Compact automation platform

Catalog
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Compact Automation Platform

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Compact Automation Platform

CPUs

Selection guide

Module type	Central processing unit			
I/O expansion	512 words (256 in, 256 out)		1024 words (512 in, 512 out)	

Communication interfaces	2 Modbus ports, 1 Modbus Plus port, 1 PCMCIA II slot			
Conformal coating	No	Yes	No	Yes
Railroad standard EN 50155	No			
Total data memory	48 K words		96 K words	
Memory **Startup RAM** **RAM** **Flash PROM** **PCMCIA II card**	 32K 512K 1 Mb Yes		 64K 1 Mb 1 Mb Yes	
Logic memory **for Modsoft LL** **for Concept IEC**	 16K words 220 kB		 32K words 620 kB	
Model	PC-E984-275	PC-E984-275C	PC-E984-285	PC-E984-285C
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256 words (128 in, 128 out)				
				
2 Modbus ports			1 Modbus Plus port	
Yes	No	Yes	No	Yes
Yes	No			
48 K words			24 K words	
32K 512K 1 Mb No			16K 512K 1 Mb No	
16 K words 220 kB			8 K words 220 kB	

PC-E984-258R	PC-E984-258	PC-E984-258C	PC-E984-265	PC-E984-265C

Presentation

General

With its broad spectrum of compatible high-performance modules, the Modicon Compact Automation Platform provides the perfect solution for medium-range systems. Its adaptable, modular architecture allows for easy installation and configuration. The Compact platform combines very small size with robust industrial design so that inexpensive and reliable installation is ensured even under difficult environmental conditions.

System Architecture

The Compact range has an open system architecture, permitting a maximum of potential solutions for all of the demanding requirements associated with automation technology. This flexibility is made possible by using open standard-based hardware platforms, with open and standardized communication buses, including the Interbus for remote I/O and IEC 1331-3 compliant software. Together, these features ensure cross-system compatibility for existing Schneider users, as well as for new customers.

Standards

High noise immunity according to IEC 801/IEC 1131-2, as well as high shock and vibration resistance (IEC 801/IEC 1131-2), are standard for the entire Compact family. In addition, the Compact product complies with UL, CSA, VDE, CE, and FM standards.

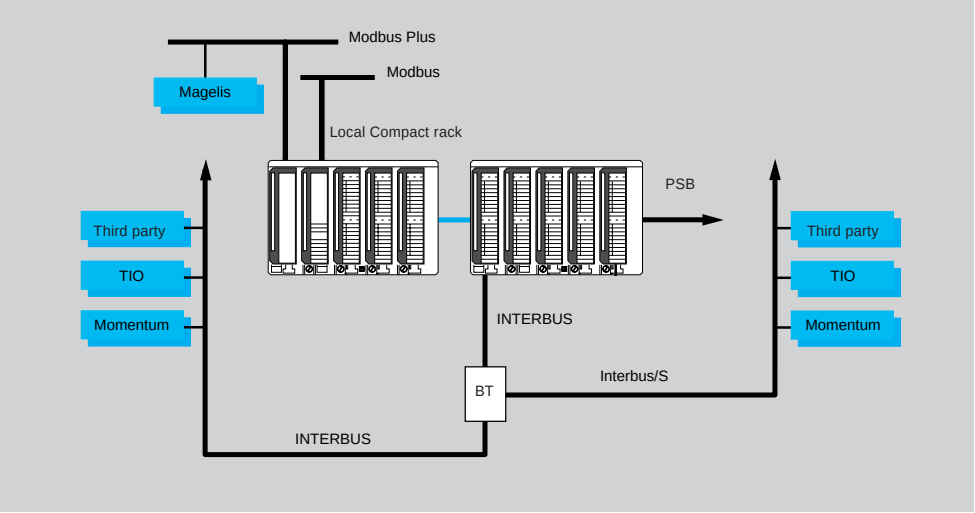
Two Compact CPUs - the PC-E984-258 and PC-E984-285 - are available with an extended operating temperature range of –40…+70°C. Only the E984-258C meets the German railway standard (EN 50 155). In addition, all four Compact PLCs are available with conformal coating, allowing them to be used reliably under extreme environmental conditions.

I/O modules with the designation AS-BXXX-25X are available with an extended operating temperature range of –40…+70°C, in order to comply with German railway Standard EN 50 155. These modules are also available with conformal coating for extreme environmental conditions.

An extended temperature range of –25…+70°C is also available through the use of additional enclosures.

Configuration

The Compact Automation Platform provides a wide range of applications for a diversity of problems. Individual I/O modules (with up to 16 I/O points) can be included in systems comprising several I/O stations with up to 16 384 total I/O points. Besides the central processing unit, one local system can accommodate up to 18 modules. The variable memory management system ensures a suitable basis for even the most demanding applications. The simultaneous use of multiple bus systems within one PLC offers a multitude of possibilities without affecting the limits of individual bus systems.



Presentation

System components

Central Processing Units

The Central Processing Unit (CPU) of the Compact Platform is double-wide. It comprises:

- the operating system, application memory, and communications interfaces
- RAM and flash PROM for data programs
- LED displays, to assist in system troubleshooting by displaying the status of the PLC and its communications

In addition, a built-in power supply provides the backplane bus with power and protects the system from interference voltage and voltage fluctuations. In case of unforeseen power problems, it ensures the PLC has sufficient time for a safe and orderly shutdown.

Power Supplies

Six power supplies are available. The P120-000 is an isolated power supply that accepts input voltages from 115 VAC or 230 VAC (± 15%) AC source and outputs a 24VDC supply to the CPU at 1A continuous current. The P120-125 is an isolated power supply that accepts input voltages from 105 to 150 VDC sources and outputs 24 VDC to the CPU at up to 1.5A continuous current. Both supplies feature overload and over voltage protection and come with an LED status indicator.

The AS- PRTU-252 and 252C are isolated power supplies with an extended operating temperature range. They accept 90 - 264 VAC and 8.5 - 13.8 VDC power in and provide 24 VDC 2A output. If the AC input voltage fails the 12 VDC input serves as backup input power. The power supplies switch to the backup in a bumpless transfer and provide a 24 VDC output that can be monitored as notification AC input power failure. The AS-PRTU-258 and AS-PRTU 258C are similar to the AS-PRTU-252 and AS-PRTU-252C except that they provide for 30 - 70 VDC backup input power.

Backplanes

The Compact primary backplane (HDTA-200) can accommodate the CPU and three I/O modules. Local system expansion is possible with up to three secondary backplanes (HDTA-201). Most I/O modules may be used in any of these backplanes. Another secondary backplane (HDTA-202) is designed to accommodate two I/O modules. Both the primary and secondary backplanes are available with conformally coated electronics.

Discrete I/O Modules

The Compact Platform offers a broad spectrum of powerful discrete I/O modules, all of which meet the requirements of the international IEC Standard, ensuring reliability even in the harshest industrial environments. All speciality modules are filtered and protected against noise, overload, and over-voltage. LED indicators show the input/output status. Each discrete output module may be assigned one of three fault modes: shut off all outputs, store the last word or enter a predefined status, to preserve system integrity if communication errors occur.

Analog I/O Modules

The Compact's Analog I/O modules permit performance of a wide range of control and monitoring tasks. Depending on the module, both voltage values and current values can be input and output. In addition, modules can be configured as resistance temperature detectors (RTD) and thermocouples (TC). A wire-break monitor is provided for almost every channel by the software and an LED indicator.

Speciality modules and system ehancements

An assortment of speciality modules and optional products are available for a variety of applications.

- **Counter modules** - the BZAE and BFRQ modules can be used to count events or parts, group objects, monitor flow volumes, perform linear measurements, and measure speeds, frequencies, and time.
- **Motion control** - flexibility in motion control applications is provided by the BMOT 201 and 202 motion modules, which offer multi-axis control of encoder and resolver inputs and outputs.
- **Modbus Plus communications** - Modbus Plus combines high-speed, peer-to-peer communications with easy installation. This local area network enables communication between third party computers, automation devices, and other data sources as peers within the system using low-cost twisted pair cable. Modbus Plus is simple to implement because all Modbus Plus functions, including data transfer and network statistics, are configured using one function block.
- **Interbus communications** - Interbus is an industry-standard communication protocol for industrial applications which transfers data between Interbus devices using the RS 485 standard. The topology consists of a ring system including one master and multiple slaves. Interbus uses distributed shift requesters, in which the data is read and written bit by bit. Each device and its registers are part of this shift register.The total cable length can be up to 10 km (6.21 miles) using fiber optic cables in both remote and distributed I/O stations.
- **Operator terminals -** The Magelis series of operator terminals provide a powerful human-machine interface. The product ranges from small, plain-language 2 x 20 character displays to full-function operator terminals with graphic displays.

Presentation

System components (continued); software

Compatibility with Existing Components

The new range of Compact PLCs is compatible with existing Compact systems, including the backplanes, cables, and most I/O modules, thereby ensuring a smooth transition. Existing Compact PLCs can be exchanged with newer models, and will gain increased performance and enhanced compatibility with Schneider Electric's Micro, Quantum, and Momentum Automation products.

Software

Two popular programming software paxkages are available for the 386-based Compact controllers, Concept and ProWORX NxT. Both are Microsoft Windows-based programs. Concept supports all five IEC 1131-3 programming languages and 984 Ladder Logic. ProWORX NxT supports 984 Ladder Logic only.

Within Concept's feature-rich environment, overall design, startup, and maintenance costs are reduced, with a resultant significant decrease in development time. ProWORX NXT's 984 programming environment supports a wider range of Modicon PLCs than any other programming software package. ProWORX includes the ability to automatically generate system wiring diagrams in Autocad-compatible PCX format files, in addition to the standard PLC program documentation. Both Concept and ProWORX support a family of loadable functions which include:

- **Starling gas flow loadables,** for performing custody transfer approvable flow measurements using American Gas Association (AGA) 3 and 8 calculations.
- **XMIT loadables,** function blocks supporting on-demand Modbus master, modem control, and ASCII read and write.

Programming with Concept

Economical implementation of the varied tasks of drive technology, control automation engineering, and RTU requires powerful tools. Concept offers a single development tool for effective system configuration that meets all requirements of the international IEC 1131-3 standard.

Concept maintains the same look and feel for all steps of system project planning and in all editors. Most of the project design steps, in particular the program creation, are independent of the PLC.

Because of Concept's unique design, it can be used with other Schneider Electric automation products, thus eliminating the time and effort needed to learn multiple programming products. Extensive help functions are only a click away at every step to aid in programming tasks. The module library is equipped with useful elements for quick, simple programming even of complex tasks. Programs are easily debugged using the built-in software simulator.

Programming with ProWORX Nxt

ProWORX Nxt is the 984 Ladder Logic programming tool that offers unrivaled support for the Compact PLC range. 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.

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.

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.

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.

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.

Programming under the advanced graphic user interface makes system configuration and development easy. The package offers easy drag-and-drop network editing, and provides a number of unique productivity enhancing tools. Features such as the automatic generation of CAD files, data acquisition, and elemental trending provide the user with the engineering tools necessary to complete a project entirely from a single package.

Presentation

System characteristics

Physical characteristics

Weight range		**kg**	0.22 ... 1.165
Dimensions	Height	**mm**	Modules: 130, Module racks: 142
	Depth	**mm**	Modules: 128
	Width	**mm**	Single-width modules: 40, Double-width modules (CPU, DEA and BMOT): 80
Wire cross-section for the terminal blocks		**mm^2**	0.25 ... 2.5
Material (Enclosure and cover frame)			Lexan 241 (Polycarbonate)
Space required in the module rack			1 slot per module (except CPU, DEA and BMOT 202: 2 slots)

Electrical characteristics

Noise immunity per EN 61000-4-2 (Electrostatic discharge)	**kV**	Air: ± 8 Contact: ± 4
Noise immunity per EN 61000-4-3 (Electromagnetic fields)		10 V/m 30 ... 1000 MHz
Noise immunity per EN 61000-4-4 (Voltage immunity)	**kV**	Power supply: ± 2 Signals: ± 1
Noise immunity per EN 61000-4-12 (1 MHz pulse)	**kV**	1
Emission EN 55 011		Class A
Power supply Noise immunity per EN 61000-4-11		Rated voltage: +15% -10%; Frequency: ± 5%; Ripple: ± 5%; VAC interruption: 10 ms

Environmental characteristics during operation

Temperature range	**°C**	0 ... 60 or -40 ... 75 for the expanded temperature range
Relative humidity		0 ... 93% non-condensing at 60 °C
Operating altitude		Fully functional up to 2500 m
Chemical interactions		SO_2 <=0.5 ml/m^3 (per IEC 68-2-42), H_2S <=0.1 ml/m^3 (per IEC 68-2-43)

Environmental characteristics during storage

Temperature range	**°C**	-40 ... +85 without battery, -40 ... +70 with battery
Relative humidity		0 ... 93% non-condensing at 60 °C
Standards compliance		UL, CSA, CE, (FM)

Backplanes

General, Description, References

General

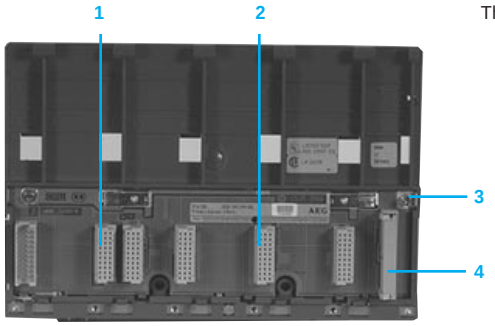
The Compact HDTA series backplanes are designed so that they mount easily on a DIN rail. The DIN rail serves as the system ground.

Three different backplanes are available, with or without conformal coating. [The conformal coating is applied over the backplane board, and protects the electronic components against harsh environmental conditions.] Suitable backplanes with different capacities are available for each stage of expansion. The **primary backplane** can accept one CPU and up to three I/O modules. The **secondary backplanes** offer additional support for two or five modules. Up to three backplanes can be connected in series to the primary backplane.

The built-in parallel backplane bus connects each slot of a backplane to the data bus and the 5 V supply. The backplanes can be mounted in either a stacked on linear fashion, as the application warrants.There is a maximum local expansion of 18 I/O module slots plus the slot for the CPU. The data bus and 5V supply can be passed to the other backplanes in the system using the WBXT-201 extension cable.

An access cover is supplied with every backplane to protect the front of the modules. Transparent holders provide space for user-defined labels.

Description



The Compact backplane is comprised as follows:

1 PLC connector
2 I/O bus connector
3 Reference ground point
4 Bus extension connector

References

Backplanes

Description	Slots	Width (mm)	Reference	Weight g (lb)
Primary	2 CPU, 3 I/O	211	**AS-HDTA-200**	330 (.73)
Secondary	5 I/O	211	**AS-HDTA-201**	330 (.73)
Secondary	2 I/O	90	**AS-HDTA-202**	150 (.33)
Primary, conformal coating	2 CPU, 3 I/O	211	**AS-HDTA-200C**	330 (.73)
Secondary, conformal coating	5 I/O	211	**AS-HDTA-201C**	330 (.73)
Secondary, conformal coating	2 I/O	90	**AS-HDTA-202C**	150 (.33)

Accessories

Description	Use	Length (m)	Reference	Weight g (lb)
I/O bus extension cable	30-pin female-to-female	0.5	**AS-WBXT-201**	--
I/O bus extension cable	30-pin female-to-male	0.5	**AS-WBXT-203**	--
I/O module cover	2 slots	--	**043507936**	--
I/O module cover	5 slots	--	**043507935**	--

CPUs

General, Description

General

The Compact Automation Platform central processing units (CPUs) use flash memory for the operating system and command set storage. This nonvolatile memory provides cost and time saving upgrades on site: instead of replacing EEPROMs or memory assemblies, only one file needs to be loaded into the CPU to upgrade data.

For both decentralized data transfer and programming, every CPU is equipped with at least two Modbus interfaces. The larger CPUs also have one Modbus Plus interface. The bus interfaces are easily accessible at the module's front panel. Two rotary switches are located on the front for models with Modbus Plus. These switches are used to set the addresses of the Modbus interfaces.

The CPU stores the application program in battery-backed RAM. The battery is located on the front of the module and can be replaced without loss of data during operation. Storing the user program in flash ROM secures data even during operation without a battery.

Two slide switches provide simplified user control of key functions. The memory protection switch prevents programming devices or other input devices from overwriting the user program. The Modbus interface switch sets the Modbus data transfer parameters as either ASCII, RTU, or any other protocol that can be set manually.

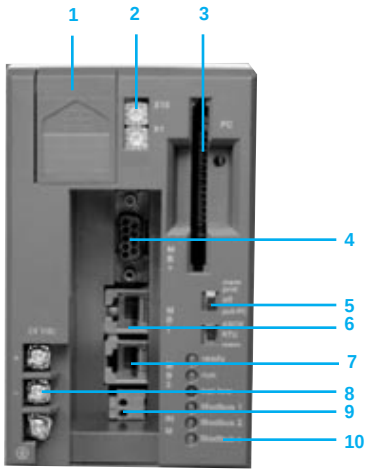
A slot for PCMCIA cards - available in the 275 and 285 series CPUs - provide another programming interface or memory expansion possibility.

Every CPU has a real-time clock that provides both the date and the time. The 258, 265, 275, and 285 controllers provide an input for synchronizing the clock with the Global Positioning System (GPS).

