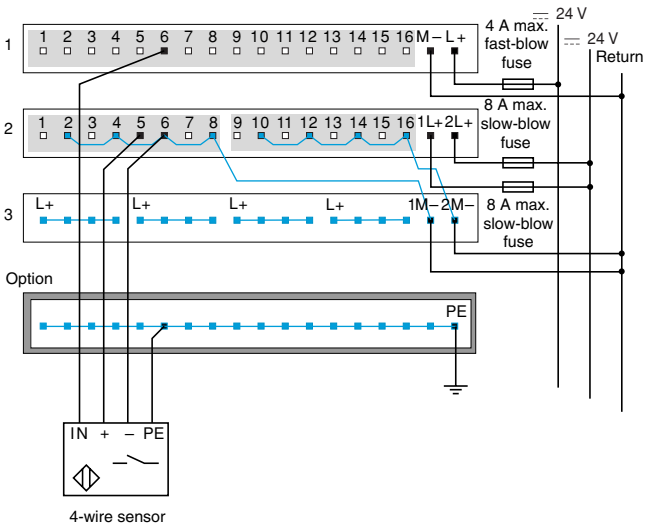
Example of external wiring of 3-wire actuator with wiring check



Group of channels

Internal wiring

Special external wiring, the output activates the sensor



Group of channels

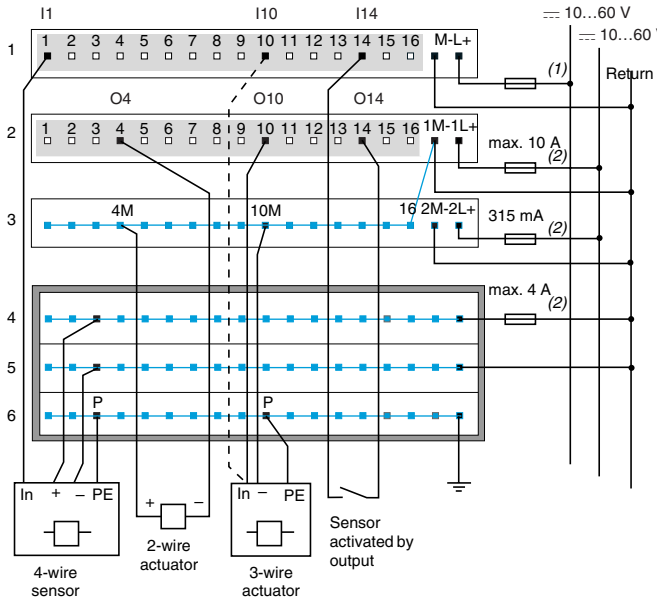
Internal wiring

Modicon Momentum automation platform
Discrete I/O bases

Connections of discrete I/O bases (continued)

170ADM85010

Example of external wiring of:
- 4-wire sensor
- 2-wire actuator
- 3-wire actuator with wiring check
- 2-wire sensor activated by output



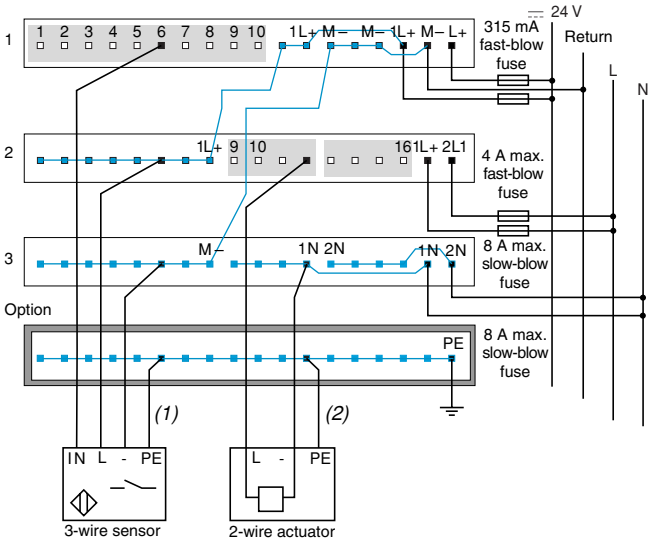
Group of channels

Internal wiring

(1) Fast-blow fuse: ⎓ 12 V: 630 mA, ⎓ 24 V: 315 mA, ⎓ 48 V: 200 mA.
(2) Fast-blow fuse.

170ADM39030

Example of external wiring of 3 or 4 sensor/3-wire/actuator



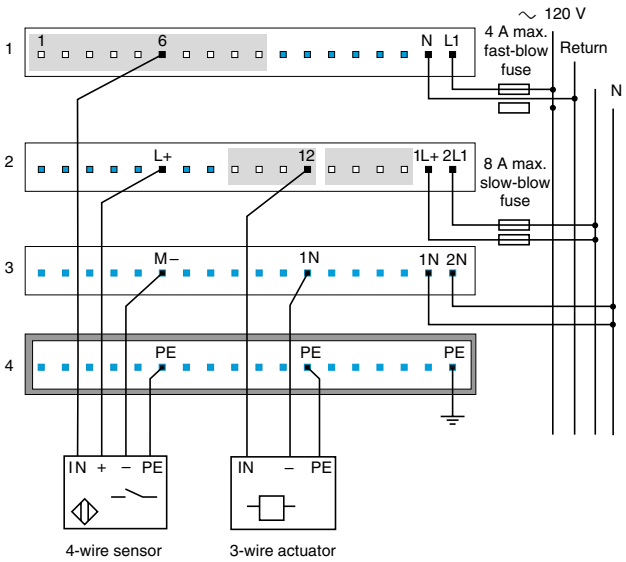
Group of channels

Internal wiring

(1) For 4-wire sensor
(2) For 3-wire actuator

170ARM37030

Example of external wiring of 4-wire sensor/3-wire actuator

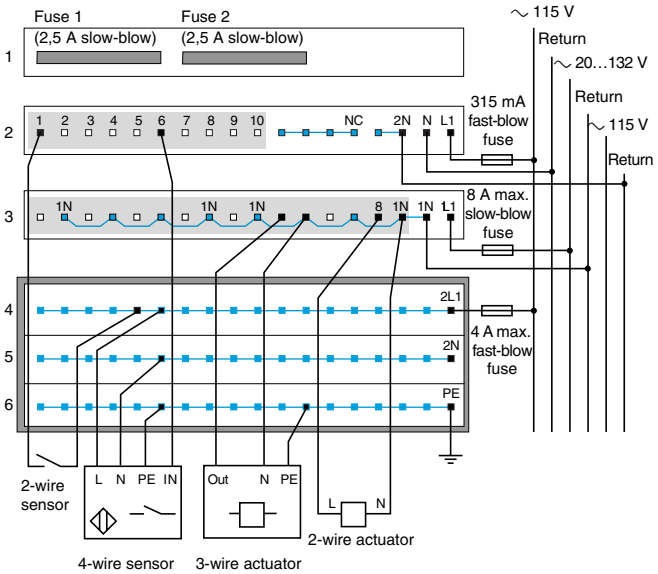


Group of channels

Internal wiring

170ADM69051

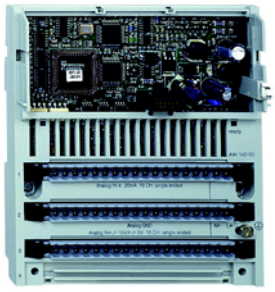
Example of external wiring of 4-wire sensor/2 and 3-wire actuators



Group of channels

Internal wiring

Modicon Momentum automation platform
Analog I/O bases

Applications		**24 VDC analog input bases**		
				
Operating voltage		24 VDC		
Measurement range		Inputs ± 5 V, ± 10 V, ± 20 mA 1-5 V, 4-20 mA	Inputs ± 5 V, ± 10 V, 4-20 mA	Inputs ± 25 mV, ± 100 mV, Temperature probe Pt 100, Pt 1000, Ni 100, Ni 1000 Thermocouple B, E, J, K, N, R, S, T
Modularity	Input channels	8 differential inputs	16 single-ended inputs	4 differential inputs
	Output channels	–	–	–
	Discrete I/O	–	–	–
Resolution		14 bits + sign bipolar 15 bits unipolar	12 bits + sign	15 bits + sign
Update time		1.33 + 1.33 x no. of declared channels (ms)	1 + 1.5 x no. of declared channels (ms	500 ms
Potential isolation	Between channels	200 VDC, 1 min	None	400 VDC
	Base and ground	500 VDC, 1 min	500 VDC, 1 min	500 VDC, 1 min
	Channels and ground	500 VAC, 1 min	1780 VAC, 1 min	500 VAC
Protection		Polarity inversion		
Number in words	In	8 words in	16 words in	4 words in
	Out	2 words out	4 words out	4 words out
Fail states		–		
Type of communicating module		**170AAI03000**	**170AAI14000**	**170AAI52040**
Pages		29	30	

24 VDC analog output bases		24 VDC mixed I/O bases (analog/discrete)			
					
24 VDC		12 VDC		24 VDC	
Outputs ± 10 V, 0-20 mA	Outputs ± 10 V, 4-20 mA	Inputs ± 5 V, ± 10 V, ± 20 mA 1-5 V, 4-20 mA Outputs ± 10 V, 0-20 mA		Inputs 0 to 10 V Outputs 0 to 10 V	Inputs - 10 to + 10 V Outputs - 10 to + 10 V
– 4 outputs –		4 differential inputs 2 outputs 4 inputs 24 VDC 2 outputs 24 VDC/0.5 A	4 inputs 12 VDC 2 outputs 12 VDC/1 A	6 inputs with common point 4 outputs with common point 8 inputs 24 VDC 8 outputs 24 VDC/0.25 A	
12 bits + sign		Inputs: 12…14 bits (dep. on range) Outputs: 12 bits		Inputs: 14 bits Outputs: 14 bits	
2 ms		Inputs: 10 ms Outputs: 1 ms		Inputs: 0.75 ms (for 6 inputs) Outputs: 1.2 ms (for 4 inputs)	
None 500 VDC, 1 min 500 VAC, 1 min		None 500 VAC, 1 min 500 VAC, 1 min			
Polarity inversion		Short-circuits and overloads (for discrete outputs)			
– 5 words out		5 words in 5 words out	5 words in 5 words out	12 words in 12 words out	
Hold, reset to zero, reset to full scale		Hold or reset to zero			
170AAO12000	**170AAO92100**	**170AMM09000**	**170AMM09001**	**170ANR12090**	**170ANR12091**
31		32		33	

Modicon Momentum automation platform
Analog I/O bases

Presentation

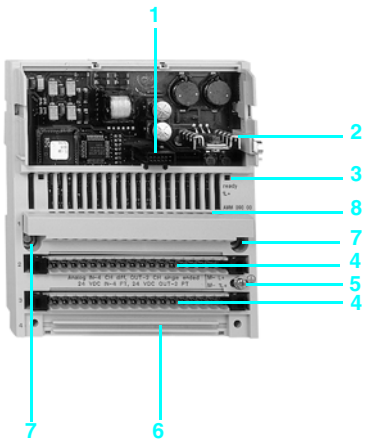
The Momentum analog input bases enable acquisition of various analog values encountered in industrial applications, including:
- Standard high level (± 5 V, ±10 V, 1-5 V, 4-20 mA, ± 20 mA).
- Low level (± 25 mV, ± 100 mV).
- Thermocouples (B, E, J, ...).
- Temperature probes (Ni ..., Pt ...).

The analog output bases are used to control analog field devices such as variable speed drives, proportional control valves, etc. The current or the voltage is proportional to the digital value defined by the user program. The outputs can be configured so that when the program stops the outputs either reset to zero or hold the last value received. This feature is useful during debugging since, if the outputs are set to “Hold”, the operation of the analog field devices is not disturbed every time the program stops.

In order to cover a wide range of applications, Momentum I/O bases offer the following functions in addition to A/D or D/A conversion:
- Choice of input/output ranges (voltage, current, thermocouple, temperature probes).
- Selection of number of channels used.
- Cold junction compensation for thermocouple modules.
- Broken wire detection (**170AAI03000**, **170AAI14000**, **170AAI52040**).

Description

170A●● analog I/O base units comprise on the front panel:
1. Internal interface connector for the communication module or processor module.
2. A locking and earth contact for the communication module or processor module.
3. LED status indicators (the number of indicators will depend on the number of channels).
4. Two connectors for the removable terminal blocks.
5. An grounding screw.
6. A slot for the power strip
7. Two screw holes for panel mounting.
8. A protective cover.



Connectors to be ordered separately:
- removable screw or spring terminal blocks **170XTS00●00.**
- 1 to 3-row screw or spring bus bar **170XTS00● 01**.

Modicon Momentum automation platform
Analog I/O bases

Characteristics of analog input bases

Type of base units			170AAI03000				
Number of inputs			1 x 8 differential inputs				
LEDs			Ready (green)				
Format of data			Full 16 bits signed (2's complement)				
Protection	Base and actuators		Polarity inversion				
Ranges			**± 10 VDC**	**± 5 VDC**	**4...20 mA**	**± 20 mA**	**1...5 VDC**
	Input impedance	**kΩ**	> 0.1000	> 0.1000	250	250	> 0.1000
	Error at 25 °C	**%**	0.27	0.21	0.27	0.32	0.13
	Error at 60 °C	**%**	0.32	0.26	0.38	0.41	0.19
	Resolution		14 bits + sign bipolar 15 bits unipolar				
Conversion times		**ms**	12 ms max. for 8 input channels (1.33 ms per input channel + 1.33 ms)				
Error indication			None				
Isolation	Channel to channel	**VDC**	± 200 for 1 minute				
	Field to ground	**VDC**	500 for 1 minute				
	Communication adapter to ground	**VAC**	500 for 1 minute				
Common mode rejection	Channel to ground		250 VAC @ 47 to 63 Hz or 100 VDC				
Crosstalk between channels		**dB**	⩾ 80				
External power requirement	Nominal	**VDC**	24				
	Limit values	**VDC**	20.4 to 28.8				
	Current	**mA**	< 382 @ 24 VDC				
EMC for industrial environment	Immunity		IEC 1131 surge on auxiliary power supply 2 kV				
	Emissions		EN 50081-2				
	Approvals		UL, CSA, CE				

References :
pages 34 and 35

Dimensions :
page 35

Connections :
pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases

Characteristics of analog input bases (continued)

Type of base units			170AAI14000			170AAI52040	
Number of inputs			1 x 16 single-ended input			1 x 4 differential inputs	
Format of data			Full 16 bits signed (2's complement)				
Protection	Base and actuators		Polarity inversion				
Error indication			None				
Ranges			**± 10 V**	**± 5 V**	**4...20 mA**	**± 25 mV**	**± 100 mV**
	Input impedance	**kΩ**	> 2200	> 2200	< 0.250	> 10000	> 10000
	Error at 25 °C		0.15 % FS	0.15 % FS	0.25 % FS	± 21 µV	± 27 µV
	Error at 60 °C		0.25 % FS	0.25 % FS	0.45 % FS	± 46 µV	± 94 µV
	Temperature drift (60 °C)	**‰**	30 PE / °C	30 PE / °C	60 PE / °C	–	
	PE (Full scale)		10 V	5 V	16 mA	–	
	Resolution		12 bits + sign	12 bits + sign	12 bits	15 bits + sign	
	Filtering		Low pass with cut-off frequency 10 kHz			–	
Current source	Pt100	**mA**	–			–	0.125
	Ni100	**mA**	–			–	0.125
	Pt1000	**mA**	–			0.125	–
	Ni1000	**mA**	–			0.125	–
Update time		**ms**	1 + 1.5 x n n = number of declared channels			500	
Error indication			None				
Potential isolation	Channel to channel	**VDC**	None			400	
	Base power supply and ground	**VDC**	500 for 1 minute			500 for 1 minute	
	Channels to ground	**VAC**	1780 for 1 minute			500 for 1 minute	
	Base power	**V**	± 30 (voltage or current output)			± 30 (voltage or current output)	
	Common mode Channel to ground	**V**	–			± 100 DC, 250 AC	
	Common mode Voltage between channels	**V**	–			200 DC, 115 AC single phase or 3-phase or 250 AC single phase	
Common mode rejection	Channel to ground		250 VAC at 47 to 63 Hz or 100 VDC			135 dB DC, 145 dB AC 50 Hz, 155 dB AC 60 Hz	
	Between channels		–			120 dB DC, 130 dB AC 50 Hz, 140 dB AC 60 Hz	
Serial mode rejection			–			35 dB AC 50 Hz, 45 dB AC 60 Hz	
Input protection			Polarity inversion				
Operating voltage		**VDC**	24				
Internal current		**mA**	305 @ 24 VDC				
Power dissipation	Typical	**W**	4.95			3.5	
	Maximum	**W**	5.55			5.5	
Fusing	Internal		2 A slow-blow			2 A slow-blow	
	External		500 mA fast-blow			500 mA fast-blow	
Agency approvals			UL, CE, CSA, FM Class I, Div. II				

References :
pages 34 and 35

Dimensions :
page 35

Connections :
pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases

Characteristics of analog output bases

Type of base units			170AAO12000		170AAO92100	
Number of outputs			1 x 4			
Format of data			Full 16 bits signed (2's complement)			
Protection	Base and actuators		Polarity inversion			
Ranges			**± 10 V**	**0…20 mA**	**± 10 V**	**4…20 mA**
	Load impedance	**kΩ**	1 minimum	0.6 maximum	1 minimum	0.6 maximum
	Capacitive load	**µF**	< 1			
	Error at 25 °C	**%**	0.2 PE	0.3 PE	0.2 PE	0.4 PE
	Error at 60 °C	**%**	0.25 PE	0.4 PE	0.25 PE	0.5 PE
	Temperature drift (60 °C)	**‰**	10 PE / °C	30 PE / °C	10 PE / °C	30 PE / °C
	Resolution		12 bits + sign			
	Update time	**ms**	< 2			
Full scale			10 V in the range of ± 10V 2 mA in the range of 0…20 mA			
Fail State			Hold, reset to zero, reset to full scale			
Potential isolation	Channel to channel		None			
	Base power supply and ground	**VDC**	500 for 1 minute			
	Channels to ground	**VAC**	500 for 1 minute			
	Out protections		Short-circuits in the voltage circuits, open in current polarity inversion			
	Base power	**V**	± 30 (voltage or current output)			
Common mode rejection		**VAC**	250 @ 47 to 63 Hz or 250 DC channel to ground			
Operating voltage		**VDC**	24			
Internal current	Base	**mA**	530 @ 24 VDC			
	Actuators	**mA**	150 @ 24 VDC			
Power dissipation	Typical	**W**	5.6			
	Maximum	**W**	8.5			
Internal fusing		**A**	2, slow-blow			
Agency approvals			UL, CE, CSA			

References :
pages 34 and 35

Dimensions :
page 35

Connections :
pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases

Characteristics of discrete and analog I/O bases

Type of base unit			170AMM09000				170AMM09001
Number of inputs and outputs			1 x 4 differential inputs 1 x 4 discrete inputs 1 x 2 analog outputs 1 x 2 discrete outputs				
Operating voltage		**VDC**	24				12
Internal current		**mA**	200 typical (at 24 VDC), 350 maximum (at 24 VDC)				700 maximum (at 12 VDC)
Differential inputs for 170 AMM 090 00/090 01	Conversion time		10 ms for all channels				
	Conversion error		**± 10 V**	**± 5 V**	**1 to 5 V**	**± 20 mA**	**4 to 20 mA**
	25 °C	**%**	0.08	0.16	0.16	0.16	0.16
	60 °C	**%**	0.15	0.3	0.3	0.3	0.3
	Resolution		14 bits	13 bits	12 bits	13 bits	12 bits
	Conversion consistency	**%**	± 0.02	± 0.04	± 0.04	± 0.04	± 0.04
	Common mode voltage		Input voltage starting at Ag ± 11 V				
	Common mode suppression	**dB**	> 54				80
	Over voltage Voltage ranges	**V**	± 30 solid state if voltage is 24 V ± 50 dynamic max. 100 ms				± 30 solid state if voltage is 12 V ± 50 dynamic max. 100 ms
	Over voltage current ranges	**mA**	–			> 48	
	Input resistance	Ω	1 M			250	
	Fail state		Hold or reset to zero				
Discrete inputs	Voltage	**VDC**	24 typical, 30 maximum				12 typical
	Signal Type		True high				
	On Voltage	**VDC**	+ 11 to + 30				+ 7.5 to + 15
	Off Voltage	**VDC**	- 3 to + 5				- 1.5 to + 2.5
	Input current	**mA**	2.5 minimum at state 1 (6 mA at operating voltage), 1.2 maximum at state 0				
	Input resistance	**kΩ**	4				2.1
	Response time	**ms**	2.2 from 0 to state 1 3.3 from 1 to state 0				
Analog outputs	Resolution		12 bits for single-phase measuring range 0…20 mA, 12 bits for 2-phase measuring range ± 10 V				
	Conversion time	**ms**	1 for all channels				
	Conversion error 25 °C		max. ± 0.35 % of upper measuring range value				
	Conversion error 60 °C		max. ± 0.70 % of upper measuring range value				
	Output load		⩾ 3 kΩ for voltage output, ⩽ 600 Ω for current output				
Discrete outputs	Voltage	**VDC**	24 typical, 30 maximum				
	Type		Semiconductor				
	Signal Type		True high				
	Current capacity		1 per channel, 2 per group, 2 per module				
	Leakage current	**mA**	< 1 @ 24 VDC				< 1 @ 12 VDC
	On State Voltage drop	**VDC**	< 0.5 @ 1 A				< 0.5 @ 0.5 A
	Response time Off to On	**ms**	< 0.1				
	On to Off	**ms**	< 0.1				
	Output protection		The outputs are protected against overload and shorted-circuits				
	Output indicator		1 red LED per “On” output in the event of an overload or shorted-circuits				
	Error message		Message “I/O error” on bus adapter if module is defective				
	Max. Switching cycles		1000/hr (inductive load 1 A), 100/s (resistive load 1 A), 8/s (filament load 2.4 W)				
Potential isolation	Discrete input and output		None				
	Analog input to output		None				
	Analog input and output and to operating voltage	**VAC**	500 for 1 minute				
	Operating voltage and all inputs and outputs from ground	**VAC**	500 for 1 minute				
Power dissipation	Typical	**W**	4.0				
	Maximum	**W**	6.0				
Agency approvals			UL, CE, CSA, FM Class I, Div. II				UL, CE, CSA

