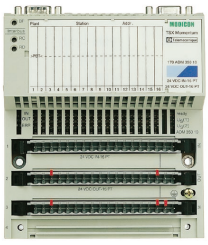
Momentum
automation platform

Catalog
June

02



Modicon
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Building a New Electric World

Momentum

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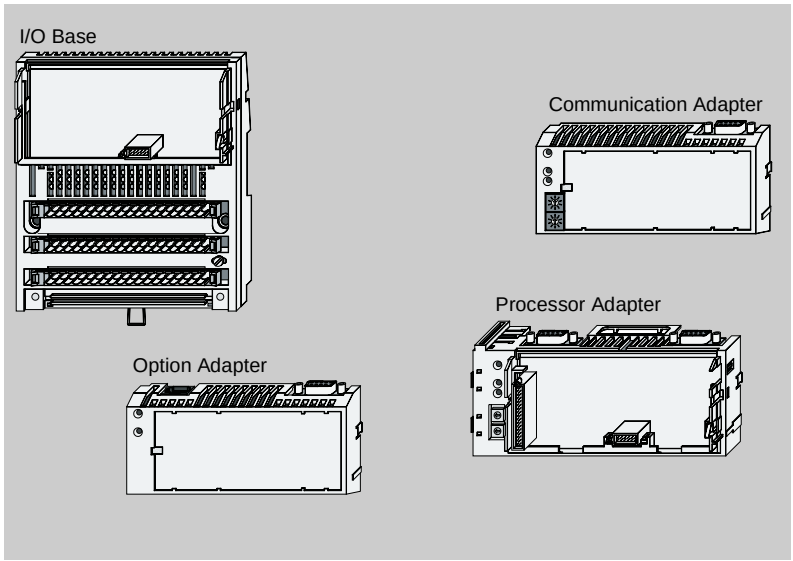
A modular concept with four easy pieces

The Momentum system comprises 4 fundamental components that easily snap together in various combinations to form versatile control systems or sub-systems.

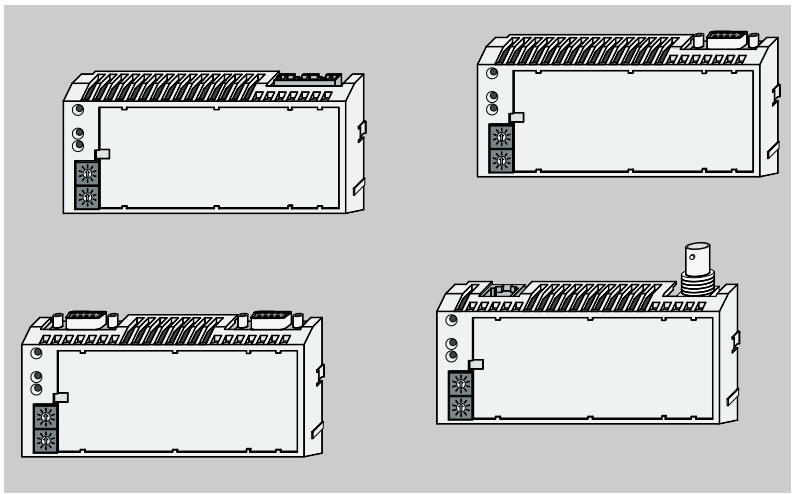
The four pieces are:

- Communication Adapters
- I/O Bases
- Processor Adapters
- Option Adapters



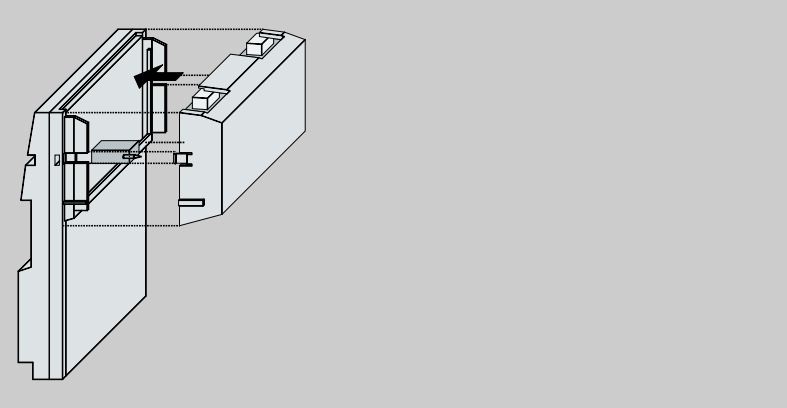
Momentum communication adapters

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



Momentum I/O bases

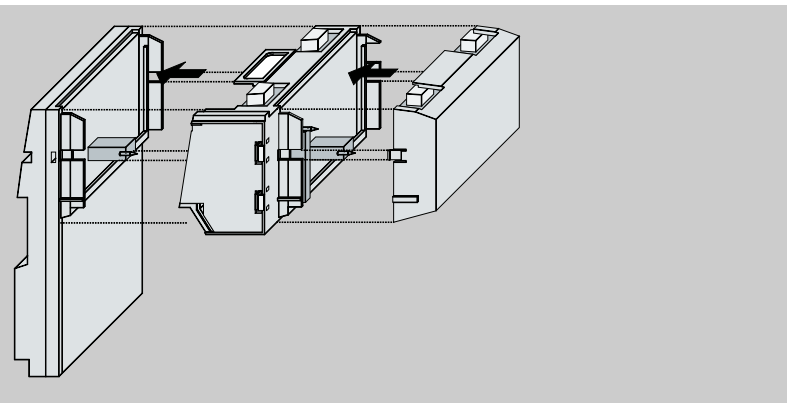
Specialized Momentum I/O Bases support the rest of the control system. The Communication Adapters, Processor Adapters and Option Adapters all snap onto the I/O Bases. A selection of I/O base modules are available, including analog I/O, discrete I/O, multi-function analog and bi-directional discrete bases. 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 processors and option adapters

When local distributed intelligence is required at the point of control, Momentum has the answer. Momentum M1 processor Adapters 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, just like the communication adapters.

The Option Adapter 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.



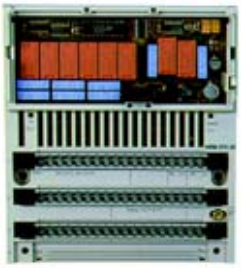
Momentum automation platform
Discrete I/O bases

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** **group to group** **Field to adapter**	None None 500 VAC		None 1780 VAC 1780 VAC	
Current capacity **Per output** **Per group** **Per module**	– – –			
Response time **OFF-ON** **ON-OFF**	2.2 ms 3.3 ms		10 ms @ 60 Hz 35 ms @ 60 Hz	13.3 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	**170 ADI 340 00**	**170 ADI 350 00**	**170 ADI 540 50**	**170 ADI 740 50**
Pages	48237/7			

Output modules for direct current		Output modules for alternating current			
24 VDC		120 VAC		230 VAC	
max. 250 mA		max. 125 mA		max. 65 mA	
–					
24 VDC		120 VAC		230 VAC	
Solid state switch		Triac			
2 x 8 out	2 x 16 out	2 x 4 out	2 x 8 out	2 x 4 out	2 x 8 out
None None 500 VAC		None None 1780 VAC			
0.5 A 4 A 8 A	0.5 A 8 A 16 A	2 A 4 A 8 A	0.5 A 4 A 8 A	2 A 4 A 8 A	0.5 A 4 A 8 A
< 0.1 ms < 0.1 ms		max. 1/2 x 1/f max. 1/2 x 1/f			
Electronically safeguarded		1 fuse per group			
1 LED/Out to adapter –	1 LED/4 Out to adapter –	None None 1 LED			
170 ADO 340 00	**170 ADO 350 00**	**170 ADO 530 50**	**170 ADO 540 50**	**170 ADO 730 50**	**170 ADO 740 50**
48237/7					

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			1 x 16 In, 2 x 4 Out
Potential isolation **Point to point** **group to group** **Field to adapter**	None None 500 VAC			None None 500 VAC
Current capacity **Per output** **Per group** **Per module**	0.5 A 4 A 8 A			2 A 8 A 16 A
Response time **OFF-ON** **ON-OFF**	2.2 ms In, < 1 ms Out 3.3 ms In, < 1 ms Out	60 µs in, < 1 ms Out 80 µs in, < 1 ms Out	2.2 ms 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** **I/O error** **Blown fuse**	1 LED/Out to adapter –			
Type of module	**170 ADM 350 10**	**170 ADM 350 11**	**170 ADM 350 15**	**170 ADM 370 10**
Pages	48237/7			

Output modules for direct current	Output modules for alternating current		
			
True high			
		24…230 VAC 20…115 VDC	120 VAC
		120 VAC	
max. 180 mA	max. 250 mA		max. 160 mA
IEC 1131 Type 1+, monitored	IEC 1131 Type 1+		IEC 1131 Type 2
	24…230 VAC or 20…115 VDC		120…132 VAC
	Relay (normally open)		Triac
1 x 16 In, 1 x 8 Out and 1 x 4 Out	1 x 10 In, 2 x 4 Out		1 x 10 In, 1 x 8 Out
None None 500 VAC	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	2 A ohmic load 8 A ohmic load 16 A ohmic load		0.5 A 4 A 4 A
	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	None	Varistor in parallel with each contact	1 internal fuse per group (not against overload)
1 LED/In, 1 LED/Out to adapter –	None None –		None None 1 LED/fuse
170 ADM 390 10	**170 ADM 390 30**	**170 ARM 370 30**	**170 ADM 690 51**
48237/7			

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.

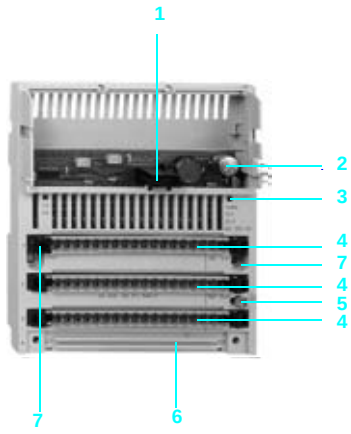
The I/O bases fit into compact standard housings that can be mounted on a DIN rail or on panels in a cabinet. They read information from field sensing devices and control discrete and analog field actuating devices. Terminal blocks and bus bars are available for use with the bases so that they can be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



170 AD● 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 Three connectors for the removable terminal blocks.
5 An earthing screw.
6 A slot for the power strip.
7 Two holes for panel mounting.

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

Characteristics :
pages 48237/3 to 48237/6

References :
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Connections :
pages 48237/9 to 48237/13

Momentum automation platform
Discrete I/O Bases

Characteristics of discrete input bases

Type of input base unit			170 ADI 340 00	170 ADI 350 00	170 ADI 540 50	170 ADI 740 50
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…132 AC (@ 47…63 Hz)	164…253 AC (@ 47…63 Hz)
Internal current		**mA**	250 (@ 24 VDC)		125 (@ 120 VAC)	–
Input voltage range		**V**	- 3…30 DC		0…132 AC	163…253 AC
	ON voltage	**V**	+ 11…30 DC		74 AC minimum	164 AC minimum
	OFF voltage	**V**	- 3…+ 5 DC		20 AC maximum	40 AC maximum
Input current	ON	**mA**	2.5 minimum		10.0 minimum	3…15
	OFF	**mA**	1.2 maximum		2.0 maximum	0…15
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	Group to group	**V**	–		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

Characteristics of discrete output bases

Type of output base unit			170 ADO 340 00	170 ADO 350 00	170 ADO 530 50	170 ADO 540 50	170 ADO 730 50	170 ADO 740 50
Number of outputs			2 x 8	2 x 16	2 x 4	2 x 8	2 x 4	2 x 8
Type of output			Solid state switch		Triac			
Output voltage		**V**	24 DC		120 AC		230 AC	
Operating voltage		**V**	24 DC		120 AC (300 for 10 s, 400 for 1 cycle)		230 AC (300 for 10 s, 400 for 1 cycle)	
Internal current		**mA**	250 (@ 24 VDC)		125		65	
Current	Point maximum	**A**	0.5		2	0.5	2	0.5
	Group	**A**	4		4			
	Module	**A**	8		8			
Min. output current		**mA**	–		5	30	5	30
Leakage current		**mA**	< 1 @ 24 VDC		1.9 @ 120 VAC		2.5 @ 230 VAC	2.4 @ 230 VAC
Surge current		**A**	5 for 1 ms		Point: 15 (1 cycle), 10 (2 cycles), 5 (3 cycles)			
On StateVoltage drop		**V**	< 0.5 DC @ 0.5 A		< 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)			Outputs electronically protected		Via internal 5 A slow-blow fuse			
Response time	On-off maximum	**ms**	< 0.1		1/2 x 1/f (= 0,5 of one line cycle)			
	Off-on maximum	**ms**	< 0.1		1/2 x 1/f (= 0,5 of one line cycle)			
Potential Isolation	Output group to output group		None		None			
	Field to communication interface	**V**	500 AC		1780 AC			
Power dissipation		**W**	3.5 typical 4.5 maximum	6.0 typical 7.5 maximum	6.0 typical 7.5 maximum			
Agency approvals			UL, CE, CSA	UL, CE, CSA	UL, CE, CSA, FM Class I, Div. II			

References :
pages 48237/7 to 48237/8

Connections :
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Characteristics of discrete I/O bases

Type of base unit			170 ADM 350 10	170 ADM 350 11	170 ADM 350 15	170 ADM 370 10	170 ADM 390 10
Number of inputs			1 x 16			4 x 4	1 x 16
Number of outputs			2 x 8			2 x 4	1 x 8 and 1 x 4
Operating voltage		**VDC**	24				
Internal current		**mA**	250 @ 24 VDC			250 @ 24 VDC (plus current for sensors)	180 @ 24 VDC
Inputs	Voltage	**VDC**	24				
	Type of signal		True high		True low	True high	
	Voltage at 1	**VDC**	+ 11…+ 30		- 3…+ 5	+ 11…+ 30	
	Voltage at 0	**VDC**	- 3…+ 5		+ 4…+ 30	- 3…+ 5	
	Input current	**mA**	2.5 min. at state 1 (6 mA at ⎓ 24 V),1.2 max. at state 0				
	Input voltage range	**VDC**	- 3…+ 30				
	Input resistance	**kΩ**	4				
	Response time	**ms**	2.2 Off to on 3.3 On to off	0.06 Off to on 0.08 On to off	2.2 ms In, < 1 ms Out 3.3 ms In, < 1 ms Out		
	Fault sensing		–				Broken wire detection
Outputs	Voltage	**VDC**	24, 30 maximum				
	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			2 per point 8 per group 16 per module	0.5 per point 4 per group 1, 2 group 2 6 per module
	Leakage current	mA	< 1 @ 24 VDC			< 1 @ 24 VDC	< 1 @ 24 VDC
	Peak current	A	5 for 1 ms			2.8 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 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			None	
	Input to output group	**V**	None			None	
	Field to communication interface		500 VAC				
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

References :
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Connections :
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Characteristics of discrete I/O bases (continued)

Type of base unit			170 ADM 390 30	170 ARM 370 30
Number of inputs			1 x 10	
Number of outputs			2 x 4	
Operating voltage		**V**	24 DC	120 AC (47…63Hz)
Internal current		**mA**	250 (@ 24 VDC)	5 minimum load current
Inputs	Voltage	**VDC**	24	
	Signal type		True High	
	On voltage minimum	**VDC**	+ 11…+ 30	
	Off voltage maximum	**VDC**	- 3…+ 5	
	Input current	**mA**	2.5 minimum On, 1.2 maximum Off	
	Input voltage range	**VDC**	- 3…+ 30	
	Input resistance	**kΩ**	4	
	Response time	**ms**	2.2 Off to On, 3.3 On to Off	
Outputs	Voltage	**V**	24 …230 AC, 20…120 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	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	

References :
pages 48237/7 to 48237/8

Connections :
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Characteristics of discrete I/O bases (continued)

Type of base unit			170 ADM 690 51
Number of inputs			1 x 10
Number of outputs			1 x 8
Operating voltage		**VAC**	120 (47…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...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…132 (@ 47…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	**VAC**	None
	Field to communication interface	**VAC**	1780
Power dissipation	Typical	**W**	6
	Maximum	**W**	8
Protection	Internal fuses	**A**	2 x 2.5 slow-blow fuses
Agency approvals			UL, CE, CSA

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Momentum automation platform
Discrete I/O Bases

Discrete input bases

170 ADI ●●0 ●0

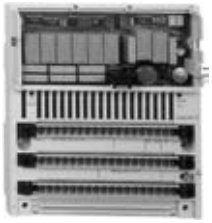
Type of current	Input voltage	Modularity (no. of points)	Conformity EC 1131-2	Reference	Weight kg
DC	24 V	16 (1 x 16)	Type 1	**170 ADI 340 00**	0.190
		32 (2 x 16)	Type 1	**170 ADI 350 00**	0.200
AC	100…120 V	16 (2 x 8)	Type 2	**170 ADI 540 50**	0.284
	200…240 V	16 (2 x 8)	Type 2	**170 ADI 740 50**	0.284

Discrete output bases

170 ADO ●●0 ●0

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	**170 ADO 340 00**	0.210
		32 (2 x 16)	0.5 A	**170 ADO 350 00**	0.210
AC triac, protected, 1 fuse per group	100…120 V	8 (2 x 4)	2 A	**170 ADO 530 50**	0.320
		16 (2 x 8)	0.5 A	**170 ADO 540 50**	0.284
	200…240 V	8 (2 x 4)	2 A	**170 ADO 730 50**	0.320
		16 (2 x 8)	0.5 A	**170 ADO 740 50**	0.284

Discrete I/O bases



170 ADM ●●0 ●●

Type of current	Input voltage	Output voltage	Modularity Inputs	Outputs, current	Reference	Weight kg
DC solid state	24 VDC Type 1	24 VDC protected	16 I (1 x 16)	16 O (2 x 8) 0.5 A	**170 ADM 350 10**	0.200
			16 I, fast (1 x 16)	16 O (2 x 8) 0.5 A	**170 ADM 350 11**	0.200
			16 I (1 x 16)	16 O (2 x 8) 0.5 A	**170 ADM 350 15**	0.200
			16 I (4 x 4)	8 O (2 x 4) 2 A	**170 ADM 370 10**	0.220
			16 I, wiring check (1 x 16)	12 O (1 x 8 and 1 x 4) 0.5 A	**170 ADM 390 10**	0.260
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	**170 ADM 390 30** *(1)*	0.260
					170 ARM 370 30 *(2)*	0.260
AC triac	100…120 VAC Type 2	120 VAC	10 I (1 x 10)	8 O 0.5 A protected by 1 fuse	**170 ADM 690 51**	0.220

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

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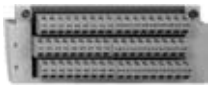
Connections : pages 48237/9 to 48237/13

170 XTS 001 00

170 XTS 002 00


170 XTS 004 01

170 XTS 005 01

170 XTS 008 01

170 XTS 006 01

CER 001

170 BSM 016 00

References

Accessories

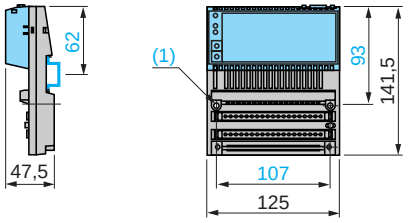
Description	Composition	Type of connection	Reference	Weight kg
Terminal blocks for I/O base connection	Set of 3 connectors 1 row	Screw	**170 XTS 001 00**	–
		Spring	**170 XTS 002 00**	–
Bus Bar	3 rows	Screw	**170 XTS 004 01**	–
		Spring	**170 XTS 003 01**	–
	2 rows	Screw	**170 XTS 005 01**	–
		Spring	**170 XTS 008 01**	–
	1 row	Screw	**170 XTS 006 01**	–
		Spring	**170 XTS 007 01**	–
Cable grounding rail	Used to connect the cable shielding	–	**CER 001**	–
High vibration environment clips	Kit containing 5 sets of clips	–	**170 XTS 120 00**	–
Dummy base unit	Used to prewire the I/O base units Requires screw or spring connection terminals		**170 BDM 090 00**	–
Discrete input simulator, 16 channels, 24 VDC	–	–	**170 BSM 016 00**	–

Replacement parts

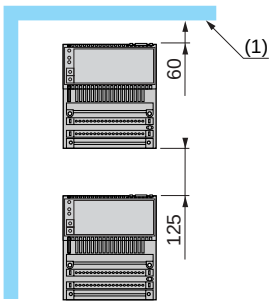
Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170 XTS 100 00**	–
Cable coding part kit	For screw or spring connection terminals	**170 XCP 200 00**	–

Dimensions, mounting

170 AD●, rail or panel mounting



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



(1) Equipment or enclosure

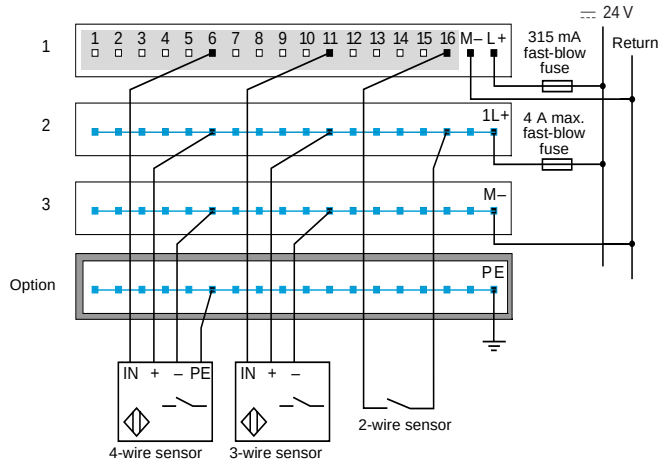
Characteristics:
pages 48237/3 to 48237/6

Connections :
pages 48237/9 to 48237/13

Momentum automation platform
Discrete I/O Bases

170 ADI 340 00

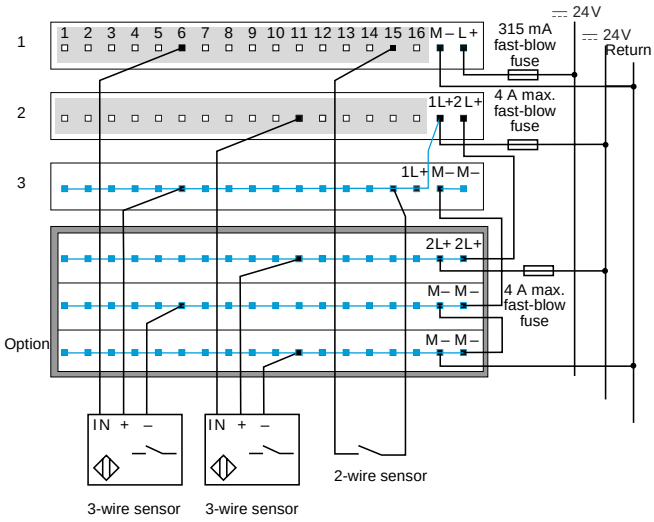
Example of external wiring of 2, 3 and 4-wire sensors