The 258C/R central processing units correspond to Railroad Standard EN 50 155. They have an expanded temperature range, flash ROM for the user program on the CPU (no battery required), and yellow LEDs.

All controllers are available with protective conformal coating on the electronic components.

Description



The Compact CPU is comprised as follows:

1 Battery
2 Address switches
3 PCMCIA card slot
4 Modbus Plus connector
5 Micro switches
6 Modbus 1 connector
7 Modbus 2 connector
8 24 VDC power connectors
9 GPS time-synch input
10 Four indicator lights (LEDs):
- READY : startup diagnostics
- RUN : program is being executed
- MODBUS : active status of Modbus interface(s)
- BAT LOW : battery needs to be replaced

CPUs

Characteristics

Module type			PC-E984-258R	PC-E984-258	PC-E984-258C	PC-E984-265	PC-E984-265C
Processor type			80386				
Frequency		**MHz**	25				
I/O expansion		**wds**	256	256 (128 in, 128 out)			
Memory	Startup RAM	**K**	32			16	
	RAM	**K**	512				
	Flash PROM	**MB**	1				
	PCMCIA II card		No				
Modsoft memory							
	Logic memory	**wds**	16 K			8 K	
	User logic size	**wds**	16 K			8 K	
Concept logic memory		**kB**	220				
Data memory		**wds**	32 K			16 K	
	Total size	**wds**	48 K			24 K	
Cycle time	1 kbit instructions	**ms**	0.36				
Local I/O expansion							
	Discrete		288				
	Analog		144				
Lithium battery	No. included with CPU		0	1	0	1	
	Voltage		3.6				
	Capacity	**mAh**	850				
	Service life		Minimum 100 days operation; minimum 5 years use installed (not installed: 10 years)				
Communications interfaces							
	Modbus		2				
	Modbus Plus		0			1	
Current (typical / maximum)		**A**	0.5 / 0.9			0.61 / 1.0	
Accuracy of the internal clock							
	at 0 ... 60 °C	**ppm**	10 ... 100				
	at 25 °C	**ppm**	50				
Operating temperature		**°C**	-40 ... 70			0 ... 60	
Conformal coating			Yes	No	Yes	No	Yes
Railroad standard EN 50 155			Yes	No	Yes	No	No
Approvals			CE	UL, CSA, CE, FM			
Internal power supply							
Voltage	Input	**VDC**	24				
	Input range	**VDC**	16.8 ... 30			19.2 ... 30	
	Minimum stored energy time	**ms**	20 at 20 VDC, 3.0 A			20 at 24 VDC, 3.5 A	
	Peak input voltage	**VDC**	33.6 for 1.0 s				
Current	Inrush current	**A**	18 after 5 ms				
	Max. bus current	**A**	2.1			2.45	
	Typical efficiency		0.725 at 24 VDC, 3.0 A				

CPUs

Characteristics

Module type			PC-E984-275	PC-E984-275C	PC-E984-285	PC-E984-285C
Processor			80386			
Frequency		**MHz**	25			
Memory	Startup RAM	**K**	32		64	
	RAM	**bytes**	512 K		1 M	
	Flash PROM	**MB**	1			
	PCMCIA II card		Yes			
I/O expansion		**wds**	512 (256 in, 256 out)		1024 (512 in, 512 out)	
Modsoft memory						
	Logic memory	**wds**	16 K		32 K	
	User logic size	**wds**	16 K		32 K	
Concept IEC memory						
	Memory	**kB**	220		620	
Data memory		**wds**	32 K		64 K	
	Total size	**wds**	48 K		96 K	
Cycle time	1 kbit instructions	**ms**	0.36			
Local I/O expansion						
	Discrete I/O		288			
	Analog I/O		144			
Lithium Battery	No. included with CPU		1			
	Voltage		3.6			
	Capacity	**mAh**	850			
	Service life		Minimum 100 days operation; minimum 5 years use installed (not installed: 10 years)			
Communications interfaces						
	Modbus (RS232)		2			
	Modbus Plus		1			
	PCMCIA II slots		1			
Module current, typical / max.		**A**	0.61 / 1.05			
PCMCIA current max.		**A**	0.06			
Real-time clock			Yes			
Accuracy of the internal clock						
	at 0 ... 60 °C	**ppm**	10 ... 100			
	at 25 °C	**ppm**	50			
Operating temperature		**°C**	0 ... 60 (32...140 °F)		-40 ... 70 (-40...158 °F) *2	
Conformal coating			No	Yes	No	Yes
Railroad Standard EN 50 155			No			
Approvals			UL, CSA, CE, FM			
Internal power supply						
Voltage	Input	**VDC**	24			
	Input range	**VDC**	19.2 ... 30			
	Minimum Stored energy time	**ms**	20 at 24 VDC, 3.5 A			
	Peak input voltage	**VDC**	33.6 for 10.0 s			
Current	Inrush current	**A**	18 after 5 ms			
	Max. bus current	**A**	2.5			
	Typical efficiency		0.725 at 24 VDC, 3.0 A			

CPUs

References

CPUs

Memory (RAM)	Ports	PCMCIA II slot	Reference (1) (2)	Weight g (lb)
512 Kb	2 Modbus	No	**PC-E984-258R**	550 (1.21)
512 Kb	2 Modbus	No	**PC-E984-258**	550 (1.21)
512 Kb	2 Modbus	No	**PC-E984-258C**	550 (1.21)
512 Kb	2 Modbus, 1 Modbus Plus	No	**PC-E984-265**	540 (1.25)
512 Kb	2 Modbus, 1 Modbus Plus	No	**PC-E984-265C**	540 (1.25)
512 Kb	2 Modbus, 1 Modbus Plus	Yes	**PC-E984-275**	580 (1.27)
512 Kb	2 Modbus, 1 Modbus Plus	Yes	**PC-E984-275C**	580 (1.27)
1 Mb	2 Modbus, 1 Modbus Plus	Yes	**PC-E984-285**	580 (1.27)
1 Mb	2 Modbus, 1 Modbus Plus	Yes	**PC-E984-285C**	580 (1.27)

Accessories

Description	Length (m)	Reference (1)	Weight g (lb)
4 MB PCMCIA flash memory card		**AS-FLSH-004**	
4 MB PCMCIA flash memory card		**AS-FLSH-004C**	
Modbus programming cable (RJ45 connector)	1	**110XCA28201**	
Modbus programming cable (RJ45 connector)	3	**110XCA28202**	
Modbus programming cable (RJ45 connector)	6	**110XCA28203**	
Modbus Plus programming cable	3.7	**110XCA28203**	
RJ45 programming cable adapter		**110XCA20300**	
CPU replacement battery (3.6 VDC)		**SL 350**	
Modbus Plus Plug-In Communications card for PC/AT bus		**AM-SA85-000**	
Redundant Modbus Plus Plug-In Communications card for PC/AT bus		**AM-SA85-002**	
Modbus Plus Plug-In communications Card for PCMCIA II interface PCs		**416 NHM 212 00**	
Modbus Plus cable	300 m roll	**97-9841-015**	
Modbus Plus connector (dark gray)		**AS-MBKT-085**	
Modbus Plus terminator (light gray)		**AS-MBKT-185**	
Modbus Plus connection accessories kit		**AS-MBPL-001**	
Front cover for DTA 202 module rack		**ABH 202**	

(1) "C" following the reference number indicates product is conformally coated
(2) "R" following the reference number indicates product is suitable for railroad applications

CPUs

References (continued)

System accessories

Description	Length	Catalog Number	Weight kg
DIN rail per DIN-EN 50022, 35 x 7.5 mm section	(Sold by the meter)	**HUT 3575**	
Floppy disk box		**AS-HBOX-201**	
Bus extension cable for skipping rows	0.5 m	**AS-WBXT-201**	
Capacitive discharge terminal		**GND 001**	
Over-voltage protector for 10 A		**OVP 001**	
Over-voltage protector for 25 A		**OVP 2480**	
Cable grounding rail for 8 cables		**CER 001**	
Grounding clamp		**EDS 000**	
Grounding inductor, 20 µH,16 A		**SCUTZLDR**	
Three-phase AC power filter (3 x 380 VAC, 50/60 Hz, 4 x 16 A)		**FSF DS 416**	
Cable with guard shield 2 x 2 x 0.5 mm^2	(Sold by the meter)	**KAB-2205-LI**	
Shielded cable 5 x 0.5 mm^2 GR. braided wire	(Sold by the meter)	**KAB-0505-MI**	
Suppressor diode		**1N5646A**	
Cable, 8 x 0.75 mm^2 twisted pair	(Sold by the meter)	**KAB-0875-LI**	
Shielded cable, 10 x 0.5 mm^2 twisted pair	(Sold by the meter)	**KAB-1005-LI**	
Cable, 10 x 0.14 mm^2 twisted pair	(Sold by the meter)	**KAB-1014-LI**	
Extension cable for DCF77E, 2 x 2 mm^2 shielded	(Sold by the meter)	**KAB-2277-LI**	

Power supplies

General, Description, Characteristics

General

Six power supplies are available for a variety of applications.

- The P120-000 is an isolated power supply that accepts input voltages from 115 VAC or 230 VAC (± 15%) AC source and outputs a 24VDC supply to the CPU at 1A continuous current. The P120-125 is an isolated power supply that accepts input voltages from 105 to 150 VDC sources and outputs 24 VDC to the CPU at up to 1.5A continuous current. Both supplies feature overload and over voltage protection and come with an LED status indicator.
- The AS- PRTU-252 and 252C are isolated power supplies with an extended operating temperature range. They accept 90 - 264 VAC and 8.5 - 13.8 VDC power in and provide 24 VDC 2A output. If the AC input voltage fails the 12 VDC input serves as backup input power. The power supplies switch to the backup in a bumpless transfer and provide a 24 VDC output that can be monitored as notification AC input power failure. The 252C is conformally coated.
- The AS-PRTU-258 and AS-PRTU 258C are similar to the AS-PRTU-252 and AS-PRTU-252C except that the 258 power supplies provide for 30 - 70 VDC backup input power.

Description

The Compact power supply is comprised as follows:

1 LED status indicators
2 Ground connector
3 Power connection screw terminals

Characteristics

Model type			AS-P120-000	AS-P120-125
Input ratings	input voltage range	**V**	95...253 AC	105...150 DC
	frequency range	**Hz**	47...63	-
	ground leakage		<1.5 mA @ 265 VAC	-
	input current		0.6 A @ 115 VAC nominal 0.3 A @ 220 VAC nominal	0.5 A @ 125 VDC nominal
	inrush current		6 A typical @ 115 VAC	1 A typical @ 125 VDC
Output ratings	output voltage	**VDC**	24 (±5%)	24 (±5%)
	current	**A**	0...1 continuous	.1...1.5 continuous
	ripple/noise	**mV**	100 peak-to-peak	650 peak-to-peak
	holdup		Operates in regulation for periods >12 ms with half-cycle dropout in nominal AC input voltage	Operates in regulation after removal of power (typical 10 ms, minimum 6 ms).
	transient load performance		20% change in load, linear ramp over 200 ms	-
	power-up stability		From AC power application to regulation within 5 s; will not overshoot regulation tolerance during power-up	From DC power application to regulation within 10 s; will not overshoot regulation tolerance during power-up
Reliability	service life		5 years	
	MTBF	**hr**	50,000 (minimum) at 30˚C, assuming fixed ground and component stress within maximum specifications	51,800 (minimum) at 30˚C, assuming fixed ground and component stress within maximum specifications
Dimensions	W x H x D	**mm (in)**	40.3 x 145 x 117.5 (1.6 x 5.6 x 4.5)	
	Weight	**g (lb)**	220 (.5)	
Agency Approvals	designed to meet		VDE 0160, UL 508, Factory Mutual Class I, Division 2 and CSA 142 standards	UL 508, CSA 142 standards

Power supplies

Characteristics (continued), References

Characteristics

Model type			AS-PRTU-252/252C	AS-PRTU-258/258C
Input ratings	input voltage range	**V**	90...264 AC and 8.5...13.8 DC	90...264 AC and 30...70 DC
	frequency range	**Hz**	47...63	
	isolation		2500 VRMS I/O, 1500 VRMS I/Gnd	
	input current		0.8 A at 120 VAC 5 A at 12 VDC	0.8 A at 120 VAC 1.2 A at 48 VDC
	inrush current		12 A at 120 VAC, 25 A at 240 VAC	
Output ratings	output voltage	**VDC**	24 (±5 V)	
	current	**A**	0.1 ...2.0, continuous	
	ripple/noise	**mV**	± 250 peak-to-peak	
	holdup time		> 12 ms at 120 VAC, > 15 ms at 240 VAC	
	transient load performance		20% change in load, linear ramp over 200 ms	
	power-up stability		Power-up and be in regulation within 2 seconds of input power being applied	
Reliability	service life		5 years	
	MTBF	**hr**	50,000 hours minimum at 30˚C, based on ground benign and component stress levels within maximum specifications	
Dimensions	W x H x D	**mm (in)**	86.3 x 145 x 117.5 (3.4 x 5.6 x 4.5)	
	Weight	**g (lb)**	590 (1.3)	
Agency Approvals	designed to meet		UL 508, CSA C22.2 142M 1987, IEC 950 / CE	

References

Power supplies

Description	Output / Temperature range	Battery backup	Reference (1)	Weight g (lb)
120 VAC			**AS-P120-000**	220 (.5)
125 VDC			**AS-P120-125**	220 (.5)
RTU	2 A, -40...+70˚C	120 VDC	**AS-PRTU-252**	590 (1.3)
RTU	2 A, -40...+70˚C	120 VDC	**AS-PRTU-252C**	590 (1.3)
RTU	2 A, -40...+70˚C	30 ... 60 VDC	**AS-PRTU-258**	590 (1.3)
RTU	2 A, -40...+70˚C	30 ... 60 VDC	**AS-PRTU-258C**	590 (1.3)

(1) The letter "C" following the reference number indicates the product is conformally coated.

Discrete I/O

VDC input modules
Selection guide

Module type	Discrete input modules			
				
Number of inputs	2 groups of 8			
Input voltage	12 ... 60 VDC, true high	5 VDC TTL, true low, sink	24 VDC, true high	24 VDC, true low, sink
Electrical isolation	Optocoupler on every input			
ON status input current	7 mA at 24 VDC 8.5 mA at 30 VDC	3.5 mA at 0 VDC	7 mA at 20 VDC 8.5 mA at 30 VDC	7 mA at 24 VDC
Input level ON voltage at 12 VDC current at 12 VDC voltage at 60 VDC current at 60 VDC	+9 ... +15 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	-1 ... +2 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	+ 12 ... + 30 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	≥ external -6 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA
Input level OFF voltage at 12 VDC current at 12 VDC voltage at 60 VDC current at 60 VDC	- 0.6 ... +1.8 VDC - 0.6 ... + 1 mA - 3 ... + 9 VDC - 1.7 ... +2.5 mA	+4 ... +5 VDC - 0.6 ... + 1 mA - 3 ... + 9 VDC - 1.7 ... +2.5 mA	-2 ... + 5 VDC - 0.6 ... + 1 mA - 3 ... + 9 VDC - 1.7 ... +2.5 mA	≤ external -12 VDC - 0.6 ... + 1 mA - 3 ... + 9 VDC - 1.7 ... +2.5 mA
Conformal Coating	No			
Cycle time, typical	4 ms	1 ms	4 ms	
Model	AS-BDEP-214	AS-BDEP-215	AS-BDEP-216	AS-BDEP-217
Page	25			

Discrete input modules

24 VDC, true high	12 ... 60 VDC, true high	24 VDC, true high	110 VDC, ± 40%
7 mA at 24 VDC 8.5 mA at 30 VDC			2.2 mA at 110 VDC
+ 12 ... + 30 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	+ 9 ... + 15 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	+ 12 ... + 30 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA	+ 55 ... + 170 VDC + 5.1 ... + 7.1 mA +45 ... +75 VDC + 2.0 ... +2.5 mA
- 2 ... + 5 VDC - 0.6 ... + 1 VDC - 3 ... +9 VDC - 1.7 ... + 2.5 mA	- 0.6 ... +1.8 VDC - 0.6 ... + 1 VDC - 3 ... +9 VDC - 1.7 ... + 2.5 mA	- 2 ... + 5 VDC - 0.6 ... + 1 VDC - 3 ... +9 VDC - 1.7 ... + 2.5 mA	- 2 ... + 10 VDC - 0.6 ... + 1 VDC - 3 ... +9 VDC - 1.7 ... + 2.5 mA
	Yes; AS-BDEP-254C	Yes; AS-BDEP-256C	Yes; AS-BDEP-257C
0.5 ms	4 ms		6 ms
AS-BDEP-220	**AS-BDEP-254**	**AS-BDEP-256**	**AS-BDEP-257**
	26		