References : pages 34 and 35
Dimensions : page 35
Connections : pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases

Characteristics of discrete and analog I/O bases (continued)

Type of base unit				170ANR12090	170ANR12091
Number of inputs and outputs				1 x 6 analog inputs 2 x 4 discrete inputs 1 x 4 analog outputs 1 x 8 discrete outputs	
Operating voltage			**VDC**	24, range 19.2 to 30	
Internal current			**mA**	400 @ 24 VDC	
Analog inputs	Resolution			14 bit	
	Input range		**VDC**	0 to 10	- 10 to + 10
	Input type			Single-ended	
	Conversion time			0.75 ms maximum for 6 input channels	
	Conversion error			0.2 % @ 25 °C for 0 - 10 VDC inputs	
	Max input signal		**VDC**	15 for voltage input	
	Max temperature drift		**VDC**	10 inputs	
	Input resistance		**MΩ**	>1 for voltage inputs	
Discrete inputs	Voltage		**VDC**	24	
	Configuration			2 groups of 4 inputs	
	Signal Type			True high	
	Minimum on voltage		**VDC**	> 11	
	Maximum off voltage		**VDC**	< 5	
	Input current	Minimum On	**mA**	6	
		Maximum Off	**mA**	2	
	Input voltage	Range	**VDC**	+ 3 to + 32	
		Surge	**VDC**	45 peak for 10 ms	
	Response time	Off to On	**ms**	1.2	
		On to Off	**ms**	1.2	
Analog outputs	Resolution			14 bit	
	Output range		**VDC**	0 to 10	- 10 to + 10
	Conversion time		**ms**	1.20 for all four channels	
	Conversion error			max. + 0.4 % of upper measuring range value @ 25 °C	
	Output load			> 2 kΩ minimum @ 0 to 10 VDC	
	Fail state			Hold or reset to zero	
Discrete outputs	Voltage		**VDC**	10-30 operating, 50 for 1 ms maximum	
	Type			Solid State Switch	
	Signal type			True high	
	Current capacity		**A**	0.25 per point, 2 per group, 2 per module	
	Leakage current		**mA**	0.4 @ 30 VDC	
	Surge current		**A**	2.5 for 1 ms	
	On state voltage drop		**VDC**	< 0.4 @ 0.25 A current	
	Response time	Off to On	**ms**	1.2	
		On to Off	**ms**	1.05	
	Output protection			The Outputs are protected against overload and shorted-circuits	
	Output indicator			1 LED per point	
Potential isolation	Discrete input to output			None	
	Analog input to output			None	
	Analog input and output to operating voltage		**VAC**	500 for 1 minute.	
	Operating voltage and all inputs and outputs from ground		**VAC**	500 for 1 minute	
Power dissipation	Typical		**W**	4.0	
	Maximum		**W**	6.0	
Agency approvals				UL, CE, CSA	

References : pages 34 and 35
Dimensions : page 35
Connections : pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases


170AAI●●0●0


170AAO●2●00


170AAM09000

Analog input bases

Type of inputs	Number of channels	Ranges	Reference	Weight kg
12 bits + sign	16 single-ended	± 5 V, ± 10 V, 4-20 mA	**170AAI14000**	0.215
15 bits + sign	4, differential	Pt 100, Pt 1000, NI 100 thermocouples B, E, J, K, N, R, S, T	**170AAI52040**	0.215
	8, differential	± 5 V, ± 10 V, 1-5V ± 20 mA, 4-20 mA	**170AAI03000**	0.215

Analog output bases

Type of outputs	Number of channels	Ranges	Reference	Weight kg
12 bits + sign	4	± 10 V, 0-20 mA	**170AAO12000**	0.215
		± 10 V, 4-20 mA	**170AAO92100**	0.215

Discrete and analog I/O bases

Type		Ranges		Reference	Weight kg
Inputs	**Outputs**	**Inputs**	**Outputs**		
4 differential analog 13 bits + sign	**2 analogs 12 bits**	± 5 V, ± 10 V 1-5 V ± 20 mA 4-20 mA	0-20 mA ± 10 V	**170AMM09000**	0.240
4 discrete	**2 discrete 0.5 A**	24 VDC	24 VDC		
4 differential analog 13 bits + sign	**2 analogs 12 bits**	± 5 V, ± 10 V 1-5 V ± 20 mA 4-20 mA	0-20 mA ± 10 V	**170AMM09001**	0.240
4 discrete	**2 discrete 0.5 A**	12 VDC	12 VDC		
6 analog 14 bits	**4 analogs 14 bits**	0-10 V	0-10 V	**170ANR12090**	0.240
2 x 4 discrete	**1 x 8 discrete 0.25 A**	24 VDC	24 VDC		
6 analog 14 bits	**4 analogs 14 bits**	± 10 V	± 10 V	**170ANR12091**	0.240
2 x 4 discrete	**1 x 8 discrete 0.25 A**	24 VDC	24 VDC		

Characteristics : pages 29 to 33
Dimensions : page 35
Connections : pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases


170XTS00100


170XTS00200


170XTS00401


170XTS00501


170XTS00801


170XTS00601


CER001

Accessories

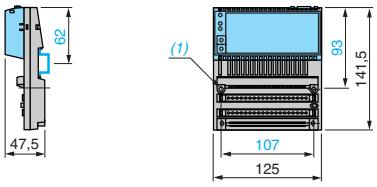
Description	Composition	Type of connection	Reference	Weight kg
Terminal blocks	Set of 3 connectors 1 row	Screw	**170XTS00100**	–
		Spring	**170XTS00200**	–
Bus Bar	3 rows	Screw	**170XTS00401**	–
		Spring	**170XTS00301**	–
	2 rows	Screw	**170XTS00501**	–
		Spring	**170XTS00801**	–
	1 rows	Screw	**170XTS00601**	–
		Spring	**170XTS00701**	–
Cable Grounding Rail	Used to connect the cable shielding		**CER001**	–
High vibration environment clips	Used to prewire the I/O base units. Requires screw or spring connection terminals		**170BDM09000**	–

Replacement parts

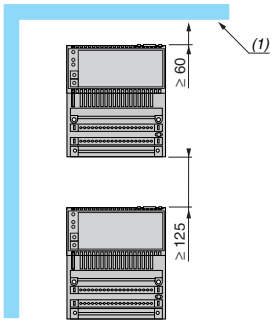
Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170XTS10000**	–
Set of coding and locating device	For screw or spring connection terminals	**170XCP20000**	–

Dimensions, mounting

170A●●
Rail or panel mounting



(1) 2 holes for M4 screws, for panel mounting.



(1) Equipment or enclosure.

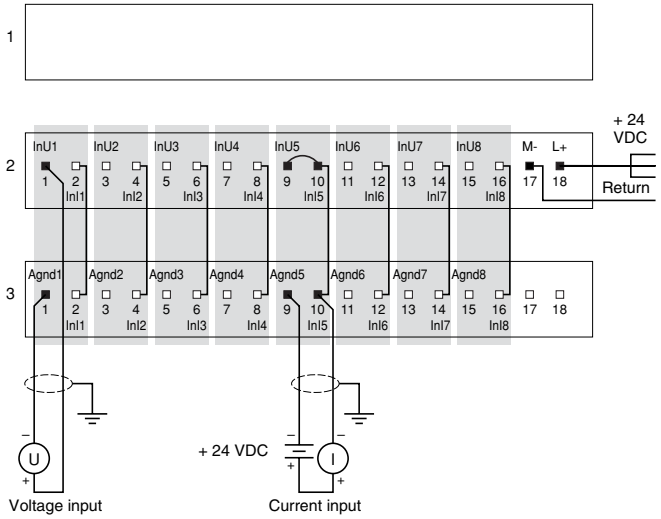
Characteristics : pages 29 to 33
Connections : pages 36 and 37

Modicon Momentum automation platform
Analog I/O bases

Connections of analog input bases and analog output bases

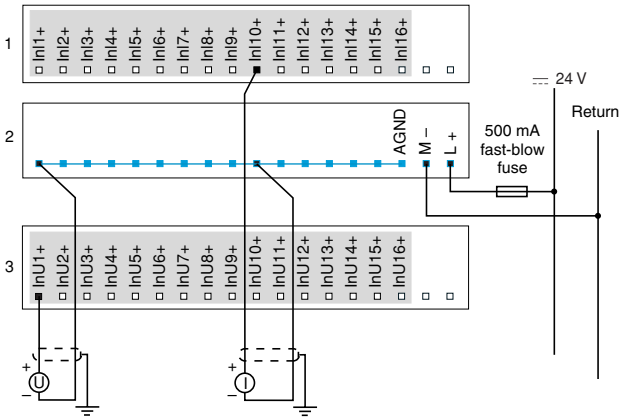
170AAI03000

Example of external wiring of 2-wire sensor



170AAI14000

Example of external wiring of 2-wire sensor

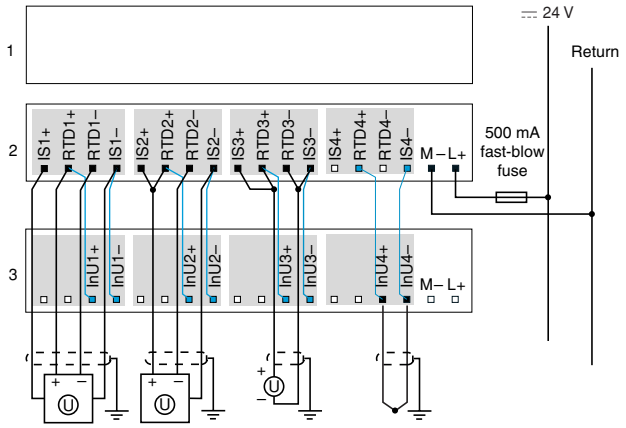


Group of channels

Internal wiring

170AAI52040

Example of external wiring of sensor

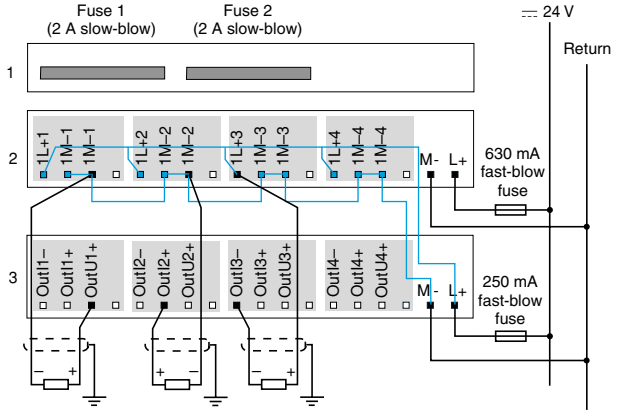


Group of channels

Internal wiring

170AAO120 / 92100

Example of external wiring of 2-wire actuator



Group of channels

Internal wiring

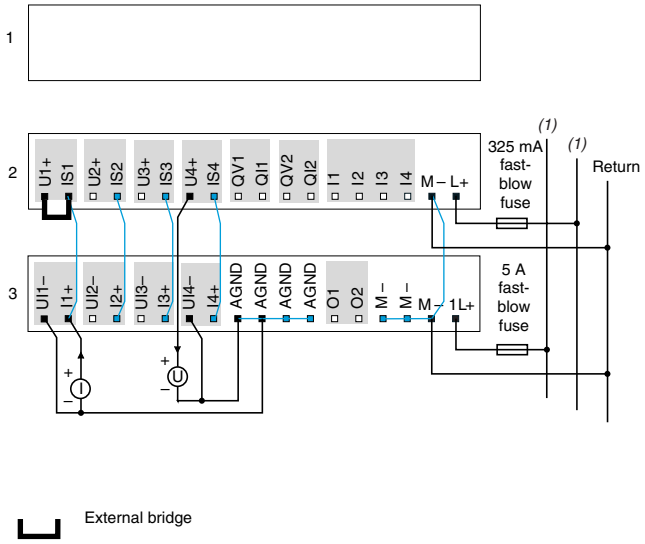
Modicon Momentum automation platform
Analog I/O bases

-

Connections of discrete and analog bases

170AMM09000 / AMM09001

Example of external wiring of 2-wire sensor

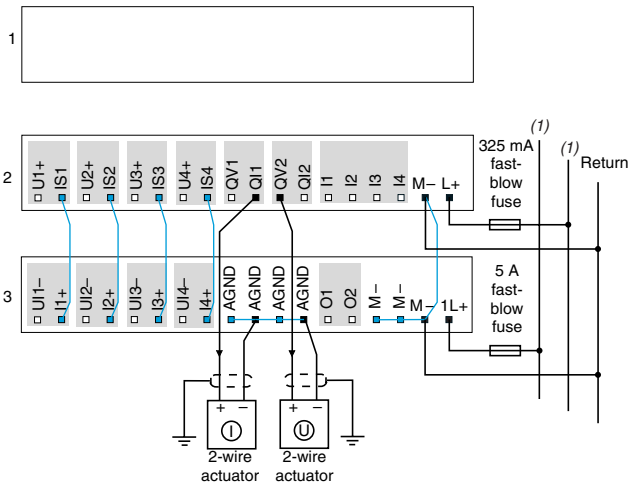


External bridge

Group of channels

Internal wiring

Example of external wiring of 2-wire actuator

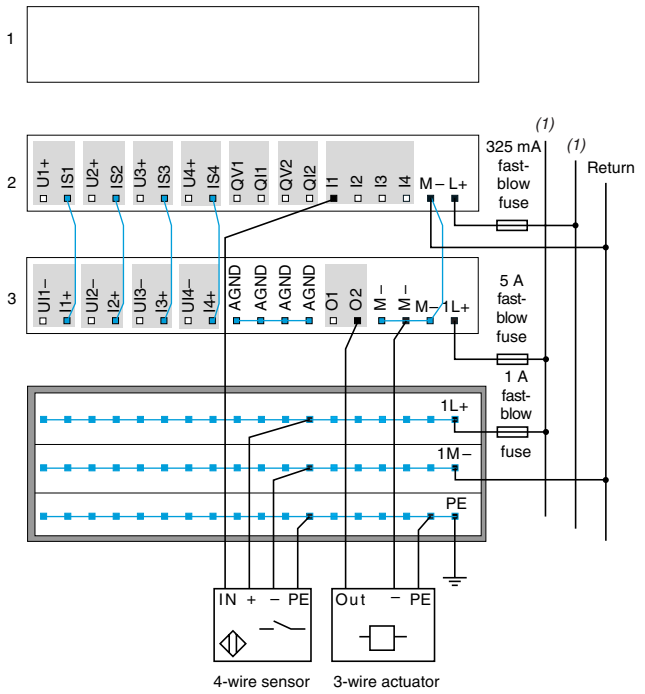


Group of channels

Internal wiring

170AMM09000 / AMM09001 (continued)

Example of external wiring of digital sensor/actuator

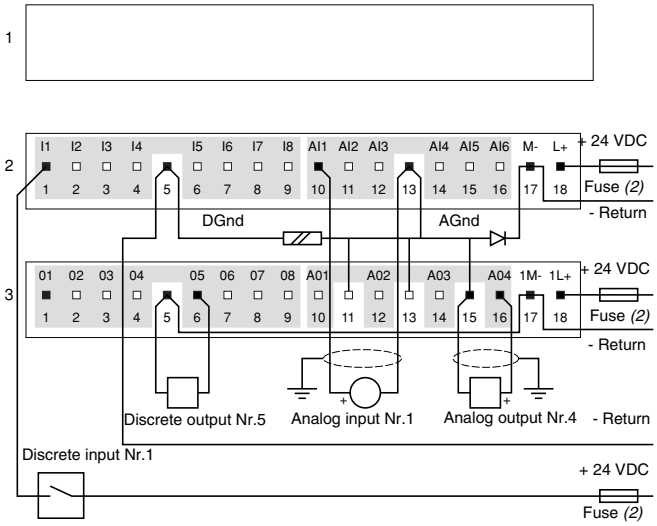


Group of channels

Internal wiring

170ANR12090 / 91

Example of mixed discrete and analog I/O sensor/actuator field wiring



(1) ⎓ 24 V for 170 AMM 090 00, ⎓ 12 V for 170 AMM 090 01
(2) Depending on application, max 5 A.

Modicon Momentum automation platform
Specialty module I/O bases

Product type		**High-speed counter**

Operating voltage		24 VDC
Unique features		2 independent, high-speed (10 kHz-200 kHz) counters
Modularity	Input channels	6 (3 per counter) True High Inputs
	Output channels	4 (2 per counter) True High Outputs
Input characteristics	Counter inputs	5 VDC differential input, 200 kHz counter; 24 VDC single-end input, 10 kHz counter
	Discrete inputs	6 (2 x 3) 24 VDC inputs: - voltage range, - 3 to + 30 VDC - response time, 3 ms Off to On or On to Off
Output characteristics	Counter outputs	Two 5 VDC differential outputs min 20 mA @ 24 VDC
	Discrete outputs	4 (2 per counter) 24 VDC outputs: - on current, 0.5 A per point, 1 A per counter - response time: < 0.1 ms Off to On, < 0.1 ms On to Off
Protection		
Surge	Input voltage	45 V peak for 10 ms
	Output current	5 A for 1 ms
Type of module		**170AEC92000**
Pages		41

I/O with Modbus Master Base

120 VAC

RS 485 2- or 4-wire Modbus port

6 True High Inputs

3 True High Outputs

–

1 group of 6 inputs (120 VAC @47 to 63 Hz):
- voltage range, 0 to 132 VAC
- response time, < 12.3 ms @ 60 Hz On to Off,
  < 12.5 ms @ 60 Hz Off to On

–

3 solid state switching outputs (120 VAC @47 to 63 Hz):
- on current, 0.5 A continuous per point, 1.5 A continuous per module
- response time: < 12.3 ms @ 60 Hz On to Off, < 12.5 ms @ 60 Hz Off to On

170ADM54080

41

Modicon Momentum automation platform
Specialty module I/O bases

Presentation

The Momentum specialty module I/O bases provide support for unique applications that broaden the range of the Momentum offering. The specialty modules are:
- a 2-channel, High-speed counter module base - **170AEC92000**.
- a 120 VAC, 6-point input/3-point output module base with a Modbus communication port - **170ADM54080**.

High-speed counter

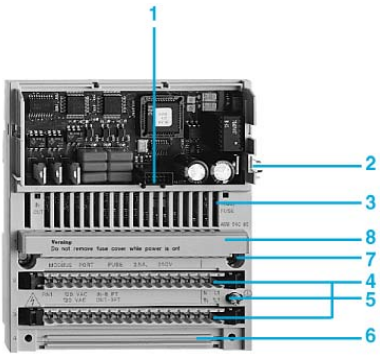
The **170AEC92000** high-speed counter module base features 2 independent counters, along with 6 discrete inputs and 4 discrete outputs.This base can connect directly to either 5 VDC differential or 24 VDC single-ended encoders. The base supports two operating modes:
- Incremental (up counter, down counter, and quadrature)
- Absolute (SSI up/down counter).

The high-speed counter module can be connected directly to many standard communication networks, for communicating with programmable controllers, industrial computers, and other controllers, by installing one of the snap-on Momentum communication adapters onto the base.

Input/Output module with Modbus communication port

The **170ADM54080** input/output module base has 6 discrete inputs and 3 discrete outputs for direct connection to 2- and 3-wire sensors and actuators, plus a Modbus communication port for connection to serial devices.

This module can also be used as the I/O base for a programmable controller, in either a standalone or distributed I/O configuration, by installing one of the snap-on Momentum M1 processor adapters.



Description

A specialty module I/O bases consists of the following components:
1 Internal interface connector for the communication module.
2 Locking and earth contact for the adapter.
3 LED status display.
4 Two connectors for the removable terminal blocks.
5 Grounding screw.
6 Grounding busbar mounting slot.
7 Mounting holes for a panel mount.
8 Protective cover for fuses (**170ADM54080**) or connector for the removable terminal block.