Group of channels
Internal wiring

170 ADI 350 00

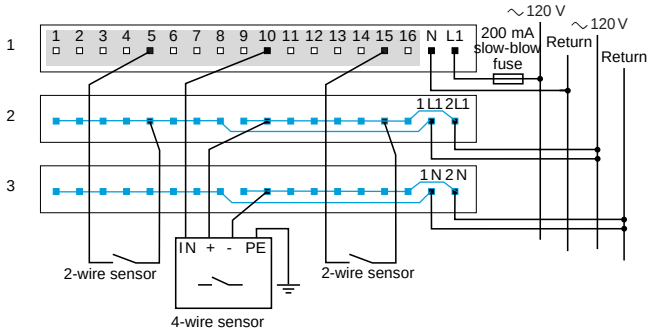
Example of external wiring of 2 and 3-wire sensors



Group of channels
Internal wiring

170 ADI 540 50

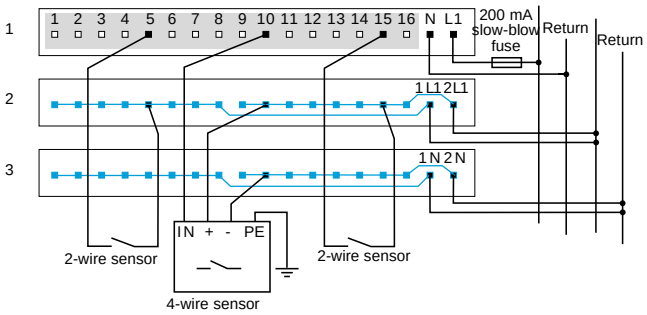
Example of external wiring of 2 and 3-wire sensors



Group of channels
Internal wiring

170 ADI 740 50

Example of external wiring of 2 and 3-wire sensors



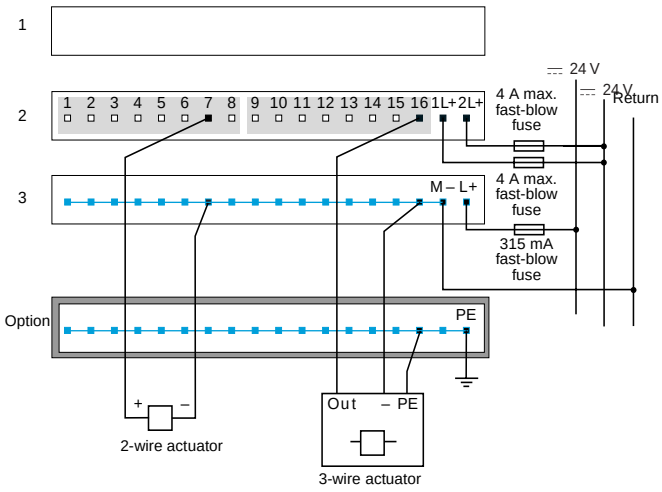
Characteristics :
pages 48237/3 to 48237/6

References :
pages 48237/7 to 48237/8

Momentum automation platform
Discrete I/O Bases

170 ADO 340 00

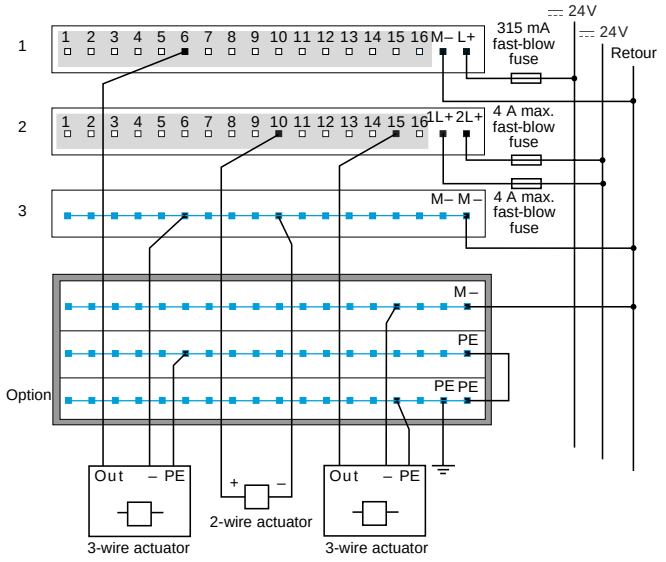
Example of external wiring of 2 and 3-wire actuators



Group of channels
Internal wiring

170 ADO 350 00

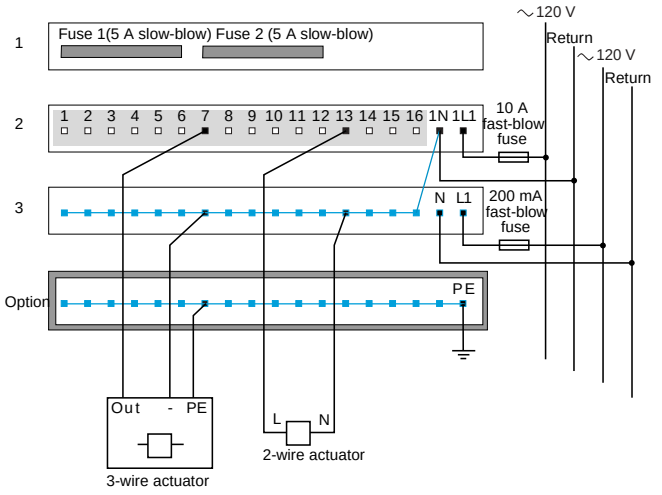
Example of external wiring of 2 and 3-wire actuators



Group of channels
Internal wiring

170 ADO 530 50/540 50

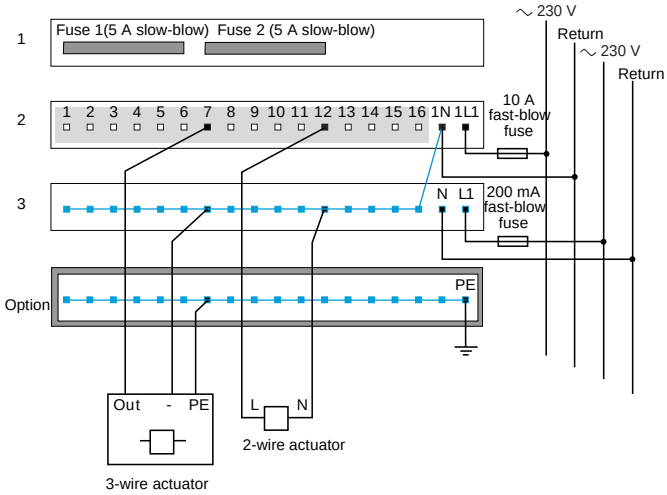
Example of external wiring of 2 and 3-wire actuator



Group of channels
Internal wiring

170 ADO 730 50/740 50

Example of external wiring of 2 and 3-wire actuators



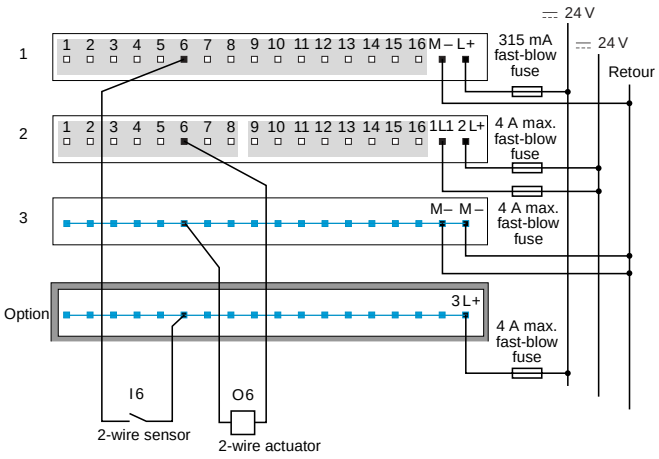
Group of channels
Internal wiring

Characteristics :
pages 48237/3 to 48237/6

References :
pages 48237/7 to 48237/8

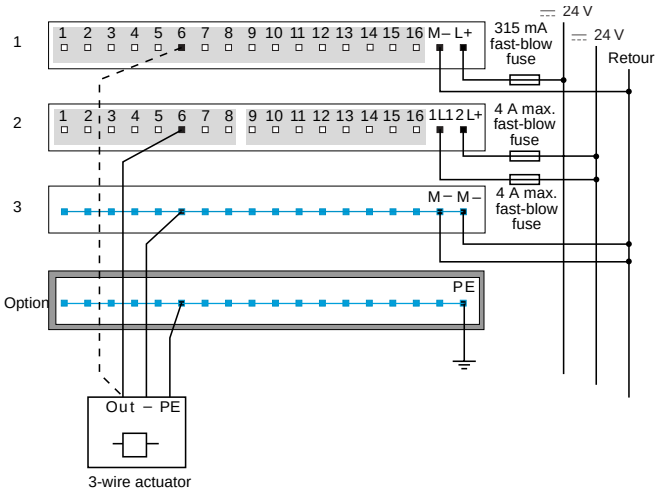
170 ADM 350 10/350 11/350 15

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



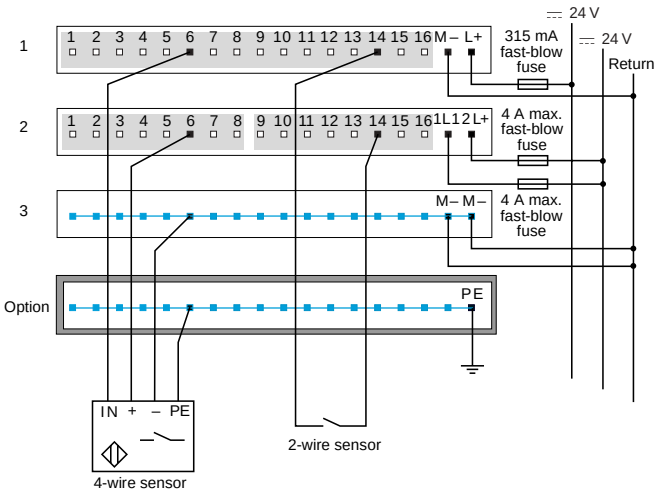
Group of channels
Internal wiring

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



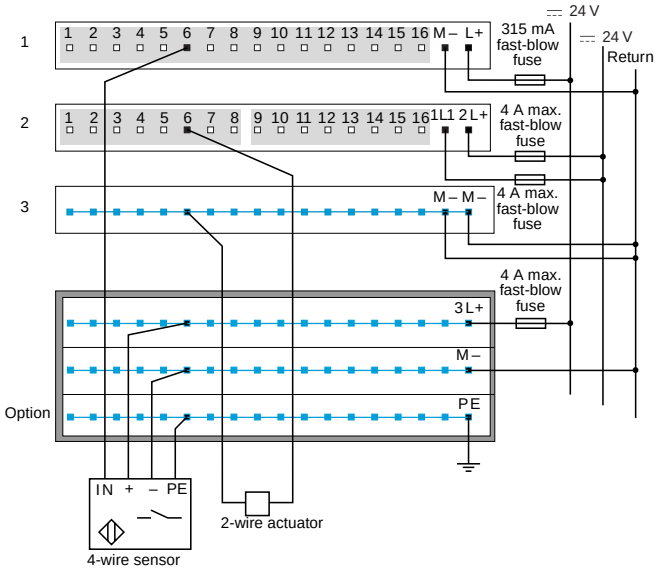
Group of channels
Internal wiring

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



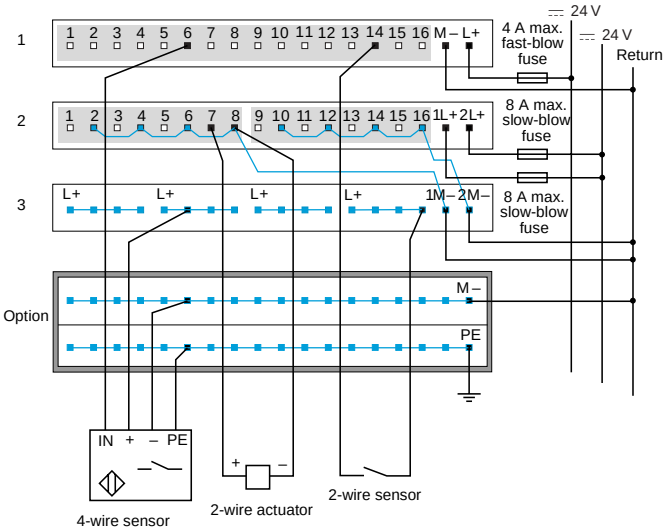
Group of channels
Internal wiring

Characteristics :
pages 48237/3 to 48237/6

References :
pages 48237/7 to 48237/8

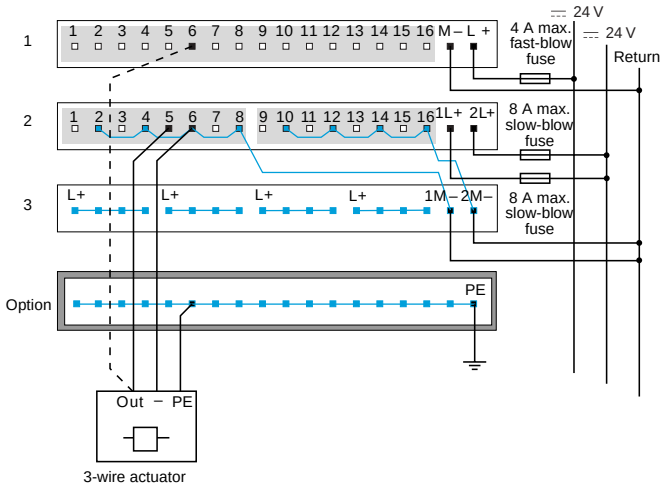
170 ADM 370 10

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



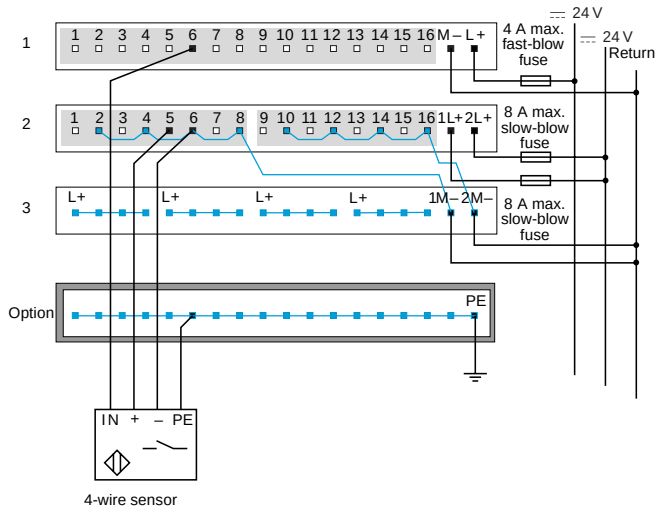
Group of channels
Internal wiring

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



Group of channels
Internal wiring

Special external wiring, the output activates the sensor



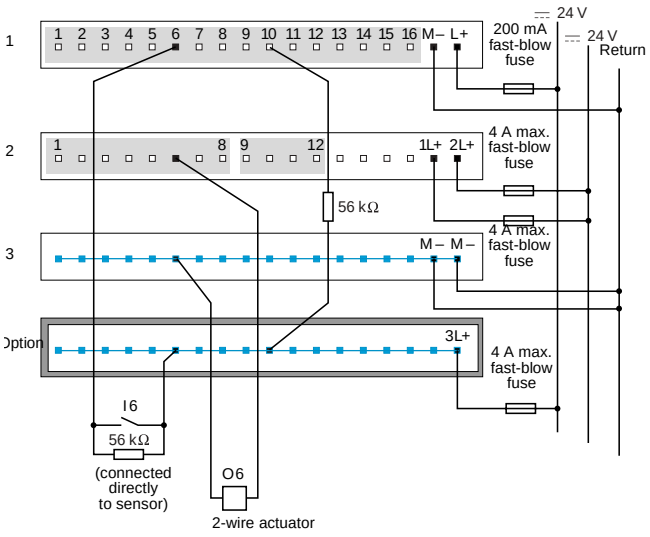
Group of channels
Internal wiring

Characteristics :
pages 48237/3 to 48237/6

References :
pages 48237/7 to 48237/8

170 ADM 390 10

Example of external wiring of 2-wire sensor/actuator

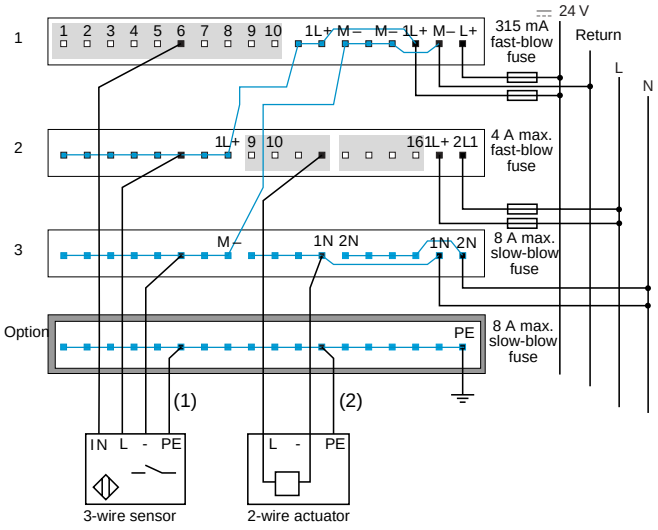


Group of channels

Internal wiring

170 ADM 390 30

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



Group of channels

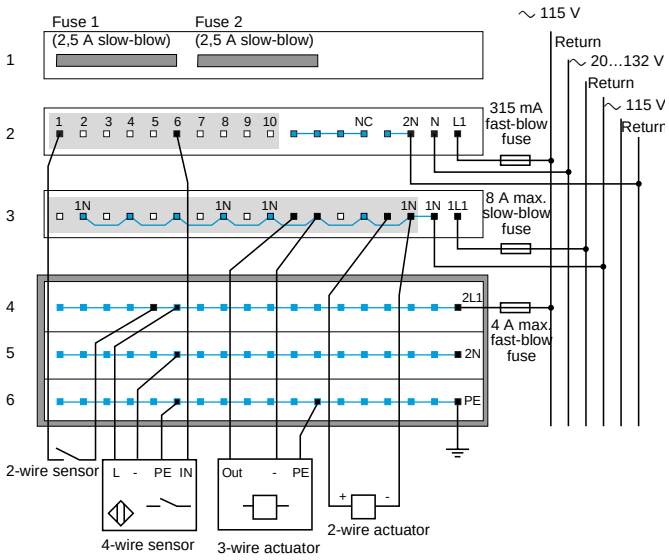
Internal wiring

(1) For 4-wire sensor

(2) For 3-wire actuator

170 ADM 690 51

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

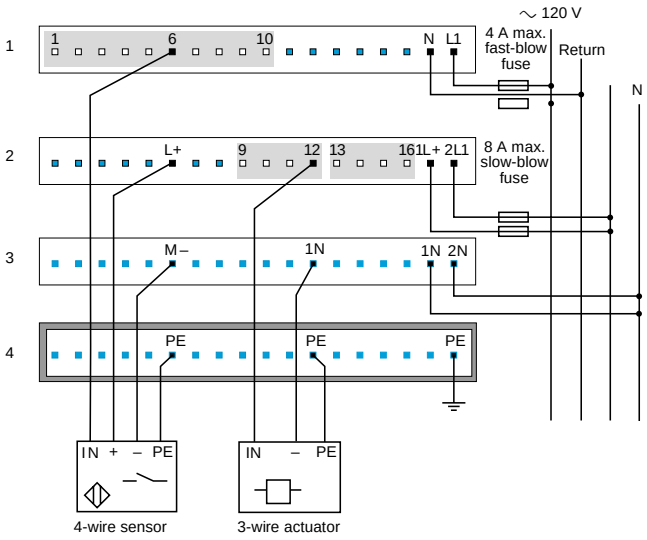


Group of channels

Internal wiring

170 ARM 370 30

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



Group of channels

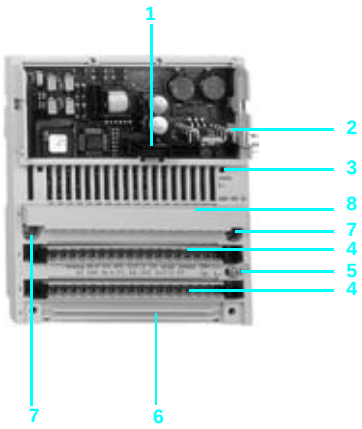
Internal wiring

Momentum automation platform
Analog I/O bases

Application	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 VDC, 1 min	1780 VAC, 1 min	1780 VAC, 1 min
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 module	**170 AAI 030 00**	**170 AAI 140 00**	**170 AAI 520 40**
Pages	48238/8		

24 VDC analog output bases		24 VDC mixed I/O bases (analog/discrete)		
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…10 V Outputs 0…10 V	Inputs - 10…+ 10 V Outputs - 10…+ 10 V
– 4 outputs –		4 differential inputs 2 outputs 4 inputs 24 VDC 2 outputs 24 VDC/0.5 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)	
No 500 VDC, 1 min 1780 VAC, 1 min		No 500 VAC, 1 min 500 VAC, 1 min		
		Short-circuits and overloads (for discrete outputs)		
– 5 words out		4 words in 4 words out	12 words in 12 words out	
Hold, reset to zero, reset to full scale		Hold or reset to zero		
170 AAO 120 00	**170 AAO 921 00**	**170 AMM 090 00**	**170 ANR 120 90**	**170 ANR 120 91**
48238/8				

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 (1-5 V, 4-20 mA, ± 5 V, ±10 V, ± 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 various 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 (170 AAI 030 00, 170 AAI 140 00, 170 AAI 520 40).

Description

170 A●● 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 earthing 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 **170 XTS 00● 00**.
- 1 to 3-row screw or spring bus bar **170 XTS 00● 01**.