Discrete I/O

VDC and VAC input modules
Selection guide

Module type	Discrete VDC input modules		
			
Number of inputs	1 group of 16	2 groups of 8	
Input voltage	24 VDC, true high	48 VDC, true high	60 VDC, true high
Electrical isolation	No electrical isolation to the I/O bus	Optocoupler on every input	
Input current status ON OFF	7 mA at 24 VDC, 8.5 mA at 30 VDC --	7 mA at 48 VDC --	7 mA at 60 VDC --
Input level ON voltage ON current OFF voltage OFF current	+12 ... +30 VDC -- -2 ... +5 VDC --	+29 ... + 56 VDC -- -3 ... +10 VDC --	+35 ... +70 VDC -- - 4 ... +13 VDC --
Bus current	15 mA	25 mA	
External operating voltage	20 ... 30 VDC	38.4 ... 60 VDC	35 ... 70 VDC
Cycle time, typical OFF-ON ON-OFF	4 ms		
Model	AS-BDEO-216	AS-BDEP-297	AS-BDEP-296
Page	27		

Discrete VAC input modules

1 group of 8		8 groups of 1	2 groups of 8
230 VAC, true high	115 VAC, true high		
6 mA at 230 VAC 0.5 mA max	15.5 mA at 115 VAC, 6 mA at 80 VAC, 20 mA at 132 VAC 3 mA max		
195 ... 264 VAC at 50 Hz -- 97 ... 138 VAC at 50 Hz --	80 ... 132 VAC at 50 Hz -- 0 ... 35 VAC at 50 Hz		
30 mA	35 mA		50 mA
170 ... 264 VAC	80 ... 132 VAC		
25 ms 50 ms	10 ms 40 ms		
AS-BDEP-208	**AS-BDEP-210**	**AS-BDEP-211**	**AS-BDEP-218**
28			

Discrete I/O

VDC output modules, VDC/VAC output modules
Selection guide

Module type	Discrete VDC ouput modules			Discrete VDC/VAC output modules
				
Number of inputs	2 x 8 transistors			4 x 1 relay
Output voltage	24 VDC, true high		5 ... 24 VDC, true low, sink	24 ... 154 VDC 24 ... 250 VAC
Electrical isolation	No isolation	Every channel is electrically isolated from the I/O bus. Every group is electrically isolated from every other group.		Individual electrically isolated relays.
Maximum cycle time	1 ms			10 ms
Maximum switching current per output **at 230 VAC** **at 24 VDC** **at 60 VDC** **at 140 VDC**	-- 0.5 mA -- --		-- 0.3 mA -- --	2A continuous, 4A surge 2A continuous, 4A surge 1A continuous 0.3A continuous
Current source **I/O bus current** **external source**	30 mA 24 VDC, 5A at 30 VDC	50 mA 24 VDC	60 mA 5 ... 24 VDC	25 mA max 24 VDC, 80 mA max
Conformal Coating	No			
Power dissipation, typical	5 W	1 W	3.5 W	2 W
Model	AS-BDAO-216	AS-BDAP-216N	AS-BDAP-217	AS-BDAP-204
Page	29			30

Discrete VDC/VAC output modules

8 x 1 relay	2 x 4 triacs	2 x 8 triacs	1 x 8 relays
	24 ... 230 VAC, true high		24 ... 154 VDC, 24 ... 250 VAC
Electrically isolated relays	Electrically isolated from the bus		Eight electrically isolated relay contacts
	8.34 ms at 60 Hz		10 ms typical
60 mA max 24 VDC, 150 mA max	70 mA max 24 ... 230 VAC	175 mA max 24 ... 230 VAC	60 mA 24 VDC, 150 mA max
			Yes; AS-BDAP-258C
	7.2 W	13 W	2 W
AS-BDAP-208	AS-BDAP-210	AS-BDAP-218	AS-BDAP-258
			31

Discrete I/O

VDC and VAC input / output modules
Selection guide

Module type	Discrete combined input / output modules		
			
Number of inputs	4	1 group of 8	
Number of outputs	4	1 group of 4 relays	
Input voltage	120 VAC	24 VDC, true high	60 VDC, true high
Output voltage	120 VAC, - 15%, + 10%	24 ... 110 VDC, 24 ... 250 VAC	20 ... 30 VDC, true high
Electrical isolation	Groups consist of 1 input and 1 output. Each group is isolated from each other group.	The relay output contacts are individually electrically isolated; the input group is electrically isolated from the output group.	
Input voltage level **ON status** **OFF status**	120 VAC, -15%, +10% --	+ 12 ... + 30 VDC - 1 ... + 5 VDC	35 ... 70 VDC - 4 ... + 13 VDC
Maximum switching current per output **at 115/230 VAC** **at 24 VDC** **at 60 VDC** **at 110 VDC** **A per group maximum**	2 A per output, 3 A per module max -- -- -- --	2 A continuous, 4 A surge 2 A continuous, 4 A surge 1 A continuous 0.45 A continuous Sum of the maximum per output	
Cycle time, typical	--	Inputs: 4 ms	Inputs: 4 ms, outputs: 10 ms
Conformal coating	No		
Model	AS-BDAP-211	AS-BDAP-212	AS-BDAP-292
Page	32		

Discrete VAC input modules

1 group of 8			
1 group of 8 transistors		1 group of 4 relays	
24 VDC, true high			66 ... 154, true high
20 ... 30 VDC, true high		24 ... 110 VDC, 24 ... 250 VAC	24 ... 154 VDC, 24 ... 250 VAC
Every channel is optoelectrically isolated from the I/O bus.		The relay output contacts are individually electrically isolated. The input group is electrically isolated from the output group.	
+ 12 ... + 30 VDC - 2 ... + 5 VDC			+ 55 ... + 170 VDC - 2 ... + 10 VDC
2 A continuous, 4 A surge 0.01 A ... 2 A 1 A continuous 0.45 A continuous 8 A		2 A continuous, 4 A surge 2 A continuous, 4 A surge 1 A continuous 0.45 A continuous Sum of the maximum per output	
Inputs: 6 ms, outputs: 10 ms	Inputs: <4ms, outputs: < 1ms	Inputs: 7 ms, outputs: 10 ms	Inputs: 6 ms, outputs: 10 ms
No	Yes: AS-BDAP-250 C	Yes: AS-BDAP-252C	No
AS-BDAP-220	**AS-BDAP-250**	**AS-BDAP-252**	**AS-BDAP-253**

Discrete I/O Modules

General, Description

General

The Compact Platform's discrete I/O modules consist of input modules, output modules, and combined input/output modules. LEDs provide at a glance the operating state of the module and the status of the inputs and outputs. The physical organization of the LEDs allows quick diagnostics of all corresponding modules.

The Compact I/O modules are entirely software configurable. Any module can be configured in any slot. All configuration parameters for each individual I/O module appear on the configuration screen of the I/O configuration list. Once configured, the software program detects missing or defective modules and sends the appropriate signal to the CPU.

Both electrically isolated and non-isolated modules are available. Peripherals are connected by means of a screw terminal strip. The screw terminal strip can be removed for installation and, as an option, protected against incorrect connections.

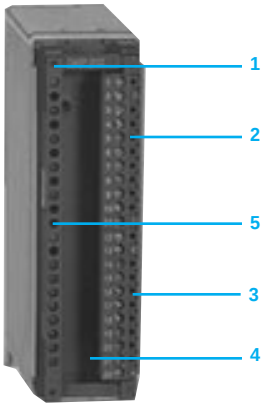
The alternating voltage range of the I/O modules extends from 24 VAC to 250 VAC. All alternating voltage modules operate reliably at least in the frequency range from 47 to 63 Hz (sinusoidal with <5% harmonic content).

The direct voltage range extends from 5 VDC input and output modules for TTL and CMOS to 10… 60 VDC and 24 … 154 VDC for relay output modules.

The Compact platform uses the following type designations:
- DEP - digital input modules, electrically isolated
- DAP - digital output modules, electrically isolated
- DEO / DAO - digital input / output modules without electrical isolation.

Modules with the type designation “AS-B-xxx-25x” have an expanded temperature range and are suitable for railroad applications. Electronic components with conformal coating are identified with the suffix “C” in the type designation.

Description



A typical Compact discrete module is comprised as follows:

1 Operating status LED of the module
2 Terminal block 1
3 Terminal block 2
4 Cable locking barrier
5 Input/output status indicator lights (LEDs):
- 1 and 12, green, yellow : bus connection present
- 2 and 13, yellow : output current exceeded
- 11 and 22 : no LED
- 3 .. 10 and 14 ... 21, red : inputs or outputs active

Discrete VDC Input Modules

Characteristics

Module type			DEP 214	DEP 215	DEP 216	DEP 217	DEP 220
Number of inputs			2 groups of 8				
Electrical isolation			Octocoupler on every input				
Input voltage		**VDC**	12 ... 60, true high	5 TTL, true low, sink	24, true high	24, true low, sink	24, true high
LEDs			16 red, 2 green				
Addresses	Discrete 1x/0x		16 In / 0 Out				
On status input current		**mA**	7 at 24VDC 8.5 at 30 VDC	3.5 at 0 VDC	7 at 20 VDC 8.5 at 30 VDC	7 at 24 VDC	7 at 24 VDC 8.5 at 30 VDC
Input Level							
On	Voltage	**VDC**	+9 ... +15 at 12VDC	-1 ... 2	+12 ... 30	≥ external -6	+12 ... 30
	Current	**mA**	+5.1 ... +7.1 at 12VDC				
	Voltage	**VDC**	+11 ... +30 at 24VDC				
	Current	**mA**	+6.0 ... +7.1 at 24VDC				
	Voltage	**VDC**	+33 ... +60 at 48VDC				
	Current	**mA**	+2.0 ... +2.5 at 48VDC				
	Voltage	**VDC**	+45 ... +75 at 60VDC				
	Current	**mA**	+2.0 ... +2.5 at 60VDC				
Off	Voltage	**VDC**	-0.6 ... +1.8 at 12 VDC	4 ... 5	-2 ... +5	≤ external -12	-2 ... +5
	Current	**mA**	-0.6 ... +1 at 12 VDC				
	Voltage	**VDC**	-3 ... +5 at 24 VDC				
	Current	**mA**	-1.7 ... +2.9 at 24 VDC				
	Voltage	**VDC**	-6 ... +10 at 48 VDC				
	Current	**mA**	-3.4 ... +2.5 at 48 VDC				
	Voltage	**VDC**	-3 ... +9 at 60 VDC				
	Current	**mA**	-1.7 ... +2.5 at 60 VDC				
Cycle time, typical		**ms**	4	1	4		0.5
Bus current		**mA**	22				10
Power dissipation, typical		**W**	4	2		3	2
External operating voltage		**VDC**	12 ... 60	4.5 ... 5.5	20 ... 30		
External fuses			2 x 0.16 A		1 x 0.16 A		
Operating temperature		**°C (F)**	0...60 (32...140)				
Weight		**kg (lb)**	0.26 (0.57)	0.22 (0.5)			
Compatible panel software							
	Concept		2.1 or higher				
	ProWORX NxT		2.0 or higher				

Discrete VDC Input Modules

Characteristics

Module type			DEP 254	DEP 254C	DEP 256	DEP 256C	DEP 257	DEP 257C
Number of inputs			2 groups of 8					
Electrical isolation			Optocoupler on every input					
Input voltage		VDC	12 ... 60, True High		24, True High		110 ± 40%	
LEDs			16 red, 2 green				16 red, 2 yellow	
Addresses	Discrete 1x/0x		16 In / 0 Out					
On status input current		mA	7 at 24VDC 8.5 at 30 VDC				2.2 at 110 VDC	
Input Level								
On	Voltage	VDC	+9 ... +15 at 12VDC		+12 ... 30		55…170	
	Current	mA	+5.1 ... +7.1 at 12VDC					
	Voltage	VDC	+11 ... +30 at 24VDC					
	Current	mA	+6.0 ... +7.1 at 24VDC					
	Voltage	VDC	+33 ... +60 at 48VDC					
	Current	mA	+2.0 ... +2.5 at 48VDC					
	Voltage	VDC	+45 ... +75 at 60VDC					
	Current	mA	+2.0 ... +2.5 at 60VDC					
Off	Voltage	VDC	-0.6 ... +1.8 at 12 VDC		-2 ... +5		-2 ... +10	
	Current	mA	-0.6 ... +1 at 12 VDC					
	Voltage	VDC	-3 ... +5 at 24 VDC					
	Current	mA	-1.7 ... +2.9 at 24 VDC					
	Voltage	VDC	-6 ... +10 at 48 VDC					
	Current	mA	-3.4 ... +2.5 at 48 VDC					
	Voltage	VDC	-3 ... +9 at 60 VDC					
	Current	mA	-1.7 ... +2.5 at 60 VDC					
Cycle time, typical		ms	4				6	
Bus current		mA	22		15		25	
Power dissipation, typical		W	3		2		3	
External operating voltage		VDC	10 ... 70		20 ... 30		66…154	
External fuses			2 x 0.16 A		1 x 0.16 A		2 x 0.16 A	
Operating temperature		°C (F)	- 40 ... 70 (-40 ... 158)					
Conformal coating			No	Yes	No	Yes	No	Yes
Suitable for railroad applications			Yes					
Weight		kg (lb)	0.26 (0.57)	0.27 (0.6)	0.22 (0.5)	0.27 (0.6)	0.22 (0.5)	
Compatible panel software								
	Concept		2.1 or higher					
	ProWORX NxT		2.0 or higher					

Discrete VDC input modules

Characteristics

Module type			DEO 216	DEP 297	DEP 296
Number of inputs			1 group of 16	2 groups of 8	
Electrical isolation			No electrical isolation to the I/O bus	Optocoupler on every input	
Input voltage		VDC	24, True High	48, True High	60, True High
LEDs			16 red, 2 green		
Addresses	Discrete 1x/0x		16 In / 0 Out		
On status input current		mA	7 at 24VDC 8.5 at 30 VDC	7 at 48 VDC	7 at 60 VDC
Input Level					
On	Voltage	VDC	+12 ... 30	29 ... 56	35 ... 70
	Current	mA	-	-	-
Off	Voltage	VDC	-2 ... +5	-3 ... +10	-4 ... +13
	Current	mA	-		
Cycle time, typical		ms	4		
Bus current		mA	15	25	
Power dissipation, typical		W	2	3	4
External operating voltage		VDC	20 ... 30	38.4 ... 60	35 ... 70
External fuses		A	1 x 0.16	1 x 0.15	
Operating temperature		°C (F)	0 ... 60 (32 ... 140)		
Weight		kg	0.22 (0.5 lb)		
Compatible panel software					
	Concept		2.1 or higher		
	ProWORX NxT		2.0 or higher		

Discrete VAC input modules

Characteristics

Module type			DEP 208	DEP 210	DEP 211	DEP 218
Number of inputs			1 group of 8		8 groups of 1	2 groups of 8
Electrical isolation			Optocoupler on every input			
Input voltage		VAC	230, True High	115, True High		
LEDs			8 red, 1 green			16 red, 1 green
Addresses	Discrete 1x/0x		8 In / 0 Out			16 In / 0 Out
Input current with status						
	On	mA	6 at 230 VAC	15.5 at 115 VAC, 6 at 80 VAC, 20 at 132 VAC		
	Off (maximum)	mA	0.5	3		
Input Level at 50 Hz						
	Voltage on	VAC	195 ... 264	80 ... 132		
	Voltage off	VAC	97 ... 138	0 ... 35		
Frequency range		Hz	47 ... 65			
Cycle time	Off-on typical	ms	25	10		
	On-off typical	ms	50	40		
Withstand voltage						
	Group to group	kV	1.8			
	Group to bus	kV	1.8			
Bus current		mA	30	35		50
Power dissipation, typical		W	2	3		
External operating voltage		VAC	170 ... 264	80 ... 132		
External fuses		A	1 x 1.6	1 x 0.2	8 x 0.1	2 x 0.2
Operating temperature		°C (F)	0 ... 60 (32 ... 140)			
Weight		kg(lb)	0.22 (0.5 lb)	0.25 (0.55 lb)		0.30 (0.66 lb)
Compatible panel software						
	Concept		2.1 or higher			
	ProWORX NxT		2.0 or higher			

Discrete VDC output modules

Characteristics

Module type			DAO 216	DAP 216 N	DAP 217
Number of outputs			2 x 8 transistors		
Electrical isolation			No electrical isolation	Every channel is electrically isolated from the I/O bus. Every group is electrically isolated from every other group.	
Output voltage		**VDC**	24, True High		5 ... 24, True Low, sink
LEDs			16 red, 1 green	16 red, 2 green, 2 yellow	16 red, 2 green
Addresses	Discrete 1x/0x		0 In / 16 Out		
Signal output level					
	On signal	**VDC**	V = Vs - 3 V		5 ... 24
	Off signal	**VDC**	0 ... +2 at <1 mA		0.7 ... 2 at 4 ... 300 mA
Maximum switching current					
	per output	**mA**	0.5		0.3
	per group	**A**	4		0.8
	per module	**A**	2 x 4		2 x 0.8
Maximum cycle time		**ms**	1		
External operating voltage		**VDC**	20 ... 30		5 ... 24
Current source					
	I/O bus current	**mA**	30	50	60
	External source		24 VDC, 5A at 30 VDC	24 VDC	5 ... 24 VDC
Power dissipation, typical		**W**	5	1	3.5
External fuses		**A**	1 x 4	2 x 2	2 x 1
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)		
Weight		**kg(lb)**	0.25 (0.55)	0.22 (0.5 lb)	
Compatible panel software					
	Concept		2.1 or higher		
	ProWORX NxT		2.0 or higher		