Characteristics: page 41
References: page 42
Connections: page 43

Modicon Momentum automation platform
Specialty module I/O bases

Characteristics

Model No.				170AEC92000	170ADM54080
Number of I/O	Counter			2 independent	–
	Inputs			2 x 3 discrete	1 x 6 discrete
	Outputs			2 x 2 discrete	1 x 3 discrete
Discrete inputs	Operating voltage		**V**	24 DC	120 AC @ 47 to 63 Hz
	Input	Range	**V**	- 3 to + 30 DC	0 to 132 AC
		Surge	**V**	45 peak for 10 ms	200 AC for 1 cycle
	Input current	On	**mA**	2.5 minimum	5.5 minimum
		Off	**mA**	1.2 maximum	1.9 maximum
	Switching level		**V**	11 DC minimum on voltage 5 DC maximum off voltage	79 AC minimum on voltage 20 AC maximum off voltage
	Response time	Off to on	**ms**	3	< 12.5 @ 60 Hz
		On to off	**ms**	3	< 12.3 @ 60 Hz
	Signal type			True High	
Discrete outputs	Operating voltage		**V**	24 DC	120 AC @ 47 to 63 Hz
	Signal type			True High	
	On state voltage drop		**V**	< 0.5 DC @ 0.5 A current	< 1.5 AC @ 0.5 A current
	Fault sensing			Overload and short circuit	1 fuse, 2.5 A @ 250 VAC
	Current capacity		**A**	0.5 per point	0.5 continuous per point
			A	1 per counter	–
			A	2 per module	1.5 continuous per module
	Current	Leakage	**mA**	< 1 @ 24 VDC	1.9 @ 120 VAC
		Surge	**mA**	5 A for 1 ms	30 minimum
	Response time	Off to on	**ms**	< 0.1	< 12.5 @ 60 Hz
		On to off	**ms**	< 0.1	< 12.3 @ 60 Hz
Counter inputs	Incremental counters			Up counter, down counter, quadrature	–
	Absolute SSI counter			Up/down counter with 4 sub-modes	–
	Input signals		**VDC**	5 differential input 24 single-ended input	– –
	Counter speed (max)		**kHz**	200, differential inputs 10, single-ended inputs	– –
	Counter capacity			24 bits plus sign per counter	–
	Counter configuration			Via communication adapter (8 input words, 8 output words)	–
Modbus port	Type			–	RS-485, 2- or 4-wire
	Communication rates		**bit/s**	–	19200 and 9600
	Format			–	8-bit RTU / 7-bit ASCII
	Modbus address range			–	0 to 247
	Time-out		**ms**	–	150 after transmission
Current consumption			**mA**	280	125 @ 120 VAC
Agency approvals				UL, CE, CSA	

References:
page 42

Connections:
page 43

Modicon Momentum automation platform
Specialty module I/O bases

References

170AEC92000

170ADM54080

Modules

Description	Characteristics	Reference	Weight kg
High-speed counter Module Base	2 independent counters	**170AEC92000**	0.210
I/O module base with Modbus communication port	RS 485 Modbus port 6 inputs, 3 outputs	**170ADM54080**	0.240

Replacement parts

Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170XTS10000**	–

Documentation

Description	Use	Reference	Weight kg
Momentum I/O bases	User guide for: 170AEC92000	**870USE00800**	–
	170ADM 4080	**870USE00200**	–

***Accessories**: Terminal blocks, bus bar, cable grounding rail and discrete input simulator, see page 19.*

Characteristics:
page 41

Connections:
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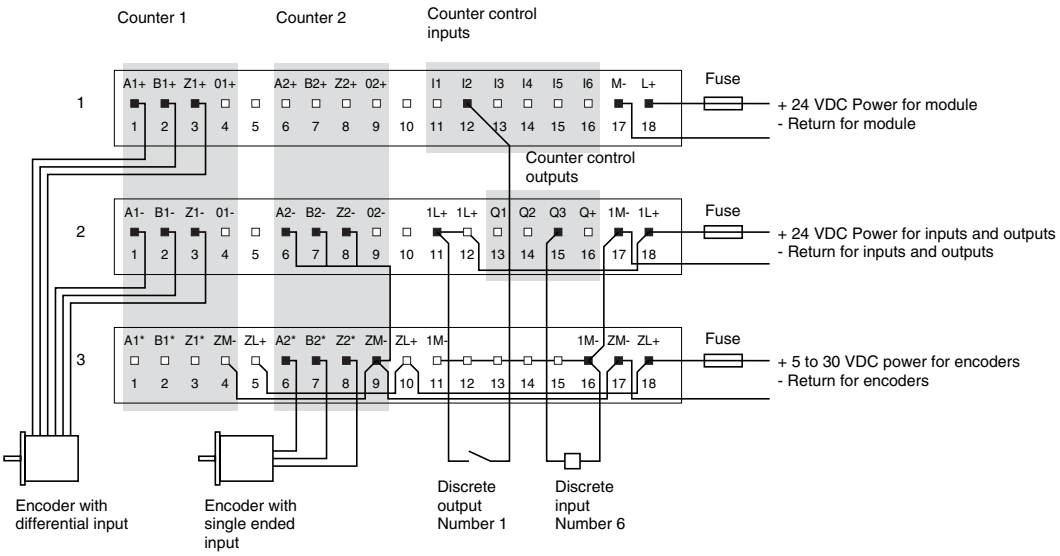
Modicon Momentum automation platform
Specialty module I/O bases

Connections

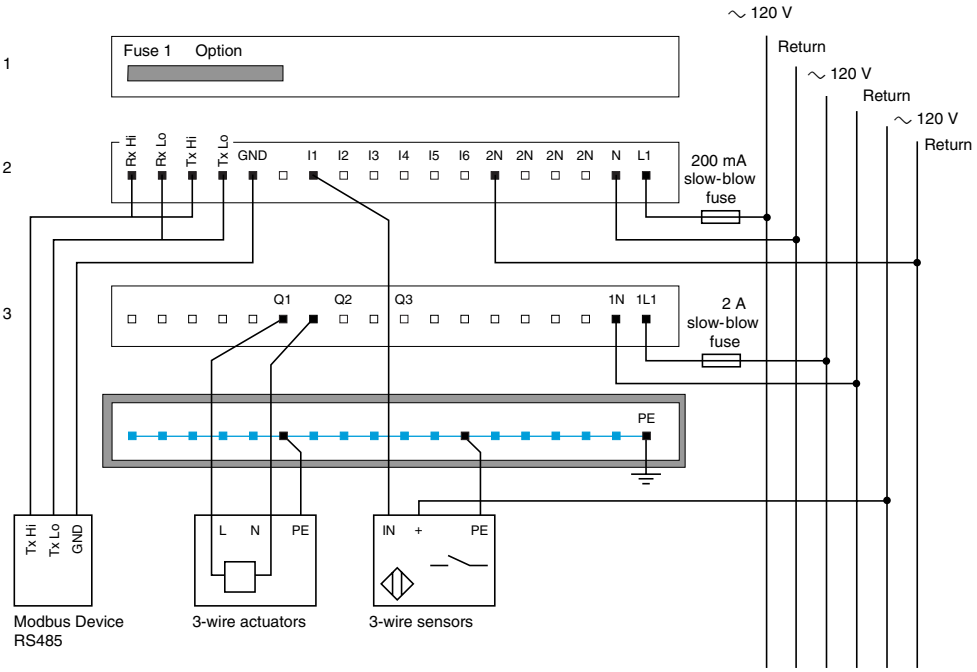
170AEC92000

A 2-encoder and input/output field wiring example



170ADM54080

A Modbus device and input/output field wiring example



Characteristics: pages 41
References: page 42

Modicon Momentum automation platform
Communication adapters

Applications		**Communication adapters for Ethernet TCP/IP**	
			
Bus and network type		Ethernet TCP/IP	
		Transparent Ready Class	
		A10	B20
Topology	Physical interface	IEEE 802.3 standard	
	Method of access	CSMA-CD	
	Bit rate	10 M bit/s	10/100 Mbit/s
Medium	Type	Twisted pair CAT5	
	Topology	Star	
	Redundancy	No	
Maximum number of devices		64	
Maximum length		1000 m per segment	
Type of communicating module		**170ENT11002**	**170ENT11001**
Pages		49	

Communication adapters for INTERBUS			Communication adapter for Profibus DP bus	Communication adapter for DeviceNet network
				
INTERBUS		INTERBUS I/O bus	Profibus DP	DeviceNet
SUPI 3		SUPI 2		
DIN 19 258 standard			EN 50170 standard	–
Master/Slave			Master/Slave	CSMA-CD
500 K bit/s			12 Mbit/s…9.6 K bit/s depending on length	500 Kbit/s
Twisted pair	Fiber optic	Twisted pair	Twisted pair	Multidrop
Ring			Multidrop, ring	Multidrop
No			No	No
40 per installation remote bus module (up to 254 bus terminal modules)			32 without repeater 126 with repeaters	64
12800 m			1200 m	500 m with repeaters
170INT11003	**170INT12000**	**170INT11000**	**170DNT11000**	**170LNT71000**
57			59	61

Modicon Momentum automation platform
Communication adapters

Applications		Communication adapters for Modbus Plus network		
		IEC Data Format		984 Data Format
				
Bus and network type		Modbus Plus		
Topology	Physical interface	Modbus Plus		
	Method of access	Token bus		
	Bit rate	1 Mbit/s		
Medium	Type	Twisted pair		
	Topology	Multidrop		
	Redundancy	No	Yes	No
Maximum number of devices	Per segment	32		
	Overall	64 (without repeaters)		
Maximum length		5 000 m with repeaters		
Type of communicating module		**170PNT11020**	**170PNT16020**	**170NEF11021**
Pages		51		

Communication adapters for Modbus Plus network 984 Data Format	Communication adapters for Fipio bus for TSX Series 7 and April 5000	for Premium PLCs
		
	Fipio	
Modbus Plus	Fip standard	
Token bus	Bus managed by bus arbitrator	
1 Mbit/s	1 Mbit/s	
Twisted pair		
Multidrop		
Yes	No	
32		
64 (without repeaters)		128
5 000 m with repeater		15 000 m with repeaters
170NEF16021	**170FNT11000**	**170FNT11001**
51	55	

Modicon Momentum automation platform
Ethernet TCP/IP communication adapters

Presentation

The Model **170ENT11002** and **170ENT11001** Ethernet communication adapters for the Momentum I/O product line provide a direct connection to Ethernet-based networks for the entire family of Momentum I/O modules. This connectivity enables communications with a full range of Ethernet TCP/IP compatible control products that includes programmable controllers, industrial computers, motion controllers, operator control stations, host computers, and other controls. This communication network provides a flexible, cost-effective solution for communicating factory floor information to various layers of an integrated manufacturing facility.

The 100BASE-TX Ethernet communication adapter, the **170ENT11001** (and the 10BASE-T adapter, the **170ENT11002**) are single adapters designed to plug on to any of the Momentum Input/Output module bases, and conform to the requirements of the Ethernet communication network.

The Ethernet IP addressing scheme allows an unlimited number of Momentum I/O modules or connections on the network. Using standard Ethernet hubs, routers, and bridges, the performance and distance capability of the Ethernet network can be tailored to meet the requirements of almost any control application.

The Ethernet communication adapter uses the standard Modbus message structure and control commands over the TCP/IP protocol, which simplifies implementation by control engineers while providing information that can be communicated over standard network media to all enterprise applications.

Since Modbus on TCP/IP over Ethernet is supported by Schneider Electric's Quantum and Premium controller families, Momentum I/O can be added to existing control systems where additional I/O capacity of a distributed I/O sub-network is needed.

The Ethernet communication adapter requires connection to a BOOTP server for setting the module's IP parameters, including its own unique IP address, default gateway, and sub-net mask, all of which is stored in the communication adapter's flash memory. Schneider Electric's automation business offers BOOTP Lite Ethernet software as a free download from the Telemecanique Internet web site www.telemecanique.com.

Description

The **170ENT1100●** Ethernet communication adapters comprises on the front panel:

1 Ethernet RJ45 connector for 100BASE-TX interface for **170ENT11001**) or 10BASE-T interface for **170ENT11002**).
2 Area for Label (label shipped with I/O base).
3 LED Status Indicators comprising for the **170ENT11002**:
- Run (green), module health,
- LAN Active (green), Ethernet network status.

LED Status Indicators comprising for the **170ENT11001**:
- Run (green), module health,
- 10T (green), 10 M bit/s network activity,
- 100T (amber), 100 M bit/s network activity,
- ST (green), Ethernet network status.

Modicon Momentum automation platform
Ethernet TCP/IP communication adapters

Characteristics

Model No			170ENT11002	170ENT11001
Communication network			Ethernet TCP/IP	
Media			Shielded twisted pair cable	
Communication rate		**M bit/s**	10	10/100
Distance		**m (ft.)**	100 (328) per segment	
Connectors			RJ45, 10BASE-T	RJ45, 100BASE-TX
Transparent Ready services	Class		A10	B20
	Standard Web server		–	"Rack Viewer" access to the product description and status and to base unit diagnostics "Data editor" access to the configuration functions and variables
	Standard Ethernet TCP/IP communication services		Modbus Messaging (read/write data words)	
			–	FDR client for automatic assignment of the IP address and network parameters SNMP agent, detection of the product by an SNMP manager
Adapter configuration			BOOTP server to assign IP parameters	
Flash memory			128 K for IP parameter storage	
Error checking			CRC-32 error check	
Error and fail states			Fail safe	
Addressing			Unique IEEE global address, IP address user assigned	
Mode of operation			Master slave, peer-to-peer	
Topology			Multi-drop bus, star	
Packaging			Standard momentum communications adapter enclosure - IP 20 environment	
Indicator lights			Run and activity lights	Run, 10 M bit/s, 100 M bit/s, and status lights
Power source			Power supply on-board the I/O base	
Hot swapping of modules			Yes	
Agency approvals			UL, CE, CSA, FM Class I, Div. II	UL, CE, CSA

References

105139

170ENT11002

Communication adapters

Description	Communication rate Transparent Ready Class *(1)*	Reference	Weight kg
Ethernet TCP/IP communication adapters	10 M bit/s A10	**170ENT11002**	0.070
	10/100 M bit/s B20	**170ENT11001**	0.070

Accessories

ConneXium cabling system	See page 78	–
BOOTP Lite Ethernet Software	Download from www.telemecanique.com	
Ethernet TCP/IP communication adapter user guide	See page 97	–

(1) Transparent Ready Class A10 and B20, for more details, consult our catalog "Transparent Ready, Ethernet TCP/IP and Web technologies"

Modicon Momentum automation platform
Modbus Plus communication adapters

Presentation

Modbus Plus communication adapters for the Momentum I/O product line can be plugged into any Momentum I/O base to create a functional I/O unit on the Modbus Plus bus, and to provide a direct connection to the Modbus Plus Network for the full family of Momentum I/O modules. This connectivity enables communications with all of the Modbus Plus compatible control products - including programmable controllers, industrial computers, operator control stations, drive systems, and other controls - to provide a flexible, cost-effective solution for distributing I/O modules throughout a large area. To expand the capabilities of the Modbus Plus Network for distributed I/O applications, the communication adapters have been designed to permit up to 64 Momentum I/O modules to be connected to the network without the need for signal repeaters.

Each Momentum I/O module is an individual node on the Modbus Plus network with its address user-selected on the dual rotary switch on the front of the communication adapter. The Momentum I/O modules can be configured for the network, and assigned program reference numbers, by using either the Peer Cop function or the MSTR function block instruction in the programmable controller or the Modbus Plus configuration in an industrial computer.

There are four types of communication adapters available:
- **170PNT11020**, Single Port, IEC Data Format
- **170PNT16020**, Redundant Port, IEC Data Format
- **170NEF11021**, Single Port, 984 Data Format
- **170NEF16021**, Redundant Port, 984 Data Format.

IEC Data Format

This version of the Momentum Modbus Plus communication adapter communicates I/O data to the programmable controller in the IEC data format, which has bit numbering 0 through 15, right to left, within the data word (i.e., input or output number 1 is bit number 0).

984 Data Format

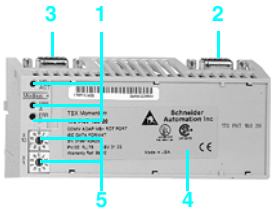
This version of the Momentum Modbus Plus communication adapter communicates I/O data to the programmable controller in the traditional 984 data format, which has bit numbering 1 through 16, left to right, within the register (i.e., input or output number 1 is bit number 1).

Since Modbus Plus is supported by the Quantum and 984 controller families, Momentum I/O can be added to existing control systems where additional I/O capacity or a distributed I/O sub-network is needed, because of requirements for the control system. See page 52 for typical control systems using Momentum I/O modules on the Modbus Plus network with programmable controllers and industrial computer systems.

Modicon Momentum automation platform

Modbus Plus communication adapters

Description



Each 170 PNT/NEF communication module comprises:

1 Three indicator lights (LEDs):
- MB + ACT indicator light (green): module powered up or communicating.
- ERR A indicator light (red): communication error network A.
- ERR B indicator light (red): communication error network B. (for redundant model).

2 A 9-way male SUB-D connector for connecting to the Modbus Plus network.

3 A 9-way male SUB-D connector for a redundant Modbus Plus network.

4 A slot for an identification label (supplied with all I/O sub-bases).

5 Two switches for coding the slave address on the bus.

Characteristics

Type of module		170PNT11020	170PNT16020	170NEF11021	170NEF16021
Communication network		Modbus Plus			
Master PLC on the network		Quantum, Premium	Quantum	Quantum, Compact 984	
Structure	Type	Industrial			
	Redundancy	No	Yes	No	Yes
	Topology	Multi-drop, devices connected using extension cable or tap-off cable			
	Length	5,000 m (6000 ft.) maximum with repeaters			
	Access method	Token bus			
Transmission	Bit rate	1 M bit/s			
	Medium	Twisted pairs			
Data Format		IEC Data Format		984 Data Format	
Number of Momentum devices	Per segment	31 connection points			
	Maximum	63 for all segments			
Power source		Power supply on-board the I/O base			
Behavior in the event of a communication error		Discrete I/O: forcing to state 0 Analogue I/O: configurable (maintain value, fallback to 0 or full scale value)			
Services		Configuration: Peer cop and MSTR function block, “peer-to-peer” mode			
Agency approvals		UL, CE, CSA, FM Class I, Div. II		UL, CE, CSA	

Référence:
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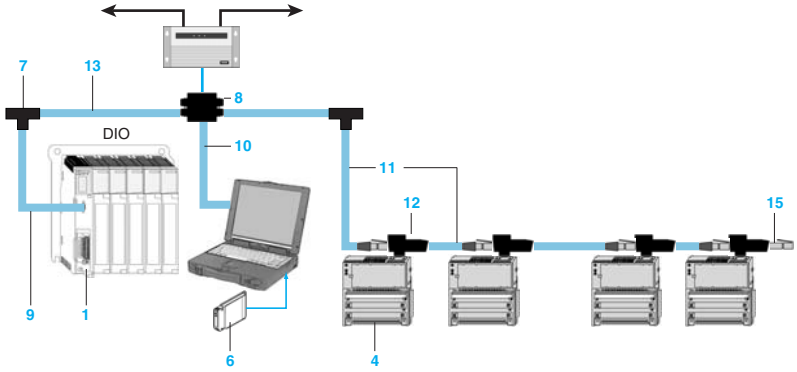
Modicon Momentum automation platform

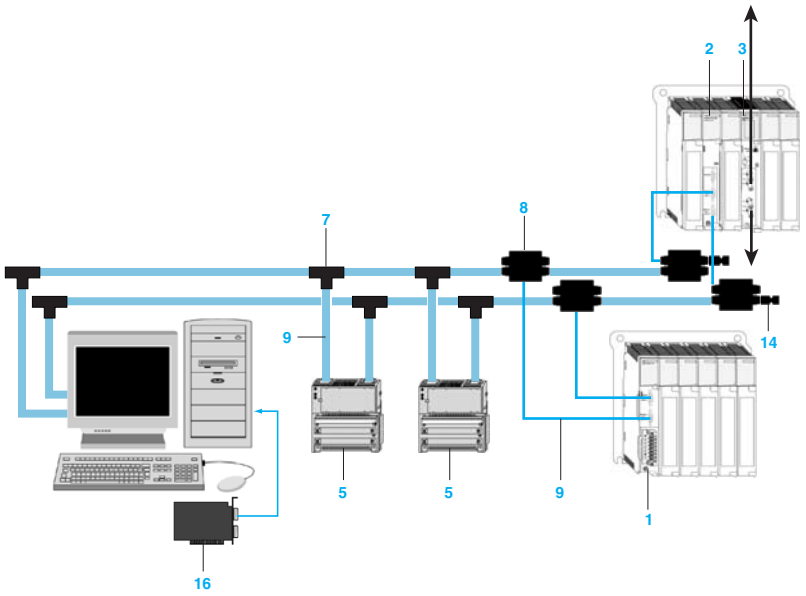
Modbus Plus communication adapters

Network topology

Momentum I/O modules in a distributed control system



Momentum I/O modules with Modbus Plus double cable in a distributed and redundant control system



1 **140CRA21110**: Quantum Modbus Plus drop interface and power supply, single-cable support, 115/230 VAC.
2 **140NOM21200**: Quantum Modbus Plus head-end interface, redundant support, twisted pair cable.
3 **140NOM25200**: Quantum Modbus Plus Head-end Interface, single-cable support, fiber optic cable.
4 **170PNT11020** or **170NEF11021**: Momentum Modbus Plus communication adapter, non-redundant network.
5 **170PNT16020** or **170NEF16021**: Momentum Modbus Plus communication adapter, redundant network.
6 **416NHM21233**: Modbus Plus type III PCMCIA Card, single port;
Or **416NHM21234**: Modbus Plus type III PCMCIA Card, single port, “plug and play”.
7 **990NAD23000**: Modbus Plus tap, IP 20.
8 **990NAD23010**: Modbus Plus tap, IP 65.
9 **990NAD21110 / 30**: Modbus Plus drop cable (lengths: 2 or 4 or 6 m).
10 **990NAD21510**: Modbus Plus ruggedized tap programming Cable, 3.05 m.
11 **170MCI 020 / 021●●**: Modbus Plus RJ45 cable (lengths: 0.25, 1, 3 or 10 m).
12 **170XTS02000**: Modbus Plus “T” connector (DB9 base).
13 **490NAA2710●**: Sandard Modbus cable (lengths: 30, 150, 300, 450 or 1500 m).
14 **990NAD23011**: Modbus Plus ruggedized tap terminators.
15 **170XTS02100**: Modbus Plus RJ45 terminator.
16 **416NHM30032**: Modbus Plus PCI PC adapter Card, dual ports.

Characteristics: page 51
References: page 53

Modicon Momentum automation platform
Modbus Plus communication adapters


170PNT11020 / NEF11021


170PNT16020 / NEF16021


ASMBKT085

References

Description	Connection	Item (1)	Bus master PLC	Reference	Weight kg
Communication adapters for Momentum I/O sub-bases	Non-redundant Modbus Plus network	4	Premium, Quantum	**170PNT11020**	–
			Compact 984	**170NEF11021**	–
	Redundant Modbus Plus network	5	Quantum	**170PNT16020**	–
			Compact 984	**170NEF16021**	–

Description	Use	Mounting on	Item (1)	Reference	Weight kg
Modbus Plus taps	IP 20 junction box for tap-off connection “T”	–	7	**990NAD23000**	0.230
	IP 20 junction box for tap-off connection “T”, connection of cable on screw terminal block with one RJ45 connector in front	DIN profile	–	**990NAD23020**	–
		Panel	–	**990NAD23021**	–
	Modbus Plus Tap (IP 20), standard Modbus cable with one RJ45 connector in front	Panel	8	**990NAD23010**	0.650
	IP 20 “T” with 2 RJ45 connectors for Modbus cable and one 9-way SUB-D connector for tap link devices	–	12	**170XTS02000**	0.260
Terminator connector kit (set of 2)	2 impedance adaptors for box (IP 20) 990 NAD 230 20/21	–	1	**990NAD23022**	–
	2 impedance adaptors for box (IP 20) 990 NAD 230 10	–	14	**990NAD23011**	–
	2 impedance adaptors for tee (IP 20) 170 XTS 020 00	–	15	**170XTS02100**	–

Connection cables

Description	Use		Item (1)	Length	Reference	Weight kg
	From	To				
Standard Modbus Plus cables	T-junction box 990 NAD 230 00, 990 NAD 230 11	T-junction box 990 NAD 230 00, 990 NAD 230 11	13	30 m	**490NAA27101**	–
				150 m	**490NAA27102**	–
				300 m	**490NAA27103**	–
				450 m	**490NAA27104**	–
				1500 m	**490NAA27106**	–
Modbus Plus cable for RJ45	“T” 170 XTS 020 00	“T” 170 XTS 020 00	11	0.25 m	**170MCI02110**	–
				1 m	**170MCI02136**	–
				3 m	**170MCI02120**	–
				10 m	**170MCI02180**	–
Modbus Plus Drop cables	Communication modules for Momentum I/O sub-bases 170 PNT/NEF	T- junction box 990 NAD 230 00/10	9	2.4 m	**990NAD21110**	–
				6 m	**990NAD21130**	–

Description	Use		Length	Reference	Weight kg
	From junction box	To equipment, cable outlet of 9-way SUB-D type connectors			
Modbus Plus Drop Cable	Flying leads	Left side	2.4 m	**990NAD21810**	–
			6 m	**990NAD21830**	–
		Right side	2.4 m	**990NAD21910**	–
			6 m	**990NAD21930**	–

Connecting accessories

Description	Use for	Reference	Weight kg
RJ45 Crimp tool	Crimping the RJ connectors	**490NAB00010**	–
9-way female SUB-D connector	Communication module connection	**ASMBKT085**	–
Wiring tool	Fitting trunk cables and drop cables in local site tap	**043509383**	–
Other connection accessories		See page 77	

(1) Item, see page 52.