Characteristics : pages 48238/3 to 48238/7
References : pages 48238/8 and 48238/9
Dimensions : page 48238/9
Connections : pages 48238/10 and 48238/11

Momentum automation platform
Analog I/O Bases

Characteristics of analog input bases

Type of base units			**170 AAI 030 00**				
Number of inputs			1 x 8				
LEDs			Ready (green)				
Format of data			Full 16 bits signed (two's complement)				
			Differential				
Ranges			**± 10 VDC**	**± 5 VDC**	**4…20 mA**	**± 20 mA**	**1 to 5 VDC**
	Input impedance	**kΩ**	> .1000	> .1000	250	250	>.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		15 bits				
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				
	Field to ground	**VDC**	500				
	Comm adapter to ground	**VAC**	500				
Common mode rejection	Channel to ground		250 VAC @ 47…63 Hz or 100 VDC				
Crosstalk between channels		**dB**	≥ 80				
External power requirement		**VDC**	24				
	Range		20.4 to 28.8 VDC				
	Current		< 382 mA @ 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 48238/8 and 48238/9

Dimensions :
page 48238/9

Connections :
pages 48238/10 and 48238/11

Characteristics of analog input bases

Type of base units			170 AAI 140 00			170 AAI 520 40	
Number of inputs			1 x 16			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	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, 1 min			500, 1 min	
	Channels to ground Base power Common mode Channel to ground	**VAC** **V** **V**	1780, 1 min ± 30 (voltage or current output) –			1780, 1 min ± 30 (voltage or current output) ± 100 VDC, 250 VAC	
	Common mode Voltage betw.channels	**V**	–			200 VDC, 115 VAC single phase or 3-phase or 250 VAC single phase	
Common mode rejection	Channel to ground		250 VAC at 47...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 48238/8 and 48238/9

Dimensions :
page 48238/9

Connections :
pages 48238/10 and 48238/11

Characteristics of analog output bases

Type of base units			170 AAO 120 00		170 AAO 921 00	
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			
Potential isolation	Channel to channel		None			
	Base power supply and Ground	**V**	500 VDC, 1 min			
	Channels to ground	**V**	1780 VAC, 1 min			
	Output protections		Short-circuits in the voltage circuits, open in current polarity inversion			
	Base power	**V**	± 30 (voltage or current output)			
Common mode rejection			250 VAC @ 47…63 Hz or 250 VDC 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 48238/8 and 48238/9

Dimensions :
page 48238/9

Connections :
pages 48238/10 and 48238/11

Characteristics of discrete and analog I/O bases

Type of base unit			170 AMM 090 00				
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				
Internal current		**mA**	200 typical (at 24 VDC), 350 maximum (at 24 VDC)				
Differential inputs	Conversion time		10 ms for all channels				
	Conversion error		**± 10 V**	**± 5 V**	**1…5 V**	**± 20 mA**	**4…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				
	Overvoltage voltage ranges	**V**	± 30 solid state if voltage is 24 V ± 50 dynamic max. 100 ms				
	Overvoltage current ranges	**mA**	Input current > 48				
	Input resistance	Ω	Voltage ranges > 1M, current ranges 250				
Discrete inputs	Voltage	**VDC**	24 typical, 30 maximum				
	Signal Type		True high				
	On Voltage	**VDC**	+ 11…+ 30				
	Off Voltage	**VDC**	- 3…+ 5				
	Input current	**mA**	2.5 minimum at state 1 (6 mA at 24 VDC), 1.2 maximum at state 0				
	Input resistance	**kΩ**	4				
	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				
	60 °C		max. ± 0.70 % of upper measuring range value				
	Output load		≥ 3 kΩ on voltage output, ≤ 6 Ω on current output				
Discrete outputs	Voltage	**VDC**	24 typical, 30 maximum				
	Type		Semiconductor				
	Signal Type		True high				
	Current capacity		1 per channel, 2 / group, 2 / module				
	Leakage current	**mA**	< 1 @ 24 VDC				
	On State Voltage drop	**VDC**	< 0.5 @ 1 A				
	Response time	**ms**	< 0.1 Off to On < 0.1 On to Off				
	Output protection		The outputs are protected against overload and short-circuit-circuiting				
	Output indicator		1 red LED per “On”output in the event of an overload or short-circuit-circuiting				
	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 min				
	Operating voltage and all inputs and outputs from ground	**VAC**	500 for 1 min				
Power dissipation	Typical	**W**	4.0				
	Maximum	**W**	6.0				
Agency approvals			UL, CE, CSA, FM Class 1, Div. 2				

References :
pages 48238/8 and 48238/9

Dimensions :
page 48238/9

Connections :
pages 48238/10 and 48238/11

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

Type of base units			170 ANR 120 90	170 ANR 120 91
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 VDC	
Internal current		**mA**	400 @ 24 VDC	
Analog inputs	Resolution		14 bit	
	Input range		0 - 10 VDC	- 10… + 10 VDC
	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		15 VDC for voltage input	
	Max temperature drift		10 VDC inputs	
	Input resistance	W	>1M 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	**mA**	6 minimum On, 2 maximum Off	
	Input voltage range		+ 3 to + 32 VDC	
	Input voltage surge		45 Volt peak for 10 ms	
	Response time	**ms**	1.2 Off to On, 1.2 On to Off	
Analog outputs	Resolution		14 bit	
	Output range	**VDC**	0 to 10	- 10… + 10 VDC
	Conversion time	**ms**	1.20 for all four channels	
	Conversion error		max. + 0.4 % of upper measuring range value @ 25 °C	
	Output load		> 2 kOhm minimum @ 0 to 10 VDC	
Discrete out	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 amp current	
	Response time	**ms**	1.2 Off to On, 1.05 On to Off	
	Output protection		The Outputs are protected against overload and short-circuiting	
	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		500 VAC for 1 min.	
	Operating voltage and all inputs and outputs from ground		500 VAC for 1 min.	
Power dissipation	Typical	**W**	4.0	
	Maximum	**W**	6.0	
Agency approvals			UL, CE, CSA	

References :
pages 48238/8 and 48238/9

Dimensions :
page 48238/9

Connections :
pages 48238/10 and 48238/11

Momentum automation platform
Analog I/O Bases

170 AAI ●●0 ●0

170 AAO ●2● 00

170 AAM 090 00

Analog input bases

Type of inputs	Number of channels	Ranges	Reference	Weight kg
12 bits + sign	16	± 5 V, ± 10 V, 4-20 mA	**170 AAI 140 00**	0.215
15 bits + sign	4, differential	Pt 100, Pt 1000, NI 100 thermocouples B, E, J, K, N, R, S, T	**170 AAI 520 40**	0.215
	8, differential	± 5 V, ± 10 V, 1-5 V± 20 mA, 4-20 mA	**170 AAI 030 00**	0.215

Analog output bases

Type of inputs/ outputs	Number of channels	Ranges	Reference	Weight kg
12 bits + sign	4	± 10 V, 0-20 mA	**170 AAO 120 00**	0.215
		± 10 V, 4-20 mA	**170 AAO 921 00**	0.215

Discrete and analog I/O bases

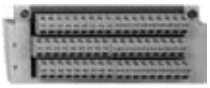
Type		Ranges		Reference	Weight kg
Inputs	Outputs	Inputs	Outputs		
4 differential analog 13 bits + sign	**2 analog 12 bits**	± 5 V, ± 10 V 1-5 V ± 20 mA, 4-20 mA	0-20 mA ± 10 V	**170 AMM 090 00**	0.240
4 discretes	**2 discretes 0.5 A**	24 VDC	24 VDC		–
6 analog 14 bits	**4 analogs 14 bits**	0-10 V	0-10 V	**170 ANR 120 90**	0.240
8 discretes	**8 discretes**		24 VDC		
6 analog 14 bits	**4 analogs**	± 10 V	± 10 V	**170 ANR 120 91**	–
8 discretes		24 VDC	24 VDC		

Characteristics : pages 48238/3 to 48238/7
Dimensions : page 48238/9
Connections : pages 48238/10 and 48238/11

Momentum automation platform
Analog I/O Bases

170 XTS 001 00

170 XTS 002 00

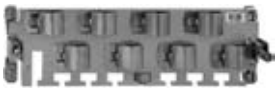


170 XTS 004 01

170 XTS 005 01

170 XTS 008 01

170 XTS 006 01



CER 001

Accessories

Description	Composition	Type of connection	Reference	Weight kg
Terminal blocks	Set of 3 connectors 1 row	Screw	**170 XTS 001 00**	–
		Spring	**170 XTS 002 00**	–
Bus Bar	3 rows	Screw	**170 XTS 004 01**	–
		Spring	**170 XTS 003 01**	–
	2 rows	Screw	**170 XTS 005 01**	–
		Spring	**170 XTS 008 01**	–
	1 row	Screw	**170 XTS 006 01**	–
		Spring	**170 XTS 007 01**	–
Cable Grounding Rail	Used to connect the cable shielding		**CER 001**	–
High vibration environment clips	Kit contains 5 sets of clips	Mechanical	**170 XTS 120 00**	–
Dummy base unit	Used to prewire the I/O base units. Requires screw or spring connection terminals		**170 BDM 090 00**	–

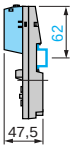
Replacement parts

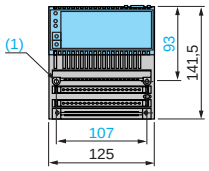
Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170 XTS 100 00**	–
Set of codingand locating devices	For screw or spring connection terminals	**170 XCP 200 00**	–

Dimensions, mounting

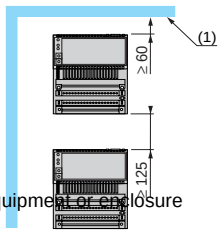
170 A●●

Rail or panel mounting





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



(1) Equipment or enclosure

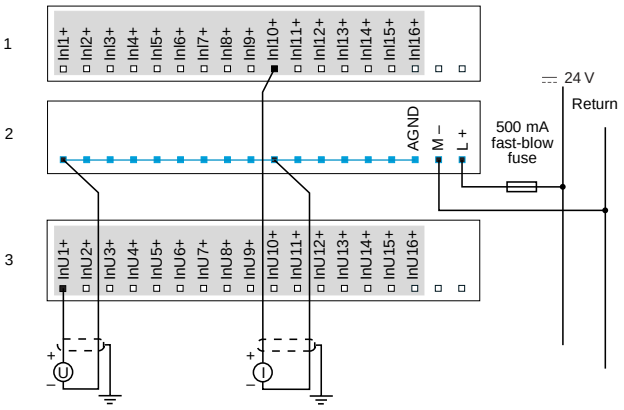
Characteristics :
pages 48238/3 to 48238/7

Connections :
pages 48238/10 and 48238/11

Momentum automation platform
Analog I/O Bases

170 AAI 140 00

Example of external wiring of 2-wire sensor

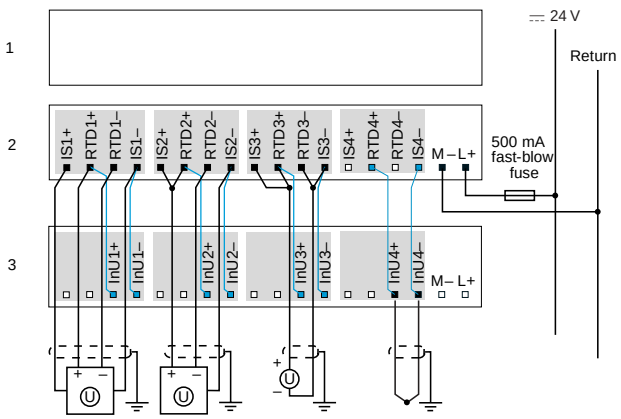


Group of channels

Internal wiring

170 AAI 520 40

Example of external wiring of sensor

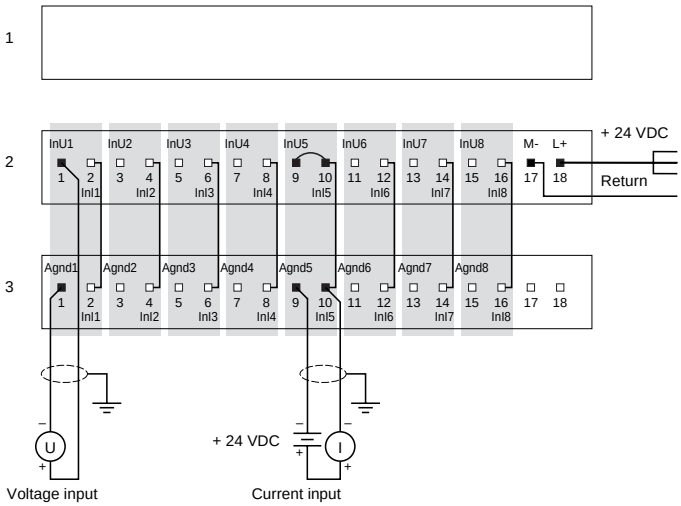


Group of channels

Internal wiring

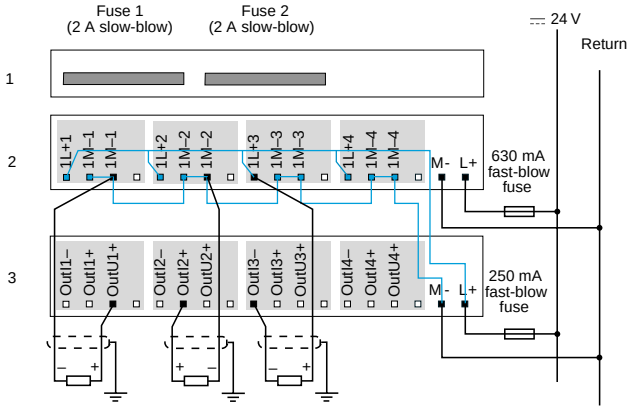
170 AAI 030 00

Example of external wiring of 2-wire sensor



170 AAO 120/921 00

Example of external wiring of 2-wire actuator

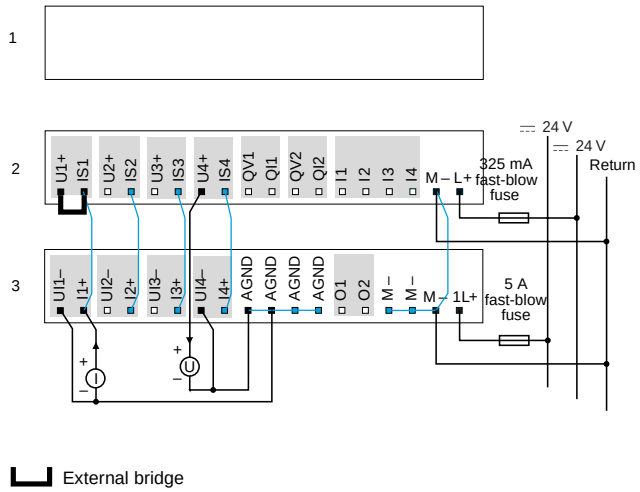


Group of channels

Internal wiring

170 AMM 090 00

Example of external wiring of 2-wire sensor

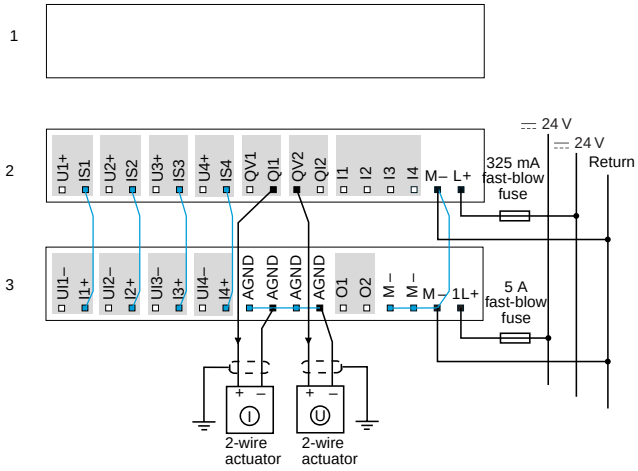


External bridge

Group of channels

Internal wiring

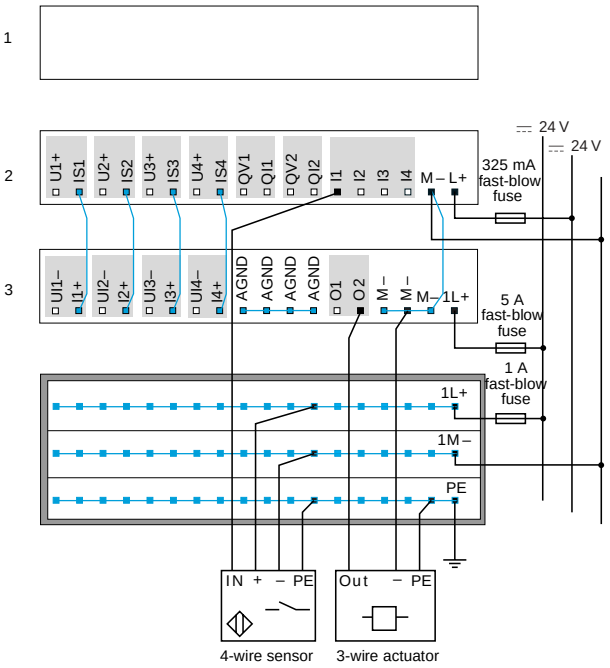
Example of external wiring of 2-wire actuator



Group of channels

Internal wiring

Example of external wiring of digital sensor/actuator

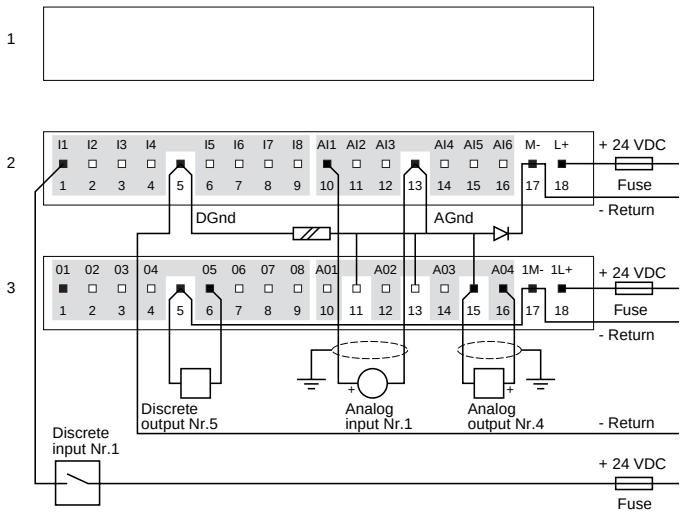


Group of channels

Internal wiring

170 ANR 120 90/91

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



(1) Depending on application, max 5A

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	**170 AEC 920 00**
Pages	48248/4

I/O with Modbus Master Base	SERIPLEX Bus Interface
120 VAC	24 VDC
RS 485 2- or 4-wire Modbus port	SERIPLEX bus connection
6 True High Inputs	Interface to bus input
3 True High Outputs	Interface to bus output
–	–
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	SERIPLEX version 2 bus input devices supported @ 24 VDC bus voltage
–	–
3 solid state switching outputs: - 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	SERIPLEX version 2 bus output devices supported @ 24 VDC bus voltage
	Short circuit and overload for discrete outputs
	500 V @ 2 Ω , power to common
	–
170 ADM 540 80	**170 ANM 050 10**
48248/4	

Momentum automation platform
Momentum 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 - 170 AEC 920 00.
- a 120 VAC, 6-point Input/3-point Output Module Base with a Modbus Communication Port - 170 ADM 540 80.
- a Base Module that provides an interface between Momentum and the SERIPLEX Component Network - 170 ANM 050 10.

High-Speed Counter

The 170 AEC 920 00 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); and 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 Comm Adapters onto the base.

Input-Output Module with Modbus Comm Port

The 170 ADM 540 80 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.

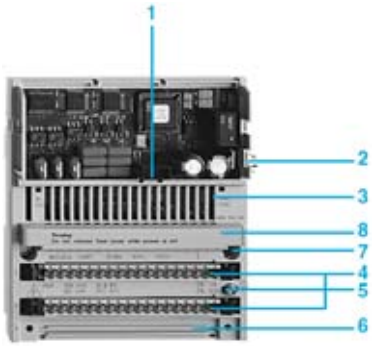
SERIPLEX Module

The 170 ANM 050 10 SERIPLEX interface for Momentum controllers allows the exchange of I/O data over the SERIPLEX Component Network. SERIPLEX, from Square D, is a device-level control network with over 3 million installed I/O points worldwide. The interface acts as a slave to its host controller, and as a master for the SERIPLEX bus. The SERIPLEX base unit may have a Momentum processor adapter or communications adapter mounted on it, thus supporting three powerful control architectures :

- Standalone Momentum controllers with SERIPLEX I/O devices.
- Networked, distributed Momentum controllers, some or all of which may connect to SERIPLEX I/O devices.
- A centralized control processor connecting to SERIPLEX bus devices and/or other types of I/O devices through a higher-level control network, such as Ethernet, Modbus Plus, DeviceNet, Interbus, or Profibu.

Description

A specialty module I/O bases consists of the following components :



1 Internal interface connectorfor the communication module.
2 Locking and earth contact for the adapter.
3 LED status display.
4 Two connectors for the removable terminal blocks.
5 Earthing screw.
6 Grounding busbar mounting slot.
7 Mounting holes for a panel mount.
8 Protective cover for fuses (170 ADM 54080) or connector for the removable terminal block.