Discrete VDC/VAC Output Modules

Characteristics

Module type			DAP 204	DAP 208	DAP 210	DAP 218
Number of outputs			4 x 1 relay	8 x 1 relay	2 x 4 triacs	2 x 8 triacs
Electrical isolation			Individual electrically isolated relays	Electrically isolated relays	Electrically isolated from the bus	
Output voltage			24 ... 154VDC, 24 ... 250 VAC		24 ... 230 VAC, True High	
LEDs			1 green, 4 red	1 green, 8 red		1 green, 16 red
Addresses	Discrete 1x/0x		0 In / 8 Out			0 In / 16 Out
Frequency range		Hz	47 ... 63			
Maximum switching current per output	at 230 VAC		2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (cos Φ = 0.5)			
	at 24 VDC		2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (L/R = 30 ms)			
	at 60 VDC		1 A continuous (resistive load) 0.6 A (L/R = 30 ms)			
	at 140 VDC		0.3 A continuous (resistive load) 0.15 A (L/R = 20 ms)			
Cycle time	maximum	ms	10		8.34 at 60 Hz	
	Cycle time (freq.)	Hz	-			
External operating values	Voltage		24 ... 154 VDC, 24 ... 250 VAC		24 ... 230 VAC	
Current source	I/O bus current	mA	max. 25	max. 60	max. 70	max. 175
	External source		24 VDC, max. 80 mA	24 VDC, max.150 mA	24 ... 230 VAC	
Power dissipation typical		W	2		7.2	13
Fuses	internal	A	-		2 x 6.3	-
	external	A	1 x 0.16, 2 x 4 A	1 x 0.16 , 4 x 4 A		
Operating temperature		°C (F)	-25 ... +70 (-13...+158)	0 ... 60 (32 ... 140)		
Weight		kg(lb)	0.24 (0.53)	0.36 (0.8)	0.45 (1)	0.90 (2.0)
Compatible panel software						
	Concept		2.1 or higher			
	ProWORX NxT		2.0 or higher			

Discrete VDC/VAC Output modules

Characteristics

Module type			DAP 258	DAP 258C
Number of outputs			1 x 8 relays	
Electrical isolation			Eight electrically isolated relay contacts	
Output voltage			24 ... 154 VDC, 24 ... 250VAC	
LEDs			1 green, 8 red	
Addresses	Discrete 1x/0x		0 In/8 Out	
Frequency range		**Hz**	47 ... 63	
Maximum switching current per output	at 230 VAC		2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (cos Φ = 0.5)	
	at 24 VDC		2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (L/R = 30 ms)	
	at 60 VDC		1 A continuous (resistive load) 0.6 A (L/R = 30 ms)	
	at 140 VDC		0.3 A continuous (resistive load) 0.15 A (L/R = 20 ms)	
	per group	**A**	Sum of the output currents	
Cycle time, inputs and outputs	typical	**ms**	10	
Current source				
	I/O bus current	**mA**	60	
	External source		24 VDC, max. 150 mA	
Power dissipation	typical	**W**	2	
External Fuses		**A**	4 x 4, 1 x 0.16	
Operating temperature		**°C (F)**	-40 ... +70 (-40 ... +158)	
Conformal coating			No	Yes
Suitable for railroad applications			Yes	
Weight		**kg(lb)**	0.24 (0.52)	
Compatible panel software				
	Concept		2.1 or higher	
	ProWORX NxT		2.0 or higher	

Discrete Combined Input / Output Modules

Specifications

Module type			DAP 211	DAP 212	DAP 292	DAP 220
Number of inputs			4	1 group of 8	1 group of 8	1 group of 8
Number of outputs			4	1 group of 4 relays		1 group of 8 transistors
Electrical isolation			Groups consist of 1 input and 1 output. Each group is isolated from each other group.	The relay output contacts are individually electrically isolated; the input group is electrically isolated from the output group.		Every channel is optoelectrically isolated from the I/O bus.
LEDs			1 green, 8 red		2 yellow, 12 red 16 red	2 green, 1 yellow,
Addresses	Discrete 1x/0x		4 in / 4 out	8 in/4 out		8 in/8 out
Input voltage		**V**	120 AC	24 DC, True High	60 DC, True High	24 DC, True High
Input level						
Voltage	On status	**V**	120 AC -15%, +10%	+12 ... +30 DC	35 ... 70 DC	+12 ... +30 DC
	Off status	**VDC**	-	-2 ... +5	-4 ... +13	-2 ... +5
Output voltage			120 VAC - 15%, +10%	24 ... 110 VDC 24 ... 250 VAC		20 ... 30 VDC true high
Output frequency range		**Hz**	47 ... 63			
Maximum switching currents						
per output	at 115/230 VAC		2 A per output max 3 A max per module	2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (cos Φ = 0.5)		
	at 24 VDC		-	2 A continuous (resistive load) 4 A surge (resistive load) 1 A continuous (L/R = 30 ms)		0.01 A ... 2 A
	at 60 VDC		-	1 A continuous (resistive load) A (L/R = 30 ms)		
	at 110 VDC		-	0.45 A continuous (resistive load) 0.25 A (L/R = 30 ms)		
	per group max.	**A**	-	Sum of the max. per output		8
Cycle time, inputs and outputs	typical	**ms**	-	Inputs: 4	Inputs: 4, Outputs: 10	Inputs: 4, Outputs: 1
Power supply						
	I/O bus current	**mA**	35 typical	25		≤ 60
	external source		120 VAC	24 VDC, max. 80 mA	60 VDC, 150 mA; 24 VDC, 150 mA	20 ... 30 VDC
Power dissipation typical		**W**	5	2		
External fuses			-	2 x 0.15 A, 2 x 4 A	2 x 4 A, 2 x 0.15 A	1 x 0.16 A, 1 x 10 A
Operating temperature		**°C(F)**	0 ... +60 (32 ... 140)			
Weight		**kg(lb)**	0.19 (0.4)	0.24 (0.53)		0.22 (0.48)
Compatible panel software						
	Concept		2.2 or higher	2.1 or higher		
	ProWORX NxT		2.0 or higher			

Discrete Combined Input / Output Modules

Characteristics

Module type			DAP 250	DAP 250C	DAP 252	DAP 252C	DAP 253
Number of inputs			1 group of 8				
Number of outputs			1 group of 8 transistors		1 group of 4 relays		
Electrical isolation			Every channel is optoelectrically isolated from the I/O bus.		The relay output contacts are individually electrically isolated. The input group is electrically isolated from the output group.		
LEDs			2 green, 1 yellow, 16 red		2 green, 12 red		2 yellow, 12 red
Addresses	Discrete 1x/0x		8 in/8 out		8 in/4 out		
Input voltage		**VDC**	24, true high		24, true high		66 ... 154, true high
Input level							
Voltage	On status	**VDC**	+12 ... +30				55 ... 170
	Off status	**VDC**	-2 ... +5				-2 ... +10
Output voltage			20 ... 30 VDC, true high		24 ... 110 VDC, 24 ... 250 VAC		24 ... 154 VDC, 24 ... 250 VAC
Output frequency range		**Hz**	74 ... 63				
Switching currents							
per output	at 115/230 VAC				2 A continuous (resistive load), 4 A surge (resistive load), 1 A continuous (cos Φ = 0.5)		2 A continuous (resistive load), 4 A surge (resistive load), 1 A continuous (cos Φ = 0.5).
	at 24 VDC		0.01 A ... 2 A		2 A continuous (resistive load), 4 A surge (resistive load), 1 A continuous (L/R = 30 ms)		2 A continuous (resistive load), 4 A surge (resistive load), 1 A continuous (L/R = 30 ms).
	at 60 VDC				1 A continuous (resistive load), 0.6 A (L/R = 30 ms)		1 A continuous (resistive load), 0.6 A (L/R = 30 ms).
	at 110 VDC				0.45 A continuous (resistive load), 0.25 A (L/R = 30 ms)		
	at 140 VDC						0.3 continuous (resistive load), 0.15 A (L/R = 30 ms)
	per group max.	**A**	8		Sum of the maximum per output		
Cycle time, inputs and outputs	typical	**ms**	Inputs: <4, Outputs: <1		Inputs: 7, Outputs: 10		Inputs: 6, Outputs: 10
Power supply							
	I/O bus current	**mA**	60		25		15
	external source		20 ... 30 VDC max. 150 mA		24 VDC, 24 VDC, 70 mA		110 VDC ± 40%, 20 mA
Power dissipation	typical	**W**	2				
External fuses			1 x 0.16 A, 1 x 10 A		2 x 0.15 A, 2 x 4 A		
Operating temperature		**°C (F)**	-40 ... +70 (-40 ... 158)				-25 ... +70 (-25 ... 158)
Conformal coating			No	Yes	No	Yes	No
Suitable for railroad applications			Yes				
Weight		**kg (lb)**	0.22 (0.48 lb)		0.19 (0.4 lb)		0.24 (0.52 lb)
Compatible panel software							
	Concept		2.1 or higher				
	ProWORX NxT		2.0 or higher				

Discrete I/O Modules

References

Discrete input modules

Description	Input Voltage	Reference (1)	Weight kg
2 x 8 inputs, true high	12...60 VDC	**AS-BDEP-214**	0.26
2 x 8 inputs, true low, sink	5V TTL	**AS-BDEP-215**	0.22
2 x 8 inputs, true high	24 VDC	**AS-BDEP-216**	0.22
2 x 8 inputs, true low, sink	24 VDC	**AS-BDEP-217**	0.27
2 x 8 high speed inputs, true high	24 VDC	**AS-BDEP-220**	0.22
2 x 8 high speed inputs, true high expanded temperature range	12...60 VDC	**AS-BDEP-254**	0.26
2 x 8 high speed inputs, true high expanded temperature range	24 VDC	**AS-BDEP-256**	0.22
2 x 8 high speed inputs, true high expanded temperature range	110 VDC	**AS-BDEP-257**	0.22
2 x 8 high speed inputs, true high expanded temperature range	12...60 VDC	**AS-BDEP-254C**	0.26
2 x 8 high speed inputs, true high expanded temperature range	24 VDC	**AS-BDEP-256C**	0.26
2 x 8 high speed inputs, true high expanded temperature range	110 VDC	**AS-BDEP-257C**	0.26
1 x 16 inputs, true high	24 VDC	**AS-BDEO-216**	0.22
2 x 8 inputs, true high	48 VDC	**AS-BDEP-297**	0.22
2 x 8 inputs, true high	60 VDC	**AS-BDEP-296**	0.22
1 x 8 inputs, true high	230 VAC	**AS-BDEP-208**	0.22
1 x 8 inputs, true high	115 VAC	**AS-BDEP-210**	0.25
8 x 1 inputs, true high	115 VAC	**AS-BDEP-211**	0.25
2 x 8 inputs, true high	115 VAC	**AS-BDEP-218**	0.3

Discrete output modules

Description	Output Voltage	Catalog Number	Weight kg
1 x 16 transistor outputs, true high	24 VDC	**AS-BDAO-216**	0.25
2 x 8 transistor outputs, true high	24 VDC	**AS-BDAP-216N**	0.22
2 x 8 transistor outputs, true low, sink	5...24 VDC	**AS-BDAP-217**	0.22
4 x 1 relay outputs	24...110 VDC or 24...230 VAC	**AS-BDAP-204**	0.24
8 x 1 relay outputs	24...110 VDC or 24...230 VAC	**AS-BDAP-208**	0.36
2 x 4 triac outputs, true high	24...230 VAC	**AS-BDAP-210**	0.45
2 x 8 triac outputs, true high	24...230 VAC	**AS-BDAP-218**	0.90
1 x 8 relay outputs, expanded temperature range	24...154 VDC or 24...250 VAC	**AS-BDAP-258**	0.24
2 x 8 relay outputs, expanded temperature range	24...154 VDC or 24...250 VAC	**AS-BDEP-258C**	0.24

(1) The letter "C" following the reference number indicates the product is conformally coated.

Discrete I/O Modules

References (continued)

Discrete combined input / output modules

Description	Input Voltage	Output Voltage	Reference (1)	Weight kg
2 x 4 inputs 2 x 4 outputs	120 VAC	120 VAC	**AS-BDAP-211**	0.19
1 x 8 inputs 1 x 4 relay outputs, true high	24 VDC	24...110 VDC or 24...250 VAC	**AS-BDAP-212**	0.19
1 x 8 inputs 1 x 4 relay outputs, true high	60 VDC	24...110 VDC or 24...250 VAC	**AS-BDAP-292**	0.24
1 x 8 inputs 1 x 8 transistor outputs, true high	24 VDC	20...30 VDC	**AS-BDAP-220**	0.22
1 x 8 inputs 1 x 8 transistor outputs true high, expanded temperature range	24 VDC	20...30 VDC	**AS-BDAP-250**	0.22
1 x 8 inputs 1 x 4 relay outputs, true high, expanded temperature range	24 VDC	24...110 VDC or 24...250 VAC	**AS-BDAP-252**	0.19
1 x 8 inputs 1 x 4 relay outputs, true high, expanded temperature range	66...154 VDC	24...110 VDC or 24...250 VAC	**AS-BDAP-253**	0.24
1 x 8 inputs 1 x 8 transistor outputs, true high, expanded temperature range	24 VDC	20...30 VDC	**AS-BDAP-250C**	0.22
1 x 8 inputs 1 x 4 relay outputs, true high, expanded temperature range	24 VDC	24...110 VDC or 24...250 VAC	**AS-BDAP-252C**	0.19

Accessories

Description	Reference	Weight kg
Empty module for prewiring	**AS-BNUL-200**	
Empty module for potential supports	**AS-BNUL-202**	
Simulator module with 8 rocker switches	**SIM-011**	
Simulator module with 16 rocker switches	**SIM-216**	
Floppy disk box for the module racks	**AS-HBOX-201**	
Pulling tool for module screw terminal strip	**AS-OTBP-000**	
Socket module 12 + 2	**CON-212**	
Connector (pins 1-11)	**AG-0020-000**	
Connector (pins 12 - 22)	**AG-0021-000**	

Analog voltage and current input modules

Selection guide

Module type	Analog voltage and current input module	
		
Number of inputs	4 two-pole inputs	
Electrical isolation	No isolation	Optoelectrically isolated from the bus
Power supply, I/O bus external	< 50 mA None	60 mA typical 24 VDC, 70 mA typical, 100 mA max.
Input voltage ranges bipolar unipolar max. input voltage input impedance	Rated value: ± 10 VDC; max: ± 19.99 VDC -- ± 30 VDC 50 kΩ	± 1 VDC, ±10 VDC 0 ... 1, 0 ...10 VDC ± 30 VDC >1000 kΩ, >1MΩ
Input current ranges bipolar unipolar max. input current input impedance	Rated value: ± 20 mA; max: ± 39.95 mA -- ± 44 mA 50 Ω at ± 20 mA	± 20 mA 0 ... 20 mA 40 mA 50 Ω
A/D conversion resolution conversion time operating error limit	12 bits + sign every input at 4096 in: < 80 ms at 50 Hz, < 66 ms at 60 Hz; every input at 2048 in : < 60 ms at 50 Hz, < 50 ms at 60 Hz 0.5% of the input value for 0 ... 60° C	11 bits + sign < 10 ms per input 0.4% of the input voltage for 0 ... 60° C 0.56% of the input value for 0 ... 60° C
Model	AS-BADU-205	AS-BADU-206
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Analog voltage and current input module

2 two-pole inputs

Optoelectrically isolated channel-to-channel and from the bus

40 mA typical, 90 mA max.
24 VDC, 60 mA typical, 120 mA max.