Characteristics:
page 51

Modicon Momentum automation platform
Fipio communication adapters

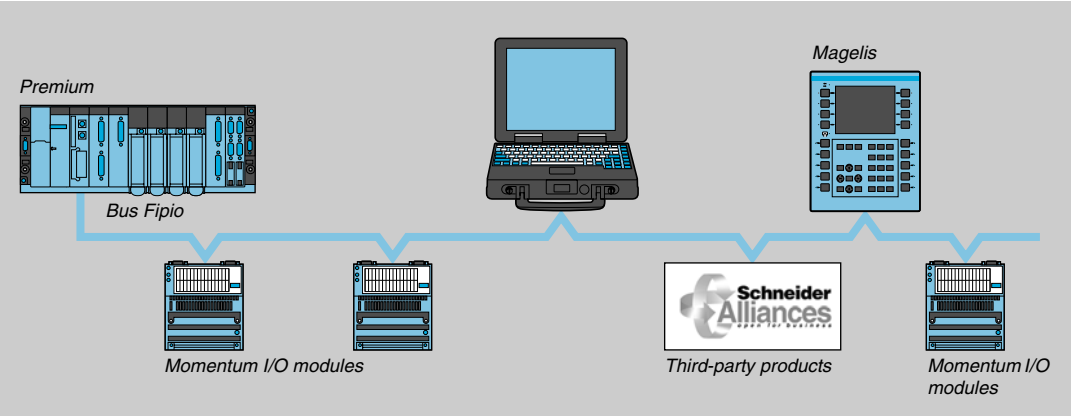
Presentation

The Fipio communication adapter can be plugged into a Momentum I/O base to create a functional I/O unit on the Fipio bus, and to provide a direct connection to the Fipio Network for the full family of Momentum I/O modules. This connectivity enables the Momentum I/O to be used along with other Fipio compatible control devices, including industrial computers, operator control stations, drive systems, and other controls, to provide a flexible, time-critical, cost-effective solution for distributing I/O modules throughout a large area.

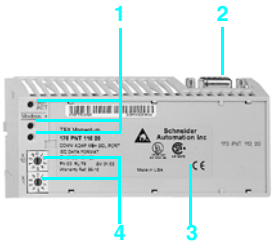
There are two types of communication adapters available:
- **170FNT11001** *(1)* for a Fipio bus connected to a Premium PLC.
- **170FNT11000** for a Fipio bus connected to TSX 7 series CPUs or APRIL 5030 and 5130 CPUs.

Each Momentum I/O module is an individual node or device on the Fipio network with its address set by the user on the dual rotary switch on the front of the communication adapter. Fipio is a network that can have up to 128 slave devices. The Fipio network's distance and communication capabilities range from 1000 meters (3330 ft.) to 15000 meters (45000 ft.) with repeaters over twisted pair cable at a data rate of 1 M bit/s.

(1) The Fipio communication adapter **170FNT11001** *does not support the* **170ADM54080** *I/O base.*



Description



The **170FNT1100●** communication module comprises:
1 Three indicator lights (LEDs):
  - Ready indicator light (green): module powered up or in service.
  - COM indicator light (yellow): data being sent or received.
  - ERR indicator light (red): faulty device.
2 A 9-way male SUB-D connector for connecting to the Fipio bus
3 A slot for an identification label (supplied with all I/O sub-bases).
4 Two switches for coding the slave address on the bus.

Modicon Momentum automation platform
Fipio communication adapters

Characteristics

Type of module		170FNT11001	170FNT11000
Communication bus		Fipio	
Bus manager PLC		Premium	TSX Series 7, model 40 or April 5000
Structure	Type	Open industrial, conforming to the WorldFip standard	
	Topology	Devices connected using extension cable or tap-off cable	
	Length meters	1,000 to 5,000 depending on the medium used	
	Access method	Producer/consumer principle, managed by a bus arbiter	
Transmission	Bit rate	1 M bit/s	
	Media	Shielded twisted pair cable 150 Ω. Fibre optic 62.5/125 or 50/125 with electrical/optical repeaters	
Number of Momentum devices	Per segment	31 connection points (without repeater)	
	Maximum	97 on all segments	61 on all segments
Behavior in the event of a communication error		Discrete I/O: forcing to state 0	
		Analogue I/O: configurable (maintain value, fallback to 0 or full scale value)	
		Other characteristics, consult our catalog Premium automation platform	
Agency approvals		UL, CE, CSA	

References

170FNT11001 / 00

TSXFPACC12

TSXFPACC14

TSXFPACC4

Description	Connection	Bus manager PLC	Reference	Weight kg
Communication adapters for Momentum I/O sub-bases	Fipio field-bus on Momentum I/O sub-bases	Premium	**170FNT11001** *(1)*	0.110
		TSX Series 7, Model 40, April 5000	**170FNT11000**	0.110

Description	Connection	Bus manager PLC	Reference	Weight kg
Female connectors (9-way SUB-D)	On 170 FNT 110 0● communication module	Black poly carbonate IP 20	**TSXFPACC12**	0.040
		Zamac	**TSXFPACC2**	0.080
Bus connection boxes	Main tap-off cable	Black poly carbonate IP 20	**TSXFPACC14**	0.120
		Zamac IP 65	**TSXFPACC4**	0.660
Tap-link cables	8 mm, 2 shielded twisted pair 150 Ω	100 m	**TSXFPCC100**	5.680
		200 m	**TSXFPCC200**	10.920
		500 m	**TSXFPCC500**	30.000
Other connection accessories			Consult our catalog “Premium automation platform”	–
Fipio Communication Adapter User Guide			See page 97	–

(1) Does not support the **170ADM54080** *I/O base.*

Modicon Momentum automation platform

INTERBUS communication adapters

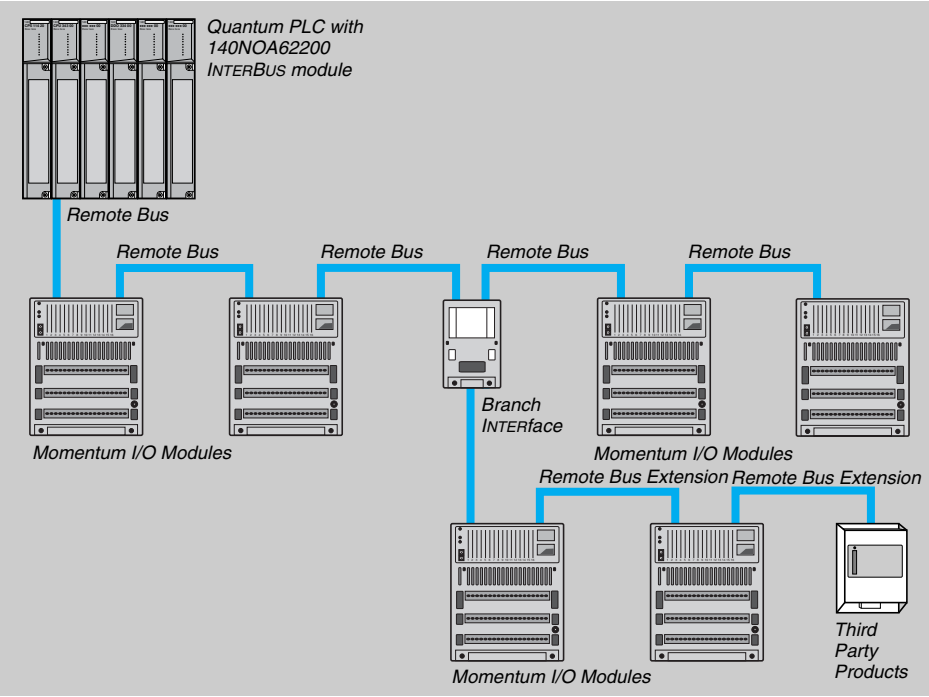
Presentation

The Momentum INTERBUS communication adapter provides a direct connection to the INTERBUS Network for the full family of Momentum I/O modules. This connectivity enables Momentum I/O to be used in open architecture control systems that utilize either a programmable controller or industrial computer as the network master. In these applications, INTERBUS serves as the communication network that connects Momentum I/O modules, along with other INTERBUS compatible control devices, for the communication of input and output information with a single master controller.

There are three types of INTERBUS adapters available:
- **170INT11000**, twisted pair media, SUPI 2.
- **170INT11003**, twisted pair media, SUPI 3, supports G4 diagnostic.
- **170INT12000**, fiber optic media, SUPI 3, supports G4 diagnostic.

The INTERBUS communication adapter is designed to plug on to any of the Momentum Input/Output module bases, thus allowing the I/O module to be accessed over the INTERBUS Communication Network. Each Momentum I/O module is an individual node or device on the INTERBUS network with its address set either by its physical location on the network, or by menu-driven software that is available with some INTERBUS master devices. INTERBUS is a cost-effective method of distributing I/O modules throughout large plant areas. The figure below illustrates a typical control system using Momentum I/O modules on the INTERBUS network, with a Quantum PLC programmable controller as the network master.

Network Topology



Description

The **170INT1100●** INTERBUS communication adapters comprise on the front panel:
1 Two 9-Pin SUB-D connectors for connection to the INTERBUS bus.
2 Area for Label (label shipped with I/O base).
3 LED Status Indicators comprising for 170INT11000 / 11003 only:
- UL (green), logic power check, for 170INT11003 only.
- BA (green), bus enabled.
- RC (green), remote bus check.
- RD (yellow), remote bus disabled.

Modicon Momentum automation platform
INTERBus communication adapters

Characteristics

Model No.		170INT11000	170INT11003	170INT12000
Communication network		INTERBUS, I/O BUS	INTERBUS	
Communication rate	**K bit/s**	500		
Number of nodes (devices)		Up to 254 devices		
Media		Twisted Pair		Fiber Optic
Distance	**m (ft.)**	Up to 12 800 (41 984 ft.), 400 (1312 ft.) between two nodes		
Connectors		2-9 Pin “D” connectors		
Error checking		CRC-16 error check		
Error and fail states		Fail safe		
Addressing		Physical location or software		
Mode of operation		Master-Slave, continuous shift register		
Topology		Ring		
INTERBUS generation		SUPI 2	SUPI 3	
Packaging		Standard Momentum communication adapter enclosure - IP 20 environment		
Indicator lights		Diagnostic and status light standard		
Power source		Power supply on board the I/O base		
Agency approvals		UL, CE, CSA, FM Class I, Div. II		UL, CE, CSA

References

170INT11000 / 11003

170INT12000

Modules

Description	Media	Generation	Reference	Weight kg
INTERBUS communication adapters	Twisted Pair	SUPI 2	**170INT11000**	0.070
		SUPI 3	**170INT11003**	0.070
	Fiber Optic	SUPI 3	**170INT12000**	0.070

Accessories

Description	Length	Reference	Weight kg
Branch INTERface, Twisted Pair, SUPI 3	–	**170BNO67101**	–
INTERBUS Connector Kit, sockets/pins, 9-pin with male and female connectors for remote bus cable	–	**170XTS00900**	–
INTERBUS Cable (with small connectors)	11 cm (0.36 ft.)	**170MCI00700**	–
INTERBUS Cable low-profile connector	100 cm (3.3 ft.)	**170MCI10001**	–
INTERBUS cables	100 m (330 ft.)	**TSXIBSCA100**	–
	400 m (1312 ft.)	**TSXIBSCA400**	–
	By the meter	**KAB3225LI**	–
Momentum front label replacement (set of 10)	–	**170XCP10000**	–
INTERBUS User Guide	–	See page 97	

Modicon Momentum automation platform
Profibus DP communication adapter

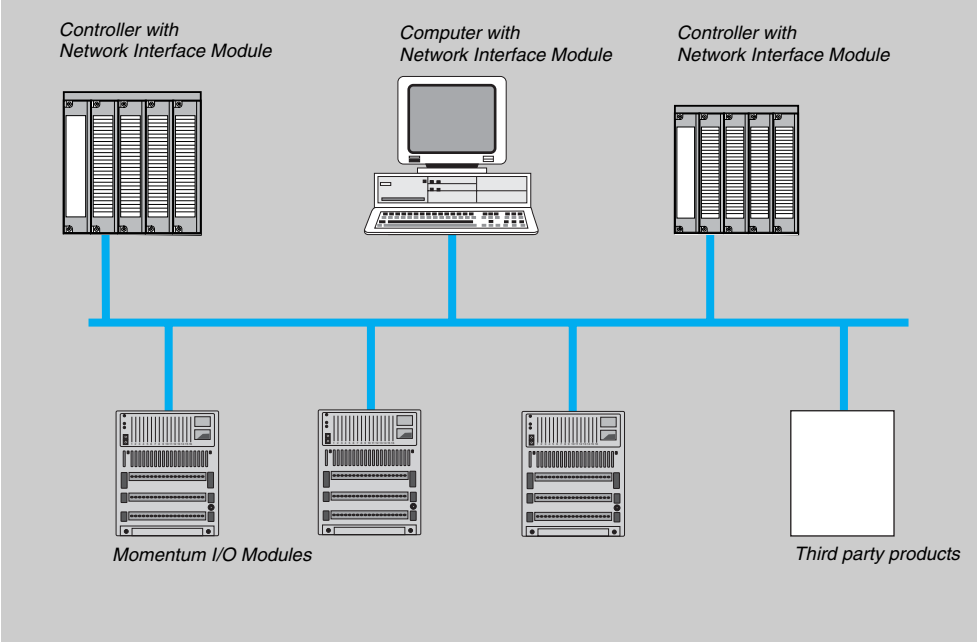
Presentation

The Model **170DNT11000** Profibus DP Communication Adapter for the Momentum I/O product line provides a direct connection to the Profibus DP Communication Network for the full family of Momentum I/O modules. This connectivity enables the Momentum I/O to be used in open architecture control systems with other Profibus DP compatible control products, including programmable controllers, industrial computers, operator control stations, drive systems, and other controls, to provide a flexible, cost-effective solution for distributing I/O modules throughout a large area.

The Profibus DP communication adapter is a single package that is designed to plug on to any of the Momentum Input/Output modules base, thus allowing the I/O module full access to the Profibus DP Communication Network. Each Momentum I/O module is an individual node on the network, with its address user-selected on the dual rotary switch on the front of the communication adapter. The figure below illustrates a typical control system using Momentum I/O modules on the Profibus DP network with programmable controllers and industrial computer systems.

The Profibus Configuration File is required for the configuration of the Momentum I/O Modules on the Profibus DP network. This file contains the Profibus PNO Identnumber for all of the Momentum I/O modules, and is available at no charge to all users as a download over the Internet from the Schneider Electric web page.

Network Topology



Description

The **170DNT11000** Profibus DP Communication Adapter comprises on the front panel:

1 LED Status Indicators comprising: BF (green), bus fault.
2 A 9-Pin SUB-D connector for connection to the Profibus DP Network.
3 Area for Label (label shipped with I/O base).
4 Rotary switches for slave addresses.

Modicon Momentum automation platform
Profibus DP communication adapter

Characteristics

Model No.		170DNT11000
Communication bus		Profibus DP
Communication rate		9.6 K bit/s…12 M bit/s
Number of nodes (devices)		Up to 126 devices (32 without repeater)
Media		Twisted Pair
Distance	**m (ft.)**	Up to 1 200 (4 000)
Connectors		9 Pin “D” connectors
Error checking		CRC-16 error check
Error and fail states		Fail safe
Addressing		Switch selectable
Mode of operation		Master-Slave
Topology		Multi-Drop, Ring
Packaging		Standard Momentum communications adapter enclosure - IP20 environment
Indicator lights		Diagnostic and status light standard
Power source		Power supply on-board the I/O base
Agency approvals		UL, CE, CSA

References

170DNT11000

Module

Description	Reference	Weight kg
Profibus DP Communication Adapter	**170DNT11000**	0.070

Accessories

Description	Length	Reference	Weight kg
Device Master File	–	*(1)*	–
Profibus DP cable	100 m (328 ft.)	**TSXPBSCA100**	–
	400 m (1312 ft.)	**TSXPBSCA400**	–
	By the meter	**KABPROFIB**	–
Profibus DP connector with Terminator	–	**490NAD91103**	–
Profibus DP in-Line Connector	–	**490NAD91104**	–
Profibus DP connector with Programming Port	–	**490NAD91105**	–
Momentum front label replacement (set of 10)	–	**170XTS10000**	–
Profibus DP User Guide		See page 97	–

(1) The Profibus device Master File (381SWA00000) is supplied with the User Guide **870USE0040●**, *or can be downloaded from the Telemecanique website at* www.telemecanique.com.

Modicon Momentum automation platform

DeviceNet communication adapter

Presentation

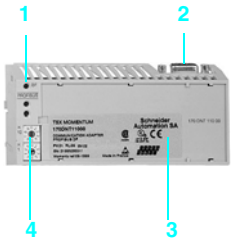
The Model **170LNT71000** DeviceNet Communication Adapter for the Momentum I/O product line provides a direct connection to the DeviceNet Communication Network for the full family of Momentum I/O modules. This connectivity enables the Momentum I/O to be used in open architecture control systems with other DeviceNet compatible control products, including programmable controllers, industrial computers, operator control stations, drive systems, and other controls, to provide a flexible, cost-effective solution for distributing I/O modules throughout a large area.

The DeviceNet communication adapter is a single package that is designed to plug on to any of the Momentum Input/Output module bases, thus allowing the I/O module full access to the DeviceNet Communication Network. Each Momentum I/O module is an individual node on the network with its address user-selected on the dual rotary switch on the front of the communication adapter.

The adapter complies with the Open DeviceNet Vendor Association (ODVA) specification Release 2.0 for network communication protocol and data transfer. Current information about the ODVA specification can be obtained at the ODVA Web site: http://www.odva.org.

Electronic Data Sheet Disk
An Electronic Data Sheet (EDC) disk is included with the DeviceNet Adapter´s user guide (reference **870USE10400**). It supplies the application software parameters for setup of each I/O base. Each file´s format on the disk complies with the ODVA specification for DeviceNet I/O module EDS parameters. Updated EDS files are available for downloading from the Customer Support areas of the Schneider Automation Web Site and Bulletin Board service.

Description



The **170LNT71000** DeviceNet Communication Adapter comprises on the front panel:

1 LED status indicators comprising:
- PWR (green), power is present from I/O base
- MNS (green/red), adapter is communicating on network
- IO (green/red), I/O is active, no faults.

2 DeviceNet connector.
3 Area for label (label shipped with I/O base).
4 Rotary switches for slave addresses.

Modicon Momentum automation platform
DeviceNet communication adapter

Characteristics

Model No.		170LNT71000
ODVA compliance		With ODVA Specification Release 2.0
Communication rates	**K bit/s**	Supports 125/250/500 standard DeviceNet baud rates
Network power loading		Operational from 1 to 25 VDC, 110 mA maximum, 75 mA typical
Number of nodes		Up to 64 nodes
Media		Twisted Pair
Distance	**m (ft.)**	Up to 500 (1640), depending on communication rate
Connectors		5-pin male connector with 5 mm pin-to-pin spacing
Error checking		CRC-16 error check
Error and fail states		Fail safe
Addressing		Switch selectable
Mode of operation		CSMA/CA, master-slave, peer-to-peer
Topology		Multi-Drop Trunk
Packaging		Standard Momentum communication adapter enclosure - IP 20 environment
Indicator lights		Diagnostic and status light standard
Power source		Power supply on board the I/O base
Agency approvals		UL, CE, CSA, FM Class I, Div. II

References

170LNT71000

Module

Description	Reference	Weight kg
DeviceNet Communication Adapter	**170LNT71000**	0.070

Accessories

Description	Quantity	Reference	Weight kg
DeviceNet connector	–	**170XTS06000**	–
Momentum front label replacement	Set of 10	**170XTS10000**	–
DeviceNet communication adapter User Guide	Includes the EDS configuration software	See page 97	–

Modicon Momentum automation platform

M1/M1E processor adapters

Type	M1 processor adapters			
				
RAM memory	64 K bit			256 K bit
Flash memory	256 K bit			
984 LL program memory	2.4 K bit			12 K bit
IEC program memory	–			160 K bit
Data memory	2 K bit			4 K bit
Scan time	1 ms/K	0.63 ms/K	1 ms/K	0.63 ms/K
Clock speed	20 MHz	32 MHz	20 MHz	32 MHz
I/O points	2048			4096
I/O drops	Up to 2048 I/O points with Modbus Plus option adapter			80 with ProWORX 128 with Concept
Power source	Power supply on-board the I/O bases			
Communication ports	1 RS 232 Modbus		1 RS 232 Modbus 1 RS 485 Modbus	1 RS 232 Modbus 1 I/O bus
IEC executive				Compatible
Type of module	**171CCS70000**	**171CCS70010**	**171CCS78000**	**171CCS76000**
Pages	66			

M1 processor adapters		M1E processor adapters			
					
512 K bit		544 K bit			
512 K bit		512 K bit	1 M bit	512 K bit	1 M bit
18 K bit					
240 K bit		–	200 K bit	–	200 K bit
24 K bit					
1 ms/K		0.3 ms/K			
32 MHz		50 MHz			
8192					
Up to 2048 I/O points with Modbus Plus option adapter	80 with ProWORX 128 with Concept	Up to 2048 I/O points with Modbus Plus option adapter		80 with ProWORX 128 with Concept	
Power supply on-board the I/O bases					
1 RS 232 Modbus 1 RS 485 Modbus	1 RS 232 Modbus 1 I/O bus	1 Ethernet (Transparent Ready class B10) 1 RS 485 Modbus		1 Ethernet (Transparent Ready class B10) 1 I/O bus	
Compatible		–	Supplied	–	Supplied
171CCC78010	**171CCC76010**	**171CCC98020**	**171CCC98030**	**171CCC96020**	**171CCC96030**
67		68	69	68	69

Modicon Momentum automation platform
M1/M1E processor adapters

Presentation

The Momentum M1/M1E processor adapters are based on the Modicon 984 family of products. You can mount these Adapters on Momentum I/O Bases to provide intelligence to the I/O. The processor adapter can quickly and independently solve logic, control its own local I/O (discrete or analog), and communicate to other control entities through one of a number of Momentum communication options. The processor adapter can turn an ordinary I/O Base into a PID controller or high-speed logic solver.