Characteristics : pages 48248/3 and 48248/4
References : page 48248/4
Connections : page 48248/5

Momentum automation platform
Momentum specialty module I/O bases

Characteristics

Model No.				170 AEC 920 00	170 ADM 540 80
Number of I/O	Counter			2 independant	–
	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	0-132 AC
	Input surge		**V**	45 peak for 10 ms	200 AC for 1 cycle
	Inputcurrent	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		**ms**	3 Off to on 3 On to off	< 12.5 at 60 Hz Off to on < 12.3 at 60 Hz On to off
	Signal type			True High	
Discrete outputs	Operating voltage		**V**	24 DC	120 AC at 47 to 63 Hz
	Signal type			True High	
	On state voltage drop		**V**	< 0.5 DC at 0.5 amp current	< 1.5 AC at 0.5 amp current
	Fault sensing			Overload and short circuit	1 fuse, 2.5 amps at 250 VAC
	Current capacity		**A**	0.5 per point 1 per counter 2 per module	0.5 continuous per point – 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 comm adapter (8 input words, 8 output words)	–
Modbus port	Type			–	RS-485, 2- or 4-wire
	Communication rates		**bits/s**	–	19,200 and 9600
	Format			–	8-bit RTU / 7-bit ASCII
	Modbus address range			–	0 to 247
	Timeout		**ms**	–	150 after transmission
Current consumption			**mA**	280	125 @ 120 VAC
Agency approvals				UL, CE, CSA	

References :
page 48248/4

Connections :
page 48248/5

Characteristics

Model No.		170 ANM 050 10
Communication type		SERIPLEX bus connection
Operating voltage	**VDC**	24
Modularity		Interfaces to bus input and bus output
Input characteristic		SERIPLEX version 2 bus input devices supported at 24 VDC bus voltage
Output characteristic		SERIPLEX version 2 bus output devices supported at 24 VDC bus voltage
Input voltage surge	**V**	500 at 2 Ohms, power to common
Current consumption	**mA**	Max. 450 @ 24 VDC
Protection		Short circuit and overload for discrete outputs
Agency approvals		UL, CE, CSA

References

170 AEC 920 00

170 ADM 540 80

Modules

Description	Characteristics	Reference	Weight kg
High-speed counter Module Base	2 independent counters	**170 AEC 920 00**	0.070
I/O module base with modbus comm port	6 inputs, 3 outputs	**170 ADM 540 80**	0.070
SERIPLEX bus interface	Interfaces to bus input and bus output	**170 ANM 050 10**	0.070

Accessories *(1)*
Replacement parts

Description	Use	Reference	Weight kg
Sheets of labels	10 front labels for Momentum modules	**170 XTS 100 00**	–

Documentation

Description	Use	Reference	Weight kg
Momentum I/O bases	User guide for: 170 AEC 920 00	**870 USE 008 00**	–
	170 ADM 540 80	**870 USE 002 00**	–
SERIPLEX	Module Instruction Bulletin	**30298 086 01**	–
	Module Installation "Mini-book"	**30298 085 01**	–
	Installation and Troubleshooting Guide	**30298 035 01A**	–

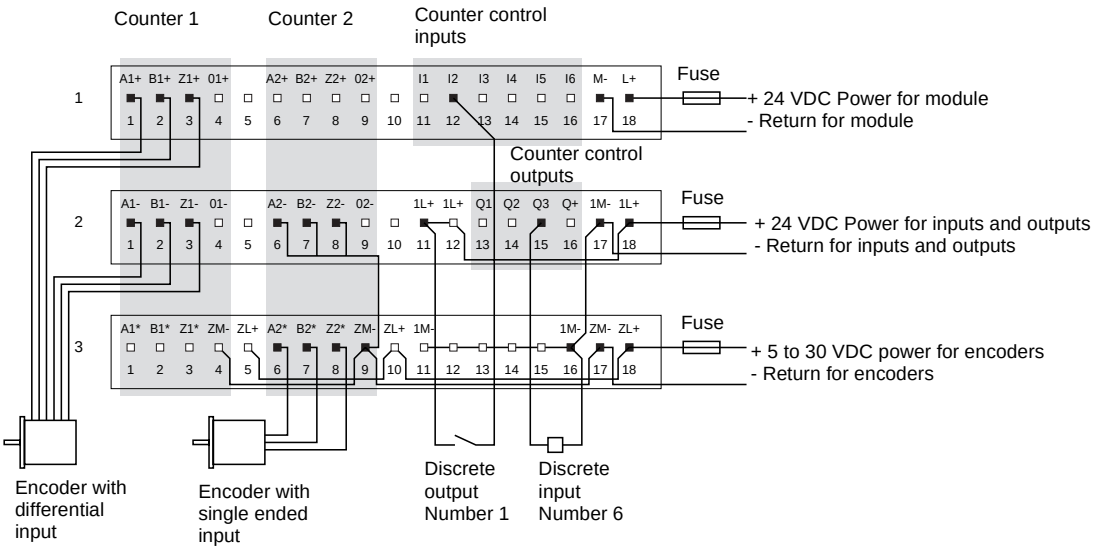
(1) Terminal blocks, bus bar, cable grounding rail and discrete input simulator, see page 48237/8.

Connections :
page 48248/5

Momentum automation platform
Momentum specialty module I/O bases

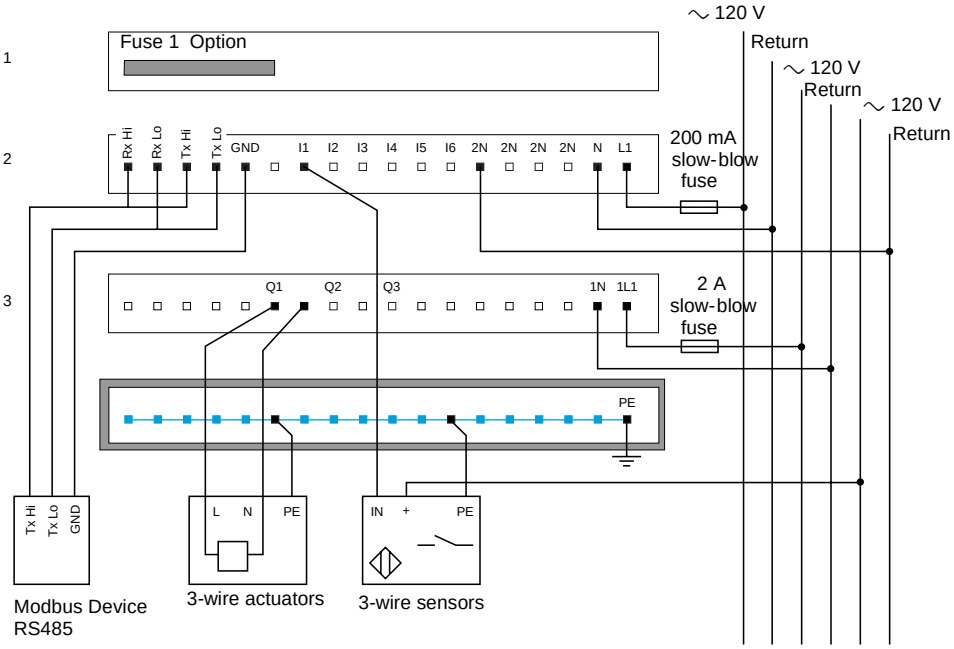
170 AEC 920 00

A 2-encoder and input/output field wiring example



170 ADM 540 80

A Modbus device and input/output field wiring example



Characteristics :
pages 48248/3 and 48248/4

References :
page 48248/4

Momentum automation platform
Communication Adapters

Applications	Communication Adapters for Ethernet	Communication Adapter for InterBus		
Bus and network type	Ethernet	InterBus-S		
		Generation 3	Generation 4	Generation 4
Topology **Physical interfce**	IEEE 802.3 standard	DIN 19 258 standard		
Method of access	CSMA-CD	Master/Slave		
Bit rate	10 M bps	10/100 M bps	500 K bps	
Medium **Type**	Twisted pair CAT5		Twisted pair	Fibre optic
Topology	Star		Ring	
Redundancy	No		No	
Maximum number of Momentum devices	–		40 per installation remote bus module (up to 256 bus terminal modules)	
Maximum length	1000 m per segment		Up to 12800 m	

Type of communicating module	**170 ENT 110 00**	**170 ENT 110 01**	**170 INT 110 00**	**170 INT 110 03**	**170 INT 120 00**
Pages	48249/3		48230/3		

Momentum I/O modules on Profibus DP bus	Momentum I/O modules on DeviceNet network
Profibus DP	DeviceNet
EN 50170 standard	–
Master/Slave	CSMA-CD
12 M bps…9.6 K bps depending on length	500 K bps
Twisted pair	Multidrop
Multidrop, ring	Multidrop
No	No
32 without repeater 126 with repeaters	64
1200 m	500 m with repeaters
170 DNT 110 00	**170 LNT 710 00**
48231/3	48233/3

Momentum automation platform
Communication Adapters

Applications	Communication Adapter for Modbus Plus		
Bus and network type	Modbus Plus		
Topology **Physical interfce**	Mobus Plus standard		
Method of access	Rotating token		
Bit rate	1 M bps		
Medium **Type**	Twisted pair		
Topology	Multidrop		
Redundancy	No	Yes	No
Maximum number of Momentum devices **Per segment**	32		
Overwall	64 (without repeaters)		
Maximum length	5 000 m with repeaters		
Type of communicating module	**170 PNT 110 20**	**170 PNT 160 20**	**170 NEF 110 21**
Pages	48232/5		

	Momentum distributed I/O modules on Fipio bus for TSX Series 7 and April 5000 PLCs	Momentum distributed I/O modules on Fipio bus for Premium PLCs
	Fipio	
	Fip standard	
	Bus managed by bus arbitrator	
	1 M bps	
	Twisted pair	
	Multidrop	
Yes	No	
		128
	Up to 5 000 m with repeater	Up to 15 000 m with repeaters
	170 NEF 160 21	**170 FNT 110 00**	**170 FNT 110 01**
	48236/3	

Momentum automation platform
Ethernet TCP/IP Communication Adapters

Presentation

The Model 170 ENT 110 00 and 170 ENT 110 01 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 170 ENT 110 01 (and the 10Base-T adapter, the 170 ENT 110 00) are single adapters designed to plug on to any of the Momentum Input/Output module bases, and conforms 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'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 automation Internet web site, **www.schneiderautomation.com.**

Description

The 170 ENT 110 0● Ethernet Communication Adapters comprises on the front panel:

1 Ethernet connector for 100Base-TX interface (170 ENT 110 01) or 10Base-T interface (170 ENT 110 00) interface (RJ45),

2 Area for Label (label shipped with I/O base),

3 LED Status Indicators comprising for the 170 ENT 110 00:
- Run (green), module health,
- LAN Active (green), Ethernet network status.

LED Status Indicators comprising for the 170 ENT 110 01:
- Run (green), module health,
- 10T (green), 10 Mbps network activity,
- 100T (amber), 100 Mbps network activity,
- ST (green), Ethernet network status.

Momentum automation platform
Ethernet TCP/IP Communication Adapters

Characteristics

Model No		170 ENT 110 00	170 ENT 110 01
Communication network		Ethernet TCP/IP	
Communication rate	**M bits/s**	10	10 / 100
Number of nodes (devices)		Unlimited with hubs and routers; 32 units point-to-point	
Media		Twisted pair cable, 10Base-T	Twisted pair cable, 100Base-TX
Flash memory		128 K for IP parameter storage	
Distance	**m (ft)**	100 (328) twisted pair cable without repeaters; unlimited distance with repeaters	
Connectors		RJ-45 10 base-T	RJ-45 100base-TX
Error checking		CRC-32 error check	
Error and fail states		Fail safe	
Addressing		Unique IEEE global address, IP address user assigned	
Adapter configuration		BOOTP server to assign IP parameters	
Mode of operation		Master slave, peer-to-peer	
Topology		Multi-drop bus, star	
Packaging		Standard momentum communications adapter enclosure - IP20 environment	
Indicator lights		Run and activity lights	Run, 10 Mbps, 100 Mbps, 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

170 ENT 110 00

Module

Description	Reference	Weight kg
Ethernet TCP/IP Communication Adapter	**170 ENT 110 00**	0.070

Accessories

BOOTP Lite Ethernet Software	Download from www.schneiderautomation.com	–
Ethernet TCP/IP Communication Adapter User Guide	**870 USE 112 00**	–

Momentum automation platform
Momentum 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 :

- 170 PNT 110 20, Single Port, IEC Data Format.
- 170 PNT 160 20, Redundant Port, IEC Data Format.
- 170 NEF 110 21, Single Port, 984 Data Format.
- 170 NEF 160 21, 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. The figures below illustrate typical control systems using Momentum I/O modules on the Modbus Plus network with programmable controllers and industrial computer systems.

Characteristics :
page 48232/3

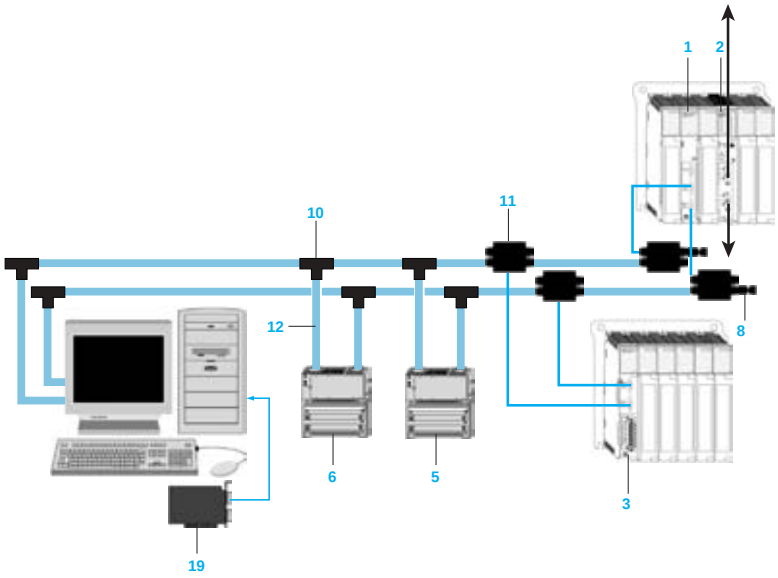
References :
page 48232/3

Momentum automation platform

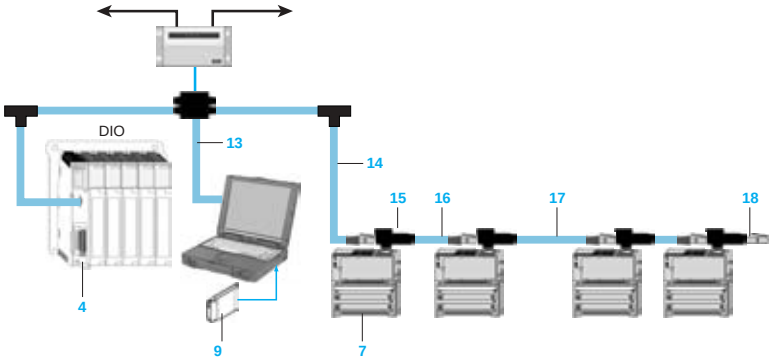
Momentum Modbus Plus communication adapters

Network topology

Momentum I/O modules in a distributed control system



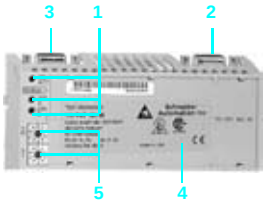
Momentum I/O modules with Modbus Plus double cable in a distributed and redundant control system



1 140 NOM 212 00Quantum Modbus Plus Head-end Interface, redundant support, twisted pair cable
2 140 NOM 252 00Quantum Modbus Plus Head-end Interface, single-cable support, fiber optic cable
3 140 CRA 212 10Quantum Modbus Plus Drop Interface and power supply, redundant support, 115/230 VAC
4 140 CRA 211 10Quantum Modbus Plus Drop Interface and power supply, single-cable support, 115/230 VAC
5 170 PNT 160 20Momentum Modbus Plus Communication Adapter, redundant network, IEC support
6 170 NEF 160 21Momentum Modbus Plus Communication Adapter, redundant network, 984 support
7 170 PNT 110 20Momentum Modbus Plus Communication Adapter, non-redundant network, IEC support
8 990 NAD 230 11Modbus Plus Ruggedized Tap Terminators
9 416 NHM 212 33Modbus Plus Type III PCMCIA Card, single port
10 990 NAD 230 00Modbus Plus Tap, IP20
11 990 NAD 230 10Modbus Plus Tap, IP65
12 990 NAD 211 10Modbus Plus Drop Cable, 2.4 m (8 ft)
13 990 NAD 215 10Modbus Plus Ruggedized Tap Programming Cable, 3.05 m (10 ft)
14 170 MCI 021 20Modbus Plus RJ45 cable, 3.05 m (10 ft)
15 170 XTS 020 00Modbus Plus “T” Connector (DB9 base)
16 170 MCI 020 10Modbus Plus RS 485 cable, 25 cm (10 in)
17 170 MCI 020 80Modbus Plus RJ45 cable, double-ended, 10 m (30 ft)
18 170 XTS 021 00Modbus Plus RJ45 Terminator
19 416 NHM 300 32Modbus Plus PCI PC Adapter Card, dual ports.

Characteristics : page 48232/4
References : page48232/5

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		170 PNT 110 20/160 20	170 NEF 110 21/160 21
Master PLC on the network		Quantum, Premium	Compact 984
Structure	Type	Industrial	
	Topology	Multi-drop, devices connected using extension cable or tap-off cable	
	Length	5,000 m (6000 ft) maximum with repeater	
	Access method	Token bus	
Transmission	Bit rate	1 Mbps	
	Medium	Twisted pairs	
Data Format		IEC Data format	984 Data Format
Number of Momentum devices	Per segment	31 connection points per segment	31 connection points per segment
	Maximum	63 for all segments	97 for all segments
Power source		Power supply on-board the I/O base	
Behaviour 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	

Momentum automation platform
Modbus Plus communication adapters

170 PNT 110 20/NEF 110 21

170 PNT 160 20/NEF 160 21

AS MBKT 085

References

Description	Connection	Bus master PLC	Reference	Weight kg
Communication modules for Momentum I/O sub-bases	Non-redundant Modbus Plus network	Premium Quantum	**170 PNT 110 20**	–
		Compact 984	**170 NEF 110 21**	–
	Redundant Modbus Plus network	Quantum Premium	**170 PNT 160 20**	–
		Compact 984	**170 NEF 160 21**	–

Description	Use	Reference	Weight kg
Modbus Plus tap	IP 20 junction box for tap-off connection (T)	**990 NAD 230 00**	0.230
	IP 65 junction box for tap-off connection (T)	**990 NAD 230 10**	0.230
9-way female SUB-D connector	Communication module connection	**AS MBKT 085**	–
Terminator connector kit (set of 2)	2 impedance adaptors for box (IP 20) 990 NAD 230 00	**AS MBKT 185**	–
	2 impedance adaptors for box (IP 65) 990 NAD 230 10	**990 NAD 230 11**	–

Connection cables

Description	Use From	To	Length	Reference	Weight kg
Standard Modbus Plus cables	T-junction box	T-junction box	30 m	**490 NAA 271 01**	–
			150 m	**490 NAA 271 02**	–
			300 m	**490 NAA 271 03**	–
			450 m	**490 NAA 271 04**	–
			1500 m	**490 NAA 271 06**	–
Modbus Plus Drop cables	Communication modules for Momentum I/O sub-bases	T-junction box 990 NAD 230 00	2.4 m	**990 NAD 211 10**	0.530
		990 NAD 230 10	6 m	**990 NAD 211 30**	0.530

Other connection accessories **See page 48247/5**

Characteristics :
page 48232/4

Momentum automation platform
Fipio Communication Adapters

Presentation

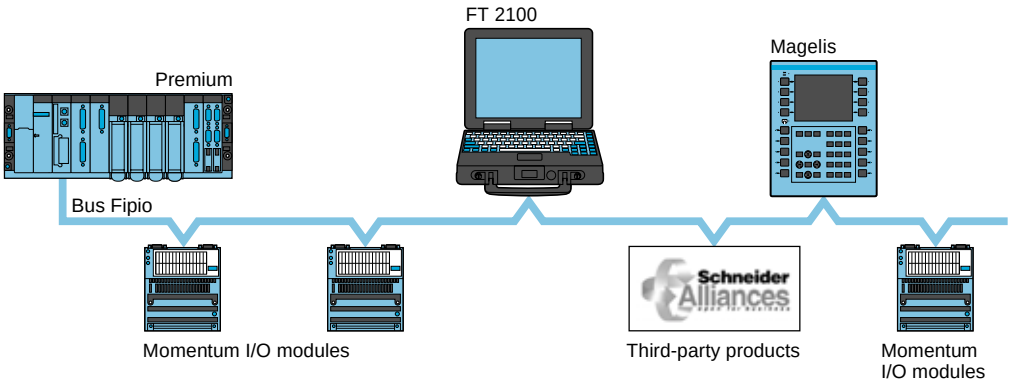
The Fipio communication adapter can be plugged into a Momentum I/O base to create a functional I/O unit on theFipio bus, and to provide a direct connection to the Fipio Network for the full family of Momentum I/O modules. This connectivity enables the Momentum I/O to be used along with other Fipio compatible 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:

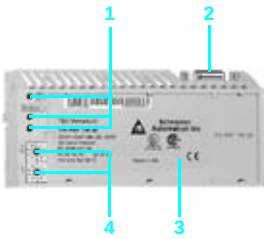
- 170 FNT 110 00 for a Fipio bus connected to TSX 7 series CPUs or APRIL 5030 and 5130 CPUs.
- 170 FNT 110 01 for a Fipio bus connected to a Premium PLC.

Each Momentum I/O module is an individual node or device on theFipio 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. TheFipio 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 baud.

NOTE: The Fipio Communication Adapters 170 FNT 110 0* do not support the following I/O bases: 170 ADM 540 80, 170 AEC 920 00, 170 ANM 050 10, 170 ANR 120 90, and 170 ANR 120 91.



Description



The 170 FNT 110 0● 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.