± 5 VDC, ±10 VDC
0 ... 5 VDC, 0 ... 10 VDC
± 30 VDC max.
>1000 kΩ, >1MΩ

± 20 mA
--
48 mA
250 Ω

15 bits + sign
< 270 for all inputs

0.56% of the input current for 0 ... 60° C
0.1% of the input value at 25° C

AS-BADU-210

Analog voltage and current input modules

Selection guide

Module type	Voltage, current, and temperature measurement modules		
			
Number of inputs	4 four-pole RTDs or 8 two-pole voltage sensors		
Electrical isolation	No isolation		
Railroad standard EN 50155	No		Yes
Voltage measurement **bipolar** **unipolar** **input impedance** **resolution** **error at 0 ... 60° C** **max. over-voltage**	± 0.5 VDC linear, ± 0.99 VDC nonlinear -- >10 M Ω 12 bits + sign 0.4 % of input value ± 24 VDC	± 0.5, ± 1, ± 5, ± 10 VDC 0...0.5, 0...1, 0...5, 0...10 VDC 1 Ω 0.003% range value, 15 bits + sign 5, 10V:±0.02% of MFV, ±0.11 MV 30 VDC, 24V supply ON, 20 OFF	± 0.5 VDC linear, ± 0.99 VDC nonlinear -- >10 M Ω -- -- --
Current measurement **bipolar** **unipolar** **unipolar with offset**	-- -- --	±10 mA (±0.5V), ±20 mA (±1V) 0...10 mA (0...0.5V), 0...20 mA (0...1V) 2...10 mA (0.1...0.5V), 4...20 mA (0.2...1V)	-- -- --
Temperature measurement (RTD) **Pt100 range** **input impedance**	-200 ... +800° C, resolution 0.25° C > 10 MΩ	-160 ... +160° C, resolution ≤0.02° C > 1MΩ	-200 ... +800° C, resolution 0.25° C > 10 MΩ
Conformal coating	No		
Model	AS-BADU-204	AS-BADU-214	AS-BADU-254
Page	47		46

	4 two-pole inputs	
	Optoelectrically isolated from the bus	
	±1 VDC, ± 10 VDC 0 ... 1VDC, 0 ... 10 VDC > 1 MΩ -- -- --	
	±20 mA 0 ... 20 mA 4 ... 20 mA	
Yes	No	Yes
AS-BADU-254C	AS-BADU-256	AS-BADU-256C

Analog voltage and current input modules

Selection guide

Module type	8-channel electrically isolated Thermocouple and RTD modules	
		
Number and type of inputs	2 groups x 4 (1 input per group for RTD) = 8 (total 2 inputs for RTD)	
Isolation	Electrically isolated by group	
Power supply **I/O bus current** **external source** **dissipation**	< 80 mA (TTL loading) 20 ... 30 VDC 2.5 W	450 mA (max. 600 mA) None (current from I/O bus) 3.0 W
A/D conversion **Resolution** **Integer with 12 bits** **Integer with 16 bits** **Signal integration time** **Conversion time**	 1 part in 4096 counts (Dec) 1 part in +32767 to -32768 counts (Dec) 2, 5, 33.3, 40, 50, 60, 100, and 200 ms (selectable by group) (integration x 1.5 ms) + 10 ms typical per channel	
RTD input signals **PT100, 100W (385,392 α)** **voltage** **current** **cold junction sensor**	 Platinum: 3 or 2/4 wire cable, -200 ...800° C (-328 ... 472° F) , 0.15 or greater ±50, 500, 2000, 5000, 10000 mV DC 4 ... 20 mA for 12 bits, ± 20 mA for 16 bits (IEEE 754) --	
Thermocouple input signals **J** **K** **N** **T** **E** **R, S** **B**	 0 ... 760° C (32 ... 1400° F) 0 ... 1000° C (32 ... 1832° F) -- -100 ... 400° C (-212 ... 752° F) 0 ... 1000° C (32 ... 1832° F) 500 ... 1750° C (932 ... 3182° F) 500 ... 1800° C (932 ... 3272° F)	
Model	AS-BADU-211	AS-BADU-212
Page	48	

Electrically isolated Thermocouple and RTD modules

8 channels	4 four-pole RTDs, 8 thermocouple
Electrically isolated from the bus	Electrically isolated channel-to-channel, 400 VDC max
100 mA (max. 150 mA) None (current from I/O bus) 0.5 (max. 1) W	120 mA typical 5 V from I/O bus --
-- 0 ... 65535 counts (Dec) -- < 1500 ms for all 8 inputs	-- -- -- --
-- 0 ... 72.8 (1.1 µV/digit) -- --	IEC 751 PT100, 200, 500, 1000 = -200 ... +850° C (-328 ... +1562° F) SAMA PT100, 200, 500, 1000 = -200 ... +650° C (-328 ... +1112° F) DIN 43760 Ni100, 200, 500, 1000 = -60 ... +250° C (-76 ... +482° F) AD592 = -25 ... +105° C (-13 ... +221° F)
Ambient ... 1100° C (2012° F) Ambient ... 1370° C (2498° F) -- -- -- -- --	-210 ... +1200° C (-346 ... +2192° F) -270 ... +1372° C (-454 ... +2501° F) -270 ... +1300° C (-454 ... +2372° F) -270 ... +400° C (-454 ... +752° F) -270 ... +1000° C (-454 ... +1832° F) -50 ... +1768° C (-58 ... +3214° F) +50 ... +1800° C (+122 ... +3272° F)
AS-BADU-216	AS-BADU-257
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Analog voltage and current output modules

Selection guide

Module type	Analog output module	
Output voltage **bipolar** **unipolar**	+ 10 (>5k Ohms) --	+ 1, + 5 + 10 0 ... 1, 0 ... 5, 0 ... 10
		
Number of outputs	2 channels	2 x 2 channels
Electrical isolation	Optoelectrically isolated from bus	Channel (1, 2) to (3, 4) electrically isolated from bus
Power supply, I/O bus **External power supply**	60 mA max., 40 mA typical 24 VDC, 150 mA max	< 1 mA (TTL loading) 24 VDC, 250 mA
A/D conversion **conversion time** **resolution** **overdrive**	11 ms per channel 11 bits + sign approx. 2.4%	< 5 ms per channel 12 bits + sign --
Precision **overall** **output error range** **deviation/temp.**	± 0.4% of full-scale reading ± 0.6 for 0 ... 60° C --	± 0.2% of full-scale reading at 25° C -- Current: <± 0.002 full-scale; voltage <± 0.005 reading
Dielectric strength **channel to channel** **channel to bus**	700 VDC 700 VDC	Ch. 1, 2 to 3, 4: 500 VDC; 1 to 2 and 3 to 4: not isolated 500 VDC at 60 Hz
Conformal coating	No	
Module	AS-BDAU-202	AS-BDAU-204
Page	50	

Analog output module		
±10 (> 3.3 kOhm) --	+ 10 (>5 kOhm) --	
		
8 channels	2 channels	
Electrically isolated from bus	Optoelectrically isolated from bus	
30 mA max., 20 mA typ. 24 VDC, 120 mA max.	60 mA max., 40 mA typ. 24 VDC, 150 mA max.	
< 1 ms per channel 11 bits + sign ± 2.4 % (max. ± 10.24 VDC)	25 ms per output 11 bits + sign approx. 2.4%	
± 0.1 for 0 ... 60° C -- --	± 0.4% of full-scale reading ± 0.6 for 0 ... 60° C --	
-- 700 VDC	700 VDC 700 VDC	
		Yes
AS-BDAU-208	AS-BDAU-252	AS-BDAU-252C
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Analog I/O Modules

General, Description

General

The Compact analog modules consist of input and output modules similar to the discrete modules. LEDs provide a quick look at the operating state of the unit and status of the inputs and outputs. The physical organization of the LEDs allows for quick diagnostics of all corresponding modules.

The Compact analog I/O modules are entirely software configurable. Any module can be configured in any slot. All configuration parameters for each individual I/O module appear on the configuration screen of the I/O configurator list. Once configured, the software program detects missing or defective modules and sends the appropriate signal to the PLC.

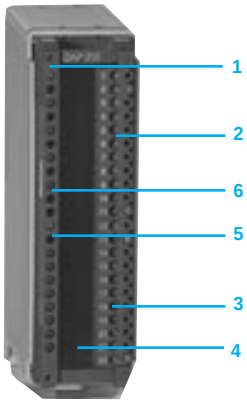
Modules are available for current, voltage, and resistance measurements. Special modules process resistance measurements with thermocouple types B, E, J, K, L, N, R, S, and T. Resistance measurement is supplemented with modules having remote thermal detection (RTD) channels for the most varied parameters. Two-wire, three-wire and four-wire RTD sensors are supported. Value ranges (unipolar, bipolar, and unipolar with offset) can be set in software to increase measurement and sensor accuracy.

The Compact platform offers both non-isolated and electrically isolated modules. Peripherals are connected by means of a screw terminal strip, which can be removed for installation and optionally protected against incorrect connection.

The type designation ADU is used for Analog-to-Digital Converters (inputs) and DAU for Digital-to-Analog Converters (outputs).

Modules with the type designation “AS-B-xxx-25x” have an expanded temperature range and are suitable for railroad applications. Electronic components with conformal coating are identified by the suffix “C” in the type designation.

Description



A typical Compact analog module is comprised as follows:

1 Operating status LED of the module
2 Terminal block 1
3 Terminal block 2
4 Cable locking barrier
5 Overcurrent display of the outputs
6 Input/output status indicator lights (LEDs):
- 1, green : bus connection and voltage present
- 2 and 13, yellow, green : output current exceeded
- 11 and 22 : no LED
- 3 .. 10 and 14 ... 21, red : inputs or outputs active

Analog voltage and current input modules

Characteristics

Module type			ADU 205	ADU 206	ADU 210
Number of inputs			4 two-pole inputs		2 two-pole inputs
Electrical isolation			No isolation	Optoelectrically isolated from the bus	Optoelectrically isolated channel-to-channel and from the bus
LEDs			1 green	2 green	
Addresses	Registers 3x/4x		4 in/0 out	5 in/1 out	4 in/0 out
Input voltage ranges					
	Bipolar	**VDC**	Rated value: ± 10, max: ± 19.99	± 1, ± 10	± 5, ± 10
	Unipolar	**VDC**	-	0 ... 1, 0 ... 10	0 ... 5, 0 ... 10
	Unipolar with offset	**VDC**	-	0.2 ... 1, 2 ... 10	1 ... 5, 2 ... 10
	Max. input voltage	**VDC**	max. ± 30	max. ± 30	max. ± 30
	Input impedance	**kΩ**	50	>1000 >1MΩ	>1000 >1MΩ
Input current ranges					
	Bipolar	**mA**	Rated value: ± 20, max: ±39.95	± 20	± 20
	Unipolar	**mA**	-	0 ... 20	
	Unipolar with offset	**mA**	-	4 ... 20	4 ... 20
	Max. input current	**mA**	± 44	40	48
	Input impedance	Ω	50 at ± 20 mA	50	250
A/D conversion					
	Resolution	**Bits**	12 + sign	11 + sign	15 + sign
	Conversion time	**ms**	every input at 4096 in: <80 at 50 Hz, <66 at 60 Hz; every input at 2048 in: <60 at 50 Hz, <50 at 60 Hz	<10 per input	< 270 for all inputs
	Operating error limit	**%**	0.5 of the input value for 0 ... 60 °C	0.4 of the input voltage for 0 ... 60 °C, 0.56 of the input value for 0 ... 60 °C	0.56 of the input current for 0 ... 60 °C 0.1 of the input value at 25 °C
Common-mode interference		**dB**	>86	>60	>105
Dielectric Strength					
	Channel to channel	**VDC**	no isolation		300
	Channel to bus	**VDC**	no isolation	500	
Power supply					
	I/O bus current	**mA**	<50	typ. 60	typ. 40, max. 90
	external source		No	24 VDC, typ. 70 mA, max. 100 mA	24 VDC, typ. 60 mA, max. 120 mA
Power dissipation		**W**	0.2	2	3 max., 2 typical
External fuses			receives current from the I/O bus	1 x 0.16	
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)		
Weight		**kg(lb)**	0.22 (0.5)	0.33 (0.725)	0.32 (0.7)
Compatible panel software					
	Concept		2.1 or higher		2.2 or higher
	ProWORX NxT		2.0 or higher		

Analog voltage and current input modules

Characteristics

Module type			ADU 254	ADU 254C	ADU 256	ADU 256C
Number of inputs			4 four-pole RTDs or 8 two-pole voltage sensors		4 two-pole inputs	
Electrical isolation			No isolation		Optoelectrically isolated from bus	
LEDs			1 green		2 green	
Addresses	Registers 3x/4x		4 in/0 out		5 in/1 out	
Voltage measurement						
Range	Bipolar	**VDC**	± 0.5 linear, ± 0.99 nonlinear		± 1, ± 10	
	Unipolar	**VDC**			0 ... 1, 0 ... 10	
	Unipolar with offset	**VDC**			0.2 ... 1, 2 ... 10	
	Input impedance	**MΩ**	>10		>1	
	max. Input voltage	**VDC**	± 24		± 30	
Current measurement						
Range	Bipolar	**mA**			± 20	
	Unipolar	**mA**			0 ... 20	
	Unipolar with offset	**mA**			4 ... 20	
	Input impedance	**W**			50	
	Max. input current	**mA**			40	
Temperature measurement (RTD)						
Range	Pt 100	**°C**	-200 ... +800, Resolution 0.25 °C			
	Input impedance	**MΩ**	>10			
A/D conversion						
	Resolution	**ms**	12 bits + sign		11 bits + sign	
	Conversion time per Input	**ms**	<80 at 50 Hz, <66.6 at 60 Hz;		<10 for 4 inputs	
	Operating error - limit		0.4 % of input value for 0 ... 60 °C		0.4 % of input voltage at 0 ... 60 °C 0.56 % of input current for 0 ... 60 °C	
Common-mode interference		**dB**	≥40		>60	
Dielectric Strength						
	Channel to channel	**VDC**	not isolated			
	Channel to bus	**VDC**	not isolated		500	
Power supply						
	I/O bus current	**mA**	<50		typ. 60	
	external source		current via I/O bus		24 VDC, typ. 70 mA, max. 100 mA	
Power dissipation typical		**W**	0.15		2	
Operating temperature		**°C (F)**	-40 ... 70 (-40 ... 158)		-40 ... 70 (-40 ... 158)	
Conformal coating			No	Yes	No	Yes
Suitable for railroad applications			Yes			
External fuses			current via I/O bus		1 x 0.16	
Weight		**kg(lb)**	0.22 (0.5)		0.33 (0.725)	
Compatible panel software						
	Concept		2.1 or higher			
	ProWORX NxT		2.0 or higher			

Analog voltage and current input modules

Characteristics

Module type			ADU 204	ADU 214
Number of inputs			4 four-pole RTDs or 8 two-pole voltage sensors	
Electrical isolation			No isolation	
LEDs			1 green	2 green
Addresses	Registers 3x/4x		4 in/0 out	3 in/2 out
Voltage measurement				
Range	Bipolar	**VDC**	± 0.5 linear, ± 0.99 nonlinear	± 0.5, ±1, ±5, ±10
	Unipolar	**VDC**		0 .... 0.5, 0 ... 1, 0 ... 5, 0 ... 10
	Unipolar with offset	**VDC**		0.1 ... 0.5, 0.2 ... 1, 1 ... 5, 2 ... 10
	Input impedance	**MΩ**	>10	1
	Resolution		12 bits+ sign	ca. 0.003 % of range final value, 15 bits+ sign
	Error at 0 ... 60 °C		0.4 % of input value	for range 5, 10V:±0.02% of MFV,± 0.11% of MV
	Max. over voltage	**VDC**	± 24	+30 (24 V supply ON), +20 (24 V supply OFF)
Current measurement				
Range with 50 Ω,TC 25 ppm				
	Bipolar	**mA**		± 10 (± 0.5 V), ± 20 (± 1 V)
	Unipolar	**mA**		0 ... 10 (0 ... 0.5 V), 0 ... 20 (0 ... 1 V)
	Unipolar with offset	**mA**		2 ... 10 (0.1 ... 0.5 V), 4 ... 20 (0.2 ... 1 V)
Range with 100 Ω,TC 25 ppm				
	Bipolar	**mA**		± 5 (± 0.5 V), ± 10 (± 1 V)
	Unipolar	**mA**		0 ... 5 (0 ... 0.5 V), 0 ... 10 (0 ... 1 V)
	Unipolar with offset	**mA**		1 ... 5 (0.1 ... 0.5 V), 2 ... 10 (0.2 ... 1 V)
	Resolution			approx. 0.003 % of range final value, 15 bits + sign
	Critical values			See voltage range, 50 Ω 0.1 W max. 40 mA const.
Temperature measurement (RTD)				
Range	Pt 100, 200 ,500 ,1000	**°C**	only Pt 100: -200 ... +800, Resolution 0.25 °C	-160 ... +160, Resolution ≤0.02 °C, -200 ... +320, Resolution ≤0.04 °C, -200 ... +640, Resolution ≤0.08 °C
	Ni 100, 200, 500, 1000	**°C**		-60 ... +160, Resolution <0.25 °C
	Input impedance	**MΩ**	>10	>1
	Resolution		12 bits + sign	<0.012 % of range final value, ≥ 13 bits + sign
	Error		0.4 % of measured value for 0 ... 60 °C	depending on RTD type & range: 0.3...1.6°C of MFV
Temperature measurement (4-wire)				
	Measuring range	Ω		0 ... 100, 0 ... 200, 0 ... 500, 0 ... 1000, 0 ... 2000
	Input impedance	**MΩ**		>1
	Resolution			<0.005 % of range final value, ≥ 14 Bit
	Error at 25 °C			for measuring range 100...2000 Ω : ± 0.1 % of MFV
	Error for 0 ... 60 °C			for measuring range 100 Ω : ± 0.30 % of MFV for measuring range 200 Ω : ± 0.25 % of MFV for measuring range 500...2000 Ω : ± 0.20 % of MFV
	continuous current			approx. 1.5 mA for measuring range 0 ... 2000 Ω
Input converter				
	Conversion time	**ms**	<80 at 50 Hz, <66.6 at 60 Hz; per channel	< 300 for all inputs
	Delay time for HF	**ms**	0.2	typ. 0.12
	Integration time	**ms**	20 at 50 Hz, 16.66 at 60 Hz, adjustable	
Differential-mode interference		**dB**	≥ 40	≥ 60
Power supply				
	I/O bus current	**mA**	< 50	typ. 45, max. 100
	external source		supplied via the I/O bus	24 VDC, typ. 70 mA, max. 150 mA
Power dissipation typical		**W**	0.15	2 (max. 3)
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)	
Weight		**kg**	0.22 (0.5 lb)	
Compatible panel software				
	Concept		2.1 or higher	2.2 or higher
	ProWORX NxT		2.0 or higher	