You can create your own controller from a number of different bases, and with other Momentum options, network your local logic solvers together into an intelligent subsystem as part of a larger Modicon application, or into a standalone, integrally networked system with local controllers with extended I/O. A controller can be added to the different bases and combined with other Momentum options, which can then be networked together in an intelligent subsystem as part of a larger Modicon application. The Momentum I/O Base can be made a standalone, integrally networked system using local controllers with extended I/O.

The Momentum M1/M1E processor adapters are meant to stand alone, be mounted on a single Momentum I/O Base (with its own extended Momentum I/O connected to the I/O Bus Port on 171CCS76000 processor adapter), or be mounted together with one of a variety of Momentum Option Adapters, providing different network capabilities, a time-of-day clock, and a battery back-up system. The built-in flash memory is used to store the executive, allowing for convenient field upgrades of the operating system. The flash memory can also be used to back up your applications, creating a local copy of your program to be loaded back into RAM, thus providing original program file integrity. On 171CCS78000 processor adapter, the RS 485 port can be used to connect to dedicated devices such as an operator interface panel or a marquee, or used in a master/slave RS 485 network to connect to multiple devices.

The processor adapters can be programmed with Modsoft version 2.5 or greater, Concept version 2.1 or greater, ProWORX NxT version 2.0 or greater or ProWORX 32.

The following table describes the characteristics of the Momentum M1/M1E processor adapters.

Characteristics

Processor Adapter	RAM Memory	Flash Memory	Scan Time	Modbus Port	I/O Bus Port	IEC Executive
171CCS70000	64 K	256 K	1 ms/K	1 x RS 232C	–	–
171CCS70010	64 K	256 K	0.63 ms/K	1 x RS 232C	–	–
171CCS76000	256 K	256 K	0.63 ms/K	1 x RS 232C	1 x I/O Bus	Compatible
171CCS78000	64 K	256 K	1 ms/K	1 x RS 232C 1 x RS 485	–	–
171CCC76010	512 K	512 K	1 ms/K	1 x RS 232C	1 x I/O Bus	Compatible
171CCC78010	512 K	512 K	1 ms/K	1 x RS 232C 1 x RS 485	–	Compatible
171CCC96020	544 K	512 K	.3 ms/K	1 x Ethernet	1 x I/O Bus	–
171CCC96030	544 K	1 Mb	.3 ms/K	1 x Ethernet	1 x I/O Bus	Supplied
171CCC98020	544 K	512 K	.3 ms/K	1 x RS 485 1 x Ethernet	–	–
171CCC98030	544 K	1 Mb	.3 ms/K	1 x RS 485 1 x Ethernet	–	Supplied

Programming Software for Momentum

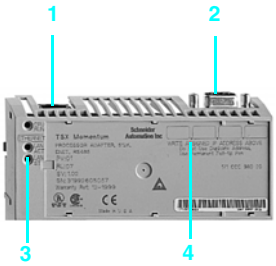
Momentum processor adapters have a number of PC programming software options available. You can program your processor Adapter via the Modbus RS 232 serial port, or with an M1E processor via Ethernet network.

If using a Modbus Plus Option Adapter in conjunction with a Processor Adapter, you can program via an SA85 card installed in a PC and connected to the same Modbus Plus network.

For more specific information, see the appropriate Momentum, ProWORX or Concept programming software literature and documentation.

Characteristics: pages 66 to 69
References: page 70

Modicon Momentum automation platform
M1/M1E processor adapters



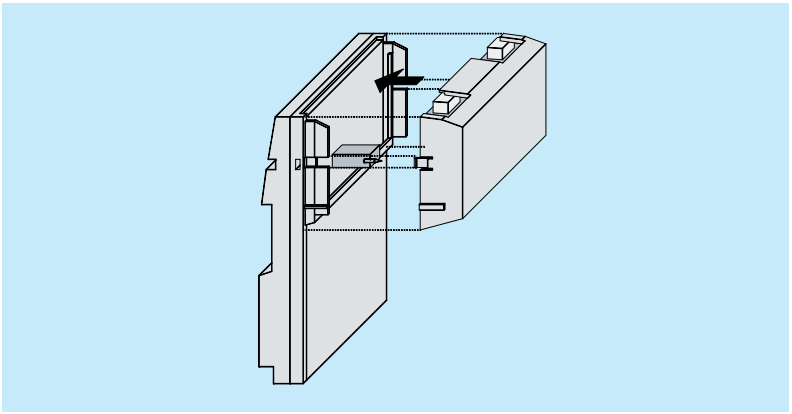
Description

A typical Momentum M1/M1E Processor Adapter consists of the following components:

1 Modbus or Ethernet Port connector.
2 Optional second port (Modbus or I/O bus).
3 LED indicators.
4 Fill-in Label.

Mounting

A typical system, showing a model 171CCS76000 Momentum M1 processor adapter mounted on top of a Momentum I/O Base. The processor adapter controls the I/O it is mounted on, the local I/O, and can control externally configured I/O. You can also use a Modbus Plus Option Adapter with the processor adapter to extend the system's I/O capacity.



Characteristics:
pages 66 to 69

References:
page 70

Modicon Momentum automation platform
M1/M1E processor adapters

Environment

Type of processor			171CCS70000	171CCS70010	171CCS78000	171CCS76000
Temperature	Operating	**°C**	0 to 60			
	Storage	**°C**	- 40 to 85			
Relative humidity			5 to 96% (non-condensing)			
Altitude		**m**	2000 (6,500 ft.)			
Mechanical withstand (immunity)	To vibrations		57 to 150 Hz @ 1 gn 10 to 57 Hz @ 0.075 mm d.a			
	To shocks		± 15 gn peak, 11 ms, half sine wave			
Designed to meet			UL, e, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP 20 conforming to IEC529			

Characteristics

Central processing unit (CPU)			x 86 based			
Word length		**bit**	16			
Material			Lexan			
Voltage		**VDC**	5.0 V (supplied by I/O Base)			
Voltage tolerance			± 5% (as supplied by I/O Base)			
RFI immunity/EMI susceptibility/Electrostatic discharge			Meets e mark for open equipment. Open equipment should be installed in an industry standard enclosure, with access restricted to qualified service personnel			
Di-electric strength			RS 232 is non-isolated from logic common			
Indicator lights			Run and communication active			
Power source			Power supply on-board the Momentum I/O Base			
Clock speed		**MHz**	20	32	20	32
Scan time		**ms/K**	1	0.63	1	0.63
Communication ports	1		Dedicated RS 232C Modbus			
	2		N/A		Dedicated RS 485 Modbus	I/O Bus (derivative of INTERBUS
Capacity	984 LL program memory	**K**	2.4			12
	IEC program memory	**K**	–			160
	Data memory	**K**	2			4
	Discrete I/O		2048 In/2048 Out (A total of 2048 words can be configured for discrete analog I/O, any mix up to the stated limits.)			2048 In/2048 Out
	Register I/O		2048 In/2048 Out (A total of 2048 words can be configured for discrete and analog I/O, any mix up to the stated limits.)			4096 words total
	I/O limit		–		- I/O local on Modbus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)	8192 bits max.: - 4096 In/4096 Out on I/O Bus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)
I/O bus addressing			–			80 I/O drops with ProWORX 128 I/O drops with Concept

References:
page 70

Modicon Momentum automation platform
M1/M1E processor adapters

Environment

Type of processor			171CCC76010	171CCC78010
Temperature	Operating	**°C**	0 to 60	
	Storage	**°C**	- 40 to 85	
Relative humidity			5 to 96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	To vibrations		57 to 150 Hz @ 1 gn 10 to 57 Hz @ 0.075 mm d.a	
	To shocks		± 15 gn peak, 11 ms, half sine wave	
Designed to meet			UL, e, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP 20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based	
Word length		**bit**	16	
Material			Lexan	
Voltage		**VDC**	5.0 V (supplied by I/O Base)	
Voltage tolerance			± 5% (as supplied by I/O Base)	
RFI immunity/EMI susceptibility/Electrostatic discharge			Meets e mark for open equipment. Open equipment should be installed in an industry standard enclosure, with access restricted to qualified service personnel	
Di-electric strength			RS 232 is non-isolated from logic common	
Indicator lights			Run and communication active	
Power source			Power supply on-board the Momentum I/O Base	
Clock speed		**MHz**	32	
Scan time		**ms/K**	1	
Communication ports	1		Dedicated RS 232C Modbus	
	2		I/O Bus (derivative of INTERBUS)	Dedicated RS 485 Modbus
Capacity	984 LL program memory	**K**	18	
	IEC program memory	**K**	240	
	Data memory	**K**	24	
	Discrete I/O		8192 In/8192 Out (A total of 8192 bits can be configured for discrete and analog I/O, any mix up to the stated limits)	
	Register I/O		26048 In/26048 Out (A total of 26048 words can be configured for discrete and analog I/O, any mix up to the stated limits)	
	I/O limit		8192 bits max.: - 4096 In/4096 Out on I/O Bus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)	- I/O local on Modbus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)
I/O bus addressing			80 I/O drops with ProWORX 128 I/O drops with Concept	–

References:
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Modicon Momentum automation platform
M1/M1E processor adapters

Environment

Type of processor			171CCC96020	171CCC98020
Temperature	Operating	**°C**	0 to 60	
	Storage	**°C**	- 40 to 85	
Relative humidity			5 to 96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	To vibrations		57 to 150 Hz @ 1 gn 10 to 57 Hz @ 0.075 mm d.a	
	To shocks		± 15 gn peak, 11 ms, half sine wave	
Designed to meet			UL, e, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP 20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based	
Word length		**bit**	16	
Material			Lexan	
Voltage		**VDC**	5.0 V (supplied by I/O Base)	
Voltage tolerance			± 5% (as supplied by I/O Base)	
RFI immunity/EMI susceptibility/Electrostatic discharge			Meets e mark for open equipment. Open equipment should be installed in an industry standard enclosure, with access restricted to qualified service personnel	
Di-electric strength			Communication port is non-isolated from logic common	
Indicator lights			RUN, Ethernet LAN active and LAN status	
Power source			Power supply on-board the Momentum I/O Base	
Flash memory		**K**	512	
Clock speed		**MHz**	50	
Scan time		**ms/K**	3	
Communication ports	1		Ethernet	
	2		I/O Bus (derivative of InterBus)	Dedicated RS 485 Modbus
Capacity	984 LL program memory	**K**	18	
	IEC program memory	**K**	–	
	Data memory	**K**	24	
	Discrete I/O		8192 In/8192 Out (A total of 8192 bits can be configured for discrete and analog I/O, any mix up to the stated limits)	
	Register I/O		26048 In/26048 Out (A total of 26048 words can be configured for discrete and analog I/O, any mix up to the stated limits)	
	I/O limit		8192 bits max.: - 4096 In/4096 Out on I/O Bus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)	- I/O local on Modbus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)
Transparent Ready services	Class		B10	
	Web services		"Rack Viewer" access to the product description and status, and to the island diagnostics "Data editor" access to the configuration functions and variables "Web page loader" software tool for loading user Web pages	
	Ethernet TCP/IP communication management services		Modbus Messaging (read/write data words) I/O Scanning	
I/O bus addressing			80 I/O drops with ProWORX 128 I/O drops with Concept	–

References:
page 70

Modicon Momentum automation platform
M1/M1E processor adapters

Environment

Type of processor			171CCC96030	171CCC98030
Temperature	Operating	**°C**	0 to 60	
	Storage	**°C**	- 40 to 85	
Relative humidity			5 to 96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	To vibrations		57 to 150 Hz @ 1 gn 10 to 57 Hz @ 0.075 mm d.a	
	To shocks		± 15 gn peak, 11 ms, half sine wave	
Designed to meet			UL, e, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP 20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based IEC Executive	
Word length		**bit**	16	
Material			Lexan	
Voltage		**VDC**	5.0 V (supplied by I/O Base)	
Voltage tolerance			± 5% (as supplied by I/O Base)	
RFI immunity/EMI susceptibility/Electrostatic discharge			Meets e mark for open equipment. Open equipment should be installed in an industry standard enclosure, with access restricted to qualified service personnel	
Di-electric strength			RUN, Ethernet LAN active and LAN status	
Indicator lights			Diagnostic and status lights, standard	
Power source			Power supply on-board the Momentum I/O Base	
Flash memory		**Mb**	1	
Clock speed		**MHz**	50	
Scan time		**ms/K**	3	
Communication ports	1		Ethernet	
	2		I/O Bus (derivative of InterBus)	Dedicated RS 485 Modbus
Capacity	984 LL program memory	**K**	18	
	IEC program memory	**K**	200	
	Data memory	**K**	24	
	Discrete I/O		8192 In/8192 Out (A total of 8192 bits can be configured for discrete and analog I/O, any mix up to the stated limits)	
	Register I/O		26048 In/26048 Out (A total of 26048 words can be configured for discrete and analog I/O, any mix up to the stated limits)	
	I/O limit		8192 bits max: - 4096 In/4096 Out on I/O Bus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)	- I/O local on Modbus - I/O can be extended using a Modbus Plus option Adapter and Peer Cop (2048 In/Out)
Transparent Ready services	Class		B10	
	Web services		"Rack Viewer" access to the product description and status, and to the island diagnostics "Data editor" access to the configuration functions and variables "Web page loader" software tool for loading user Web pages	
	Ethernet TCP/IP communication management services		Modbus Messaging (read/write data words) I/O Scanning	
I/O bus addressing			80 I/O drops with ProWORX 128 I/O drops with Concept	–

References:
page 70

Modicon Momentum automation platform
M1/M1E processor adapters

171CCS7●0●0

171CCC7●010

171CCC9●020 / 30

M1/M1E processor adapters

RAM Memory	Communication Port(s)	Clock Speed	Reference	Weight kg (oz.)
64 K	1 Modbus	20 MHz	**171CCS70000**	0.042(1.5)
	1 Modbus	32 MHz	**171CCS70010**	0.042(1.5)
	2 Modbus	20 MHz	**171CCS78000**	0.042(1.5)
256 K	1 Modbus, 1 I/O Bus	32 MHz	**171CCS76000**	0.042(1.5)
512 K	1 Modbus, 1 I/O Bus	32 MHz	**171CCC76010**	0.042(1.5)
	2 Modbus	32 MHz	**171CCC78010**	0.042(1.5)
544 K (1)	1 Modbus, 1 Ethernet	50 MHz	**171CCC98020**	0.042(1.5)
	1 Ethernet, 1 I/O Bus	50 MHz	**171CCC96020**	0.042(1.5)
544 K, IEC Exec (1)	1 Modbus, 1 Ethernet	50 MHz	**171CCC98030**	0.042(1.5)
	1 Ethernet, 1 I/O Bus	50 MHz	**171CCC96030**	0.042(1.5)

Connection accessories and documentation

Description	Type	Sold in lot of	Reference	Weight kg (oz.)
RS 232 communication cable RJ45 to RJ45	1 m (3 ft.)	–	**110XCA28201**	–
	3 m (10 ft.)	–	**110XCA28202**	–
	6 m (20 ft.)	–	**110XCA28203**	–
RS 485 cable connector T for RJ45	–	–	**170XTS04000**	–
RS 485 terminating (RJ45 resistor plugs)	–	2	**170XTS02100**	–
D-shell adapters	RJ45 to 9-pin (for AT serial port)	–	**110XCA20300**	–
	RJ45 to 25-pin (for XT serial port)	–	**110XCA20400**	–
Ground clamp	–	–	**424244739**	–
ConneXium cabling system	Ethernet cabling for M1E processor adapters	–	See page 78	–
Concept software	–	–	See page 88	–
ProWORX software	–	–	See page 93	–
Processor adapters user guide	–	–	See page 97	–

(1) Transparent Ready Class B10 (embedded standard Web server - standard Ethernet TCP/IP communication services). For more details, consult our catalog "Transparent Ready, Ethernet TCP/IP and Web technologies".

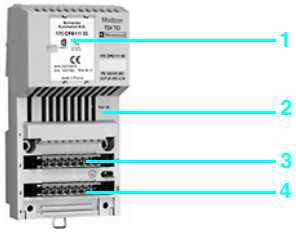
Presentation: page 64 | Description: page 65 | Characteristics: pages 66 to 69

Modicon Momentum automation platform

M1 processor adapters

Power supply

An optional power supply, the **170CPS11100**, is available for the Momentum product family. Normally, power for controller, option, and communication modules is obtained from the power supply built into the I/O bases modules. However, the **170CPS11100** provides a power solution for applications requiring conversion from 230 or 120 VAC to 24 VDC. The supply mounts alongside the other Momentum components on the DIN rail. The jumper-selectable, 230/120 VAC. power is input to the power supply with the use of a spring- or screw-type terminal strip; the 24 VDC power is output to the system in the same manner.



Description

A power supply consists of the following components:

1 Fill-in identifying label.
2 LED status display.
3 Input voltage (AC) terminal strip connector mounting slot.
4 Output voltage (DC) terminal strip connector mounting slot.

Characteristics

Model			170CPS11100
Input voltage		**VAC**	120 or 230 (jumper selectable)
Output voltage		**VDC**	24
Maximum output		**A**	0.7
External fuses	120 VAC input voltage	**A**	0.63, time lag
	230 VAC input voltage	**A**	0.315, time lag

References

170CPS11100

Designation	Description	Reference	Weight kg (oz.)
Power supply	120 VAC or 230 VAC	**170CPS11100**	0.284 (10)
Terminal strips (set of 3)	With spring terminals	**170XTS01200**	–
	With screw terminals	**170XTS01100**	–

Modicon Momentum automation platform
Option adapters

Configuration	Modbus Plus option adapters	
		
Communication network	Modbus Plus	
Communication port(s)	1 Modbus Plus	2 redundant Modbus Plus
Communication port connector	9-pin D-shell	
Time-of-day clock	On-board, ± 13 sec./day accuracy	
Back-up battery	User-replaceable 2/3 AA Lithium	
Voltage	5 VDC supplied by I/O base	
Operating temperature	0 to 60°C	
Humidity	5 to 95%, relative non condensing	
Shock	± 15 g peak, 11 ms, half-sine wave	
Vibration	10 to 57 Hz @ 0,075 mm d.a.	
Type of module	172PNN21022	172PNN26022
Page	76	

Serial option adapter

General-purpose serial communications

1 software-selectable RS 232/RS 485 serial port

9-pin D-shell

On-board, ± 13 sec./day accuracy

User-replaceable 2/3 AA Lithium

5 VDC supplied by I/O base

0 to 60°C

5 to 95%, relative non condensing

± 15 g peak, 11 ms, half-sine wave

10 to 57 Hz @ 0,075 mm d.a.

172JNN21032

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Modicon Momentum automation platform
Option adapters

Presentation

The Momentum option adapters, mounted on Momentum I/O bases, can be used to enhance the capabilities of the Momentum processor adapters that mount on top of the option adapter, to fulfill a variety of roles. The option adapters allow you to network your local logic solvers together into an intelligent subsystem as part of a larger Schneider Electric application, or into a standalone, integrally networked system with local controllers with extended I/O.

The Momentum option adapters are:
- **172PNN21022** - one Modbus Plus communication port,
- **172PNN26022** - two redundant Modbus Plus communication ports,
- **172JNN21032** - one general-purpose serial communication port, RS 232 or RS 485 selectable.

Each of these option adapters provides an on-board, TOD *(Time-Of-Day)* clock that is available to the application residing in the processor adapter. The clock is useful for the scheduling of events, time-stamping operations and operator interface requirements. In addition, each option adapter contains a battery-backup system that maintains the application and its variables in the event of a power outage to the processor adapter. The option adapter's convenient side-door access allows for quick replacement of the single 2/3 AA Lithium battery.

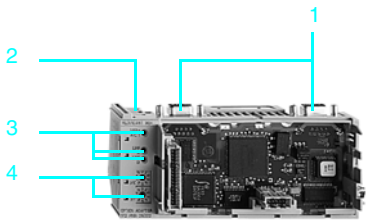
In addition to the TOD clock and battery backup features, the **172PNN21022** adapter allows you to add networking to the intelligent I/O base. Model **172PNN26022** allows you to add redundantly-cabled networking to the I/O base. This opens the Momentum product line to a broad spectrum of applications. You can use the port to connect to other processors, such as:
- Other Momentum processor/option adapters
- Other PLCs enabled with Modbus Plus
- Momentum Modbus Plus communication adapters and I/O bases
- Other third party devices using Modbus Plus to communicate.

Model **172JNN21032** allows you to add a second, defacto-industry standard Modbus port (selectable RS 232/485) to the I/O base. You can use the port to connect to other processors, such as other Momentum processor/option adapters, and other devices, such as operator interface panels and display marquees.