Momentum automation platform
Fipio Communication Adapters

Characteristics

Type of module		170 FNT 110 00	170 FNT 110 01
Bus manager PLC		TSX Series 7, model 40 or April 5000	Premium
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 Mbps	
	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 per segment (without repeater)	31 connection points per segment (without repeater)
	Maximum	63 on all segments	97 on all segments
Behaviour 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 Nr. 78745	
Agency approvals		UL, CE, CSA	–

References

170 FNT 110 01/00

Description	Connection	Bus manager PLC	Reference	Weight kg
Communication modules for Momentum I/O sub-bases	Fipio fieldbus on Momentum I/O sub-bases	Premium	**170 FNT 110 01**	0.110
		TSX Series 7 Model 40 April 5000	**170 FNT 110 00**	0.110

TSX FP ACC 12

TSX FP ACC 14

TSX FP ACC 4

Description	Connection	Bus manager PLC	Reference	Weight kg
Female connectors (9-way SUB-D)	On 170 FNT 110 0● communication module	Black polycarbonate IP 20	**TSX FP ACC 12**	0.040
		Zamac	**TSX FP ACC 2**	0.080
Bus connection boxes	Main tap-off cable	Black polycarbonate IP 20	**TSX FP ACC 14**	0.120
		Zamac IP 65	**TSX FP ACC 4**	0.660
Tap-link cables	8 mm, 2 shielded twisted pair 150 Ω	100 m	**TSX FP CC 100**	5.680
		200 m	**TSX FP CC 200**	10.920
		500 m	**TSX FP CC 500**	30.000
Other connection accessories			Consult our catalog Nr.78745	–

Momentum automation platform
InterBus-S Communication Adapters

Presentation

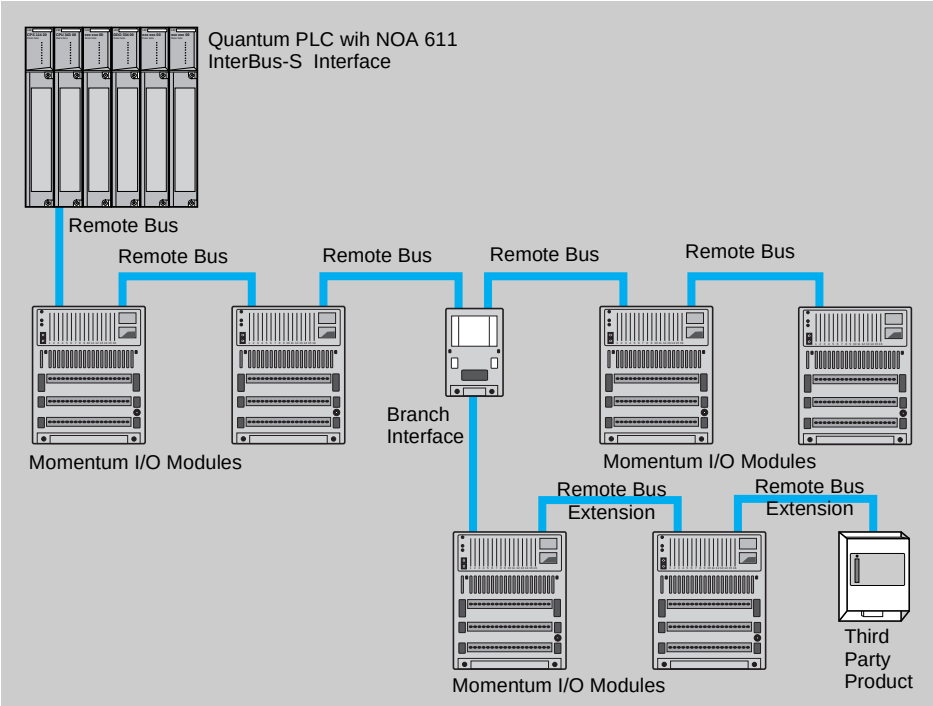
The Momentum InterBus-S Communication Adapter provides a direct connection to the InterBus-S Network for the full family of Momentum I/O modules. This connectivity enables Momentum I/O to be used in open architecture control systems that utilize either a programmable controller or industrial computer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

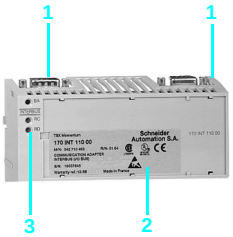
There are three types of InterBus-S adapters available:
- 170 INT 110 00, twisted pair media, Internet generation 3, SUPI 2.
- 170 INT 110 03, twisted pair media, Internet generation 4, SUPI 3, version 2.
- 170 INT 120 00, fiber optic media, Internet generation 4, SUPI 3.

The InterBus-S 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-S Communication Network. Each Momentum I/O module is an individual node or device on the InterBus-S network with its address set either by its physical location on the network, or by menu-driven software that is available with some InterBus-S master devices. InterBus-S 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-S network, with a Quantum PLC programmable controller as the network master.

NOTE: The 170 INT 110 03 Interbus Adapter does not support the 170 ANM 050 10 Seriplex base.

Network Topology





Description

The 170 INT 110 0● InterBus-S Communication Adapters comprise on the front panel :
1 Two 9-Pin SUB-D connectors for connection to the InterBus-S bus.
2 Area for Label (label shipped with I/O base).
3 LED Status Indicators comprising :
- BA (green), bus enabled.
- RC (green), remote bus check.
- RD (red), remote bus disabled.

Momentum automation platform
InterBus-S Communication Adapters

Characteristics

Model No.		170 INT 110 00	170 INT 110 03	170 INT 120 00
Communication rate	**Kbits/s**	500		
Number of nodes (devices)		Up to 256 devices		
Media		Twisted Pair		Fiber Optic
Distance	**m (ft)**	Up to 12 800 (41 984), 400 (1312) 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		3 (SUPI 2)	4 (SUPI 3, Version 2)	4 (SUPI 3)
Packaging		Standard Momentum communication 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

170 INT 110 0●

170 INT 120 00

Modules

Description	Generation	Reference	Weight kg
InterBus-S Communication Adapter, Twisted Pair	3 (SUPI 2)	**170 INT 110 00**	0.070
InterBus-S Communication Adapter, Twisted Pair	4 (SUPI 3, Version 2)	**170 INT 110 03**	0.070
InterBus-S Communication Adapter, Fiber Optic	4 (SUPI 3)	**170 INT 120 00**	0.070

Accessories

Description	Length	Reference	Weight kg
Branch Interface, Twisted Pair	–	**170 BNO 671 00**	–
Branch Interface with Fiber Optic Interface for Remote Bus	–	**170 BNO 681 00**	–
InterBus-S Connector Kit, sockets/pins, 9-pin with male and female connectors for the KAB 3225Lx remote bus cable	–	**170 XTS 009 00**	–
InterBus-S Cable (with small connectors)	11 cm (0.36 ft)	**170 MCI 007 00**	–
InterBus-S Cable	11 cm (0.36 ft)	**170 XTS 007 00**	–
InterBus-S Cable low-profile connector	100 cm (3.3 ft)	**170 MCI 100 01**	–
InterBus-S Twisted Pair Comm Adapter User Guide (in english)		**870 USE 003 00**	–
InterBus-S Fiber Optic Comm Adapter User Guide (in english)		**870 USE 006 00**	–
Momentum front label replacement (set of 10)	–	**170 XCP 100 00**	–

Momentum automation platform
Profibus communication adapter

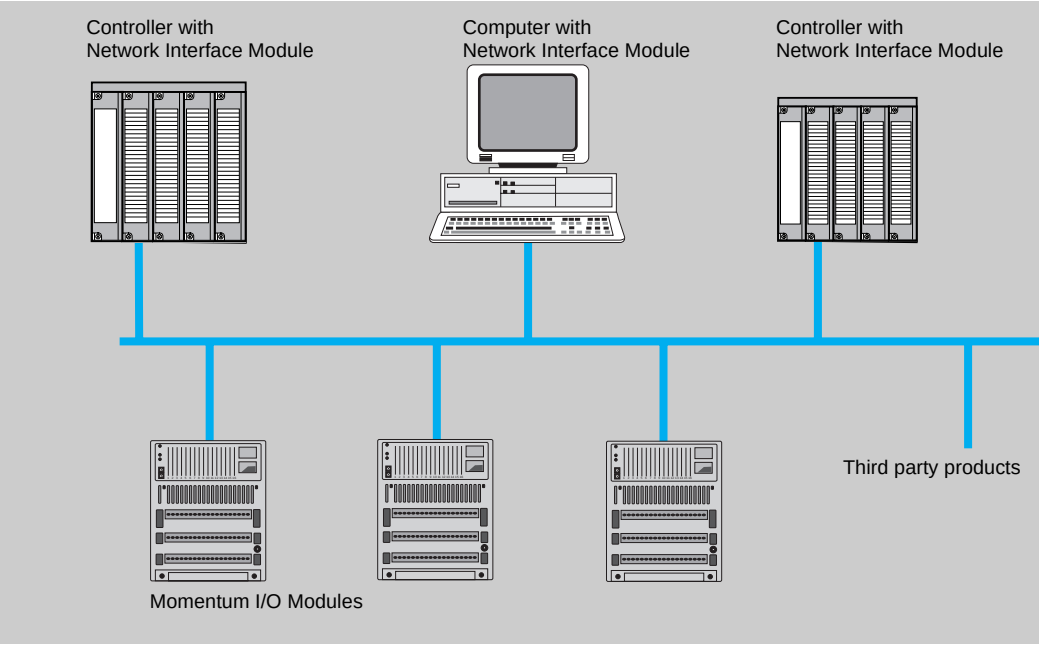
Presentation

The Model 170 DNT 110 00 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.

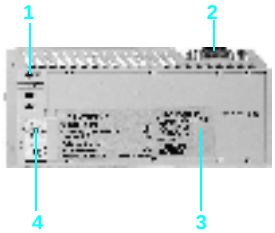
The Profibus DP communication adapter is a single package that is designed to plug on to any of the Momentum Input/Output modules base, thus allowing the I/O module full access to the Profibus DP Communication Network. Each Momentum I/O module is an individual node on the network, with its address user-selected 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 (part number 381 SWA 000 00) is required for the configuration of the Momentum I/O Modules on the Profibus network. This file contain 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 170 DNT 110 00 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.

Momentum automation platform
Profibus communication adapter

Characteristics

Model No.		170 DNT 110 00
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 commmunications adapter enclosure - IP20 environment
ndicator lights		Diagnostic and status light standard
Power source		Power supply on-board the I/O base
Agency approvals		UL, CE, CSA

References

170 DNT 110 00

Module

Description	Reference	Weight kg
Profibus DP Communication Adapter	**170 DNT 110 00**	0.070

Accessories

Description	Length	Reference	Weight kg
Device Master File	–	*(1)*	–
Profibus Cable O2Y(ST)CY 2 x 0.64 mm	by the meter	**KAB PROFIB**	–
Profibus cable O2Y(ST)CY 2 x 0.64 mm	100 m (328 ft)	**TSX PBS CA 100**	–
	400 m (1312 ft)	**TSX PBS CA 400**	–
Profibus Connector with Terminator		**490 NAD 911 03**	–
Profibus In-Line Connector		**490 NAD 911 04**	–
Profibus Connector with Programming Port		**490 NAD 911 05**	–
Momentum front label replacement (set of 10)		**170 XTS 100 00**	–

(1) The Profibus device Master File (381 SWA 000 00) is supplied with the User Guide (870 USE 004 0●), or can be dowloaded from the Schneider Automation website at www.schneiderautomation.com.

Momentum automation platform
DeviceNet communication adapter

Presentation

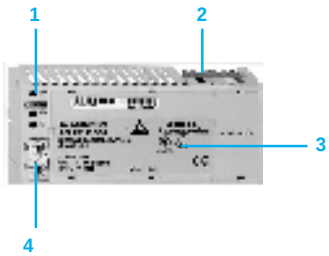
The Model 170 LNT 710 00 DeviceNet Communication Adapter for the Momentum I/O product line provides a direct connection to the DeviceNet Communication Network for the full family of Momentum I/O modules. This connectivity enables the Momentum I/O to be used in open architecture control systems with other 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 modules 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 (part number 870 USE 104 00). 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 170 LNT 710 00 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.

Momentum automation platform
DeviceNet communication adapter

Characteristics

Model No.		170 LNT 710 00
ODVA compliance		With ODVA Specification Release 2.0
Communication rates	**Kbits/s**	Supports 125/250/500 standard DeviceNet baud rates
Network power loading		Operational from 11…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 - IP20 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

170 LNT 710 00

Module

Description	Reference	Weight kg
DeviceNet Communication Adapter	**170 LNT 710 00**	0.070

Accessories

Description	Quantity	Reference	Weight kg
DeviceNet Connector	–	**170 XTS 060 00**	–
Momentum front label replacement	Set of 10	**170 XTS 100 00**	–
DeviceNet Communication Adapter User Guide (includes the EDS configuration software)	–	**870 USE 104 00**	–

Momentum automation platform
ConneXium industrial Ethernet

Product type	Hubs		
Technology	Ethernet 10 Mbit/s		Ethernet 100 Mbit/s
Interfaces	4 10BASE-T ports	3 10BASE-T ports 2 10BASE-FL ports	4 100BASE-TX ports
Connection Type	Twisted pair cable	Twisted pair cable and redundant fiber optic ring	Twisted pair cable
Type of connector	Shielded RJ45 for 10BaseT	Shielded RJ45 for 10BASE-T BFOC for 10BASE-FL	Shielded RJ45 for 100BaseTX
Terminal block	1 x 5-pin pluggable		
Operating voltage	18 to 32 VDC safety extra low voltage		9.6 to 57.6 VDC safety extra low voltage
Power consumption	80 mA typical, 130 mA max at 24 VDC	160 mA typical, 350 mA max at 24 VDC	200 mA typical, 270 mA max at 24 VDC
Range	Twisted pair line length maximum 100 m	Fiber optic maximum 3100 m Twisted pair maximum 100 m	Twisted pair line length maximum 100 m
Type of module	**499 NEH 104 10**	**499 NOH 105 10**	**499 NEH 141 00**
Pages	48190/7		

Switches		Transceivers	
Ethernet 10 Mbit/s and Fast Ethernet 100 Mbit/s		Ethernet 10 Mbit/s	Ethernet 100 Mbit/s
5 10BASE-T/100BASE-TX and 2 100BASE-TX ports	5 10BASE-T/100BASE-TX and 2 100BASE-FX ports	1 10BASE-T port and 1 10BASE-FL port	1 100BASE-TX port and 1 100BASE-FX port
Twisted pair cable	Twisted pair cable and redundant fiber optic ring	Twisted pair cable and fiber optic Ethernet cable	
Shielded RJ45 for 10BaseT/100BaseTX	Shielded RJ45 for 10BASE-T and 100BASE-TX; SC for 100BASE-FX	Shielded RJ45 for 10BASE-T BFOC for 10BASE-FL	Shielded RJ45 for 100BASE-TX SC for 100BASE-FX
18 to 32 VDC, safety extra low voltage			
800 mA maximum at 24 VDC		80 mA typical, 100 mA maximum at 24 VDC	160 mA typical, 190 mA maximum at 24 VDC
Twisted pair line length maximum 100 m	Fiber optic maximum 3000 m Twisted pair maximum 100 m	Twisted pair line length 100 m; 62.5/125µm fiber, 3100 m (NTR100 10), 3000 m (NTR 101 00)	
499 NES 171 00	**499 NOS 171 00**	**499 NTR 100 10**	**499 NTR 101 00**
48190/7			

Product type	Optical cables		
Cable type	Standard glass fiber optic		
Pre-assembled connector type	MT/RJ-SC duplex	MT/RJ-ST duplex	MT/RJ-MT/RJ duplex
Cable lenght(s)	5 m (16.4 ft)		
Radiation susceptibility	No radiation along the cable		
Agency approvals	Category 5 of cabling standard EIA/TIA-568; class D of IEC 11801/EN50173		
Networks link	–		
Operating power	–		
Ports	–		
Type of module	**490 NOC 000 05**	**490 NOT 000 05**	**490 NOR 000 05**
Pages	48190/6		

Electrical cables		Bridges	
Shielded and foil twisted pair straight-through cable	Shielded and foil twisted pair cross-over cable	Modbus Plus to Ethernet Bridge	Modbus to Ethernet Bridge
RJ45 (two per cable)		–	
2, 5, 12, 40, 80 m 6.5, 16.4, 39.4, 131.2, 262.4 ft	5, 15, 40, 80 m 16.4, 49.2, 131.2, 262.4 ft	–	
–			
UL and CSA (22.1) approval indicated by "U" after part number (example: 490 NTW 000 40U)		–	UL, CSA, CE
		Modbus Plus to Ethernet	Modbus to Ethernet
		110/220 VAC, auto sensing	9…30 VDC range; 12 or 24 VDC, nominal
		1 Ethernet 10BASE-T, 10BASE-2, 10BASE-5 port; 1 dual/single cable Modbus Plus port	1 RJ45 port for 10BASE-T cable
490 NTW 000 ●●	**490 NTC 000 ●●**	**174 CEV 200 30**	**174 CEV 300 10**
48190/7			

Momentum automation platform
ConneXium industrial Ethernet

Presentation

As part of its Transparent Factory family of products, Schneider Electric offers a range of industrially hardened network hubs, switches, transceivers, bridges, and cables. These Ethernet-standard communication components enable you to integrate Ethernet solutions from the device level to the control network, and beyond to the corporate intranet. Each ConneXium Industrial Ethernet product is designed with compliance to Ethernet standards, and with third-party compatibility in mind.

■ **ConneXium Hubs** connect devices and provide segments to shared communication among PLCs. TF Hubs are low-cost solutions which enable communications with devices, such as Momentum I/O, to Ethernet networks.

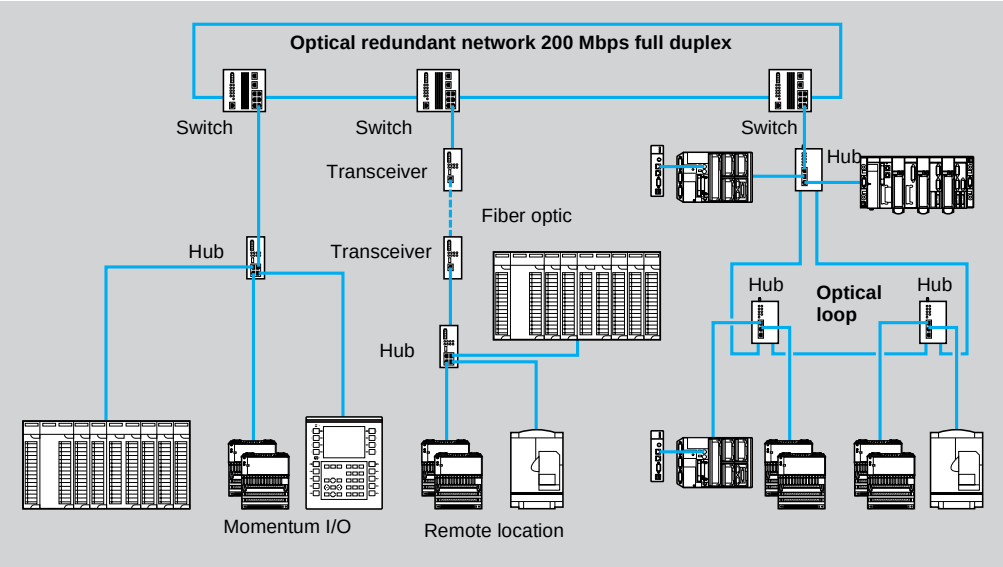
■ **ConneXium Switches** segment the application in different zones, groups, or cells/machines. The proper placement of switches can increase network performance by relieving network congestion. TF switches implement SNMP protocol, allowing standard network management tools to monitor and diagnose the network, and thus are a key architectural component for real-time and deterministic network communication.

■ **ConneXium Transceivers** provide connections to fiber optic networks in areas of high electromagnetic interference. The use of multiple transceivers enables long distances between process areas.

■ **ConneXium Bridges** enable Modbus to Ethernet and Modbus Plus to Ethernet communications, with multiple ports allowing flexibility among network components.

■ **ConneXium Cables** connect each automation device to the attached hub, switch, transceiver, or bridge. Cables are available in fiber optic and twisted pair options, with a wide variety of connectors and cable lengths.

All Ethernet cabling system components are built to rigorous industrial standards, and are designed to perform in harsh environments. ConneXium Switches and Hubs support a high level of resilience. Their scalable redundant features - from single to double ring structure - make it easy to build the kind of fault-tolerant network that fits the specific requirements of your environment.



References :
page 48190/7

Characteristics :
pages 48190/3 to 48190/6

Momentum automation platform
ConneXium industrial Ethernet

Mechanical construction

Models		499 NEH 104 10	499 NEH 141 00	499 NOH 105 10
Operating temperature	**° C (F)**	0 to 60 (32 to 140)		
Relative humidity		10…95% (non-condensing)		
Dimensions W x H x D	**mm (in)**	40 x 125 x 80 (1.58 x 4.92 x 3.15)	47 x 135 x 111 (1.85 x 5.31 x 4.37)	80 x 140 x 80 (3.15 x 5.51 x 3.15)
Weight	**g (Lb)**	520 (1.2)	240 (0.529)	900 (2)
Enclosure		IP 30	IP 20	IP 30
Agency approvals and compliance		cUL 1950; FM 3810; FM 3611 Class 1, Div. 2; CE, Germanischer Lloyd, IEC 61131-2		

Characteristics

Models		499 NEH 004 10	499 NEH 041 00	499 NOH 005 10
Technology		Ethernet 10 Mbps	Ethernet 100 Mbps	Ethernet 10 Mbps
Interfaces		4 10baseT ports with RJ45 shielded connectors	4 100baseTX ports with RJ45 shielded connectors	- 3 10baseT ports with RJ45 shielded connectors - 2 10baseFL ports with BFOC connectors
Connection type		Twisted pair cable		Twisted pair cables or redundant fibre optic ring
Terminal block		1 x 5-pin, pluggable		
Operating voltage	**VDC**	18 to 32, safety low voltage		
Redundancy		Power supply		Power supply and optical ring
Power consumption at 24 VDC	**mA**	80 typical, 130 maximum	210 typical, 270 maximum	160 typical, 350 maximum
Maximum range	**m (ft)**	Twisted pair line length, max 100 (max 330)		Fiber optic, max 3100 (max 10,000) Twisted pair, max 100 (max 330)
Number of cascaded hubs		4 max	2 max	4 max
Number of hubs in a ring		–		11 max
Fault indicator		Power supply failure; permanent fault in hub; faulty link status of TP port; at least one port has auto-partitioned		
LED indicators		P1, P2 power, DA/STAT 1 to DA/STAT 4: data collision, segmentation, and link status per port		P1, P2 power, DA/STAT 1 to DA/STAT 5: data collision, segmentation, and link status per port

References :
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Mechanical construction

Models		499 NES 171 00	499 NOS 171 00
Operating temperature	**° C (F)**	0 to 50 (32 to 122)	
Relative humidity		10…95% (non-condensing)	
Dimensions W x H x D	**mm** **(in)**	105 x 130 x 105 (4.1 x 5.1 x 4.1)	110 x 131 x 111 (4.3 x 5.2 x 4.4)
Weight	**g (Lb)**	850 (1.87)	
Enclosure		IP 20	
Agency approvals and compliance		cUL 1950; cUl 508; cUL 1604 Class 1, Div. 2; CE, Germanischer Lloyd, IEC 61131-2	

Characteristics

Models		499 NES 171 00	499 NOS 171 00
Technology		Ethernet 10 Mbit/s and Fast Ethernet 100 Mbit/s	
Interfaces		5 10BASE-T/100BASE-TX ports with shielded RJ45 connectors 2 100BASE-TX ports with RJ45 connectors	5 10BASE-T/100BASE-TX ports with shielded RJ45 connectors 2 100BASE-FX ports with SC connectors
Connection type		Twisted pair cable	Twisted pair cables and redundant fiber optic ring
Terminal block		1 x 5-pin, pluggable	
Operating voltage	**VDC**	18 to 32, safety low voltage	
Redundancy		Power supply; optical and/or copper ring structure; fast media redundancy (< 0.3s); redundant manager	
Power consumption at 24 VDC	**mA**	800 maximum	
Maximum range	**m (ft)**	Twisted pair line length, max 100 (max 330)	Fiber optic, max 3100 (max 10,000) Twisted pair, max 100 (max 330)
Number of switches in a ring		Maximum 50 at 100 Mbit/s	
Number of cascaded switches		2 max	
Fault indicator		Power supply failure; permanent fault in switch; faulty link status of TP port; at least one port has auto-partitioned, self-test error, ring monitoring not possible	
LED indicators		P1, P2 power, Port 1 to 7 status, Redundancy Manager, and Standby	