Analog voltage and current input modules

Characteristics

Module type			ADU 211	ADU 212	ADU 216
Number of inputs			2 groups x (4 (1 for RTD)) = 8 (2 for RTD)		8 channels
Electrical isolation			electrically isolated by group		electrically isolated from the bus
LEDs			1 green, 1 yellow		1 (green or red), 1 green
Addresses	Registers 3x/4x		3 in/3 out		5 in/1 out
Input signals					
Thermocouple	J	**°C (F)**	0 ... 760 (32 ... 1400)		Ambient... 2012
	K	**°C (F)**	0 ... 1000 (32 ... 1832)		Ambient... 2498
	T	**°C (F)**	-100 ... 400 (-212 ... 752)		
	E	**°C (F)**	0 ... 1000 (32 ... 1832)		
	R, S	**°C (F)**	500 ... 1750 (932 ... 3182)		
	B	**°C (F)**	+500 ... 1800 (932 ... 3272)		
RTD	PT100, 100 W (385,392 α)	**°C (F)**	Platinum: 3 or 2/4 wire cable, -200...800, 0.15 or greater (-328... 472)		
	Voltage	**mV**	± 50, 500, 2000, 5000, 10000 DC		0 ... 72.8 (1.1 µV/digit)
	Current	**mA**	4 ... 20 for 12 bits, ± 20 for 16 bits (IEEE 754)		
Input impedance		**MΩ**	typical 10		<500 for thermocouples and PTC sensor
Noise suppression					
Common-mode interference		**dB**	68 at 50 or 60 Hz		55 at 50 or 60 Hz (1 kHz minimum)
Absolute precision					
Thermocouple	J	**°C (F)**	± 1.5 (2.7)		
	K	**°C (F)**	± 2.0 (3.6)		
	T	**°C (F)**	± 3.0 (5.4)		
	E	**°C (F)**	± 1.2 (2.2)		
	R, S	**°C (F)**	± 7.0 (12.5)		
	B	**°C (F)**	± 15.0 (27.0)		
RTD	of range, final value	**%**	385 alpha: ± 0.40 typ., ± 1.0 max.		
	of range, final value	**%**	392 alpha: ± 0.40		
	Voltage		50 mVDC: ± 0.40 % of full scale reading 0.5, 2, 5 & 10 VDC: ± 0.11 % of full scale reading		
	Current	**%**	4 to 20 mA, ± 20 mA: ± 0.20 % of full scale reading		
A/D conversion					
Resolution	Integer with 12 bits		1 part in 4096 counts (Dec)		
	Integer with 16 bits		1 part in +32767 to -32768 counts (Dec)		0 ... 65535 counts (Dec)
	Signal integration time	**ms**	2, 5, 33.3, 40, 50, 60, 100, and 200 (selectable by group)		
	Conversion time	**ms**	(Integration x 1.5) + 10 ms typical per channel		<1500 for all 8 inputs
	Error limit	**%**			0.1 of input value ± 0.15 °C at 25 °C ± 0.3 of input value ± 0.75 °C
Dielectric Strength					
	Channel to bus	**VDC**	500		± 300
	Channel to channel	**VDC**	± 30 in groups		not isolated
Power supply					
	I/O bus current	**mA**	<80 (TTL loading)	450 (max. 600 mA)	100 mA (max. 150 mA)
	external source	**VDC**	20 ... 30	No (current from I/O bus)	
Power dissipation	typical	**W**	2.5	3.0	0.5 (max. 1)
External fuses		**A**	2 x 0.5 A		
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)		
Weight		**kg**	0.36 (0.80 lb)		0.33 (0.725 lb)
Compatible panel software					
	Concept		2.22SR2 or higher		2.1 or higher
	ProWORX NxT		2.0 or higher		

Analog voltage and current input modules

Characteristics

Module type			**ADU 257**
Number of inputs			4 four-pole RTDs, 8 thermocouple
Electrical isolation			electrically isolated channel-to-channel, 400 VDC max
LEDs			1 red, 12 green
Addresses	Registers 3x/4x		20 in /0 out
Input signals			
Thermocouples	J	**°C (F)**	-210 ... +1200 (-346 ... +2192)
	K	**°C (F)**	-270 ... +1372 (-454 ... +2501)
	N	**°C (F)**	-270 ... +1300 (-454 ... +2372)
	T	**°C (F)**	-270 ... +400 (-454 ... +752)
	E	**°C (F)**	-270 ... +1000 (-454 ... +1832)
	R, S	**°C (F)**	-50 ... +1768 (-58 ... 3214)
	B	**°C (F)**	+50 ... +1800 (+122 ... +3272)
RTD	IEC 751 PT100, 200, 500, 1000	**°C (F)**	-200 ... +850 (-328 ... +1562)
	SAMA PT100, 200, 500, 1000	**°C (F)**	-200 ... +650 (-328 ... +1112)
	DIN 43760 Ni100, 200, 500, 1000	**°C (F)**	-60 ... +250 (-76 ... +482)
	Cold Junction Sensor AD592	**°C (F)**	-25 ... +105 (-13 ... +221)
	Overload protection	**VDC**	± 30 continuous
	Measuring range	Ω	0 ... 4000
Input resolutions supported			12 bit, 16 bit, 32 bit, 15 bit plus sign
Input characteristics			
	Rejection	**dB**	> 110
	Conversion time	**ms**	800 maximum
Dielectric Strength			
	Channel to channel	**VDC**	400 maximum
	Channel to bus	**VAC**	500
Power supply			
	I/O bus current	**mA**	120 typical
	external source	**V**	5 from I/O bus
Agency approvals			ADU 257, VDE 0160, UL 508, CSA 22.2 No. 142, and European Directive EMC 89/336/EEC
Operating temperature		**°C (F)**	-40 ... +70 (-40 ... 158)
Weight		**kg(lb)**	0.32 (0.71)
Compatible panel software			
	Concept		2.2 or higher
	ProWORX NxT		2.0 or higher

Analog voltage and current output modules

Characteristics

Module type			DAU 202	DAU 204	DAU 208
Number of outputs			2 channels	2 x 2 channels	8 channels
Electrical isolation			optoelectrically isolated from bus	channel (1, 2) to (3, 4) electrically isolated from bus	electrically isolated from bus
LEDs			2 green	5 green, 4 red, 1 yellow	2 green
Addresses	Registers 3x/4x		0 in/2 out	1 in/6 out	0 in/8 out
Operating voltage					
	Bipolar	**VDC**	±10 (>5 kOhm)	± 1, ± 5, ± 10	± 10 (> 3.3 kOhm)
	Unipolar	**VDC**	-	0 ... 1, 0 ... 5, 0 ... 10	-
	Unipolar with offset	**VDC**	-	-	-
Operating current					
	Bipolar	**mA**	± 20 (<500 Ohm)	-	-
	Unipolar	**mA**	-	0 ... 20	-
	Unipolar with offset	**mA**	-	4 ... 20	-
A/D conversion					
	Conversion time	**ms**	11 per channel	<5 per channel	<1 per channel
	Resolution		11 bits + sign	12 bits + sign	11 bits + sign
	Overdrive	**%**	approx. 2.4	-	± 2.4 (max. ± 10.24 VDC)
Precision	Overall	**%**	± 0.4 of full scale reading	± 0.2 of full scale reading at 25°C	± 0.1 for 0 ... 60 °C
	Output error range		± 0.6 for 0 ... 60 °C	-	-
	Deviation/temp.	**%/°C**	-	Current: <± 0.002 full-scale Voltage: <± 0.005 reading	-
Dielectric Strength					
	Channel to channel	**VDC**	700	Ch. 1, 2 to 3, 4: 500 V; 1 to 2 and 3 to 4: not isolated	-
	Channel to bus	**VDC**	700	500 at 60 Hz	700
Power supply					
	I/O bus current	**mA**	max. 60, typ. 40	<1 (TTL loading)	max. 30, typ. 20
	external source		24 VDC, max. 150 mA	24 VDC, 250 mA	24 VDC, max. 120 mA
Power dissipation	typical	**W**	2	-	3
External fuses		**A**	1 x 0.16	1 x 0.5	1 x 0.16
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)		
Weight		**kg(lb)**	0.3 (0.6)	0.453 (1.0)	0.35 (0.77)
Compatible panel software					
	Concept		2.1 or higher		
	ProWORX NxT		2.0 or higher		

Analog voltage and current output modules

Characteristics

Module type			DAU 252	DAU 252C
Number of outputs			2 channels	
Electrical isolation			Optoelectrically isolated from the bus	
LEDs			2 green	
Addresses	Registers 3x/4x		0 in/2 out	
Operating voltage				
	Bipolar	**VDC**	± 10 (>5 kOhm)	
	Unipolar	**VDC**		
	Unipolar with offset	**VDC**		
Operating current				
	Bipolar	**mA**	± 20 (<500 Ohm)	
	Unipolar	**mA**		
	Unipolar with offset	**mA**		
A/D conversion				
	Conversion time	**ms**	25 per output	
	Resolution		11 bits + sign	
	Overdrive	**%**	approx. 2.4	
Precision	Overall	**%**	± 0.4 of full scale reading	
	Output error range		± 0.6 for 0 ... 60 °C	
Dielectric strength				
	channel to channel	**VDC**	700	
	Channel to bus	**VDC**	700	
Power supply				
	I/O bus current	**mA**	max. 60, typ. 40	
	external source		24 VDC, max. 150 mA	
Power dissipation	typical	**W**	2	
Conformal coating			No	Yes
Suitable for railroad applications			Yes	
External fuses		**A**	1 x 0.16	
Operating temperature		**°C (F)**	-40 ... +70 (-40 ... 158)	
Weight		**kg**	0.3 (0.6 lb)	
Compatible panel software				
	Concept		2.1 or higher	
	ProWORX NxT		2.0 or higher	

Analog I/O modules

References

Analog input modules

Description	Input Values	Reference (1)	Weight kg
4 channels, 11 bits + sign	± 10 V or ± 20 mA	**AS-BADU-205**	0.22
4 channels, 11 bits + sign, electrically isolated from bus	± 10 V or ± 20 mA	**AS-BADU-206**	0.33
4 channels, 14 bits + sign, electrically isolated from bus	± 5 V or ± 10 V or ± 20 mA	**AS-BADU-210**	0.32
8 channels, 12 bits, thermocouple Types J, K, E, R, S, B, T, electrically isolated in groups	4 ... 20 mA	**AS-BADU-211**	0.36
8 channels, 12 bits, thermocouple Types J, K, E, R, S, B, T, electrically isolated, in groups no external supply	4 ... 20 mA	**AS-BADU-212**	0.36
4/8 channels, 16 bits, thermocouple Types J, K, electrically isolated from bus		**AS-BADU-216**	0.33
4 channels, Pt100, 12 bits + sign	± 500 mV	**AS-BADU-204**	0.22
4/8 channels, 15 bits, Pt100 ... 1000, Ni100 ... 1000		**AS-BADU-214**	0.22
4 channels, Pt100, 12 bits + sign, expanded temperature range	± 500 mV	**AS-BADU-254**	0.22
4 channels, Pt100, 12 bits + sign, expanded temperature range,	± 500 mV	**AS-BADU-254C**	0.22
4 channels, 11 bits + sign, electrically isolated from bus, expanded temperature range	± 10 V or ± 20 mA	**AS-BADU-256**	0.33
4 channels, 11 bits + sign, electrically isolated from bus, expanded temperature range	± 10 V or ± 20 mA	**AS-BADU-256C**	0.33
4 pole RTD, 8 thermocouple Types J, K, E, R, S, B, T, K, and CJC, expanded temperature range		**AS-BADU-257**	0.32

(1) The letter "C" following the reference number indicates the product is conformally coated.

Analog I/O modules

References

Analog output modules

Description	Output voltages	Reference	Weight kg
2 channels, 11 bits + sign, electrically isolated	± 10 V or ± 20 mA	**AS-BDAU-202**	0.3
4 channels, 11 bits + sign or 12 bits	± 1, 5 or 10 V , ± 20 mA or 4...20 mA	**AS-BDAU-204**	0.45
8 channels, 11 bits + sign, electrically isolated from bus	± 10 V	**AS-BDAU-208**	0.35
2 channels, 11 bits + sign, electrically isolated from bus, expanded temperature range	± 10 V or ± 20 mA	**AS-BDAU-252**	0.3
2 channels, 11 bits + sign, electrically isolated from bus, expanded temperature range	± 10 V or ± 20 mA	**AS-BDAU-252C**	0.3

Accessories

Description	Catalog Number	Weight kg
Empty module for prewiring	**AS-BNUL-200**	
Empty module for potential supports	**AS-BNUL-202**	
Simulator module, analog with 2 potentiometers, 1 indicator	**SIM-203**	
Floppy disk box for the module racks	**AS-HBOX-201**	
Pulling tool for module screw terminal strip	**AS-OTBP-000**	
Socket module 12 + 2	**CON-212**	

Module type	Counter and frequency modules	
		
Number of inputs	4	
Electrical isolation	30 VDC channel-to-bus	
Signal voltage range	0.25 ... 36 VAC	5 VDC (± 0.5 VDC)
Accuracy	± 0.1% of full scale, ± 1 count	± 1 count over full range
Frequency inputs Counter mode Frequency mode pulse width overspeed	0 ... 10 kHz 0 ... 10 kHz 0 ... 10 kHz 20 µ minimum 12.5 kHz detection	
Power required Internal External, regulated or unregulated External source, typical	275 mA at 5 VDC maximum from the backplane 20 ... 30 VDC 70 mA at 24 VDC	
Model	AS-BVRC-200	AS-BCTR-205
Page	63	

Counter and frequency modules

12 VDC (± 1.2 VDC)	24 VDC (± 2.4 VDC)
AS-BCTR-212	AS-BCTR-224

Module type	Sensor signal motion control module

Module topology **discrete inputs** **discrete outputs** **analog outputs**	 5 1 1
Power supply from I/O bus	5 VDC at 300 mA
Digital output drive capability **Digital input impedance**	150 mA 3.5 kΩ (ON at 15 VDC minimum, OFF at 5 VDC maximum)
Analog drive capability **Analog resolution** **Analog accuracy**	10 VDC, 3 mA 12 bits ± 10 mVDC without offsets, + 50 mVDC with offsets
Drive interface **fault input** **enable relay** **DC motor signal**	 True high Form C contacts, 30 VDC at 0.5 A resistive ± 10 VDC at 3 mA differential
Communications **interface** **baud rate** **5 VDC supply**	 1 RS-232 Modbus serial port 3000 ... 9600 (9600 default) 75 mA maximum
Encoder feedback **differential signal** **input impedance** **encoder frequency** **resolution** **power from CPU**	 2 V minimum 145 Ω nominal 500 Hz square wave maximum, 350 ns minimum time between edges 4 times encoder line count 5 V nominal, 4.4 V minimum, 75 mA maximum
Resolver feedback **reference drive** **sine/cosine inputs** **repeatability** **resolution** **system accuracy**	 -- -- -- -- --
Model	AS-BMOT-201
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Resolver signal motion control module

5 VDC at 600 mA

3.75 ± 0.05 kHz; 2 ± 1.0 Vrms4
7 kΩ impedance
± 3 minutes of arc
12 bits to 6000 RPM; 14 bits to 1350 RPM
16 bits to 300 RPM + 115 minutes of arc maximum

AS-BMOT-202

Module type	Frequency input module

Power supply	
external 24 VDC	24 VDC, 1.1 A approx.
counter in/outputs external 5 VDC	5 VDC, 20 mA
counter inputs internal from I/O bus	5 V, 100 mA max., 75 mA typical
Operating temperature	0 ... 60° C (32 ... 140° F)
Frequency inputs	
number of inputs	4 for input pulses with 5 VDC (TTL) or 24 VDC
min pulse width	0.35 ms
counting range	0 ... 32,767
counting frequency	1 kHz max (input 1 with 5V pulses, max 50 kHz)
5 V TTL signal level	
1 signal	> + 2.3 V
0 signal	0 ... + 1 V
input current	< 2.5 mA at 0 v (current sink)
24 V signal level	
1 signal	+ 12 ... + 30
0 signal	- 2 ... + 5 V
input current	< 6 at 30 V (current source)
Accuracy (time = 5)	
at 5 Hz	0.5% of operating mode < 20 Hz
at 25 Hz	4% of operating mode < 1 kHz
at 100 Hz	1% of operating mode < 1 kHz
at 1 kHz	0.1% of operating mode < 1 kHz
Semiconductor outputs	
number of outputs	4
working voltage U	Us = 24 VDC
1 signal output level	U = Us - 0 ... 2 V
0 signal output level	0 ... +2 V, < 1 mA
load current / output	500 mA max (current source)
operating delay	< 1 ms
switching cycles	1000/h (0.28/s) with inductive load and 100/s with ohmic load
Process inputs	
number of inputs	4
type of networking	Potential free (optical coupler) to the I/O bus
rated signal value	+ 24 V
1 signal level	+ 12 ... + 30 V
0 signal level	- 2 ... + 5 V
input current	7 mA at 24 V, 8.5 mA at 30 V
input delay	4 ms
Meets railroad standard EN 50155	No
Model	AS-BFRQ-204
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Frequency input module

- 40 ... +70° C (- 104 ... +158° F)

Yes

AS-BFRQ-254

Module type	Counter / positioner module

Module topology	Switch-selectable counter / positioner
operating mode	--
counting inputs	--
enable inputs	2
relay outputs	
Electrical isolation	No isolation
Power supply	24 VDC, 30 mA maximum for all operating modes
external at 24 VDC	--
external at 5 VDC	5 V, 100 mA maximum
internal from I/O bus	
Max contact current	24 ... 60 VDC, 24 ... 250 VAC
working voltage range	2 A continuous resistive; 4 instantaneous resistive
load at 230 VAC	2 A continuous resistive; 4 instantaneous resistive
load at 24 VDC	5 mA
wetting current	approx. 10 ms
contact delay time	
Max wire length	20 m (65 ft)
24 V pulse generator	50 m (163 ft)
5 V pulse generator	12 bits
Resolution	± 10 mVDC without offsets, ± 50 mVDC with offsets
Accuracy	
Relay contact service life	20,000,000 mechanical switching cycles
Counter input signal level at 5 V	--
characteristics	--
On signal	--
Off signal	--
input current	
Counter input signal level at 24 V	--
characteristics	--
On signal	--
Off signal	--
input current	--
min 0 pulse width	--
mark-space ratio	--
counting range	--
counting frequency	
Semiconductor outputs	--
number of outputs	--
working voltage V	
Model	AS-BZAE-201
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High-speed counter module

High-speed counter
4
4
4 24 VDC outputs

Optocoupler on each field point

Count inputs 25 mA max.; gate inputs 30 mA max.; outputs 1 A max.
Count inputs 10 mA
5 VDC, 100 mA maximum, 75 mA typical

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For input pulses of 5 VDC (TTL) or 24 VDC
≥ 2.3 V
0 ... 1 V
≤ 2.5 mA each at 0 V (current sink)

For input pulses of 5 VDC (TTL) or 24 VDC
12 ... 30 V
- 2 ... + 5 V
< 6 mA each at 30 V (current source)
0.35 ms
65 / 35% maximum allowable
0 ... 32,767 or - 32,768 ... 0 ... +32,767, depending on operating mode
1 kHz maximum, Input 1 with 5 V pulses, 10 kHz maximum

4
Vs = 24 VDC

AS-BZAE-204

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General

Functions such as counting work pieces, determining rotational speed and frequency, and positioning a moving unit require counting, motion, and positional capabilities that can no longer be implemented using standard digital inputs with a counting frequency below 100 Hz. For this reason, the Compact platform (using Concept software) has three modules with counting frequencies up to 500 kHz, along with specialized motion control modules.