Programming software for Momentum

Momentum processor adapters have a number of PC programming software options available. You can program your processor adapter via the Modbus RS 232 serial port, or if using a Modbus Plus option adapter in conjunction with a processor adapter, via an SA85 card installed in a PC and connected to the same Modbus Plus network. For more specific information, see the appropriate Momentum, ProWORX, and Concept programming software documentation.

Modicon Momentum automation platform
Option adapters



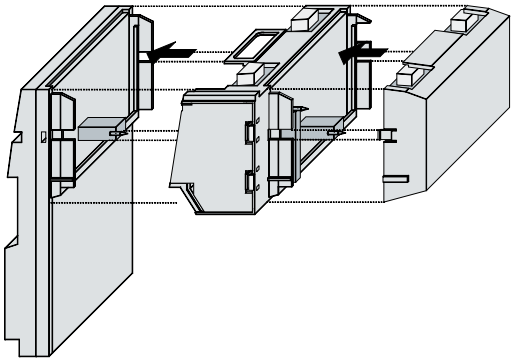
Description

A typical Momentum option adapter consists of the following components:

1 9-pin D-shell connector(s) for Modbus Plus communications.
2 Battery compartment.
3 LED indicators.
4 Address switches for Modbus Plus.

Mounting

The Momentum option adapters provide the processor adapters with additional networking capabilities, a time-of-day clock, and a battery back-up. The option adapters also snap onto the I/O base; in this figure, the processor adapter stacks on top. Here, the option adapter is used in conjunction with the processor adapter to extend the system's I/O capacity.

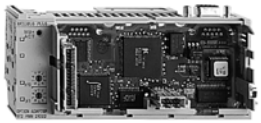


Modicon Momentum automation platform
Option adapters

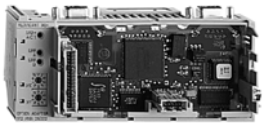
Characteristics

Model No			172PNN21022	172PNN26022	172JNN21032
Time-of-day clock			On-board, ± 13 s/day accuracy		
Battery	Type		User-replaceable 2/3 AA Lithium		
	Service life		< 30 days from the time a battery-low indication is received, to actual battery failure @ 40 °C maximum service life ambient temperature with the system continuously powered down		
	Shelf life		In excess of 5 years at room temperature		
Communication port(s)			One Modbus Plus port Drop address range 1 to 64	Two redundant Modbus Plus ports	General-purpose serial port RS 232 or RS 485 selectable
Communication port connector(s)			9-pin D-shell		
Operating temperature		**°C**	0 to 60		
Storage temperature		**°C**	- 40 to 85		
Relative humidity			5 to 95% (non-condensing)		
Attitude		**m (ft.)**	2000 (6.562)		
Shock			± 15 gn peak, 11ms, half sine wave		
Vibration		**Hz**	57 to 150 @ 1 gn 10 to 57 @ 0.075 mm d.a.		
Height		**in (mm)**	1.01 (25.) [2.10 (58.3) on battery side]		
Width		**in (mm)**	5.57 (143.1)		
Depth		**in (mm)**	2.36 (60.06)		
Weight		**oz. (g)**	3.00 (85.05)		
Material			Lexan		
Voltage		**VDC**	5.0 (supplied by I/O base)		
Voltage tolerance			± 5% (as supplied by I/O base)		
RFI immunity/EMI susceptibility/Electrostatic discharge			Meets CE mark for open equipment. Open equipment should be installed in an industry standard enclosure, with access restricted to qualified service personnel		
Di-electric strength		**VDC**	500		
Designed to meet			UL, CE, CSA, NEMA 250 Type 1, and IP 20 conforming to IE 529		UL, CSA, NEMA 250 Type 1, and IP 20 conforming to IE 529, FM Class I, Div. II
Packaging			Standard Momentum option adaptor		
Indicator lights			Communication active light		
Power source			Power supply on-board the Momentum I/O base		

Modicon Momentum automation platform
Option adapters



172PNN21022



172PNN26022

172JNN21032

Option adapter modules

Description	Reference	Weight kg (oz.)
Modbus Plus option adapter, Single Port	**172PNN21022**	0.070 (2.5)
Modbus Plus option adapter, dual redundant ports	**172PNN26022**	0.070 (2.5)
Serial option adapter, single serial port	**172JNN21032**	0.070 (2.5)

Accessories

Description	Use		Length	Reference	Weight kg
	From	To			
Standard Modbus Plus cables	T-junction box	T-junction box	30 m (100 ft.)	**490NAA27101**	–
			150 m (100 ft.)	**490NAA27102**	–
			300 m (100 ft.)	**490NAA27103**	–
			450 m (1500 ft.)	**490NAA27104**	–
			1500 m (5000 ft.)	**490NAA27106**	–
Modbus Plus Drop cables	Communication modules for Momentum I/O bases	T-junction box	2.4 m (8 ft.)	**900NAD21110**	0.530
			6 m (20 ft.)	**990NAD21130**	0.530
Modbus Plus RS 485 cables	–	–	25 m (10.0 in)	**170MCI02010**	–
			1 m (3 ft.)	**170MCI02036**	–
RS 485 master communication cable (RJ45/RJ45)	–	–	0.3 m (1 ft.)	**170MCI04110**	–
Modbus Plus RJ45 cable	–	–	3 m (10 ft.)	**170MCI02120**	–
Modbus Plus RJ45 cables double-ended	–	–	3 m (10 ft.)	**170MCI02180**	–
			10 m (30 ft.)	**170MCI02080**	–
RS 232 communication cables (RJ45/RJ45)	–	–	1 m (3 ft.)	**110XCA28201**	–
			3 m (10 ft.)	**110XCA28202**	–
			6 m (20 ft.)	**110XCA28203**	–

Description	Use	Reference	Weight kg
Modbus Plus taps	IP 20 junction box for tap-off connection (T), integrate the terminator. Requires the wiring tools 043 509 383	**990NAD23000**	0.230
	IP 65 junction box for tap-off connection (T), supports 1 RJ45 connector on front panel for terminal	**990NAD23010**	–
Modbus Plus line connector (9-Pin Sub-D)	Communication module connection	**ASMBKT085**	–
Modbus Plus line terminators (sold in lot of 2)	2 impedance adapters for box (IP 20) 990 NAD 230 00 (replacement part)	**ASMBKT185**	–
	2 impedance adapters for box (IP 65) 990 NAD 230 10	**990NAD23011**	–
D-shell adapters	RJ45 to 9-pin (for AT serial port)	**110XCA20300**	–
	RJ45 to 25-pin (for XT serial port)	**110XCA20400**	–

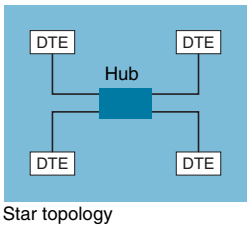
Description	Sold in lots of	Reference	Weight kg (oz.)
RS 485 (9-Pin Sub-D) **cable connector T for RJ45**	–	**170XTS04000**	–
RJ45 shielded connectors	25	**170XTS02200**	–
Modbus Plus terminating RJ45 resistor plugs	2	**170XTS02100**	–
RS 485 (RJ45) **cable connector T for RJ45**	–	**170XTS04100**	–
RS 485 Multi-Master RJ45 shunt plugs	2	**170XTS04200**	–
Modbus Plus (9-Pin Sub-D) **cable connector T for RJ45**	–	**170XTS02000**	–
Ground clamp	–	**424244739**	–
Wiring tool Mounting trunk and tap wires on the IP20 junction box 990 NAD 230 00	–	**043509383**	–

Modicon Momentum automation platform
Cabling system
ConneXium hubs

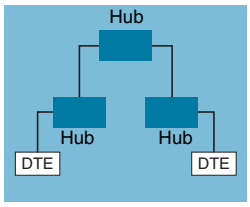
Presentation

Hubs are used for transmitting signals between several media (ports). Hubs are “plug and play” devices that do not need any configuration.
The use of hubs makes it possible to create the following topologies:
- Star topology using hubs.
- Tree topology using hubs.

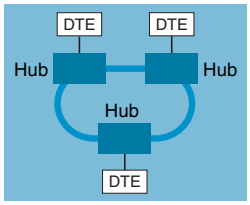
For more details, consult our catalog “Transparent Ready, Ethernet TCP/IP and Web technologies”.



Star topology



Tree topology



Ring topology
(with 499NOH10510)

Characteristics and references

Hubs					
Interfaces	Copper cable ports	Number and type	4 x 10BASE-T ports	4 x 100BASE-TX ports	3 x 10BASE-T ports
		Shielded connectors	RJ45		
		Medium	Shielded twisted pair		
		Line length	100 m		
	Optical fiber ports	Number and type	–		2 x 10BASE-FL ports
		Connectors	–		ST (BFOC)
		Medium	–		Multi mode optical fiber
		Line length			
		50/125 µm fiber	–		2300 m (7.546 ft.) *(1)*
		62.2/125 µm fiber	–		3100 m (10.170 ft.) *(1)*
		Optical budget			
		50/125 µm fiber	–		10 dB
		62.2/125 µm fiber	–		13 dB
Topology	Number of cascaded hubs (copper)		4 max.	2 max.	4 max.
	Number of hubs in a ring (fiber)		–		11 max.
Redundancy			P1 and P2 redundant power supplies		P1 and P2 redundant power supplies, redundant optical ring
Power supply	Voltage		⎓ 24 V (18 to 32 V), safety extra low voltage (SELV)		
	Power consumption		80 mA (130 max. at ⎓ 24 V)	210 mA (270 max. at ⎓ 24 V)	160 mA (350 max. at ⎓ 24 V)
	Removable terminal		5-pin		
Operating temperature			0 to + 60 °C (32 to 140 °F)		
Relative humidity			10 to 95% non condensing		
Degree of protection			IP 30	IP 20	IP 30
Dimensions W x H x D		mm (in)	40 x 125 x 80 (1.57 x 4.92 x 3.14)	47 x 135 x 111 (3.15 x 5.51 x 3.35)	80 x 140 x 85 (1.85 x 5.31 x 4.37)
Weight		kg (lbs)	0.530 (1.17)	0.240 (0.53)	0.900 (1.98)
Conformity to standards			cUL 60950, UL 508 and CSA 142, UL 1604 and CSA 213 Class 1 Division 2, CE, GL		
			FM 3810, FM 3611 Class 1 Division 2	–	FM 3810, FM 3611 Class 1 Division 2
LED indicators			Power, activity, link	Power, activity, link, error	Power, activity, link, collision
Alarm contact			Power supply failure, permanent fault in hub, faulty link status of TP port (volt-free contact 1 A max. under ⎓ 24 V)		
Reference			**499NEH10410**	**499NEH14100**	**499NOH10510**

(1) Depends on the optical budget and fiber attenuation (typical specification: 2000 m (6.560 ft.).

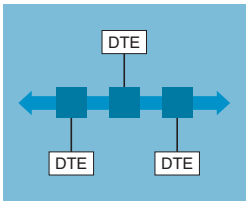
Modicon Momentum automation platform
Cabling system
ConneXium transceivers

Presentation

The use of ConneXium transceivers makes it possible to perform the following:
■ Creation of linear fiber optic bus topologies, for products with twisted pair cable Ethernet connection.
■ Interfacing products with twisted pair cable Ethernet connection with fiber optic cable.

Transceivers are “plug and play” devices that do not need any configuration. For more details, consult our catalog “Transparent Ready, Ethernet TCP/IP and Web technologies”.

ConneXium transceivers provide fiber optic connections for transmission in areas subject to interference (high levels of electromagnetic interference) and for long distance communications.



Linear topology on optical fiber

Characteristics and references

Transceivers				
Interfaces	Copper cable port	Number and type	1 x 10BASE-T port	1 x 100BASE-TX port
		Shielded connectors	RJ45	
		Medium	Shielded twisted pair	
		Line length	100 m (328 ft.)	
	Optical fiber ports	Number and type	1 x 10BASE-FL port	1 x 100BASE-FX port
		Connectors	ST (BFOC)	SC
		Medium	Multi mode optical fiber	
		Line length		
		50/125 µm fiber	2300 m (7.546 ft.) *(1)*	5000 m (16.404 ft.) *(1)*
		62.5/125 µm fiber	3100 m (10.170 ft.) *(1)*	4000 m (13.123 ft.) *(1)*
		Optical budget		
		50/125 µm fiber	10 dB	8 dB
		62.5/125 µm fiber	13 dB	11 dB
Redundancy			P1 and P2 redundant power supplies	
Power supply	Voltage		⎓ 24 V (18 to 32), safety extra low voltage (SELV)	
	Power consumption		80 mA (100 max. at ⎓ 24 V)	190 mA (240 max. at ⎓ 24 V)
	Removable terminal		5-pin	
Operating temperature			0 to + 60 °C (32 to 140 °F)	
Relative humidity			10 to 95% non condensing	
Degree of protection			IP 30	IP 20
Dimensions W x H x D		mm (in)	40 x 134 x 80 (1.57 x 5.47 x 3.14)	47 x 135 x 111 (3.15 x 5.51 x 3.35)
Weight		kg (lbs)	0.520 (1.15)	0.230 (0.50)
Conformity to standards			cUL 60950, UL 508 and CSA 142, UL 1604 and CSA 213 Class 1 Division 2, CE, GL	
			FM 3810, FM 3611 Class 1 Division 2	–
LED indicators			P1 and P2 power supplies, Ethernet link/port status	
Alarm contact			Power supply failure, permanent fault in hub, faulty link status of TP port (volt-free contact 1 A max. under ⎓ 24 V)	
Reference			**499NTR10010**	**499NTR10100**

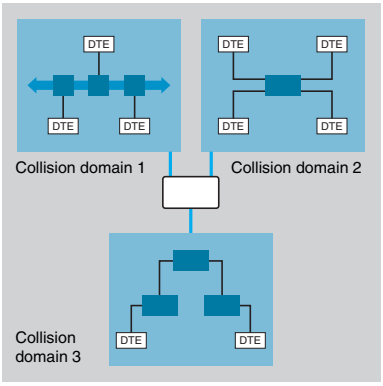
(1) Depends on the optical budget and fiber attenuation (typical specification: 2000 m (6.560 ft.).

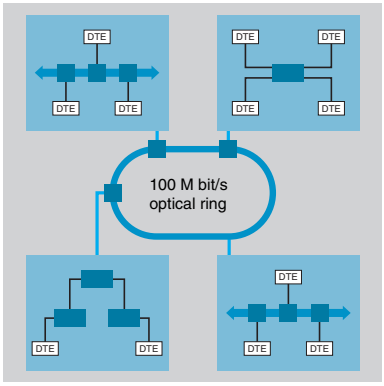
Modicon Momentum automation platform

Cabling system

ConneXium switches

Presentation





Switches are used to increase the limits of architectures based on hubs or transceivers, by separating collision domains. Higher layer communication is provided between the ports, and collisions at link layer are not propagated (filtering). They therefore improve performance by better allocation of the pass band due to the reduction of collisions and the network load.
Certain Connexium switches also enable redundant architectures to be created on twisted pair copper or fiber optic rings.
Switches are “plug & play” devices that do not need any configuration. They can also be administered remotely via the SNMP or HTTP protocols for monitoring and diagnostics purposes.

Characteristics and references

Switches			Unmanaged basic	Shielded twisted pair and optical fiber, unmanaged			
Interfaces	Copper cable ports	Number and type	5 x 10BASE-T/ 100BASE-TX ports	4 x 10BASE-T/ 100BASE-TX ports	3 x 10BASE-T/ 100BASE-TX ports	4 x 10BASE-T/ 100BASE-TX ports	3 x 10BASE-T/ 100BASE-TX ports
		Shielded connectors	RJ45				
		Medium	Shielded twisted pair				
		Max. distances	100 m (328 ft.)				
	Optical fiber ports	Number and type	–	1 x 100BASE-FX port	2 x 100BASE-FX ports	1 x 100BASE-FX port	2 x 100BASE-FX ports
		Connectors	–	SC			
		Medium	–	Multi mode fiber		Mono mode fiber	
		Fiber length					
		50/125 µm fiber	–	5000 m (16.404 ft.) *(1)*		–	
		62.5/125 µm	–	4000 m (13.124 ft.) *(1)*		–	
		9/125 µm	–	–		32 500 m (106.627 ft.) *(2)*	
		Optical budget					
		50/125 µm fiber	–	8 dB		–	
		62.5/125 µm	–	11 dB		–	
		9/125 µm		–		16 dB	
Topology	Number of switches	Cascaded	Any				
		Redundant in a ring	–				
Power supply redundancy			–	P1 and P2 redundant power supplies			
Power supply	Voltage		⎓ 24 V (19.2 to 30 V)	⎓ 24 V (18 to 32 V), safety extra low voltage (SELV)			
	Power consumption		100 mA (120 max.)	200 mA max.	240 mA max.	200 mA max.	240 mA max.
	Removable terminals		3-pin	5-pin			
Operating temperature			0 to + 60°C (32 to 140 °F)				
Relative humidity			10 to 95% non condensing				
Degree of protection			IP 20				
Dimensions W x H x D		mm (in)	75.2 x 143 x 43 (2.96 x 5.63 x 1.69)	47 x 135 x 111 (3.15 x 5.51 x 3.35)			
Weight		kg (lbs)	0.190 (0.42)	0.330 (0.72)	0.335 (0.74)	0.330 (0.72)	0.335 (0.74)
Conformity to standards			UL 508, CSA 1010, EN 61131-2	cUL 60950, UL 508 and CSA 142, UL 1604 and CSA 213 Class 1 Division 2, CE, GL			
LED indicators			Power supply, ETH link status, 10/100 M bps	P1 and P2 power supplies, Ethernet link status, transmission activity, error			
Alarm contact			–	Activity, power supply failure, permanent fault in switch, faulty link status of TP port (volt-free contact 1 A max. under ⎓ 24 V)			
Reference			**499NES25100**	**499NMS25101**	**499NMS25102**	**499NSS25101**	**499NSS25102**

(1) Depends on the optical budget and fiber attenuation (typical specification: 2 km).
(2) Depends on the optical budget and fiber attenuation (typical specification: 15 km).

Characteristics and references *(continued)*

Switches			Unmanaged, copper	Managed, copper	Managed, copper + fiber	
Interfaces	Copper cable ports	Number and type	8 x 10BASE-T/ 100BASE-TX ports	7 x 10BASE-T/ 100BASE-TX ports	5 x 10BASE-T/100BASE-TX ports	
		Shielded connectors	RJ45			
		Medium	Shielded twisted pair			
		Max. distances	100 m (328 ft.)			
	Optical fiber ports	Number and type	–		2 x 100BASE-FX ports	
		Connectors	–		SC	
		Medium	–		Multi mode optical fiber	Mono mode optical fiber
		Fiber length				
		50/125 µm	–		5000 m (16.404 ft.) *(1)*	–
		62.2/125 µm	–		4000 m (13.123 ft.) *(1)*	–
		9/125 µm	–		–	32 500 m (106.627 ft.) *(2)*
		Optical budget	–			
		50/125 µm	–		8 dB	–
		62.2/125 µm	–		11 dB	–
		9/125 µm	–		–	16 dB
	Ethernet services		–	FDR client, SNMP V3, SNTP, multicast filtering for optimization of the Global Data protocol, Web based configuration VLAN, IGMP Snooping, RSTP *(Rapid Scanning Three Protocol)*, Port priority, Flow control, Port security		
Topology	Number of switches	Cascaded	Any			
		Redundant in a ring	–	50 max.		
Redundancy			P1 and P2 redundant power supplies			
Power supply	Voltage		⎓ 24 V (88 to 32 V), safety extra low voltage (SELV)			
	Power consumption		125 mA (290 max.)	400 mA		
	Removable terminals		5-pin			
Operating temperature			0 to + 60°C	0 to + 55°C		
Relative humidity			10 to 95% non condensing			
Degree of protection			IP20			
Dimensions W x H x D		mm (in)	47 x 135 x 111 (3.15 x 5.51 x 3.35)	110 x 131 x 111 mm (4.33 x 5.16 x 4.37)		
Weight		kg (lbs)	0.230 (0.72)	0.460 (1.00)		
Conformity to standards			cUL 60950, UL 508 and CSA 14, UL 1604 and CSA 213 Class 1 Division 2, CE, GL			
LED indicators			P1 and P2 power supplies, Ethernet link status,	P1 and P2 power supplies, Ethernet link status, redundancy management		
Alarm contact			Power supply failure, permanent fault in hub, faulty link status of TP port (volt-free contact 1 A max. under ⎓ 24 V)			
			–	Redundancy health		
Reference			**499NES18100**	**499NES27100**	**499NOS27100**	**499NSS27100**

(1) Depends on the optical fiber budget and fiber attenuation (typical specification: 2 km).
(2) Depends on the optical fiber budget and fiber attenuation (typical specification: 15 km).

Modicon Momentum automation platform
Cabling system
ConneXium IP 67 switch

Characteristics and references

IP 67 switch			**Unmanaged, copper**
Interfaces	Copper cable ports	Number and type	6 x 10BASE-T/ 100BASE-TX ports
		Shielded connectors	M12 (type D)
		Medium	Shielded twisted pair
		Max. distances	100 m (328 ft.)
	Optical fiber ports	Number and type	–
		Connectors	–
		Medium	–
		Fiber length	–
		Optical budget	–
	Ethernet services		Store and forward, auto MDI/MDX (no need cross over cable), Duplex mode and speed auto negotiation, auto polarity
Topology	Number of switches	Cascaded	Any
		Redundant in a ring	–
Redundancy			–
Power supply	Voltage		⎓ 24 V (⎓ 18 to 32 V), safety extra low voltage (SELV)
	Power consumption		100mA
	Removable terminals		5-pin
Operating temperature			0 to + 60°C
Relative humidity			–
Degree of protection			IP67
Dimensions W x H x D		mm (in)	60 x 126 x 31 (2.36 x 4.96 x 1.22)
Weight		kg (lbs)	0.210 (0.46)
Conformity to standards			cUL 508 and CSA 22-214
LED indicators			Power supplies, link status, data activity
Alarm contact			–
Reference			**TCSESU051F0**

Separate parts		
Power cables, length 2,5 m (8.2 ft.)	Female M12 straight connector	Female M12 elbow wed connector
Reference	**XZCP1164L**	**XZCP1264L**
Spare power connector	Female M12 straight connector	Female M12 elbow wed connector
Reference	**XZCC12FDM50**	**XZCC12FCM50B**

Ethernet cables: see page 83.