References :
page 48190/7

Mechanical construction

Models		499 NTR 100 10	499 NTR 101 00
Operating temperature	**° C (F)**	0 to 60 (32 to 140)	
Relative humidity		10…95% (non-condensing)	
Dimensions W x H x D	**mm (in)**	40 x 134 x 80 (1.58 x 5.28 x 3.15)	47 x 135 x 111 (1.9 x 5.3 x 4.4)
Weight	**g (Lb)**	520 (1.2)	230 (0.51)
Enclosure		IP 30	IP 20
Agency approvals and compliance		cUL 1950; FM 3810 Class 1, Div. 2; CE, Germanischer Lloyd, IEC 61131-2	cUL 1950; cUl 508; cUL 1604; Class 1, Div. 2; CE, Germanischer Lloyd, IEC 61131-2

Characteristics

Models		499 NTR 100 10	499 NTR 101 00
Technology		Ethernet 10 Mbit/s	Ethernet 100 Mbit/s
Interfaces		1 10BASE-T port with shielded RJ45 connector 1 10BASE-FL port with BFOC connector	1 100BASE-TX port with shielded RJ45 connector 1 100BASE-FX ports with SC connector
Connection type		Twisted pair cable and fiber optic Ethernet cable	
Terminal block		1 x 5-pin, pluggable	
Operating voltage	**VDC**	18 to 32, safety low voltage	
Redundancy		Power supply	
Power consumption at 24 VDC	**mA**	80 typical, 100 maximum	160 typical, 190 maximum
Maximum range	**m (ft)**	10BASE-T 100(328) 10BASE-FL 3100 (1070)	10BASE-TX 100(328) 10BASE-FX 3100 (1070)
Link budget		11.5 db for 50/125 and 62.5/125 ύm fiber	8 db for 50/125 um fiber, 11 db for 62.5/125 um fiber
LED indicators		P1, P2 power, DA STAT 1 status and DA STAT 2 status	

References :
page 48190/7

Electrical cables

Models		490 NTW 000 ●●	490 NTC 000 ●●
Cable type		Shielded and foil twisted pair straight-through cable	Shielded and foil twisted pair crossed cord
Available cable length	**m** **(ft)**	2, 5, 12, 40, 80 (6.5,16.4, 39.4,131.2, 262.4)	5, 15, 40, 80 (16.4, 49.2,131.2, 262.4)
Pre-assembled connector type		RJ45 (two per cable)	
Agency approvals and compliance		UL, CSA 22.1 and NFPA 70 approval indicated by "U" after part number (example: 490 NTW 000 40U); Category 5 of international cabling standard EIA/TIA-568; Class D of IEC 11801 / EN50173; Low Smoke Zero Halogen (LSZH); flame retardant of NFC32 070 #1 (C2) and CEI 322/1	

Optical cables

Models		490 NOC 000 05	490 NOT 000 05	490 NOR 000 05
Pre-assembled connector type		MT/RJ-SC duplex	MT/RJ-ST duplex	MT/RJ-MT/RJ duplex
Cable type		Standard glass fiber optic		
Cable length	**m** **(ft)**	5 (16.4)		
Radiation susceptibility		No radiation along the cable		

Bridges

Models		174 CEV 200 30	174 CEV 300 10
Networks link		Modbus Plus to Ethernet	Modbus to Ethernet
Operating power		110 / 220 VAC, auto sensing	9 ... 30 VDC range; 12 or 24 VDC, nominal
Ports		1 Ethernet 10BASE-T (RJ45), 10BASE-2 (BNC), 10BASE-5 (AUI); 1 dual / single cable Modbus Plus	1 RJ45 port for 10BASE-T cable
Mounting		Vertical panel or horizontal shelf	DIN rail
Dimensions W x H x D	**mm** **(in)**	122 x 229 x 248 (4.8 x 9 x 9.8)	35 x 95 x 60 (1.4 x 3.7 x 2.4)

References :
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Momentum automation platform
ConneXium industrial Ethernet

References

499 NEH 104 10

499 NES 171 00

499 NTR 100 10

174 CEV 300 10

490 NTW 000 ●●

490 NOC 000 0●

Hubs

Description	Reference	Weight kg (lb)
Ethernet Hub 10 Mbps, 4 10BASE-T ports	**499 NEH 104 10**	0.520 (1.2)
Ethernet Hub 10 Mbps, 3 10BASE-T ports, 2 10BASE-FL ports	**499 NOH 105 10**	0.900 (2)
Ethernet Hub 100 Mbps, 4 100BASE-TX ports	**499 NEH 141 00**	0.520 (1.2)

Switches

Ethernet Switch 10/100 Mbps, 7 100BASE-TX ports	**499 NES 171 00**	1.450 (3.2)
Ethernet Switch 10/100 Mbps, 5 100BASE-TX ports, 2 100BASE-FX ports	**499 NOS 171 00**	1.450 (3.2

Transceivers

Ethernet Transceiver 10 Mbps, 1 10BASE-T port, 1 10BASE-FL port	**499 NTR 100 10**	0.520 (1.2)
Ethernet Transceiver 100 Mbps, 1 100BASE-TX port, 1 100BASE-FX port	**499 NTR 101 00**	0.520 (1.2)

Bridges

Modbus Plus to Ethernet Bridge	**174 CEV 200 30**	4.263 (9.4)
Modbus to Ethernet Bridge	**174 CEV 300 10**	0.500 (1.0)

Cables

Description	Length m/ft	Reference	Weight kg (lb)
Shielded and foil twisted pair cord cable	2/6.5	**490 NTW 000 02**	–
	5/16.4	**490 NTW 000 05**	–
	12/39.4	**490 NTW 000 12**	–
	40/131.2	**490 NTW 000 40**	–
	80/262.4	**490 NTW 000 80**	–
Shielded and foil twisted pair crossed cord cable	5/16.4	**490 NTC 000 05**	–
	15/49.2	**490 NTC 000 15**	–
	40/131.2	**490 NTC 000 40**	–
	80/262.4	**490 NTC 000 80**	–
Fiber optic cable, MT/RJ-SC duplex connectors	5/16.4	**490 NOC 000 05**	–
Fiber optic cable, MT/RJ-ST connectors	5/16.4	**490 NOT 000 05**	–
Fiber optic cable, MT/RJ-MT/RJ connectors	5/16.4	**490 NOR 000 05**	–

Ethernet PLC Products

Description	Platform	Reference	Weight kg (lb)
Ethernet CPU with Ethernet and Modbus ports	Momentum	**171 CCC 980 20**	–
Ethernet CPU with Ethernet and I/O bus ports		**171 CCC 960 20**	–
Ethernet Communication Adapter		**170 ENT 110 00**	–
MMS Ethernet CPU for twisted pair cable	Quantum	**140 NOE 511 00**	–
MMS Ethernet CPU for fiber optic cable		**140 NOE 551 00**	–
TCP/IP Ethernet CPU with I/O scanner		**140 NOE 771 00**	–
TCP/IP Ethernet CPU with Embedded Web Server		**140 NOE 771 10**	–
Ethernet CPU	Premium	**TSX ETY 110 00**	–
Ethernet CPU with Embedded Web Server		**TSX ETY 110 WS**	–

Characteristics :
pages 48190/3 to 48190/6

Momentum automation platform
M1/M1E processor adapters

Type	M1 processor adapters			
RAM memory	64 K			256 K
Flash memory	256 K			
984 LL program memory	2.4 K			12 K
IEC program memory				160 K
Data memory	2 K			4 K
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	**171 CCS 700 00**	**171 CCS 700 10**	**171 CCS 780 00**	**171 CCS 760 00**
Page	48245/8			

512 K			
512 K	512 K for 171 CCC 980 20 1 MB for 171 CCC 980 30	512 K	512 Ko for 171 CCC 960 20 1 Mo for 171 CCC 960 30
18 K			
240 K	–/200 K	240 K	–/200 K
24 K			
1 ms/K	0.3 ms/K	1 ms/K	0.3 ms/K
32 MHz	50 MHz	32 MHz	50 MHz
8192			
Up to 2048 I/O points with Modbus Plus option adapter		80 with ProWORX 128 with Concept	
1 RS 232 Modbus 1 RS 485 Modbus	1 Ethernet 1 RS 485 Modbus	1 RS 232 Modbus 1 I/O bus	1 Ethernet 1 I/O bus
	Supplied with 171 CCC 980 30	Compatible	Supplied with 171 CCC 960 30
171 CCC 780 10	**171 CCC 980 20/30**	**171 CCC 760 10**	**171 CCC 960 20/30**

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 Model Number 171 CCS 760 00), 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 Model Number 171 CCS 780 00, the RS485 port can be used to connect to dedicated devices such as an operator interface panel or a marquee, or used in a Master/Slave RS485 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, or ProWORX NxT version 2.0 or greater.
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
171 CCS 700 00	64 K	256 K	1 ms/K	1 x RS 232C	–	–
171 CCS 700 10	64 K	256 K	0.63 ms/K	1 x RS 232C	–	–
171 CCS 760 00	256 K	256 K	0.63 ms/K	1 x RS 232C	1 x I/O Bus	Compatible
171 CCS 780 00	64 K	256 K	1 ms/K	1 x RS 232C 1 x RS 485	–	–
171 CCC 760 10	512 K	512 K	1 ms/K	1 x RS 232C	1 x I/O Bus	Compatible
171 CCC 780 10	512 K	512 K	1 ms/K	1 x RS 232C 1 x RS 485	–	Compatible
171 CCC 960 20	544 K	512 K	.3 ms/K	1 x Ethernet	1 x I/O Bus	–
171 CCC 960 30	544 K	1 Mb	.3 ms/K	1 x Ethernet	1 x I/O Bus	Supplied
171 CCC 980 20	544 K	512 K	.3 ms/K	1 x RS 485 1 x Ethernet	–	–
171 CCC 980 30	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 RS232 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, Concept, or Modsoft programming software literature and documentation.

Characteristics :
pages 48245/4 to 48245/7

References :
page 48245/8

Momentum automation platform
M1/M1E processor adapters

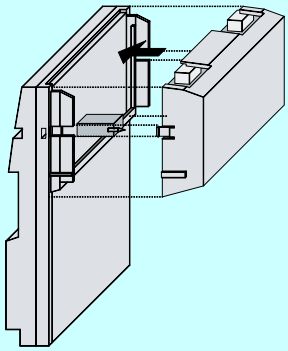
Description

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 171 CCS 760 00 Momentum M1/M1E 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 48245/4 to 48245/7

References :
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Momentum automation platform
M1/M1E processor adapters

Environment

Type of processor			171 CCS 700 00	171 CCS 700 10	171 CCS 780 00	171 CCS 760 00
Temperature	operating	**°C**	0...60			
	storage	**°C**	- 40...85			
Relative humidity			5...96% (non-condensing)			
Altitude		**m**	2000 (6,500 ft.)			
Mechanical withstand (immunity)	to vibrations		57...150 Hz @ 1 G 10...57 Hz @ 0.075 mm d.a			
	to shocks		± 15 G peak, 11 ms, half sine wave			
Designed to meet			UL, CE, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP20 conforming to IEC529			

Characteristics

Central processing unit (CPU)			x 86 based (Intel or AMD)			
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 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			RS 232 is non-isolated from logic common			
Indicator lights			Diagnostic and status lights, standard			
Power source			Power supply on-board the Momentum I/O Base			
Clock speed		**MHz**	20	32	20	32
Comm 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 and analog I/O, any mix up to the stated limits.)			4096 words total
	scan time	**ms/K**	1	0.63	1	0.63
I/O bus addressing			–			80 I/O drops with Modsoft 128 I/O drops with Concept

References :
page 48245/8

Environment

Type of processor			171 CCC 760 10	171 CCC 780 10
Temperature	operating	**°C**	0...60	
	storage	**°C**	- 40...85	
Relative humidity			5...96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	to vibrations		57...150 Hz @ 1 G 10...57 Hz @ 0.075 mm d.a	
	to shocks		± 15 G peak, 11 ms, half sine wave	
Designed to meet			UL, CE, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based (Intel or AMD)	
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 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			RS 232 is non-isolated from logic common	
Indicator lights			Diagnostic and status lights, standard	
Power source			Power supply on-board the Momentum I/O Base	
Clock speed		**MHz**	32	
Comm 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 (4096 In/4096 Out; I/O can be extended using a Modbus Plus option Adapter and Peer Cop)	<local> (No I/O bus port; I/O can be extended using a Modbus Plus option Adapter (2048 10 pts) and Peer Cop)
	scan time	**ms/K**	1	

References :
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Environment

Type of processor			171 CCC 960 20	171 CCC 980 20
Temperature	operating	**°C**	0...60	
	storage	**°C**	- 40...85	
Relative humidity			5...96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	to vibrations		57...150 Hz @ 1 G 10...57 Hz @ 0.075 mm d.a	
	to shocks		± 15 G peak, 11 ms, half sine wave	
Designed to meet			UL, CE, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based (Intel or AMD)	
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 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			Comm port is non-isolated from logic common	
Indicator lights			Diagnostic and status lights, standard	
Power source			Power supply on-board the Momentum I/O Base	
Flash memory		**K**	512	
Clock speed		**MHz**	50	
Comm 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		<local> (No I/O bus port; I/O can be extended using a Modbus Plus option Adapter 2048 10 pts, and Peer Cop.)	8192 bits (4096 In/4096 Out; I/O can be extended using a Modbus Plus option Adapter and Peer Cop.)
	scan time	**ms/K**	.3	

References :
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Environment

Type of processor			171 CCC 960 30	171 CCC 980 30
Temperature	operating	**°C**	0...60	
	storage	**°C**	- 40...85	
Relative humidity			5...96% (non-condensing)	
Altitude		**m**	2000 (6,500 ft.)	
Mechanical withstand (immunity)	to vibrations		57...150 Hz @ 1 G 10...57 Hz @ 0.075 mm d.a	
	to shocks		± 15 G peak, 11 ms, half sine wave	
Designed to meet			UL, CE, CUL, FM Class 1 Div. 2, NEMA 250 Type 1, and IP20 conforming to IEC52	

Characteristics

Central processing unit (CPU)			x 86 based (Intel or AMD) 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 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			Comm port is non-isolated from logic common	
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	
Comm 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		<local> (No I/O bus port; I/O can be extended using a Modbus Plus option Adapter 2048 10 pts, and Peer Cop)	8192 bits (4096 In/4096 Out; I/O can be extended using a Modbus Plus option Adapter and Peer Cop)
	scan time	**ms/K**	.3	

References :
page 48245/8

Momentum automation platform
M1/M1E processor adapters

171 CCS 7●0 ●0

171 CCC ●●0 ●0

M1/M1E processor adapters

RAM Memory	Comm Port(s)	Clock Speed	Reference	Weight kg (oz)
64 K	1 Modbus	20 MHz	**171 CCS 700 00**	0.042(1.5)
64 K	1 Modbus	32 MHz	**171 CCS 700 10**	0.042(1.5)
64 K	2 Modbus	20 MHz	**171 CCS 780 00**	0.042(1.5)
256 K	1 Modbus, 1 I/O Bus	32 MHz	**171 CCS 760 00**	0.042(1.5)
512 K	2 Modbus	32 MHz	**171 CCC 780 10**	0.042(1.5)
512 K	1 Modbus, 1 Ethernet	50 MHz	**171 CCC 980 20**	0.042(1.5)
544 K, IEC Exec	1 Modbus, 1 Ethernet	50 MHz	**171 CCC 980 30**	0.042(1.5)
512 K	1 Modbus, 1 I/O Bus	32 MHz	**171 CCC 760 10**	0.042(1.5)
544 K	1 Ethernet, 1 I/O Bus	50 MHz	**171 CCC 960 20**	0.042(1.5)
544 K, IEC Exec	1 Ethernet, 1 I/O Bus	50 MHz	**171 CCC 960 30**	0.042(1.5)

Connection accessories and documentation

Description	Type	Quantity	Reference	Weight kg
RS 232 communication cable RJ45 to RJ45	1 m (3 ft)	–	**110 XCA 282 01**	–
	3 m (10 ft)	–	**110 XCA 282 02**	–
	6 m (20 ft)	–	**110 XCA 282 03**	–
RS 485 cable connector T for RJ45	–	–	**170 XTS 040 00**	–
RS 485 terminating (RJ45 resistor plugs)	–	Set of 2	**170 XTS 021 00**	–
D-shell adapters	RJ45 to 9-pin (for AT serial port)	–	**110 XCA 203 00**	–
	RJ45 to 25-pin (for XT serial port)	–	**110 XCA 204 00**	–
Ground clamp	–	–	**424 251 739**	–
RJ crimping tool	–	–	**170 XTS 023 00**	–
Concept software	–	–	**see page 48251/7**	–
ProWORX software	–	–	**see page 48251/7**	–
Momentum M1/M1E Processor adapters user guide (in english)	–	–	**870 USE 101 00**	–

Characteristics :
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Momentum automation platform

M1 processor adapters

Power supply

An optional power supply, the 170 CPS 111 00, 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 170 CPS 111 00 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 stripconnector mounting slot.
4 Output voltage (DC) terminal stripconnector mounting slot.

Characteristics

Model			170 CPS 111 00
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

170 CPS 111 00

Designation	Description	Reference	Weight kg (oz
Power supply	230 or 120 VAC.	**170 CPS 111 00**	0.284 (10)
Terminal strips (set of three)	With spring terminals	**170 XTS 012 00**	–
	With screw terminals	**170 XTS 011 00**	–

Momentum automation platform
Option adapters

Configuration	Modbus Plus option adapters	
Communication network	Modbus Plus	
Communication port(s)	1 Modbus Plus	2 redundant Modbus Plus
Comm port connector	9-pin D-shell	
Time-of-day clock	On-board, ± 13 sec/day accuracy	
Back-up batteries	2 user-replaceable AAA alkaline	
Voltage	5 VDC supplied by I/O base	
Operating temperature	0 ... 60°C	
Humidity	5 ... 95%, relative noncondensing	
Shock	± 15 g peak, 11 ms, half-sine wave	
Vibration	10 ... 57 Hz @ 0,075 mm d.a.	
Type of module	**172 PNN 210 22**	**172 PNN 260 22**
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Serial option adapter

General-purpose serial communications

1 software-selectable RS 232/RS 485 serial port

172 JNN 210 32

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 application, or into a standalone, integrally networked system with local controllers with extended I/O.

The Momentum Option Adapters are:

- **172 PNN 210 22** - one Modbus Plus communication port
- **172 PNN 260 22** - two redundant Modbus Plus communication ports
- **172 JNN 210 32** - one general-purpose serial communication port, RS232/RS485 selectable

Each of these Option Adapters provides an on-board, time-of-day (TOD) 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 two AAA batteries.

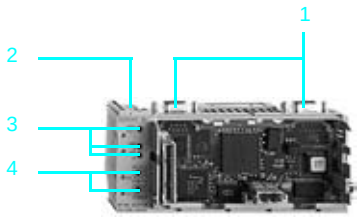
In addition to the TOD clock and battery backup features, the 172 PNN 210 22 adapter allows you to add networking to the intelligent I/O Base. Model 172 PNN 260 22 allows you to add redundantly-cabled networking to the I/O Base. This opens the Momentum product line to a broad spectrum of applications. 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, and other third party devices using Modbus Plus to communicate.

Model 172 JNN 210 32 allows you to add a second, defacto-industry standard Modbus port (selectable RS232/485) 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 RS232 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.

Momentum automation platform
Option Adapters



Description

A typical Momentum Option Adapter consists of the following components :

9-pin D-shell connector(s) for Modbus Plus communications

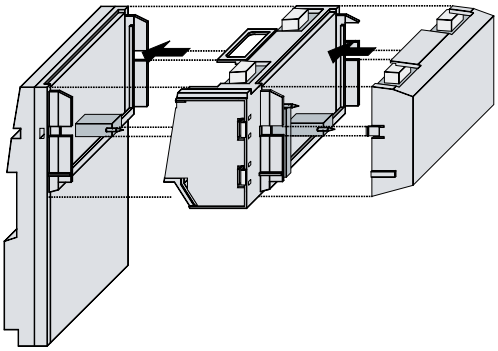
Batttery compartment

LED indicators

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.