Counting and positioning modules

The AS-BZAE-201 module is a high-speed counter used for positioning and position detection. Its counting range spans 7 decades (23 bits). The counting frequency to be processed is a function of the signal level: it may be a maximum of 500 kHz at 5 VDC or a maximum of 50 kHz at 24 VDC. The modes “Counting” and Position Detection” are set on the module. An additional 24 VDC enabled input makes it possible to implement counting gates or reference cams. Two relay outputs are also available. The module is supplied with 5 VDC power internally via the backplane bus and externally with 24 VDC or 5 VDC for high-speed counting operations.

The AS-BVRC-200 and AS-BCTR-205/212/224 series of counter input modules allow direct connection of up to four high-speed pulses or four VRC (turbine flow meters, positive displacement meters, AC waveforms, etc.) to a single module. The module is configurable with K and M factor information to perform the American Gas Association's Report 7 calculation. The VRC/CTR modules operate identically; each supports a different voltage level:

- AS-BVRC-200 - Variable reluctance coil (turbine meter) inputs (.025 to36 VAC peak typical)
- AS-BCTR-205 - 5 VDC
- AS-BCTR-212 - 12 VDC
- AS-BCTR-224 - 24 VDC

The VRC/CTR series are replacements for the AS-BVIC series of modules.

Measuring frequency and rotational speed

The AS-BFRQ-204 and AS-BFRQ-254 modules are used to measure frequency and rotational speed. They have four frequency inputs for counting pulse voltages at 5 VDC (TTL) or 24 VDC and can be inserted into any rack slot. The inputs can count frequencies up to 1 kHz or 1 x 50 kHz. In addition, there are four permanently assigned 24 VDC semiconductor outputs (0.5A). These outputs monitor limit-related faults (short-circuit, overload protection, shutdown with storage, group display of overload/short circuit shut down, centralized short circuit alarm and hardware reset to acknowledge the overload). An additional four 24 VDC processed inputs are available.

The module is supplied with 5 VDC power internally via the backplane bus and externally with 24 VDC for the 24 VDC counting inputs, the outputs, and the frequency inputs. In addition, 5 VDC can be connected externally for 5 VDC input pulses. The AS-BFRQ-254 module differs only from the AS-BFRQ-204 in that it is suitable for railroad applications and supports an extended temperature range.

Single-axis motion control

The AS-BMOT-201 and AS-BMOT-202 modules are designed specifically for single-axis motor controllers (positioners). The AS-BMOT-201 is a single-width module, which controls brushless DC motors. It operates by processing incremental travel sensor signals, which contain position information. The fourteen LEDs provide information on the status of the process and of the module. The AS-BMOT-202 is a double-width module, which determines the position and speed of the axis to be controlled using resolver signals. Both modules are supported with an additional software driver. All connections and displays are readily accessible on the front panel of the modules.

Intelligent and Specialty Modules

Counter and frequency modules characteristics

Module type			VRC 200	CTR 205	CTR 212	CTR 224
Number of inputs			4			
Electrical isolation		**VDC**	30			
LEDs			1 green, 1 yellow, 4 red			
Addresses	Registers 3x/4x		3 in/ 3 out			
Supply voltage		**VDC**	24, ± 2.4	-		
Signal voltage range		**V**	0.25 ... 36 AC	5 DC, ± 0.5 DC	12 DC, ± 1.2 DC	24 DC, ± 2.4 DC
Frequency						
	Inputs	**kHz**	0 ... 10			
	Counter mode	**kHz**	0 ... 10			
	Frequency mode	**kHz**	0 ... 10			
	Pulse width	**µs**	20 minimum			
	Overspeed		12.5 kHz detection			
Accuracy			± 0.1% of full scale, ±1count	± 1 count over full range		
Power required						
	internal		275 mA at 5 VDC max from the backplane			
	external, regulated or unregulated	**VDC**	20 ... 30			
	external source typical		70 mA at 24 VDC			
Operating temperature		**°C (F)**	-0 ... 60 (32 ... 140)			
Agency approvals			VDE 0160, UL 508, CSA 22.2 No. 142, FM class 1, Div 2 and European Directive EMC 89/336/EEC			
Weight		**kg(lb)**	0.30 (0.7)			
Compatible panel software						
	Concept		2.2SR2 or higher			
	ProWORX NxT		2.0 or higher			

Intelligent and Specialty Modules

Motion module characteristics

Module type			MOT 201	MOT 202
Module topology				
	Discrete inputs		5	
	Discrete outputs		1	
	Analog outputs		1	
Electrical isolation			Digital inputs optoelectrically isolated to 500 VDC	
Power supply from I/O bus			5 VDC at 300 mA	5 VDC at 600 mA
LEDs			3 green, 4 yellow, 7 red	3 green, 4 yellow, 8 red
Addresses	Registers 3x/4x		6 in / 6 out	
Inputs / Outputs				
Digital	Output drive capability	**mA**	150	
	Input impedance	**kΩ**	3.5 (On at 15 VDC min, Off at 5 VDC max)	
Analog	Drive capability		10 VDC, 3 mA	
	Resolution		12 bits	
	Accuracy	**mVDC**	± 10 without offsets, ± 50 with offsets	
Drive interface				
	Fault input		True high	
	Enable relay		Form C contacts, 30 VDC at 0.5 A resistive	
	DC motor signal		± 10 VDC at 3mA differential	
Communications				
	Interface		1 RS-232 Modbus serial port	
	Baud rate		300 ... 9600 (9600 default)	
	5 VDC supply	**mA**	75 maximum	
Encoder feedback				
	Differential signal		2 V minimum	
	Input impedance	Ω	145 nominal	
	Encoder frequency		500 kHz square wave max, 350 ns minimum time between edges	
	Resolution		4 times encoder line count	
	Power from CPU	**V**	5 nominal, 4.4 minimum, 75 mA maximum	
Resolver feedback				
	Reference drive		-	3.75 ± 0.05 kHz; 2 ± 1.0 Vrms
	Sine/cosine inputs	**kΩ**	-	7 impedance
	Repeatability		-	± 3 min of arc
	Resolution		-	12 bits to 6000 RPM; 14 bits to 1350 RPM
	System accuracy		-	16 bits to 300 RPM ± 115 min of arc maximum
Temperature				
	Operating	**°C (F)**	0 ... 60 (32 ... 140)	
	Storage	**°C (F)**	-40 ... +85 (-40 ... 185)	
Humidity		**°C**	93% relative humidity at 60, noncondensing	
Weight		**kg(lb)**	0.36 (0.8)	0.61 (1.35)
Agency approvals			VDE 0160, UL508, CSA C22.2 No. 142 , and European Directive EMC 89/336/EEC (MOT 201 only)	
Compatible panel software				
	Concept		2.1 or higher	
	ProWORX NxT		2.0 or higher	

Intelligent and Specialty Modules

Frequency input modules characteristics

Module type			FRQ 204	FRQ 254
Power supply				
External	24V counter in/outputs	**VDC**	24, 1.1 A approx.	
	5 V counter inputs	**VDC**	5, 20 mA	
Internal	from I/O bus		5 V, max. 100 mA, typical 75 mA	
Power loss		W	1.3 typical	
LEDs			2 green, 1 yellow, 8 red	
Addresses	Registers 3x/4x		5 in / 0 out	
Frequency inputs				
	Number of inputs		4 for input pulses with 5 VDC (TTL) or 24 VDC	
	Minimum pulse width	**ms**	0.35	
	Counting range		0 ... 32 767	
	Counting frequency	**kHz**	1 max. (Input 1 with 5 V pulses, max 50 kHz)	
Signal level at 5 V TTL				
	1 signal	**V**	> +2.3	
	0 signal	**V**	0 ... +1	
	Input current	**mA**	< 2.5 at 0 V (current sink)	
Signal level at 24 V				
	1 signal	**V**	+12 ... +30	
	0 signal	**V**	-2 ... +5	
	Input current	**mA**	< 6 at 30 V (current source)	
Accuracy (time = 5)				
	at 5 Hz		0.5% of operating mode < 20 Hz	
	at 20 Hz		2% of operating mode < 20 Hz	
	at 25 Hz		4% of operating mode < 1 kHz	
	at 100 Hz		1% of operating mode < 1 kHz	
	at 1 kHz		0.1% of operating mode < 1 kHz	
	at 5 ... 50 kHz		0.05% of operating mode < 50 kHz	
	Type of networking		Potential free (optical coupler) to I/O bus	
Process inputs				
	Number of inputs		4	
	Type of networking		Potential free (optical coupler) to I/O bus	
	Rated signal value	**V**	+24	
	1 signal level	**V**	+12 ... +30	
	0 signal level	**V**	-2 ... +5	
	Input current	**mA**	7 at 24 V , 8.5 at 30 V	
	Input delay	**ms**	4	
Semiconductor outputs				
	Number of outputs		4	
	Type of networking		Potential free (optical coupler) to I/O bus	
	Working voltage U		Us = 24 VDC	
	Signal logic		Positive	
	1 signal output level		U = Us - 0 ... 2 V	
	0 signal output level		0 ... +2 V, <1 mA	
	Load current /output	**mA**	500 max (current source)	
	Operating delay	**ms**	< 1	
	Switching cycles		1000/h (0.28/s) with inductive load and 100/s with ohmic load	
Maximum cable lengths				
	Counter inputs	**m(ft)**	100 (984) max, shielded	
	Outputs/enable inputs	**m(ft)**	400 (1312) max, unshielded; 1000 (3281) max, shielded	
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)	-40 ... +70 (-104 ... 158)
Suitable for railroad applications			No	Yes
Weight		**kg(lb)**	0.30 (0.66)	
Agency approvals			VDE 0160, UL508, CSA C22.2 No. 142 , and European Directive EMC 89/336/EEC / Low Voltage 79/23/EEC	
Compatible panel software				
	Concept		2.1 or higher	
	ProWORX NxT		2.0 or higher	

Intelligent and Specialty Modules

Counter/positioner module characteristics

Module type			**ZAE 201**
Module topology			
	Operating mode		Switch-selectable counter/positioner
	Counting inputs		-
	Enable inputs		-
	Relay outputs		2
Electrical isolation			No isolation
Power supply			
External	at 24 VDC maxiumum	**VDC**	24, 30 mA for all operating modes
	at 5 VDC	**VDC**	-
Internal	from I/O bus		5 V, 100 mA maximum
LEDs			2 green, 2 yellow, 3 red
Addresses	Registers 3x/4x		3 in / 3 out
Electrical Characteristics			
	Working voltage range	**V**	24 ... 60 DC, 24 ... 250 AC
Max Contact current	Load at 230 VAC	**A**	2 continuous resistive; 4 instantaneous resistive
	Load at 24 VDC	**A**	2 continuous resistive; 4 instantaneous resistive
	Wetting current	**mA**	5
	Contact delay time	**ms**	10 approx
Max wire length	24 V pulse generator	**m (ft)**	20 (65)
	5 V pulse generator	**m (ft)**	50 (163)
	Resolution		12 bits
	Accuracy	**mVDC**	± 10 without offsets, ± 50 with offsets
Input Characteristics			
	5 V input selection	**V**	12 V peak-to-peak maximum, 400 mV peak-to-peak minimum
24 V input selection	for 1 signal	**V**	12 ... 30
	for 0 signal	**V**	-2 ... +5
	Count gate/ref trip	**VDC**	1 = 12 min, 0 = 5 max
	Duration	**ms**	> 10
Max count frequency	for 5 V input	**kHz**	500
	for 24 V input	**kHz**	50
	PNP Encoder Quad		Two-track plus marker signal
Relay contact service life			
	Mech. switching cycles		20,000,000
Elec switching cycles, re-sistive load	at 230 VAC / 0.2 A		10,000,000
	at 230 VAC / 0.5 A		7,000,000
	at 30 VDC / 2 A		with clamping diode, 8,000,000 typical
	at 60 VDC / 1 A		with clamping diode, 1,000,000 typical, 3,000,000 maximum, 3000 cycles/hr maximum
Elec switching cycles, inductive load	at 230 VAC / 0.5 A		5,000,000
Weight		**kg(lb)**	0.3 (0.7)
Agency approvals			VDE 0160, UL508, CSA C22.2 No. 142 , and FM Class 1, Div. 2 Standards
Compatible panel software			
	Concept		2.1 or higher
	ProWORX NxT		2.0 or higher

Intelligent and Specialty Modules

High-speed counter module characteristics

Module type			**ZAE 204**
Module topology			
	Operating mode		High-speed counter
	Counting inputs		4
	Enable inputs		4
	Outputs		4 24 VDC outputs
Electrical isolation			Optocoupler on each field point
Power supply			
External	at 24 VDC maxiumum	**VDC**	Count inputs 25 mA; gate inputs 30 mA; outputs 1 A
	at 5 VDC	**VDC**	Count inputs 10 mA
Internal	from I/O bus		5 V, 100 mA maximum; 75 mA typical
LEDs			2 green, 1 yellow, 8 red
Addresses	Registers 3x/4x		6 in / 1 out
Counter inputs			
	Characteristics		For input pulses of 5 VDC (TTL) or 24 VDC
Signal level at 5V	On signal	**V**	≥ 2.3
	Off signal	**V**	0 ... 1
	Input current	**mA**	≤ 2.5 each at 0 V (current sink)
Signal level at 24V	On signal	**V**	12 ... 30 V
	Off signal	**V**	-2 ... +5
	Input current	**mA**	< 6 each at 30 V (current source)
	Min. 0 pulse width	**ms**	0.35
	Mark-space ratio		65/35% maximum allowable
	Counting Range		0 ... 32,767 or -32,768 ... 0 ... +32,767, depending on operating mode
	Counting frequency		1 kHz maximum; Input 1 with 5V pulses, 10 kHz maximum
Enable inputs (gate)			
	Number of inputs		4
	Rated signal value	**V**	24
	High signal level	**V**	+12 ... +30
	Low signal level	**V**	-2 ... +5
	Input current	**mA**	7 at 24 V
	Input delay	**ms**	4
Semiconductor outputs			
	Number of outputs		4
	Working voltage V		Vs = 24 VDC
	Signal language		True high
	On signal output level		Vs - 0 ... +2 V
	Off signal output level		0 ... +2 V, <1 mA
	Vs		20 ... 30 VDC
	Load current /output	**mA**	500 max
	Load current all output	**A**	1 max
	Switching delay	**ms**	< 1
	Power dissipation	**W**	1.25
	Inrush current		5 W maximum for lamps
Operating frequency			
	Resistive load		100/s
	Inductive load 500mA		1000/hr
	Bulb load		8/s at 1.2 W, 1000/hr at 5 W
Weight		**kg(lb)**	0.3 (0.7)
Agency approvals			VDE 0160, UL508, CSA C22.2 No. 142 , and FM Class 1, Div. 2 Standards
CPU and software compatibility			
	CPUs		Not compatible with 386 processor-based CPUs
	ProWORX NxT		2.0 or higher

InterBus communication modules

Selection guide

Module type	InterBus master module	InterBus slave module
		
Discrete 3x/4x addresses	16 in / 16 out and 64 in / 64 out	16 in / 16 out
Number of registers 3x input 4x output	63 words 63 words	15 words 15 words
Internal I/O bus power supply	5 VDC, 190 mA typical, 250 mA maximum	5300 mA maximum
External power supply input voltage fusing power ON current	-- -- --	
RS 485 field bus	150 Ω, non-isolated	150 Ω in, potential-free; 150 Ω in, potential-bound
Number of modules supported	15 max in 16 word mode, 3 in 64 word mode	15 max
Power dissipation	13 W maximum, 1 W typical	1.5 W maximum
Agency approvals	VDE 0160, UL 508	
Model	AS-BBKF-201	AS-BBKF-202
Page	71	

InterBus remote bus interface

0 in / 0 out

1 word required for system data
31 words available for communications

--

UB = 24 VDC, 0.85 A maximum
1.25 A, medium time lag
20 A, 1 ms time constant

Potential-free, serial

1 module per HDTA sub-rack

6 W typical

VDE 0160, UL 508, CSA C22.2 No. 142, European Directive EMC 89/336/ EEC / Low Voltage 79/23/EEC

AS-BDEA-202

InterBus Communication Modules

General, Description

General

The Compact Platform includes a master InterBus module (AS-BBKF-201) and two slave modules (AS-BBKF-202 and AS-BDEA-202). The master module is the interface between the PLC and the external InterBus user. The slave module serves as the contact unit of an external system of modules having the master module in the base station. All nodes operate in full duplex, i.e., all outputs are read, and all inputs are written within a module "message cycle."