Modicon Momentum automation platform

Cabling system

ConneXium connection cables

Presentation

ConneXium shielded connection cables are available in two versions to meet current standards and approvals:

■ Standard EIA/TIA 568 shielded twisted pair cables:
These cables conform to the EIA/TIA-568 standard, category 5, IEC 11801/EN 50173 class D. Their fire behavior conforms to NFC 32070# class C2 and IEC 322/1, Low Smoke Zero Halogen (LSZH).

■ UL and CSA 22.1 approved shielded twisted pair cables:
These cables are UL and CSA 22.1 approved. Their fire resistance conforms to NFPA 70.

490NT●000●●

References

Standard EIA/TIA 568 shielded twisted pair cables

Description	Pre-equipped at both ends	Length m (ft.)	Reference	Weight kg
Straight-through shielded twisted pair cables	2 RJ45 connectors For connection to terminal devices (DTE)	2 (6.6)	**490NTW00002**	–
		5 (16.4)	**490NTW00005**	–
		12 (39.4)	**490NTW00012**	–
		40 (131.2)	**490NTW00040**	–
		80 (262.5)	**490NTW00080**	–

Description	Pre-equipped at both ends	Length	Reference	Weight kg
Crossed cord shielded twisted pair cables	2 RJ45 connectors For connections between hubs, switches and transceivers	5 (16.4)	**490NTC00005**	–
		15 (49.2)	**490NTC00015**	–
		40 (131.2)	**490NTC00040**	–
		80 (262.5)	**490NTC00080**	–

490NOC00005

UL and CSA 22.1 approved shielded twisted pair cables

Description	Pre-equipped at both ends	Length	Reference	Weight kg
Straight-through shielded twisted pair cables	2 RJ45 connectors For connection to terminal devices (DTE)	2 (6.6)	**490NTW00002U**	–
		5 (16.4)	**490NTW00005U**	–
		12 (39.4)	**490NTW00012U**	–
		40 (131.2)	**490NTW00040U**	–
		80 (262.5)	**490NTW00080U**	–

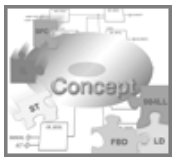
490NOT00005

Description	Pre-equipped at both ends	Length	Reference	Weight kg
Crossed cord shielded twisted pair cables	2 RJ45 connectors For connections between hubs, switches and transceivers	5 (16.4)	**490NTC00005U**	–
		15 (49.2)	**490NTC00015U**	–
		40 (131.2)	**490NTC00040U**	–
		80 (262.5)	**490NTC00080U**	–

490NOR00005

Description	Pre-equipped at both ends	Length m (ft.)	Reference	Weight kg
Glass fiber optic cables for terminal devices (DTE) to hubs, switches and transceivers	1 SC connector and 1 MT-RJ connector	5 (16.4)	**490NOC00005**	–
	1 ST (BFOC) connector and 1 MT-RJ connector	5 (16.4)	**490NOT00005**	–
	2 MT-RJ connectors	3 (9.8)	**490NOR00003**	–
		5 (16.4)	**490NOR00005**	–
		15 (49.2)	**490NOR00015**	–

Modicon Momentum automation platform
Concept programming software



Presentation

Concept is a software configuration and application programming tool for the automation platform. It is a Windows-based software that can be run on a standard personal computer. The configuration task can be carried out online (with the PC connected to the CPU) or offline (PC only). Concept supports the configuration by recommending only permissible combinations, thereby preventing misconfiguration. During online operation, the configured hardware is checked immediately for validity, and illegal statements are rejected.

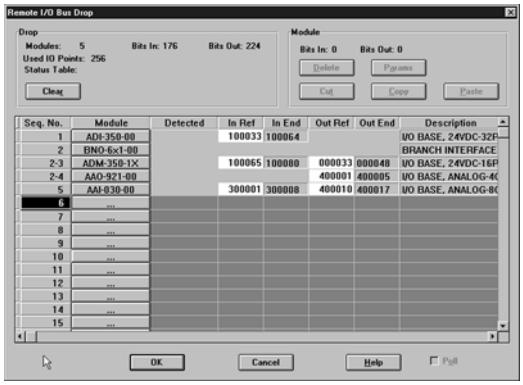
When the connection between programming unit (PC) and CPU is established, the configured values (e.g., from the variables editor) are checked and compared with actual hardware resources. If a mismatch is detected, an error message is issued.

Concept editors support five IEC programming languages:
- Function block diagram (FBD)
- Ladder diagram (LD)
- Sequential function chart (SFC)
- Instruction list (IL)
- Structured text (ST)

as well as Modsoft-compatible ladder logic (LL984). IEC 61131-3 compliant data types are also available. With the data type editor, custom data types can be converted to and from the IEC data types.

The basic elements of the FBD programming language are functions and function blocks that can be combined to create a logical unit. The same basic elements are used in the LD programming language; additionally, LD provides contact and coil elements. The SFC programming language uses basic step, transition, connection, branch, join and jump elements. The IL and ST text programming languages use instructions, expressions, and key words. The LL984 programming language uses an instruction set and contact and coil elements.

You can write your control program in logical segments. A segment can be a functional unit, such as conveyor belt control. Only one programming language is used within a given segment. You build the control program, which the automation device uses to control the process, by combining segments within one program. Within the program, IEC segments (written in FBD, LD, SFC, IL and ST) can be merged. The LL984 segments are always processed as a block by the IEC segments. Concept's sophisticated user interface uses windows and menus for easy navigation. Commands can be selected and executed quickly and easily using a mouse. Context-sensitive help is available at each editing step.



PLC hardware configuration

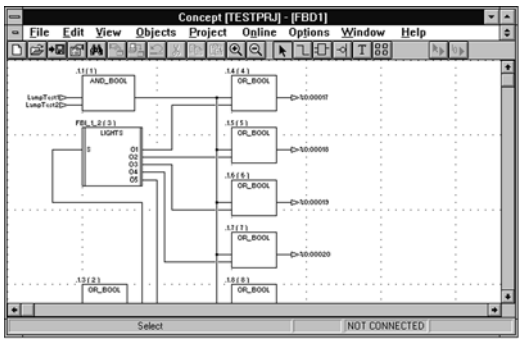
Variables for linking basic objects within one section are not required by the graphic programming languages (FBD, LD, SFC and LL984) since these links are created by connections. These connections are managed by the system, which eliminates any configuration effort. Other variables, such as variables for data transfers between different sections, are configured with the variables editor. With the data type editor, custom data types can be derived from existing data types.

Modicon Momentum automation platform
Concept programming software

Functions

Concept provides an editor for each programming language. These editors contain custom menus and tool bars. You can select the editor to be used as you create each program segment.

In addition to the language editors, Concept provides a data type editor, a variables editor and a reference data editor.



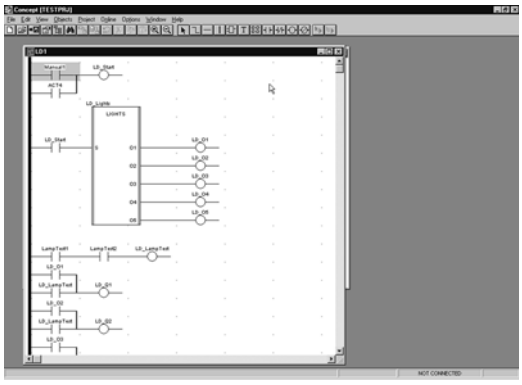
Function block diagram (FBD)

With the IEC 61131-3 function block diagram language, you can combine elementary functions, elementary function blocks (EFBs) and derived function blocks (all three of which are known as FFBs) with variables in an FBD. FFBs and variables can be commented. Text can be freely placed within the graphic. Many FFBs offer an option for input extensions.

Concept provides various block libraries with predefined EFBs for programming an FBD. EFBs are grouped in the libraries according to application types to facilitate the search.

In the FBD editor, you can display, modify and load initial values; current values can be displayed. The CLC and CLC_PRO libraries allow you to display animated diagrams of the FFBs and a graph of the current values.

For custom function blocks (DFBs), the Concept-DFB editor is used. In this editor, you can create your own function blocks from EFBs or existing DFBs. DFBs created in the FBD editor can be recalled in the LD, IL and ST editors, and DFBs created in the LD, IL and ST editors can be used in the FBD editor.



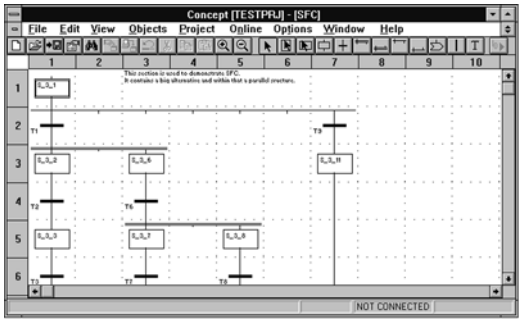
Ladder diagram (LD)

With the IEC 61131-3 ladder diagram language, you can build an LD program with elementary functions, function blocks and derived function blocks (all of which are known as FFBs), along with contacts, coils and variables. FFBs, contacts, coils and variables can be commented. Text can be placed freely within the graphics. Many FFBs offer an option for input extensions.
The structure of an LD segment corresponds to that of a current path for relay circuits. On its left side is a left bus bar, which corresponds to the phase (L conductor) of a current path. As with a current path, only the LD objects (contacts, coils) connected to a power supply (i.e., connected to the left bus bar) are processed in LD programming. The right bus bar, which corresponds to the neutral conductor, is not visible. However, all coils and FFB outputs are internally connected to it in order to create a current flow.
The same EFB block libraries available for the FBD editor can be used in the LD editor to program a ladder diagram.

In the LD editor, initial values can be displayed, modified and loaded; current values can be displayed. For the EFBs in libraries CLC and CLC_PRO, animated diagrams of the FFBs and a graph of the current values can be displayed.

For custom function blocks (DFBs), the Concept-DFB editor is used. With this editor, you can create your own function blocks from EFBs or existing DFBs. DFBs created in the LD editor can be recalled in the FBD, IL and ST editors, and DFBs created in the FBD, IL and ST editors can be used in the LD editor.

Modicon Momentum automation platform
Concept programming software



Functions (continued)

Sequential function chart (SFC) *(1)*

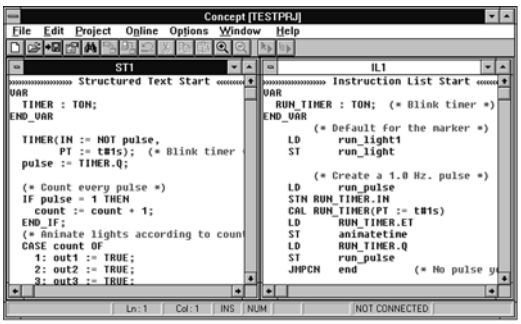
With the IEC 61131-3 sequential function chart (SFC) language, you can define a series of SFC objects that comprise a control sequence. Steps, transitions and jumps in the sequence can be commented. You can place text freely within graphics. You can assign any number of actions to every step. A series of monitoring functions–e.g., maximum and minimum monitoring time–can be integrated into each step's characteristics. The actions can be assigned an attribute symbol (as required by IEC) to control the action's performance after it has been activated–e.g., a variable can be set to remain active after exiting.

Instruction list (IL)

With the IEC 61131-3 IL language, you can call entire functions and function blocks conditionally or unconditionally, execute assignments and make conditional and unconditional jumps within a program segment.

IL is a text-based language, and standard Windows word processing tools can be used to generate code. The IL editor also provides several word processing commands. Keywords, separators and comments are spell-checked automatically as they are entered. Errors are highlighted in color.

For custom function blocks (DFBs), the Concept-DFB editor is used. In this editor, you can create your own function blocks from EFBs or existing DFBs. DFBs created in the IL editor can be recalled in the ST, LD and FBD editors, and DFBs created in the ST, LD and FBD editors can be used in the IL editor.



Structured text (ST)

With the IEC 61131-3 ST language, you can call function blocks, execute functions and assignments and conditionally execute and repeat instructions. The ST programming environment is similar to Pascal. It is a text-based language, and Windows word processing functions can be used to enter code. The ST editor itself also provides several word processing commands. Keywords, separators, and comments are spell-checked automatically as they are entered. Errors are highlighted in color.

Custom function blocks (DFBs) created with the ST editor can be called in the IL, LD and FBD editors; DFBs created in the IL, LD and FBD editors can be used in the ST editor.

(1) SFC language, only available with Concept M and Concept XL software.

Modicon Momentum automation platform
Concept programming software

Functions (continued)

Data type editor

The data type editor defines new derived data types. Any elementary data types and derived data types already existing in a project can be used for defining new data types. With derived data types, various block parameters can be transferred as one set. Within the program, this set is divided again into single parameters, processed, then output as either a parameter set or individual parameters. Derived data types are defined in text format, and standard Windows word processing tools can be used. The data type editor also provides several word processing commands.

Variables editor

The variables editor contains input options for:
- The variable type (located variable, unlocated variable, constant).
- The symbolic name.
- The data type.
- Direct address (explicit, if desired).
- Comments.
- Identification as human-machine interface (HMI) variable for data exchange.

Reference data editor

In online mode, the reference data editor displays, forces and controls variables.

The editor contains the following options:
- Default values for the variable.
- Status display for the variable.
- Various format definitions.
- The ability to isolate the variable from the process.

Modicon Momentum automation platform
Concept programming software

Functions (continued)

Libraries

EC Library

The IEC library contains the EFBs defined in IEC 61131-3 (calculations, counters, timers, etc)
.

Extended Library

The extended library contains useful supplements to various libraries. It provides EFBs for mean value creation, maximum value selection, negation, triggering, converting, building a traverse with interpolation of the first order, edge detection and determination of the neutral range for process variables.

System Library

The system library contains EFBs in support of system functions. It provides EFBs for cycle time detection, utilization of various system clocks, control of SFC sections and system status display.

CLC and CLC_PRO Library

The CLC library is used for defining process-specific control loops. It contains control, differentiation, integration and polygon graph EFBs. The CLC_PRO library contains the same EFBs as the CLC library along with data structures.

Communication Library

The communication libraries of built-in function blocks provide easy integration of programs which allow communication between PLCs or HMI devices from within the PLC's application program. Like other function blocks, these EFBs can be used in all languages to share data, or provide data to the HMI device for display to the operator.

Diagnostics Library

The diagnostics library is used for troubleshooting the control program. It contains EFBs for action, reaction, interlocking, and process prerequisite diagnostics, along with signal monitoring.

LIB984 Library

The LIB984 library provides common function blocks used in both the 984 ladder logic editor and the IEC languages. This allows for easy transition of portions of application code from the 984LL environment to the IEC environment.

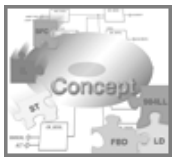
Fuzzy Logic Library

The fuzzy library contains EFBs for fuzzy logic.

Analog I/O Library

The ANA_IO library is used to process analog values.

Modicon Momentum automation platform
Concept programming software



References

Concept packages

Description	License type	Reference	Weight kg
Concept S Version 2.6	Single-station	**372SPU47101V26**	–
Concept M Version 2.6	Single-station	**372SPU47201V26**	–
Concept XL Version 2.6	Single-station	**372SPU47401V26**	–
	Group (3 stations)	**372SPU47411V26**	–
	Team (10 stations)	**372SPU47421V26**	–
	Site (> 10 stations)	**372SPU47431V26**	–
Concept EFB Toolkit Version 2.6	Single-station	**332SPU47001V26**	–
HVAC Function Blocks Library	Site (> 10 stations)	**372HVA16030V25**	–

Concept package for exploitation and maintenance

Description	License type	Reference	Weight kg
Concept Application Loader	Single-station	**372SPU47701V26**	–

Concept upgrades

Description	License type	Reference	Weight kg
Concept XL V x.x to Concept XL V 2.6	Single-station	**372ESS47401**	–
	Group (3 stations)	**372ESS47403**	–
	Team (10 stations)	**372ESS47410**	–
	Site (> 10 stations)	**372ESS47400**	–
Concept S V x.x to Concept S V 2.6	Single-station	**372ESS47101**	–
Concept M V x.x to Concept M V 2.6	Single-station	**372ESS47201**	–
Modsoft V x.x to Concept XL V 2.6	Depends on number of users	**372ESS48501**	–
Concept EFB Toolkit V x.x to V 2.6	–	**372ESS47101**	–

Documentation

Description	Number of volumes	Reference *(1)*	Weight kg
Concept Installation Instructions	1	**840USE4920●**	–
Concept User Manual	3	**840USE4930●**	–
Concept IEC Block Library	13	**840USE4940●**	–
Concept 984 LL Block Library	2	**840USE4960●**	–
Concept EFB Tool User Manual	1	**840USE49501**	–

(1) ● = ***0*** *in this position indicates english language,* ***1*** *indicates french language,* ***2*** *indicates german language and* ***3*** *indicates spanish language.*

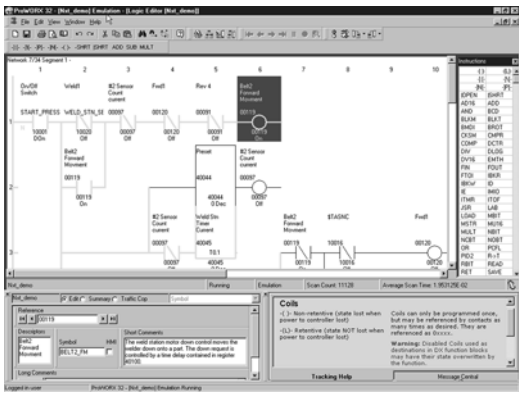
Modicon Momentum automation platform
ProWORX 32 programming software

ProWORX 32

Presentation

ProWORX 32 programming software is a full-featured, Modicon PLC programming software that is compatible with Windows platforms (98/NT/2000/XP) that gives you the power to program all your Modicon controllers online or offline, manage your I/O subsystems, and analyze your plant's activity in real-time.

Some of the new ProWORX 32 features:
32-bit processing. With 32-bit processing, ProWORX 32 is an even more powerful solution than its predecessors, ProWORX Plus and ProWORX NxT. 32-bit processing lets you utilize the power of state-of-the-art operating systems for optimal development and operational performance.
A comprehensive suite of tools. ProWORX 32 provides everything you will need to start, configure, test and complete your project, quickly, reliably and professionally. With its improved suite of standard utilities, ProWORX 32 is a virtual "one stop shop" for your Automation Journey. No more searching on the web for special features or functions, they're all included to save you time and increase your productivity.
A powerful offer. In addition, ProWORX 32 will simplify and speed up your system development and commissioning time with powerful diagnostics, easier integration, and greater openness and flexibility.
Easier integration. Using standard Microsoft components for the basis of ProWORX 32 opens up a wealth of user data. Import and export capabilities have been enhanced to provide a variety of integration options for HMI and third party devices, such as a built in "Alliance Tool" which allows users to create hardware profiles for newly developed devices. The profiles can even be sent electronically to Schneider Electric for inclusion in future product releases.



Windows environment

The familiar Windows-based programming environment means you spend less time learning how to do things, and more time being productive. ProWORX uses familiar Windows features like user-defined screens, drag-and-drop, cut and paste, search, and global replace.

Conversion

484 to 984 in one step! The most flexible conversion tools available in the automation industry. That is the reputation ProWORX products have always enjoyed, and ProWORX 32 is no exception. With the ability to convert from older project databases to this latest tool, ProWORX 32 supports almost 30 years of PLC heritage.
.

Multiple projects

Imagine the time and effort you could save by testing a new project with an existing project while it is running live. Now you can with the Multiple Projects function of ProWORX 32, even with two PLCs running simultaneously! Perform diagnostic checks to validate interdependencies between your emulated project and your live applications, all in real time, so you can go live with total confidence.

Intuitive Register Editor

A powerful analysis tool, the Data Watch Window shows you information from your plant in real-time, or logs it to disk for in-depth historical analysis later on. Easily get the data you need to make informed, effective production decisions. View and edit data in full page display, see trends and track data points against time in a spreadsheet, and monitor any combinations of discrete and analog activities.

I/O drawing generator

Save hours of painstaking effort with ProWORX 32's I/O Drawing Generator, which automatically creates wiring diagrams for the I/O cards defined in the Traffic Cop. Generate necessary drawings all at once or just one card at a time – simply select an address the I/O card uses with the Network Editor, then click the drawing button on the Hardware Back Referencing panel to display the diagram, and if desired, save it as an AUTOCAD-compatible.DXF file or print it.

Modicon Momentum automation platform
ProWORX 32 programming software

Presentation (continued)

Network editor
With the Network Editor, ProWORX 32 reduces development time by using the same commands and instructions for every controller. Simply cut, copy, and paste networks from one platform to any other.

Program Documentation
ProWORX 32 is first-class software with first-class program documentation. Use one of the many standard templates to get started, and progress to assemble your own custom documentation. For better references and easier-to-use documentation, we have provided annotation down to the “Bit” level to allow longer comments and more lines of text. Even simple things like using Windows O/S fonts to eliminate printer issues demonstrates that every detail has been considered.

Real-time network status
Find the controller you need fast and simplify network diagnostics with ProWORX 32's powerful Network Scan feature. Network Scan searches your Modbus or Modbus Plus networks, then identifies and graphically displays each device found and shows its status.

Powerful diagnostics
To effectively control your operation, you need to see your operation in action. The built-in HMI allows you to build a simple representation of your application to visualize the entire operation. With the “Data Watch Window”, you can see values in real-time and perform “Data Logging” for later data analysis. The “Trending” tool is a simple built-in chart recorder to help you visualize performance factors without having to crunch hard data. And “Diagnostic Trace” helps to easily solve complicated issues such as network element interdependencies.

Advanced I/O management
Ensure that the I/O card you are configuring in the software matches the one on your plant floor with ProWORX 32's graphical Traffic Cop. It displays I/O cards on your screen the same way they look in real life, eliminating all confusion. To place a card, just select it from the convenient drop down menu and then drag it into the controller slot you want. To save even more time, the Traffic Cop automatically associates the card's I/O points with a block of free addresses in your controller. Once configured, manage your I/O with Pro WORX 32's complete documentation tools, with references for each head, drop, rack, slot and address. And the Traffic Cop's graphical display shows you at a glance that your I/O is healthy.