Momentum automation platform
Option Adapters

Characteristics

Model No			172 PNN 210 22	172 PNN 260 22	172 JNN 210 32
Time-of-day clock			On-board, ± 13 s/day accuracy		
Batteries	type		Two user-replaceable AAA alkaline		
	service life		< 30 days from the time a battery-low indication is received, to actual battery failure @ 40½C 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...64	Two redundant Modbus Plus ports	General-purpose serial port RS232 or RS485 selectable
Comm port connector(s)			9-pin D-shell		
Operating temperature		**°C**	0...60		
Storage temperature		**°C**	- 40...85		
Relative humidity			5...95% (non-condensing)		
Attitude		**m (ft)**	2000 (6.562)		
Shock			± 15 g peak, 11ms, half sine wave		
Vibration		**Hz**	57...150 @ 1 g 10 ...57 @ 0.075 mm d.a.		
Height			1.01 in (25. mm) [2.10 in (58.3 mm) on battery side]		
Width			5.57 in (143.1 mm)		
Depth			2.36 in (60.06 mm)		
Weight			3.00 oz (85.05 g)		
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 resricted to qualified service personnel		
Di-electric strength		**VDC**	500		
Designed to meet			UL, CE, CSA, NEMA 250 Type 1, and IP20 conforming to IEC529		
Packaging			Standard momentum top-hat enclosure		
Indicator lights			Diagnostic and status lights, standard		
Power source			Power supply on-board the Momentum I/O Base		

Momentum automation platform
Option Adapters

172 PNN 210 22

172 PNN 260 22

172 JNN 210 32

Modules

Description	Reference	Weight kg (oz)
Modbus Plus Option Adapters, Single Port	**172 PNN 210 22**	0.070 (2.5)
Modbus Plus Option Adapters, Dual redundant Ports	**172 PNN 260 22**	0.070 (2.5)
Serial Option Adapters, Single Serial Port	**172 JNN 210 32**	0.070 (2.5)

Accessoires

Description	Use		Length	Reference	Weight kg
	From	To			
Standard Modbus Plus cables	T-junction box	T-junction box	30 m (100 ft)	**480 NAA 271 01**	–
			150 m (100 ft)	**480 NAA 271 02**	–
			300 m (100 ft)	**480 NAA 271 03**	–
			450 m (1500 ft)	**480 NAA 271 04**	–
			1500 m (5000 ft)	**480 NAA 271 06**	–
Modbus Plus Drop cables	Communication modules for Momentum I/O bases	T-junction box	2.4 m (8 ft)	**900 NAD 211 10**	0.530
			6 m (20 ft)	**990 NAD 211 30**	0.530
Modbus Plus RS 485 cable	–	–	25 m (10.0 in)	**170 MCI 020 10**	–
			1 m (3 ft)	**170 MCI 020 36**	–
RS 485 master communication cable (RJ45/RJ45)	–	–	0.3 m (1 ft)	**170 MCI 041 10**	–
Modbus Plus RJ45 cable	–	–	3 m (10 ft)	**170 MCI 021 20**	–
Modbus Plus RJ45 cable double-ended	–	–	3 m (10 ft)	**170 MCI 021 80**	–
			10 m (30 ft)	**170 MCI 020 80**	–
RS 232 communication cable (RJ45/RJ45)	–	–	1 m (3 ft)	**110 XCA 282 01**	–
			3 m (10 ft)	**110 XCA 282 02**	–
			6 m (20 ft)	**110 XCA 282 03**	–
Modbus Plus tap	IP20 junction box for tap-off connection (T)	–	–	**990 NAD 230 00**	0.230
	IP65 junction box for tap-off connection (T)			**990 NAD 230 10**	–
Modbus Plus line connector (9-Pin Sub-D)	Communication module connection	–	–	**AS MBKT 085**	–
Modbus Plus terminator connector kit (set of 2)	2 impedance adapters for box (IP20) 990 NAD 230 00	–	–	**AS MBKT 185**	–
	2 impedance adapters for box (IP65) 990 NAD 230 10	–	–	**990 NAD 230 11**	–
D-shell adapters	RJ45 to 9-pin (for AT serial port)			**110 XCA 203 00**	–
	RJ45 to 12-pin (for XT serial port)			**110 XCA 204 00**	–

Description	Reference	Weight kg (oz)
RS 485 (9-Pin Sub-D) cable connector T for RJ45	**170 XTS 040 00**	–
RJ45 shielded connectors (set of 25)	**170 XTS 022 00**	–
Modbus Plus terminating RJ 45 resistor plugs (set of 2)	**170 XTS 021 00**	–
RS 485 (RJ45) cable connector T for RJ45	**170 XTS 041 00**	–
RS 485 Multi-Master RJ45 shunt plugs (set of 2)	**170 XTS 042 00**	–
Modbus Plus (9-Pin Sub-D) cable connector T for RJ 45	**170 XTS 020 00**	–
Ground clamp	**424 244 739**	–
RJ crimping tool	**170 XTS 023 00**	–

Momentum automation platform
Programming software
Concept

Presentation

Concept is a software configuration and application programming tool for the Momentum 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 Momentum 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 Momentum 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)

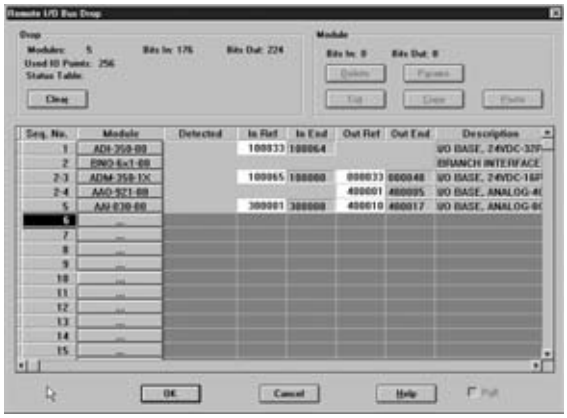
as well as Modsoft-compatible ladder logic (LL984). IEC 1131-3 compliant data types are also available. With the data type editor, custom data types can be converted to and from the IEC data types.

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.



References :
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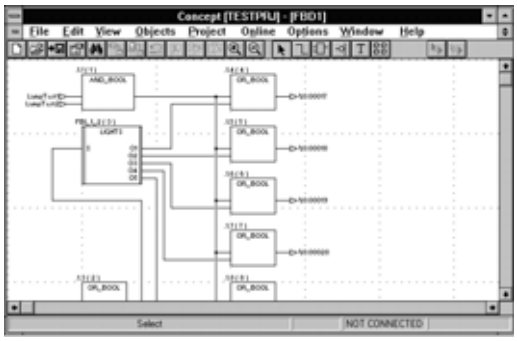
Momentum automation platform
Programming software
Concept

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)



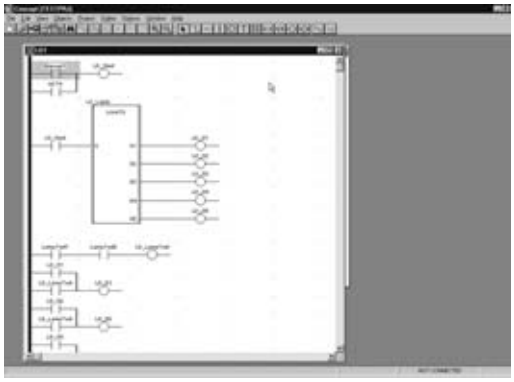
With the IEC 1131-3 function block diagram language, you can combine elementary functions, elementary function blocks (EFBs) and derived function blocks (all three of which are known as FFBs) with variables in an FBD. FFBs and variables can be commented. Text can be freely placed within the graphic. 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 1131-3 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, inital 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.

References :
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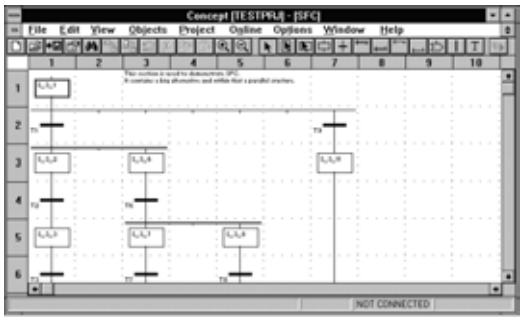
Momentum automation platform
Programming software
Concept

Sequential function chart (SFC)



With the IEC 1131-3 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 assiged 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.

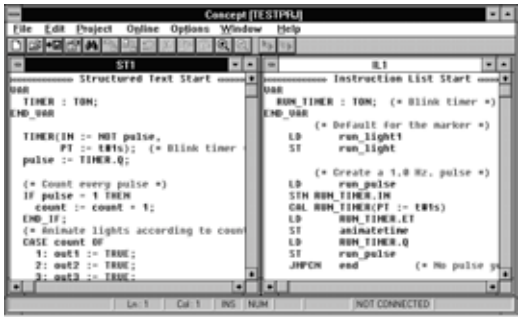
Instruction list (IL)

With the IEC 1131-3 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 1131-3 ST language, you can call function blocks, exectute 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.

References :
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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

Libraries

IEC Library
The IEC library contains the EFBs defined in IEC 1131-3 (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.

References :
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Momentum automation platform
Programming software
ProWORX

The ProWORX programming software is a full-featured, Modicon PLC programming software that is compatible with any Windows platform - 3.1/95/98/NT. A few of the new ProWORX features follow:

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.

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 discretes and analogs.

I/O drawing generator

Save hours of painstaking effort with ProWORX NxT'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. NxT displays the diagram, and if desired, saves it as an AUTOCAD-compatible .DXF file or prints it

Network editor

With the Network Editor, ProWORX NxT 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.

Real-time network status

Find the controller you need fast and simplify network diagnostics with ProWORX NxT'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.

Advanced I/O management

Ensure that the I/O card you are configuring in the software matches the one on your plant floor with Pro WORX NxT'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 with a block of free addresses in your controller. Once configured, manage your I/O with NxT'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.

References
Concept softwares

Description	License type	References	Weight kg
Concept packages			
Concept S Version 2.5	single-user license	**372 SPU 471 01 V25**	–
Concept M Version 2.5	single-user license	**372 SPU 472 01 V25**	–
Concept XL Version 2.5	single-user license	**372 SPU 474 01 V25**	–
	three-user license	**372 SPU 474 11 V25**	–
	10-user license	**372 SPU 474 21 V25**	–
	network license	**372 SPU 474 31 V25**	–
Concept EFB Toolkit Version 2.5	–	**372 SPU 470 01 V25**	–

References :
page 48251/7

Momentum automation platform
Programming software
Concept and ProWORX

References (suite)

Concept upgrades

Description	License type	References (1)	Weight kg
Concept XL V. 2.2 to Concept XL V.2.5	single-user license	**372 ESS 474 01**	–
	three-user license	**372 ESS 474 03**	–
	10-user license	**372 ESS 474 10**	–
	network license	**372 ESS 474 00**	–
Concept S/XS to Concept S Version 2.2	single-user license	**372 SPU 471 5● V22**	–
Concept M to Concept M Version 2.2	single-user license	**372 SPU 472 5● V22**	–
Modsoft V x.xx to Concept XL Version 2.2	single-user license	**372 SPU 485 5● V22**	–
Concept EFB Toolkit V x.x to V 2.2	single-user license	**332 SPU 470 51 V22**	–

Documentation

Description	Number of volumes	References (1)	Weight kg
Concept Installation Instructions	1	**840 USE 492 0●**	–
Concept User Manual	3	**840 USE 493 0●**	–
Concept IEC Block Library	13	**840 USE 494 0●**	–
Concept 984 LL Block Library	2	**840 USE 496 0●**	–
Concept EFB Tool User Manual	1	**840 USE 495 01**	–

ProWORX software

Description	License type	References (1)	Weight kg
ProWORX packages			
ProWORX NxT Online	single-user license	**372 SPU 681 01 NONL**	–
ProWORX NxT Offline/ Online	single-user license	**372 SPU 680 01 NDEV**	–
	3-user license	**372 SPU 680 01 NSTH**	–
	10-user license	**372 SPU 680 01 NSTE**	–
	20-user license	**372 SPU 680 01 NSTW**	–
ProWORX NxT Lite Offline/Online	single-user license	**372 SPU 610 01 NLDV**	–
	3-user license	**372 SPU 610 01 NLTH**	–
	10-user license	**372 SPU 610 01 NLTE**	–
	20-user license	**372 SPU 610 01 NLTW**	–
ProWORX Upgrades Modsoft Upgrade to ProWORX NDEV	single-user license	**372 SPU 684 01 NXUP**	–
	3-user license	**372 SPU 684 01 MSTH**	–
	10-user license	**372 SPU 684 01 MSTE**	–
	20-user license	**372 SPU 684 01 MSTW**	–
ProWORX Plus Upgrade to NxT NDEV	single-user license	**372 SPU 684 01 NXPW**	–
	3-user license	**372 SPU 684 01 NPTH**	–
	10-user license	**372 SPU 684 01 NPTE**	–
	20-user license	**372 SPU 684 01 NPTW**	–
ProWORX NxT Online/ Offline Development	single-user license	**372 SPU 610 01 DEV**	–

*(1) ● = **1** in this position indicates english language, **2** indicates german language.*

ProWORX products

Description	User	References	Weight kg
ProWORX packages			
ProWORX NxT 32	Server	**372 SPU 780 01 PSEV**	–
		372 SPU 780 01 PSSV	–
	Offline/Online Client	**372 SPU 780 01 PDEV**	–
	Online Client	**372 SPU 781 01 PONL**	–
ProWORX NxT 32 Lite	Offline/Online Client	**372 SPU 710 01 PLDV**	–
Legacy Product Upgrade to NX32	Client	**372 SPU 784 01 LPUP**	–
	Multiuser Incremental Addition	**372 SPU 780 01 SEAT**	–
ProWORX 32	3 Multi-user Client License	**372 SPU 780 01 PSTH**	–
	10 Multi-user Client License	**372 SPU 780 01 PSTE**	–
ProWORX 32 Lite	3 Multi-user Client License	**372 SPU 710 01 PLTH**	–
	10 Multi-user Client License	**372 SPU 710 01 PLTE**	–
Legacy Product Upgrade to NX32	3 Multi-user Client License	**372 SPU 784 01 LPTH**	–
	10 Multi-user Client License	**372 SPU 784 01 LPTE**	–

Documentation

Description	Language	Reference	Weight kg
ProWORX NxT Programming Software User Manual	–	**372 SPU 680 01 NMAN**	–
ProWORX 32 User Manual	English	**372 SPU 780 01 EMAN**	–
	French	**372 SPU 780 01 FMAN**	–
	German	**372 SPU 780 01 DMAN**	–
	Spanish	**372 SPU 780 01 SMAN**	–

Momentum automation platform
Products

Products

Model number	Description	Category
042 703 583	Blank cover for Row 1 of I/O Base	Accessories
043 513 781	Warning cover for Row 1 (Warning: Do not remove fuse cover while power is on)	Accessories
110 XCA 203 00	D shell Adapter RJ45 to 9 pin	Accessories
110 XCA 203 01	RJ45 to 9 Pin male adapter kit	Accessories
110 XCA 203 02	RJ45 to 9 Pin female adapter kit	Accessories
110 XCA 204 00	D shell Adapter RJ45 to 12 pin	Accessories
110 XCA 204 01	RJ45 to 25 Pin male adapter kit	Accessories
110 XCA 204 02	RJ45 to 25 Pin female adapter kit	Accessories
110 XCA 282 01	RS232 communication cable RJ45 to RJ45 - 1m	Accessories
110 XCA 282 02	RS232 communication cable RJ45 to RJ45 - 3m	Accessories
110 XCA 282 03	RS232 communication cable RJ45 to RJ45 - 6m	Accessories
170 AAI 030 00	Analog - 8 Channel Differential Input Module Base	Analog I/O Base
170 AAI 140 00	Analog - 16 Channel Single-Ended Input Module Base	Analog I/O Base
170 AAI 520 40	Analog - 4 Channel RTD, Thermocouple, and Mv Input Module Base	Analog I/O Base
170 AAO 120 00	Analog - 4 Channel Output 0-20mA Module Base	Analog I/O Base
170 AAO 921 00	Analog - 4 Channel Output 4-20mA Module Base	Analog I/O Base
170 ADI 340 00	24V DC - 16 Point Input Module Base	Discrete I/O Base
170 ADI 350 00	24V DC - 32 Point Input Module Base	Discrete I/O Base
170 ADI 540 50	120V AC - 16 Point Input Module Base	Discrete I/O Base
170 ADI 740 50	230V AC - 16 Point Input Module Base	Discrete I/O Base
170 ADM 350 10	24V DC - 16 Point Input/ 16 Pt Output Module Base	Discrete I/O Base
170 ADM 350 11	24V DC - 16 Point Input/ 16 Pt Output - Fast Module Base	Discrete I/O Base
170 ADM 350 15	24V DC - 16 Point Input/ 16 Pt Output Module Base - True Low	Discrete I/O Base
170 ADM 370 10	24V DC - 16 Point Input/ 8 Pt Output @ 2A Module Base	Discrete I/O Base
170 ADM 390 10	24V DC - 16 Point Input/ 12 Pt Output - Monitored Module Base	Discrete I/O Base
170 ADM 390 30	24V DC - 10 Point Input/ 8 Pt Relay Output Module Base	Discrete I/O Base
170 ADM 540 80	120V AC - 6 Point Input/ 3 Pt Output w/ Modbus Master Base	Specialty I/O Base
170 ADM 690 51	120V AC - 10 Point Input/ 8 Pt Output Module Base	Discrete I/O Base
170 ADO 340 00	24V DC - 16 Point Output Module Base	Discrete I/O Base
170 ADO 350 00	24V DC - 32 Point Output Module Base	Discrete I/O Base
170 ADO 530 50	120V AC - 8 Point Output @ 2A Module Base	Discrete I/O Base
170 ADO 540 50	120V AC - 16 Point Output Module Base	Discrete I/O Base
170 ADO 730 50	230V AC - 8 Point Output @ 2A Module Base	Discrete I/O Base
170 ADO 740 50	230V AC - 16 Point Output Module Base	Discrete I/O Base
170 AEC 920 00	High Speed Counter Module Base	Specialty I/O Base
170 AMM 090 00	Analog - 4 Ch In/ 2 Ch Out Module Base, w/ 24V DC 4 In/2 Out Digital	Mixed I/O Base
170 ANM 050 10	Seriplex Bus Interface	Specialty I/O Base
170 ANR 120 90	Analog - 6 Ch In, 4 CH Out Module Base w/24V DC 8 In/Out Digital	Mixed I/O Base
170 ARM 370 30	24V DC - 10 Pt Input/ 8 Point Relay Output, 120V AC Power Module Base	Discrete I/O Base
170 BDM 090 00	Dummy Base Unit	Accessories
170 BNO 671 00	Interbus S Branch Interface - SUPI 2	Communications Adapter
170 BNO 671 01	Interbus S Branch Interface - SUPI 3	Communications Adapter
170 BNO 681 00	Interbus S Fiber Optic Branch Interface - SUPI 3	Communications Adapter

Momentum automation platform
Products

Products (continued)

Model number	Description	Category
170 BSM 016 00	24V DC Input Simulator - Switches	Accessories
170 CPS 111 00	120/230 VAC Power Supply	Power Supply
170 DNT 110 00	ProfiBus DP Communication Adapter	Communications Adapter
170 ENT 110 00	Ethernet Communication Adapter (10 Mbps)	Communications Adapter
170 ENT 110 01	Ethernet Communication Adapter, version 2 (10/100 Mbps)	Communications Adapter
170 FNT 110 00	FIPIO Communication Adapter (V 1.0)	Communications Adapter
170 FNT 110 01	FIPIO Communication Adapter (V 2.0)	Communications Adapter
170 INT 110 00	Interbus (I/Obus) Communication Adapter - Gen 3	Communications Adapter
170 INT 110 01	Interbus (I/Obus) Communication Adapter - Gen 4	Communications Adapter
170 INT 120 00	Interbus Fiberoptic Communication Adapter - Gen 4	Communications Adapter
170 LNT 710 00	DeviceNet Communication Adapter	Communications Adapter
170 MCI 007 00	Interbus (I/O Bus) Cable - 11 cm. Long	Accessories
170 MCI 008 00	InterBus-S Cable - 8cm	Accessories
170 MCI 020 10	MB+ Cable /RS485 Short Interconnect Cable 10 inch	Accessories
170 MCI 020 36	Modbus Plus/RS485 3ft. Interconnect Cable for RJ45	Accessories
170 MCI 020 80	MB+ Cable 30 ft for RJ45 Double Ended	Accessories
170 MCI 021 20	Modbus Plus Cable - 10 ft. for RJ45	Accessories
170 MCI 021 80	MB+ Cable 10 ft for RJ45 Double Ended	Accessories
170 MCI 025 00	InterBus-S Cable - 25cm	Accessories
170 MCI 041 10	RS485 (RJ45/RJ45) Master Communication Cable	Accessories
170 MCI 100 01	Interbus (I/Obus) Cable - 100 cm. Long - low profile connector	Accessories
170 NEF 110 21	MB+ Communication Adapter - Single Port, 984 Format	Communications Adapter
170 NEF 160 21	MB+ Communication Adapter - Redundant Port, 984 Format	Communications Adapter
170 PNT 110 20	MB+ Communication Adapter - Single Port, IEC Format	Communications Adapter
170 PNT 160 20	MB+ Communication Adapter - Redundant Port, IEC Format	Communications Adapter
170 XCP 100 00	Set of Interbus S Labels	Accessories
170 XCP 200 00	Cable Coding Part Number	Accessories
170 XTS 001 00	Connector Set, Screw-type	Accessories
170 XTS 002 00	Connector Set, Spring-type	Accessories
170 XTS 003 01	Bus Bar - 3 Row, Spring-type	Accessories
170 XTS 004 01	Bus Bar - 3 Row, Screw-type	Accessories
170 XTS 005 01	Bus Bar - 2 Row, Screw-type	Accessories
170 XTS 006 01	Bus Bar - Single Row, Screw-type	Accessories
170 XTS 007 01	Bus Bar - Single Row, Spring-type	Accessories
170 XTS 008 01	Bus Bar - 2 Row, Spring-type	Accessories
170 XTS 009 00	Interbus (I/Obus) Connector Kit	Accessories
170 XTS 011 00	Connector Set , Screw -type , 8 pole for Power supply	Accessories
170 XTS 012 00	Connector Set, Spring-type , 8 pole for Power supply	Accessories
170 XTS 020 00	Modbus Plus (DB9) Cable Connector 'T' for RJ45	Accessories
170 XTS 021 00	Modbus Plus/RS485 Terminating RJ45 Resistor Plugs - Qty 2	Accessories
170 XTS 022 00	RJ45 Shielded Connectors - Qty 25	Accessories
170 XTS 023 00	RJ Crimping Tool Die	Accessories
170 XTS 040 00	RS485 (DB9) Cable Connector 'T' for RJ45	Accessories
170 XTS 041 00	RS485 (RJ45) Cable Connector 'T' for RJ45	Accessories
170 XTS 042 00	RS485 Multi-Master RJ45 Shunt Plugs - Qty 2	Accessories

Products (continued)