Modicon Momentum automation platform
ProWORX 32 programming software

Presentation (continued)

Client/Server Tools

ProWORX 32 allows projects to be developed in a collaborative environment without sacrificing control and security by utilizing the ProWORX 32 server as the central repository for projects, the center for security, and the hub for communications. The system administrator has total control over user accounts, user groups, passwords, rights, and auditing policies and can grant access when and where needed.

The client/server relationship allows projects to be skillfully managed and controlled. The server can be used to keep “Master” versions of PLC projects for editing (subject to rights), while editing is achieved using the client. This can be done via a standalone PC or even on the server since both client and server can reside on the same PC.

The server has the capability to schedule software backups of the controller, detect software modifications and store multiple versions. Even more powerful is the ability to communicate from the client to the server using either Ethernet TCP/IP or Modbus Plus.

Project Emulator

The project emulator is a very powerful tool that will help save considerable time in the design and testing of your system. It provides the ability to test projects prior to running them in the PLC run-time environment to ensure your system will run at peak efficiency immediately upon commissioning. Two emulators are provided that test interdependent projects with one another, giving you complete confidence and peace of mind before going live.

Material List Generation

Want a shopping list for your PLC equipment? The Material List Generation function automatically creates a list for the project, either online or offline, even taking into account the contents of the Traffic Cop. Add prices and comments once the list is generated, saving you time and insuring that all required components are fully documented and identified.

Modicon Momentum automation platform
ProWORX 32 programming software

ProWORX 32

ProWORX Client/Server software

ProWORX packages

Description	License type	Reference	Weight kg
ProWORX 32	Server	**372SPU78001PSEV**	–
	Client/Server Suite	**372SPU78001PSSV**	–
	Offline/Online Client	**372SPU78001PDEV**	–
	Group (3 stations)	**372SPU78001PSTH**	–
	Team (10 stations)	**372SPU78001PSTE**	–
	Site (> 10 stations)	**372SPU78001SITE**	–
	Online Client	**372SPU78101PONL**	–
ProWORX 32 Lite	Offline/Online Client	**372SPU71001PLDV**	–
	Group (3 stations)	**372SPU71001PLTH**	–
	Team (10 stations)	**372SPU71001PLTE**	–
Legacy Product Upgrade to ProWORX 32	Client	**372SPU78401LPUP**	–
	Group (3 stations)	**372SPU78401LPTH**	–
	Team (10 stations)	**372SPU78401LPTE**	–
	Multi-station Incremental Addition	**372SPU78401SEAT**	–

Documentation

Description	Language	Reference	Weight kg
ProWORX 32 User Manuals	English	**372SPU78001EMAN**	–
	French	**372SPU78001FMAN**	–
	German	**372SPU78001DMAN**	–
	Spanish	**372SPU78001SMAN**	–

Modicon Momentum automation platform

Aggressive environments protection
Optional conformal coating

Presentation

If your control system needs to operate in a corrosive environment, selected Momentum modules can be ordered with a conformal coating applied to components of the product. Conformal coating will extend its life and enhance its environmental performance capabilities.

Mixed flowing gas (power on)

Standard	Pollutant	Parts/billion	Momentum's performance
EIA 364-65 level III	Cl_2	20 (±5)	Meets the standard
	NO_2	200 (±50)	Exceeds standard (1250 parts/billion)
	H_2S	100 (±20)	Meets standard
ISA-S71.04 GX severe	Cl_2	10	Exceeds standard (20 parts/billion)
	NO_2	1250	Meets standard
	H_2S	50	Exceeds standard (100 parts/billion)
	SO_2	300	Meets standard

Humidity (operating)

Standard	Concentration (%)	Momentum's performance
IEC-68-2-3	93 @ 60 °C (140 °F)	Meets standard

Salt mist (non-operating)

Standard	Concentration (%)	Momentum's performance
IEC 68-2-11	5 (±1)	Exceeds standard (5.7%)

Fungus resistance

Standard		Momentum's performance
MIL-I-46058C		**Designed to meet standard**

Temperature cycling (operating)

Standard	Cycles	Momentum's performance
IEC 68-2-14	100 @ 0…60 °C (32…140 °F)	Meets standard

Dust (non-operating)

Standard	Pollutant	Weight (%)	Momentum's performance
EIA 364-TP91 (pending)	Silica	36	Meets standard
	Calcite	29	Meets standard
	Iron oxide	12	Meets standard
	Alumina	8	Meets standard
	Gypsum	5	Meets standard
	Paper fiber	3	Meets standard
	Cotton fiber	3	Meets standard
	Polyester fiber	2	Meets standard
	Carbon black	1	Meets standard
	Human hair	0.5	Meets standard
	Cigarette ash	0.5	Meets standard

Modicon Momentum automation platform

Aggressive environments protection
Optional conformal coating

References

This following is a list of Momentum products that are availability with the optional conformal coating.

Note : *Please note that a "***C***" is appended to the standard reference for those Momentum products.*

170ADI3●000C

Discrete I/O bases

Type of current	Input voltage	Modularity (no. of points)	Conformity EC 1131-2	Reference	Weight kg
Discrete input bases	24 VDC	16 (1 x 16)	Type 1	**170ADI34000C**	0.190
		32 (2 x 16)	Type 1	**170ADI35000C**	0.200

Type of current	Output voltage	Modularity (no. of points)	Current per output	Reference	Weight kg
Discrete output bases solid state, protected	24 VDC	16 (2 x 8)	0.5 A	**170ADO34000C**	0.210
		32 (2 x 16)	0.5 A	**170ADO35000C**	0.210

Type of current	Input voltage	Output voltage	Modularity Input	Outputs, current	Reference	Weight kg
Discrete I/O bases	24 VDC Type 1	24 VDC protected solid state	16 I (1 x 16)	16 O (2 x 8) 0.5 A	**170ADM35010C**	0.200
			16 I (4 x 4)	8 O (2 x 4) 2 A	**170ADM37010C**	0.220
	24 VDC Type 1	24/230 VAC 20/115 VDC relay	10 I (1 x 10)	8 O (2 x 4) 2 A	**170ADM39030C** *(1)*	0.260

170AAI●●0●0C

Analog I/O bases

Type	Number of channels	Ranges	Reference	Weight kg
Analog inputs 2 bits + sign	16 single-ended	± 5 V, ± 10 V, 4-20 mA	**170AAI14000C**	0.215
Analog outputs 15 bits + sign	4, differential	Pt 100, Pt 1000, Ni 100 thermocouples B, E, J, K, N, R, S, T	**170AAI52040C**	0.215
	8, differential	± 5 V, ± 10 V, 1-5 V± 20 mA, 4-20 mA	**170AAI03000C**	0.215
Analog outputs12 bits + sign	4	± 10 V, 4-20 mA	**170AAO92100C**	0.215

Type of discrete and analog I/O bases				Reference	Weight kg
Inputs		**Outputs**			
4 differential analog inputs 13 bits + sign	± 5 V, ± 10 V, 1-5 V ± 20 mA, 4-20 mA	2 analog outputs 12 bits	0-20 mA ± 10 V	**170AMM09000C**	0.240
4 discrete inputs	24 VDC	2 discrete inputs	24 VDC-0,5 A		

170ENT11002C

521501

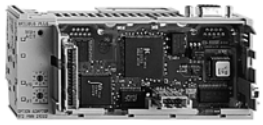
Communication adapters

Description	Characteristics	Reference	Weight kg
Ethernet TCP/IP network	10 M bit/s	**170 ENT 110 02C**	0.070
Modbus Plus network	IEC format, non-redundant	**170 PNT 110 01C**	0.070
	984 format, non-redundant	**170 NEF 110 21C**	0.070
Fipio bus	Bus manager Premium	**170 FNT 110 20C**	0.070
INTERBUS	Generation 3 (SUPI 2)	**170 INT 110 00C**	0.070
	Generation 4 (SUPI 3, version 2)	**170 INT 110 03C**	0.070
Profibus DP	9.6 K bit/s to 12 M bit/s	**170 DNT 110 00C**	0.070

171CCC●●0●0

M1/M1E processor adapters

Memories	Communication Port(s)	Clock Speed	Reference	Weight kg
256 Ko RAM, 256 Ko Flash	1 Modbus, 1 I/O Bus	32 MHz	**171CCS76000C**	0.042
512 Ko RAM, 256 Ko Flash	1 Modbus, 1 I/O Bus	32 MHz	**171CCC76010C**	0.042
544 Ko RAM, 512 Ko Flash	1 Ethernet, 1 I/O Bus	50 MHz	**171CCC96020C**	0.042
544 Ko RAM, 1 Mo Flash, IEC Exec	1 Ethernet, 1 I/O Bus	50 MHz	**171CCC96030C**	0.042



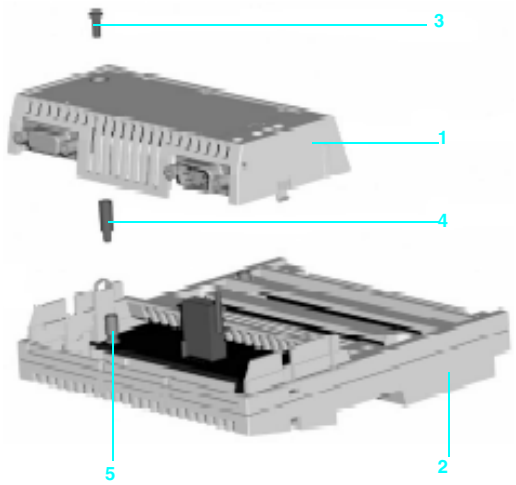
172PNN21022C

Option adapters

Memories		Reference	Weight kg
Modbus Plus network	Single port, Time-of-Day *(TOD)* and battery backup	**172PNN21022C**	0.070
Modus link	2 x RS 232/RS 485 ports, Time-of-Day *(TOD)* and battery backup	**172JNN21032C**	0.070

(1) Operating voltage 24 VDC.

Modicon Momentum automation platform
Enhanced grounding system



1 Communication adapter cover
2 I/O base
3 Standard screw M3-6
4 Male-female standoff
5 Added standoff

Momentum communication adapter ground screw

Due to new INTERBUS standards for electrical noise immunity, a number of Momentum products have been updated to include the enhanced grounding system, which is required to meet the revised electrical noise immunity standard (ability to pass a 2.2 k VDC electrical fast transient burst test).

This grounding system includes a ground screw in the communication or M1/M1E processor adapter, which is connected to a fixed standoff-ground nut on the printed circuit board and to a standoff on selected Momentum I/O bases

Nota : *This electrical noise immunity requirement applies only to systems that require INTERBUS certification, version 2, and not to any other communication network that Momentum I/O currently uses. The standard electrical fast transient test for Momentum is 500 VDC.*

The following is a list of the Momentum modules that currently have been updated to include the new grounding system:
- Communication adapters.
- M1/M1E processor adapters and option adapters
- Discrete and analog I/O bases

References

Range	Description	Reference	See page
Communication adapters	Ethernet TCP/IP 10/100 M bits/s (V2)	**170ENT11001**	49
	Ethernet TCP/IP 10 M bits/s (V1)	**170ENT11002**	49
	INTERBUS SUPI 3 (V2)	**170INT11003**	57
	Fipio bus (for Premium) (V2)	**170FNT11001**	55 / 96
M1/M1E processor adapters	64 K, 1 Modbus, 20 MHz	**171CCS70000**	70
	64 K, 1 Modbus, 32 MHz	**171CCS70010**	70
	64 K, 2 Modbus, 20 MHz	**171CCS78000**	70
	256 K, 1 Modbus, 1 I/O bus, 32 MHz	**171CCS76000**	70
	512 K, 1 Modbus, 1 I/O bus, 32 MHz	**171CCC76010**	70
	512 K, 2 Modbus, 32 MHz	**171CCC78010**	70
	544 K, 1 Modbus, 1 Ethernet, 50 MHz	**171CCC98020**	70
	544 K, 1 Ethernet, 1 I/O bus, 50 MHz	**171CCC96020**	70
	544 K, IEC Exec, 1 Modbus, 1 Ethernet, 50 MHz	**171CCC98030**	70
	544 K, IEC Exec, 1 Ethernet, 1 I/O bus, 50 MHz	**171CCC96030**	70
Option adapters	Modbus Plus, single port	**172PNN21022**	77
	Modbus Plus, dual redundant ports	**172PNN26022**	77
	RS 232/RS 485 serial port	**172JNN21032**	77
Discrete input bases	24 VDC 16 inputs	**170ADI34000**	19
	24 VDC 32 inputs	**170ADI35000**	19
Discrete output bases	24 VDC 16 solid state outputs 0.5 A	**170ADO34000**	19
	24 VDC 32 solid state outputs0.5 A	**170ADO35000**	19
	DC/AC 6 relay form “C” outputs 5 A	**170ADO83030**	19
Discrete I/O bases	24 VDC 16 inputs/16 outputs 0.5 A	**170ADM35010**	19
	24 VDC 16 fast inputs/16 outputs 0.5 A	**170ADM35011**	19
	24 VDC 16 inputs/16 outputs 0.5 A	**170ADM35015**	19
	24 VDC 16 inputs wiring check/ 12 outputs 0.5 A	**170ADM39010**	19
	24 VDC 16 inputs/8 outputs 2 A	**170ADM37010**	19
	12 to 60 VDC 16 inputs/16 outputs 0.5 A	**170ADM85010**	19
	24 VDC 10 inputs/AC or DC/8 relay 2A	**170ADM39030**	19
		170ARM37030	19
Analog input bases	16 single-ended inputs 12 bits + sign	**170AAI14000**	34
	8 differential inputs 15 bits + sign	**170AAI03000**	34
Discrete and analog I/O bases	4 differential analog inputs/2 analog outputs 4 discrete inputs/2 discrete outputs	**170AMM09000**	34
		170AMM09001	34
	6 analog inputs/4 analog outputs 8 discrete inputs/8 discrete outputs	**170ANR12090**	34
		170ANR12091	34
Specialty I/O bases	High-speed counter base, 2 independent counters 200 kHz max.	**170AEC92000**	42
	I/O base with Modbus RS 485 communication port and 120 VAC 6 inputs/3 outputs 0,5 A	**170ADM54080**	42

Modicon Momentum automation platform
User Documentation

References

Description	Language	Reference	Weight kg
Momentum I/O bases user guide	English	**870USE00200**	–
	French	**870USE00201**	–
	German	**870USE00202**	–
	Spanish	**870USE00203**	–
High-Speed counter base (170 AEC 920 00) user guide	English	**870USE00800**	–
	French	**870USE00801**	–
	German	**870USE00802**	–
M1/M1E processor adapters and option adapter user guide	English	**870USE10110**	–
	French	**870USE10111**	–
	German	**870USE10112**	–
	Spanish	**870USE10113**	–
INTERBUS communication adapters user guide	English	**870USE01000**	–
	French	**870USE01001**	–
	German	**870USE01002**	–
	Spanish	**870USE01003**	–
INTERBUS communication adapter user guide	English	**870USE00300**	–
	French	**870USE00301**	–
Profibus DP communication adapter user guide (includes the GSD configuration software on 3.5" disk)	English	**870USE00400**	–
	French	**870USE00401**	–
	German	**870USE00402**	–
Modbus Plus communication adapter, 170 PNT Series user guide	English	**870USE10300**	–
	French	**870USE10301**	–
	German	**870USE10302**	–
Modbus Plus communication adapter, 170 NEF Series user guide	English	**870USE11100**	–
Fipio communication adapter (170 FNT 110 00) user guide	English	**870USE00500**	–
	French	**870USE00501**	–
	German	**870USE00502**	–
	Spanish	**870USE00503**	–
Fipio communication adapter (170 FNT 110 01) user guide	English	**870USE10500**	–
	French	**870USE10501**	–
	German	**870USE10502**	–
	Spanish	**870USE10503**	–
DeviceNet communication adapter user guide (includes the EDS configuration software on 3.5" disk)	English	**870USE10400**	–
Fipio Bus / Fipway network reference manual	English	**TSXDRFIPE**	–
	French	**TSXDRFIPF**	–
	German	**TSXDRFIPG**	–
	Spanish	**TSXDRFIPS**	–
Modbus Plus network planning and installation guide	English	**890USE10000**	–
	French	**890USE10001**	–
	German	**890USE10002**	–
	Spanish	**890USE10003**	–
Modbus Plus network BM85 bridge multiplexer user guide	English	**890USE10300**	–
Ethernet TCP/IP network 10BASE-T and 100BASE-TX	English	**490USE13300**	–
	French	**490USE13301**	–
	German	**490USE13302**	–
	Spanish	**490USE13303**	–
Modbus/TCP/IP Ethernet communication adapter user guide	English	**870USE11400**	–
	French	**870USE11401**	–
	German	**870USE11402**	–
	Spanish	**870USE11403**	–
XMIT Function Block version 3.0 user guide	English	**840USE11300**	–

In some countries, certification of certain electrical components is enforced by law. A standard conformity certificate is then issued by the official organization. Each certified product must carry approval symbols when enforced.
Use on board merchant navy vessels generally requires prior approval (= certification) of an electrical device by certain marine classification authorities.

Key	Certification body	Country
CSA	Canadian Standards Association	Canada
C-Tick	Australian Communication Authority	Australia
UL	Underwriters Laboratories	USA

Key	Classification authority	Country
ABS	American Bureau of Shipping	USA
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
GOST	Institut de recherche Scientifique Gost Standardt	C.I.S., Russia
LR	Lloyd's Register	United-Kingdom
RINA	Registro Italiano Navale	Italy
RMRS	Register of Shipping	C.I.S.

The table below shows the situation as of 01/06/2005 for certifications obtained or pending from organizations for base PLCs. An overview of certificates for Telemecanique products is available on our Internet web site:
www.telemecanique.com

Product certifications

Certifications

Certified
Pending certification

		UL	CSA	ACA (C-Tick)	SIMTARS	GOST	Hazardous locations Class 1 Div 2 *(1)*
		USA	Canada	Australia	Australia	CEI, Russia	US
Advantys STB							FM
Advantys Telefast							
ConneXium							*(2)*
Lexium 05							
Lexium 17D							
Magelis iPC		*(3)*					UL
Magelis XBT G							
Magelis XBT F/FC/H/P/E/HM/PM				*(4)*			
Magelis XBT N/R							CSA/UL
Modicon Momentum							FM *(5)*
Modicon Premium	**PL7**						CSA
	Unity						CSA
Modicon Quantum	**Concept**						FM
	Unity						FM
Modicon TSX Micro							
TBX							
Twido		*(3)*	*(2)*				CSA/UL *(2)*
Twin Line							

(1) ***Hazardous locations****: CSA 22.2 no. 213, certified products are suitable for use in Class I, division 2, groups A, B, C and D or non-hazardous locations only.*
(2) Depending on product, consult our site: **www.telemecanique.com**
(3) cULus north-american certification (Canada and US).
(4) Only XBT F/FC.
(5) Depending on product, see pages of characteristics in this catalog.

Local certifications

BG	Germany	TSXDPZ10D2A safety module (TSX Micro) TSXPAY262/282 safety modules (Premium)
AS-Interface	Europe	TWDNOI10M3 master module (Twido) TSXSAZ10 master module (TSX Micro) TSXSAY100 / 1000 master modules (Premium) TBXSAP10 Fipio bus/AS-Interface bus gateway

Marine classification

	Marine classification des authorities						
	ABS	BV	DNV	GL	LR	RINA	RMRS
	USA	France	Norway	Germany	Unit.-Kingdom	Italy	C.I.S.
Advantys STB							
Advantys Telefast							
ConneXium				*(1)*			
Lexium 05							
Lexium 17D							
Magelis *i*PC							
Magelis XBT G			*(2)*				
Magelis XBT F/FC/H/P/E/HM/PM							
Magelis XBT-N/R				*(3)*		*(3)*	
Modicon Momentum							
Modicon Premium PL7							
Modicon Premium Unity	*(3)*						
Modicon Quantum Concept							
Modicon Quantum Unity							
Modicon TSX Micro							
TBX							
Twido			*(1)*	*(1)*	*(1)*		
Twin Line							

Certified
Pending certification

(1) Depending on product, consult our site: **www.telemecanique.com**
(2) Except Magelis **XBTG2110**.
(3) Request for Marine certifications forecast 4th quarter 2004.

Community regulations

European directives

The opening of European markets implies a harmonization of regulations in the various European Union member states.
European Directives are documents used to remove obstacles to the free movement of goods and their application is compulsory in all states of the European Union.
Member states are obliged to transcribe each Directive into their national legislation and, at the same time, to withdraw any conflicting regulations.
The Directives, particularly those of a technical nature with which we are concerned, only set objectives, called “general requirements”.
The manufacturer must take all necessary measures to ensure that his products conform to the requirements of each Directive relating to his equipment.
As a general rule, the manufacturer affirms that his product conforms to the necessary requirements of the Directive(s) by applying the CE label to his product.
CE marking is applied to Telemecanique products where relevant.

The significance of CE marking

- CE marking on a product means that the manufacturer certifies that his product conforms to the relevant European Directives; it is necessary in order that a product which is subject to a Directive(s) can be marketed and freely moved within the European Union.
- CE marking is intended solely for the national authorities responsible for market regulation.

For electrical equipment, only conformity of the product to standards indicates that it is suitable for use, and only a guarantee by a recognized manufacturer can ensure a high level of quality.
One or more Directives, as appropriate, may apply to our products, in particular:
- The Low Voltage Directive 72/23/EEC amended by Directive 93/68/EEC: CE marking under the terms of this Directive is compulsory as of 1 January 1997.
- The Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: CE marking on the products covered by this Directive has been compulsory since 1 January 1996.

The system designer must use devices external to the SCADA to protect against active faults, which are not indicated and are judged to be dangerous to the application.
This may require solutions from various different technologies such as mechanical, electromechanical, pneumatic or hydraulic devices (for example, directly wiring a limit switch and emergency stop switches to the coil of a movement control contactor).

Product Reference Index

Schneider Electric Industries SAS

Headquarters

89, bd Franklin Roosevelt
F - 92506 Rueil Malmaison Cedex

http://www.schneider-electric.com

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