Model number	Description	Category
170 XTS 060 00	Device Net Connector	Accessories
170 XTS 100 00	Universal Momentum Front Label Replacement (10)	Accessories
170 XTS 120 00	High Vibration Environment Clips (set of 5)	Accessories
171 CCC 760 10	M1 Processor Adapter, 512K RAM, RS232 and I/Obus Ports	Processor Adapter
171 CCC 780 10	M1 Processor Adapter, 512K RAM, RS232 and RS485 Ports	Processor Adapter
171 CCC 960 20	M1 Processor Adapter, 512K RAM, Ethernet and I/Obus Ports	Processor Adapter
171 CCC 960 30	M1 Processor Adapter, 512K RAM,1M Flash Ethernet and I/Obus Ports ICE Exec	Processor Adapter
171 CCC 980 20	M1 Processor Adapter, 512K RAM, Ethernet and RS485 Ports	Processor Adapter
171 CCC 980 30	M1 Processor Adapter, 512K RAM, 1M Flash, Ethernet and RS485 Ports ICE Exec	Processor Adapter
171 CCS 700 00	M1 Processor Adapter, 64K RAM, RS232 Port	Processor Adapter
171 CCS 700 10	M1 Processor Adapter, Fast CPU, 64K RAM, RS232 Port	Processor Adapter
171 CCS 760 00	M1 Processor Adapter, 256K RAM, RS232 and I/Obus Ports	Processor Adapter
171 CCS 780 00	M1 Processor Adapter, 64K RAM, RS232 and RS485 Ports	Processor Adapter
172 JNN 210 32	Modbus (RS232/485) Option Adapter, TODD Clock and Battery Backup	Communication Option Adapters
172 PNN 210 22	MBA Option Adapter, TODD Clock and Battery Backup	Communication Option Adapters
172 PNN 260 22	Redundant MBA Option Adapter, TODD Clock and Battery Backup	Communication Option Adapters
381 SWA 000 00	Device Master File	Accessories
424 244 739	Ground Clamp	Accessories
424 251 739	Ground Clamp	Accessories
490 NAA 271 01	Standard Modbus Plus Cable - 30m	Accessories
490 NAA 271 02	Standard Modbus Plus Cable - 150m	Accessories
490 NAA 271 03	Standard Modbus Plus Cable - 300m	Accessories
490 NAA 271 04	Standard Modbus Plus Cable - 450m	Accessories
490 NAA 271 06	Standard Modbus Plus Cable - 1500m	Accessories
490 NAB 000 10	RJ45 Crimp Tool	Accessories
490 NAD 211 10	Modbus Plus Drop Cable - 2.4m	Accessories
490 NAD 211 30	Modbus Plus Drop Cable - 6m	Accessories
490 NAD 911 03	Profibus Connector - with Terminator	Accessories
490 NAD 911 04	Profibus In-Line Connector	Accessories
490 NAD 911 05	Profibus Connector with Programming Port	Accessories
990 NAD 211 10	Modbus Plus Cable - Low Profile - 2.4m	Accessories
990 NAD 211 30	Modbus Plus Cable - Low Profile - 6m	Accessories
990 NAD 218 10	Modbus Plus Drop Cable - Left Side - 2.4m	Accessories
990 NAD 218 30	Modbus Plus Drop Cable - Left Side - 6m	Accessories
990 NAD 219 10	Modbus Plus Drop Cable - Right Side - 2.4m	Accessories
990 NAD 219 30	Modbus Plus Drop Cable - Right Side - 6m	Accessories
990 NAD 230 00	Modbus Plus Tap	Accessories
AS MBKT 085	9 Way Sub-D Female Connector - IP20	Accessories
AS MBKT 185	Terminal Connector Kit	Accessories
CER 001	Cable Grounding Rail	Accessories
KAB 3225 L*	Remote Bus Cable - * indicates length in meters	Accessories
KAB PROFIB	Profibus cable - by the meter	Accessories
TSX FP ACC 12	9 Way Sub-D Female Connector - IP20	Accessories
TSX FP ACC 14	Bus Connection Box - IP20	Accessories
TSX FP ACC 2	9 Way Sub-D Female Connector - IP65	Accessories
TSX FP ACC 4	Bus Connection Box - IP65	Accessories
TSX FP CC 100	Tap Link Cable - 100m	Accessories
TSX FP CC 200	Tap Link Cable - 200m	Accessories
TSX FP CC 500	Tap Link Cable - 500m	Accessories

Momentum automation platform
User Documentation

References

Description	Language	Reference	Weight kg
Momentum I/O Bases User Guide	English	**870 USE 002 00**	–
	French	**870 USE 002 01**	–
	German	**870 USE 002 02**	–
	Italian	**870 USE 002 04**	–
	Spanish	**870 USE 002 03**	–
M1/M1E Processor Adapters and Option Adapter User Guide	English	**870 USE 101 00**	–
	French	**870 USE 101 01**	–
	German	**870 USE 101 02**	–
	Italian	**870 USE 101 04**	–
	Spanish	**870 USE 101 03**	–
InterBus Communication Adapter User Guide	English	**870 USE 010 00**	–
	French	**870 USE 010 01**	–
	German	**870 USE 010 02**	–
	Italian	**870 USE 010 04**	–
	Spanish	**870 USE 010 03**	–
InterBus-S Fiber Optic Communication Adapter User Guide	English	**870 USE 006 00**	–
Profibus Communication Adapter User Guide (includes the GSD configuration software on 3.5" disk)	English	**870 USE 004 00**	–
	French	**870 USE 004 01**	–
	German	**870 USE 004 02**	–
	Italian	**870 USE 004 04**	–
	Spanish	**870 USE 004 03**	–
Fipio Communication Adapter 170 FNT 110 00) User Guide	English	**870 USE 005 00**	–
	French	**870 USE 005 01**	–
	German	**870 USE 005 02**	–
	Italian	**870 USE 005 04**	–
	Spanish	**870 USE 005 03**	–
Fipio Communication Adapter (170 FNT 110 01) User Guide	English	**870 USE 105 00**	–
	French	**870 USE 105 01**	–
	German	**870 USE 105 02**	–
	Italian	**870 USE 105 04**	–
	Spanish	**870 USE 105 03**	–
High-Speed Counter Module Base (170 AEC 920 00) User Guide	English	**870 USE 008 00**	–
	French	**870 USE 008 01**	–
	German	**870 USE 008 02**	–

Schneider Electric worldwide

Up-dated: 23-06-2000

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Cuba	Schneider Electric	Bureau de Liaison de La Havane Calle 36- N°306-Apto1 Entre 3ra y 5ta Avenida Miramar - Playa Habana	Tel.: +53 724 15 59 Fax: +53 724 12 17	
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Denmark	Schneider Electric A/S	Baltorpbakken 14 DK-2750 Ballerup	Tel.: +45 44 73 78 88 Fax: +4544 68 5255	**www.schneider-electric.dk**
Dominican Republic	Schneider Electric	Calle Jacinto Manon Esq. Federico Geraldino Edificio D' Roca Plaza Suite 402, Ens. Paraiso - Santo Domingo	Tel.: +1 809 334 66 63 Fax: +1 809 334 66 68	
Ecuador	Schneider Ecuador	Av. de los Shyris y Rio Coca Esq. Edificio Eurocentro Segundo Piso - 6466 Quito	Tel.: +593 2 25 03 23 Fax: +593 2 43 49 40	
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Finland	Schneider Electric Oy	Sinikalliontie 16 02630 Espoo	Tel.: +358 9 527 000 Fax: +358 9 5270 0376	**www.schneider-electric.fi**
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Germany	Schneider Electric GmbH	Gothaer Straße 29 D-40880 Ratingen	Tel.: +49210 240 40 Fax: +492 10 240 49 256	**www.schneider-electric.de**
Ghana	Schneider Electric	Private Mail Bag - Kotoa Airport Accra	Tel. : +23321 70 10 842/11 687 Fax : +233 21 77 96 22	
Greece	Schneider Electric AE	14th km - RN Athens-Lamia GR - 14564 Kifissia	Tel.: +3016 29 52 00 Fax: +3016 29 52 10	**www.schneider-electric.com.gr**
Haiti	Schneider Electric	Calle Jacinto Manon Esq. Federico Geraldino Edificio D' Roca Plaza Suite 402, Ens. Paraiso - Santo Domingo	Tel.: +809 334 66 63 Fax: +809 334 66 68	
Hong Kong	Schneider Electric (Hong Kong) Ltd	Room 3108-28, 31th Floor, Sun Hung Kai Centre, 30 Harbour Road, Wanchai	Tel.: +852 25 65 06 21 Fax: +852 28 11 10 29	
Hungary	Schneider Electric Hungária Villamossági Rt.	Fehérvári út 108 – 112 H-1116 Budapest	Tel.: +36 1 382 26-06 Fax: +36 1 206 1429	**www.schneider-electric.hu**

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Indonesia	■ P.T. Schneider Indonesia	Ventura Building 7th Floor Jalan R.A. Kartini Kav.26 Cilandak - 12430 Jakarta	Tel.: +62 +21 750 44 06 Fax: +62 +21 750 44 15/ 16	**www.schneider-electric.co.id**
Iran (Islamic Republic of)	■ Telemecanique Iran	1047 Avenue VALI ASSR P.O. Box 15875-3547 15116 Teheran	Tel.: +98 218 71 01 42 Fax: +98 218 71 81 87	
Ireland	■ Schneider Electric Ireland	Maynooth Road Cellbridge - Co. Kildare	Tel.: +353+0 1 6012200 Fax: +353+0 1 6012201	**www.schneiderelectric.ie**
Italy	■ Schneider Electric S.p.A.	Centro Direzionale Colleoni Palazzo Sirio - Viale Colleoni, 7 20041 Agrate Brianza (Mi)	Tel.: +39 39 655 8111 Fax: +39 39 609 1510	**www.schneiderelectric.it**
Japan	■ Schneider Electric Japan Ltd	SK Bldg, Sendagaya 4-14-4, Sendagaya Shibuya-Ku - 151 Tokyo	Tel.: +81 354 74 44 74 Fax: +81 354 74 44 70	**www.schneider-electric.co.jp**
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Kuwait	■ Schneider Electric Kuwait	Al Gaas Tower - Sharq 2nd Floor PO Box 20092 - 13 061 Safat	Tel.: +965 240 75 46 Fax: +965 240 75 06	
Latvia	■ Schneider Electric	Rue Tornia, 4 IIIB, office 203 LV1050 Riga	Tel.: +371 750 32 32 Tel.: +371 750 32 34 Fax: +371 732 07 97	
Lebanon	■ Schneider Electric Liban	SODECO Square Office Tower Bloc B, 13th Floor Rue de Damas - Beyrouth	Tel.: +961 1.613.006/007 Fax: +96 1.613.008	
Lithuania	■ Schneider Electric	rue Juozapaviciaus, 11 2600 Vilnus	Tel.: +370 275 31 73 Tel.: +370 275 32 64 Fax: +370 272 19 78	
Malaysia	■ Schneider Electric (Malaysia) Sdn Bhd	No.11 Jalan U1/19, Seksyen U1 Hicom-Glenmarie Industrial Park Shah Alam 40150 Selangor Darul Ehsan	Tel.: +60 37 05 11 50 Fax: +60 37 05 11 70	**www.schneider-electric.com.my**
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Mexico	■ Groupe Schneider Mexico	Calz. Rojo Gomez N° 1121 Col. Guadalupe del Moral México 09300	Tel.: +525 686 30 00 Fax: +525 686 24 09	**www.schneider-electric.com.mx**
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Netherlands	■ Schneider Electric BV	Waarderweg 40 - Postbus 836 2003 RV Haarlem	Tel.: +31 23 512 4124 Fax: +31 23 512 4100	**www.schneider-electric.nl**
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Nigeria	■ Merlin Gerin Nigeria Ltd	Plot 25 Sanni Tola Sonolki Close Off Harold Sodipo Crescent PO Box 12 505 - Ikeja - Lagos	Tel.: +234 14 93 63 99 Fax: +234 14 97 45 99	
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Philippines	■ Schneider Electric Philippines, Inc	Schneider Electric Philippines, Inc 1314 Batangas Street Makati City 1234 - Metro-Manila	Tel.: +63 28 44 84 18 Fax: +63 28 16 00 63	
Poland	■ Schneider Electric Polska Sp.zo.o.	ul. Domaniewska 41 02-672 - Warszawa	Tel.: +48 22 606 25 00 Fax: +48 22 606 11 66 Fax: +48 22 606 11 58	**www.schneider-electric.pl**
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Senegal	■ Schneider Electric Afrique de L'Ouest	BP 15952 - Dakar-Fann Quartier Almadies - Dakar	Tel.: +221 820 68 05 Fax: +221 820 58 50	
Singapore	■ Schneider Electric Singapore Pte Ltd	10 Ang Mo Kio Street 65 #02-17/20 TechPoint Singapore 569059	Tel.: +65 484 78 77 Fax: +65 484 78 00	**www.schneider-electric.com.sg**
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Spain	■ Schneider Electric España, S.A.	Pl. Dr. Letamendi, 5-7 08007 Barcelona	Tel.: +34 93 484 3100 Fax: +34 93 484 3308	**www.schneiderelectric.es**
Sweden	■ Schneider Electric AB	Djupdalsvägen 17/19 19129 Sollentuna	Tel.: +46 8 623 84 00 Fax: +46 8 623 84 85	**www.schneider-electric.se**
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Thailand	■ Schneider (Thailand) Ltd	20th Floor Richmond Building 75 Sukhumvit 26 Road, Klongtoey Bangkok 10110	Tel.: +66 2 261 1899 Fax: +66 2 260 8235	**www.schneider-electric.co.th**
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Turkey	■ Schneider Elektrik Sanayi Ve Ticaret A.S.	Tütüncü Mehmet Efendi Cad. N°:110 Kat 1-2 - 81080 Göztepe – Istanbul	Tel.: +90 21 63 86 95 70 Fax: +90 21 63 86 38 75	**www.schneiderelectric.com.tr**
Ukraine	■ Schneider Electric	Rue Krechtchalik 2 252601 Kiev	Tel.: +380 44 462 04 25 Fax: +380 44 462 04 24	
United Arab Emirates	■ Schneider Electric Abu Dhabi	PO Box 29580 Office Floor 2/Lulu Street Al Marina Plaza Tower - Abu Dhabi	Tel.: +9712 6 339444 Fax: +9712 6 316606	
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United States	■ Schneider Electric	North American Division 1415 Roselle Road Palatine - IL 60067	Tel.: +1 847 397 2600 Fax: +1 847 925 7500	**www.squared.com**
Uruguay	■ Schneider Electric Uruguay S.A.	Gabriela Pereira 3039 Montevideo	Tel.: +59 82 707 2392 Fax: +59 82 709 0713	
Venezuela	■ Schneider Mg SD TE, S.A	Calle 162/ Piso 2 Edificio Centro Cynamid La Urbina, 1070 - 75319 Caracas	Tel.: +58 2 241 13 44 Fax: +58 2 243 60 09	**www.schneider-electric.com.ve**
Viet Nam	■ R.R.O. of Schneider Electric S.A.	Unit 808, 8th Floor Me Linh Point Tower 2 Ngo Duc Ke Street, District 1 Ho Chi Minh City	Tel.: +84 8 829 60 72 Fax: +84 8 829 60 67	
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For all the other countries, contacts are ensured by the Regional Divisions (see below).

Africa & Middle-East Zone				
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Middle-East Region	■ Schneider Elektrik A.S.	Sanayi Ve Ticaret A.S. Tütüncü Mehmet Efendi Cad. N°:110 Kat. 1-2 81080 Götztepe-Istanbul Turkey	Tel.: +(90) 2163 86 95 70 Fax: +(90) 21 63 86 38 75	**www.schneider-electric.com.tr**
North-East Africa Region	■ Schneider Electric Egypt	68, El Tayaran Street Nasr City, 11371 Cairo Egypt	Tel.: +(20) 24 01 01 19 Fax: +(20) 24 01 66 87	**www.schneider.com.eg**
North-West Africa Region	■ Schneider Electric Maroc	26, rue Ibnou Khalikane Quartier Palmiers 20100 Casablanca Morocco	Tel.: +(212) 299 08 48 à 57 Fax: +(212) 299 08 67 et 69	**www.schneider.co.ma**
South Africa Region	■ Schneider Electric South Africa (PTY) Ltd	Cnr Bekker & Montrose roads 1685 - Midrand. South Africa	Tel.: +(27) 11 254 6400 Fax: +(27) 11 315 8830	**www.schneider-electric.co.za**
South Asia Region	■ Schneider Electric India Pvt Ltd.	D-27 South Extension Part II 110 049 New Dehli India	Tel.: +(91) 116 25 76 58 Fax: +(91) 116 25 80 80	**www.schneiderelectric.in.com**
Asian Zone				
Great China	■ Schneider Beijing	Landmark bldg-Room 1801 8 North Dong Sanhuan Rd, Chaoyang District 100004 Beijing China	Tel.: +(86) 10 65 90 69 07 Fax: +(86) 10 65 90 00 13	**www.schneider-electric.com.cn**
South-East Asia	■ Schneider South East Asia (HQ) Pte Ltd.	460 Alexandra Road #15-01 PSA building 119963 Singapore	Tel.: +(65) 270 23 66 Fax: +(65) 273 46 10	
European Zone				
ECE-CIS Countries	■ Schneider Electric CEI	80, Leningradsky Prospekt 125178 Moscou Russia	Tel.: +(7) 502 224 5050, 5033 and 5034 Fax: +(7) 502 224 5220	
Nordic countries	■ Schneider Electric A/S	Baltorpbakken 14 DK - 2750 Ballerup Denmark	Tel.: +(45) 44 73 7888 Fax: +(45) 44 68 5255	**www.schneider-electric.dk**
East Adriatic countries	■ Schneider Electric SA	Fallerovo Setaliste 22 10000 Zagreb Croatia	Tel.: +(385) 1 367 100 Fax: +(385) 1 367 111	
North-America Zone				
	■ Schneider Electric North American Division	1415 Roselle Road Palatine IL 60067 USA	Tel.: +(1) 847 397 2600 Fax: +(1) 847 925 7500	**www.squared.com**
South America & Caribbean Zone				
	■ Schneider Electric Emp. Partic. Head Office Zone	Avenida Brigadeiro Faria Lima 1478 15° A 01451-913 São Paulo-SP Brazil	Tel.: +(55) 11 816 45 00 Fax: +(55) 11 813 09 43 Fax: Fax:	**www.schneider.com.br**
Pacific Zone				
	■ Schneider Electric (Australia) Pty. Limited	2, Solent Circuit Norwest Business Park NSW 2153 Baulkham Hill Australia	Tel.: +(61) 298 51 28 00 Fax: +(61) 296 29 83 10	**www.schneider.com.au**
Subsidiaries and partners				
	■ NUM SA	21, avenue Maréchal Foch - BP 68 95101 Argenteuil Cedex France	Tel. : +33 (0)1 34 23 66 66 Fax : +33 (0)1 34 23 67 82	**www.num.com**
	■ SIG Positec Automation GmbH	Breslauer Straße 7 77933 Lahr Allemagne	Tel. : +49 (0)78 21 946 02 Fax : +49 (0)78 21 946 220	**www.sig-positec.de**
	■ Phytron Electronik GmbH	Industriestr. 12 D-82194 Gröbenzell Allemagne	Tel. : +49 (0)8142-503 0 Fax : +49 (0)8142-503 190	**www.phytron.com**

Product certifications and marine classification authorities

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.
LR	Lloyd's Register	United-Kingdom
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	C.I.S.

The table below shows the situation as of the 01.09.2000 for certifications obtained or pending from organizations for base PLCs. Further information regarding certified modules can be obtained from your Regional Sales Office.

	Certifications				Others		
Normal execution		C-Tick			Class1 Div 2 Hazardous		
Certified	CSA	ACA	SIMTARS	UL	locations	BG	AS-i
Pending certification	Canada	Australia	Australia	USA	USA	Germany	Europe
ABE-7	■			■			
CCX 17				■			
FT2100	■			■			
Lexium MHD	■			■			
Lexium BPH	■			■			
Micro	■	■	■	■	■	*(1)*	*(2)*
Momentum	■	■		■	■		
Nano	■	■		■			
Premium	■	■	■	■	■	*(3)*	*(4)*
Quantum	■	■		■			
TBX	■	■		■			
TSX/PMX 47 to 107	■			■			*(5)*
TXBT-F	■	■		■			
XBT-F/FC	■	■		■			
XBT-H/P/E/HM/PM	■			■			

(1) TSX DPZ 10D2A safety module
(2) TSX SAZ 10 AS-i bus master module and TSX SUP A02/A05 AS-i bus power supplies
(3) TSX PAY 262/282 safety modules
(4) TSX SAY 100 AS-i bus master modules
(5) TBX SAP 10 Fipio/AS-i gateway

Product certifications and marine classification authorities (continued)

Normal execution Certified Pending certification	Marine classification authorities							
	ABS USA	BV France	DNV Norway	GL Germany	GOST CIS	LR United-Kingdom	RINA Italy	RRS CIS
ABE-7								
CCX 17								
FT2100								
Lexium MHD								
Lexium BPH								
Micro								
Momentum								
Nano								
Premium								
Quantum								
TBX								
TSX/PMX 47 to 107								
TXBT-F								
XBT-F/FC								
XBT-H/P/E/HM/PM								

References

Description	Language	Reference	Weight kg
Fipio Bus / Fipway Networking Reference Manual	English	**TSX DR FIP E**	–
	French	**TSX DR FIP F**	–
	German	**TSX DR FIP G**	–
	Spanish	**TSX DR FIP S**	–
170 PNT Series Modbus Plus Communication Adapter User Guide	English	**870 USE 103 00**	–
	French	**870 USE 103 01**	–
	German	**870 USE 103 02**	–
	Italian	**870 USE 103 04**	–
	Spanish	**870 USE 103 03**	–
170 NEF Series Modbus Plus Communication Adapter User Guide	English	**870 USE 111 00**	–
	French	**870 USE 111 01**	–
	German	**870 USE 111 02**	–
	Italian	**870 USE 111 04**	–
	Spanish	**870 USE 111 03**	–
Modbus Plus Network Planning and Installation Guide	English	**890 USE 100 00**	–
	French	**890 USE 100 01**	–
	German	**890 USE 100 02**	–
	Spanish	**890 USE 100 03**	–
Modbus Plus Network BM85 Bridge Multiplexer User Guide	English	**890 USE 103 00**	–
DeviceNet Communication Adapter User Guide (includes the EDS configuration software on 3.5" disk)	English	**870 USE 104 00**	–
	French	**870 USE 104 01**	–
	German	**870 USE 104 02**	–
	Italian	**870 USE 104 04**	–
	Spanish	**870 USE 104 03**	–
Modbus/TCP/IP Ethernet Communication Adapter User Guide	English	**870 USE 114 00**	–
	French	**870 USE 114 01**	–
	German	**870 USE 114 02**	–
	Italian	**870 USE 114 04**	–
	Spanish	**870 USE 114 03**	–
XMIT Function Block Version 3.0 User Guide	English	**840 USE 113 00**	–
Ethernet 10BaseT and 100BaseTx	English	**490 USE 130 00**	–
	French	**490 USE 130 01**	–
	German	**490 USE 130 02**	–
	Spanish	**490 USE 130 03**	–
Seriplex User Guide	–	**30298 086 01**	–

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 recognised 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 could not be applied before 1 January 1995 and 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.

Protective treatment of equipment

Premium and Quantum PLCs meet the requirements of “TC” treatment *(1)*.
For installations in industrial production workshops or in an environment which corresponds to “TH” treatment *(2)*, Premium PLCs should be enclosed in casings with a minimum of IP 54 protection as prescribed by standards IEC 664 and NF C 20 040.
Premium and Quantum PLCs are supplied with an IP 20 protection index. They can therefore be installed without enclosure in locations with restricted access which do not exceed pollution degree 2 (control room which does not contain a machine or dust-producing activity).

(1) “TC” treatment : all climate treatment.
(2) “TH” treatment : treatment for hot and humid environments.

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