The InterBus protocol is structured as a data ring with one central master-slave access method. Consequently, it has the structure of a spatially distributed shift register through which the data is clocked bit by bit. Every module and its I/O data are a component part of the registering. To simplify system installation, the ring system is placed within a cable harness. The external appearance of the system is that of a tree topology. Every module has an identification code containing information such as the module type, data length, and status. In addition, the I/O modules contain input and output registers for data transfer.

The InterBus system has two cycle modes:

- The **ID cycle** executed at startup and following a reset. In the ID cycle, the identification register of every module is read. This data is used to generate the process image on the bus master, thereby defining the size and structure of the shift register.

- The **data cycle** is the actual working cycle that performs data transfer. In the data cycle, the input data is transferred from the registers of all modules into the master module and the output data is transferred from the master to the modules.

Test procedures

After every cycle, special test procedures are used to check for correct data transfer. Upon completion of error-free transfer, the data are accepted into the master module or transmitted to the module outputs. If an error is detected, the data of the faulty cycle is discarded, since a new cycle can be completed faster than correcting the corrupt data.

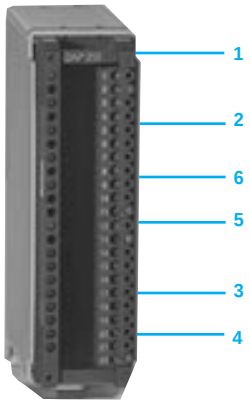
Expansion

The InterBus master module can be installed in any backplane slot. Master modules installed in the backplane require 64 I/O words each (= 128 words) in the PLC, leaving 63 I/O words available to the InterBus user to be connected. In the secondary backplane, the master module each handles 15 I/O words for addressing the InterBus users and occupies a memory area of 16 I/O words each in the PLC. The slave modules are designed to match the master module, so it can exchange 15 I/O words.

ProfiBus slave module

A ProfiBus slave module, the AS-BDEA-203, is available when connection to a ProfiBus network is desired.

Description



The Compact InterBus module is comprised as follows:

1 Operating status LED of the module
2 Terminal block 1
3 Terminal block 2
4 Cable locking barrier
5 InterBus remote bus port
6 Input/output status indicator lights (LEDs):
- 1, green : bus connection and voltage present
- 3, green : InterBus ready
- 4, green : InterBus transmission active
- 5, red, : InterBus transmission error
- 6, red : error on InterBus slave device
- 2 and 8-12 : no LED
- 14 ... 21, red : number of InterBus node with error condition

InterBus Communication Modules

Characteristics

Module type			BKF 201	BKF 202	DEA 202
Function			InterBus master module	InterBus slave module	InterBus remote bus interface
Internal I/O bus power supply		**VDC**	5, 190 mA typ, 250 mA max	5, 300 mA max	--
External power supply					
	input voltage		--		UB=24 VDC, 0.85 A max
	fusing	**A**	--		1.25, med time-lag
	power ON current	**A**	--		20, 1 ms time constant
LEDs			11 red, 3 green	1 red, 3 green	1 red, 5 green
Addresses	Discrete 3x/4x		16 In/16 Out and 64 In/64 Out	16 In/16 Out	0 In/0 Out
Number of registers					
	3x input	**wds**	63	15	1 word required for system data
	4x output	**wds**	63	15	31 available for communications
RS 485 field bus		Ω	150, non-isolated	150 in, potential-free 150 in, potential-bound	potential-free, serial
Number of modules supported		**max**	15 in 16 word mode, 3 in 64 word mode	15	1 per HDTA subrack
Power dissipation		**W**	1.3 max, 1 typical	1.5 max	6 typical
Operating temperature		**°C (F)**	0 ... 60 (32 ... 140)		
Weight		**kg(lb)**	0.21 (0.46)	0.25 (0.55)	0.5 (1.1)
Agency approvals			VDE 0160, UL508		VDE 0160, UL508, CSA C22.2 No. 142, Euro Direct EMC 89/336/EEC / Low Voltage 79/23/EEC
Compatible panel software					
	Concept		2.1 or higher		
	ProWORX NxT		2.0 or higher		

Intelligent and Specialty Modules

References

Intelligent modules

Description	Reference	Weight kg
Switch selectable counter/positioner relay output	**AS-BZAE-201**	0.3
High-speed counter, counting and enable inputs	**AS-BZAE-204**	0.3
4 Frequency and 4 process inputs, 4 semiconductor outputs module	**AS-BFRQ-204**	0.3
4 Frequency and 4 process inputs, 4 semiconductor outputs, expanded temperature suitable for railroad applications	**AS-BFRQ-254**	0.3
10 kHz, VRC (turbine meter) input and frequency, 4 inputs, performs AGA 7 for factored count 12.5 kHz overspeed detection	**AS-BVRC-200**	0.3
10 kHz, 5, 12, or 24 volt pulse, 4 inputs calculates factored count 2.5kHz overspeed detection	**AS-BCTR-205, 212, 224**	0.3

Accessories for intelligent modules

Description	Length m (ft)	Reference	Weight kg
Data cable, 11-conductor, screw/ clamp-type terminal, 9-conductor socket	2.5 (8.2)	**YDL-063**	
Printer cable, 11-conductor, screw / clamp-type terminal, 25-pin connector	3 (9.8)	**YDL-064**	

Motion modules

Description	Reference	Weight kg
Single-axis motion control module, incremental encoder inputs	**AS-BMOT-201**	0.36
Single-axis motion control module incremental encoder and resolver inputs	**AS-BMOT-202**	0.61

Accessories for motion modules

Description	Length m (ft)	Reference	Weight kg
Cyberline connecting cable, amplifier front connection	2.44 (8) 4.57 (15)	**AS-W920-008** **AS-W920-015**	
Cyberline connecting cable, amplifier plug connection	2.44 (8) 4.57 (15)	**AS-W921-008** **AS-W921-015**	
BMOT adapter and cable, customer wiring	2.44 (8) 4.57 (15)	**AS-W922-008** **AS-W922-015**	
BMOT encoder connecting cable, connection box, 2 encoders	0.91 (8) 1.82 (6)	**AS-W923-003** **AS-W923-006**	

InterBus communication Modules

References

InterBus modules

Description	Reference	Weight kg
InterBus master module	**AS-BBKF-201**	0.21
InterBus slave module	**AS-BBKF-202**	0.25
InterBus remote bus interface module	**AS-BDEA-202**	0.25

InterBus accessories

Description	Length	Reference	Weight kg
InterBus cable, prefabricated	1 m	**170 MCI 100 00**	
InterBus connector set, socket/pin 9-pin, DSUB, cut clamping technology		**171 XTS 00 00**	
Remote bus cable, LIYCY 3 x 2 x 0.25 mm^2	(Sold by the meter)	**KAB-3225-LI**	

ProfiBus module

Description	Reference	Weight kg
ProfiBus DP slave module	**AS-BDEA-203**	0.5

Programming software

Concept
PLC hardware configuration

Concept is a software configuration and application programming tool for the Compact 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 Compact 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 Compact 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:

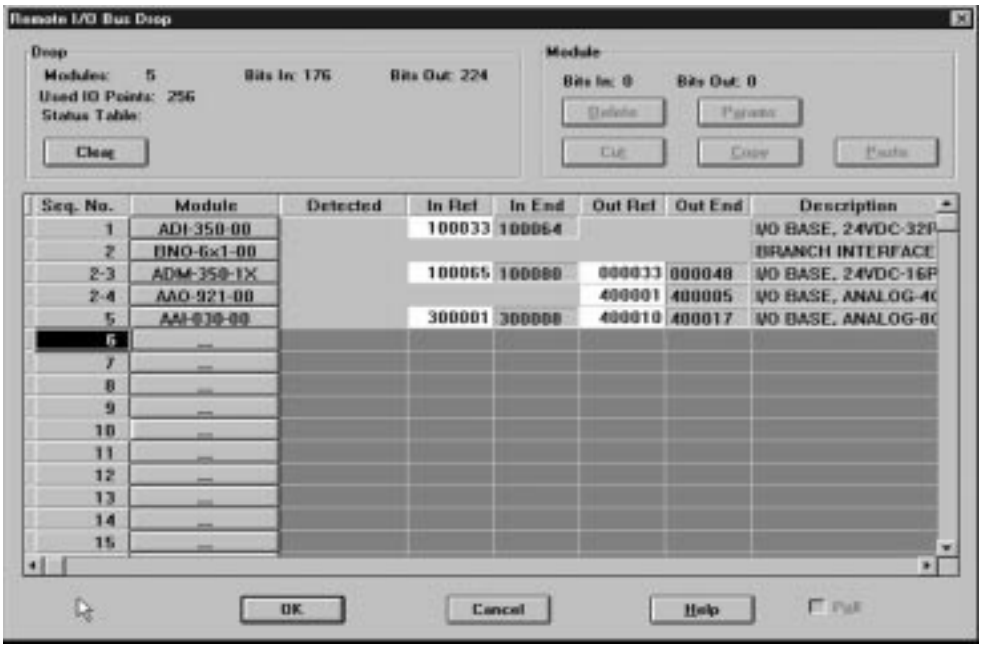
- ❒ Function block diagram (FBD)
- ❒ Ladder diagram (LD)
- ❒ Sequential function chart (SFC)
- ❒ Instruction list (IL)
- ❒ Structured text (ST)

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.

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.



Concept
Languages

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.

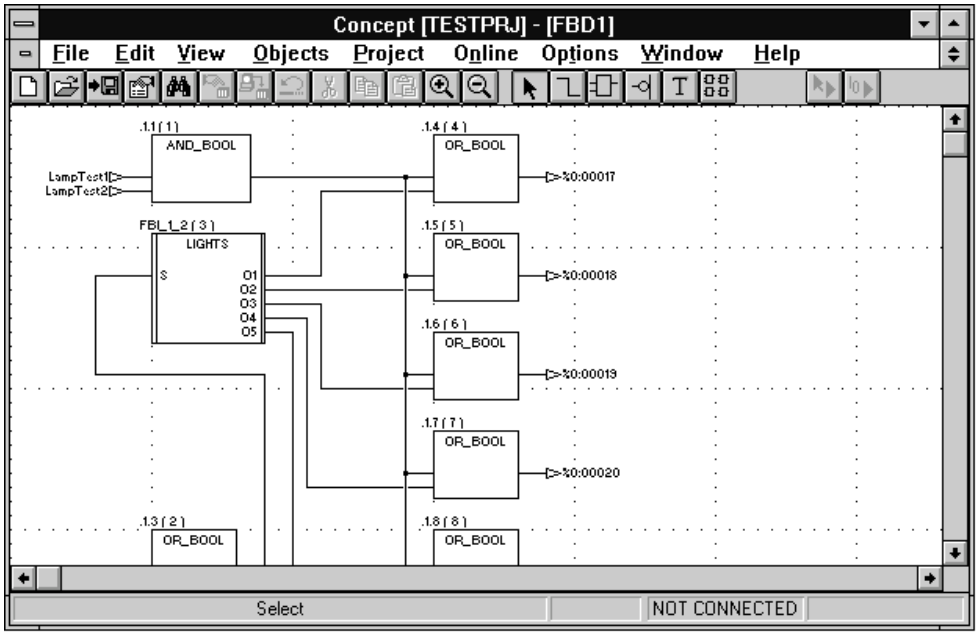
Function block diagram (FBD)

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)

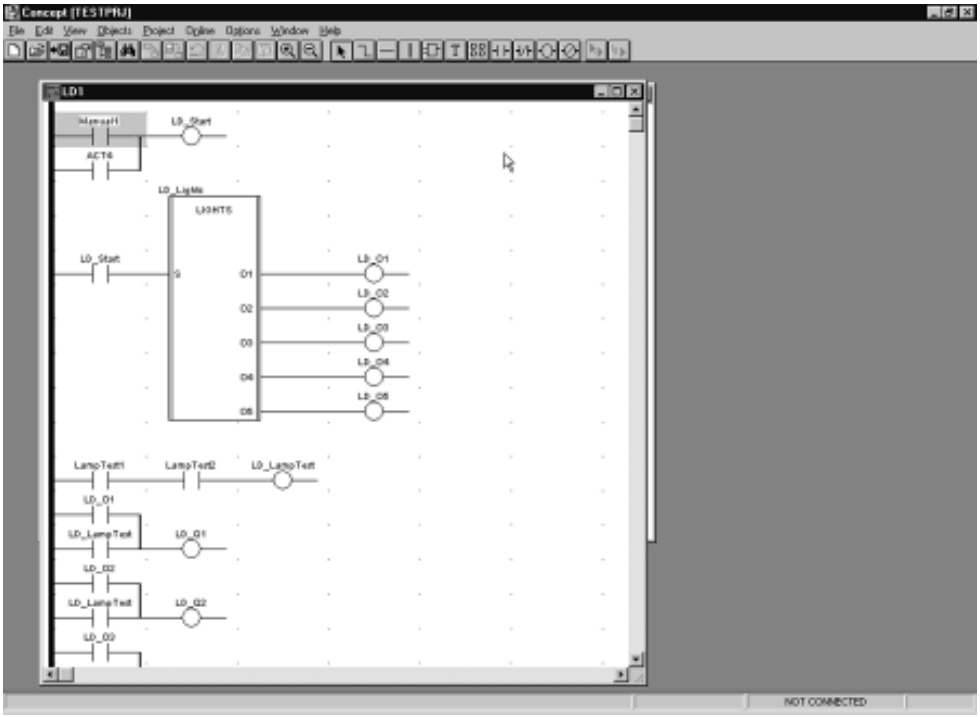
With the IEC 1131-3 ladder diagram language, you can build an LD program with elementary functions, function blocks and derived function blocks (all of which are known as FFBs), along with contacts, coils and variables. FFBs, contacts, coils and variables can be commented. Text can be placed freely within 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.

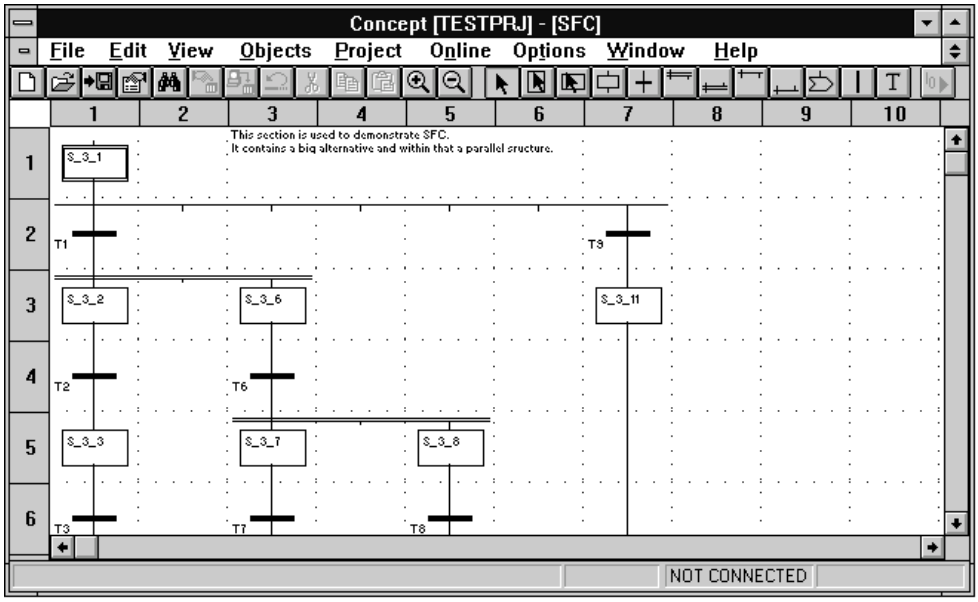
In the LD editor, inital values can be displayed, modified and loaded; current values can be displayed. For the EFBs in libraries CLC and CLC_PRO, animated diagrams of the FFBs and a graph of the current values can be displayed.

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.



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.

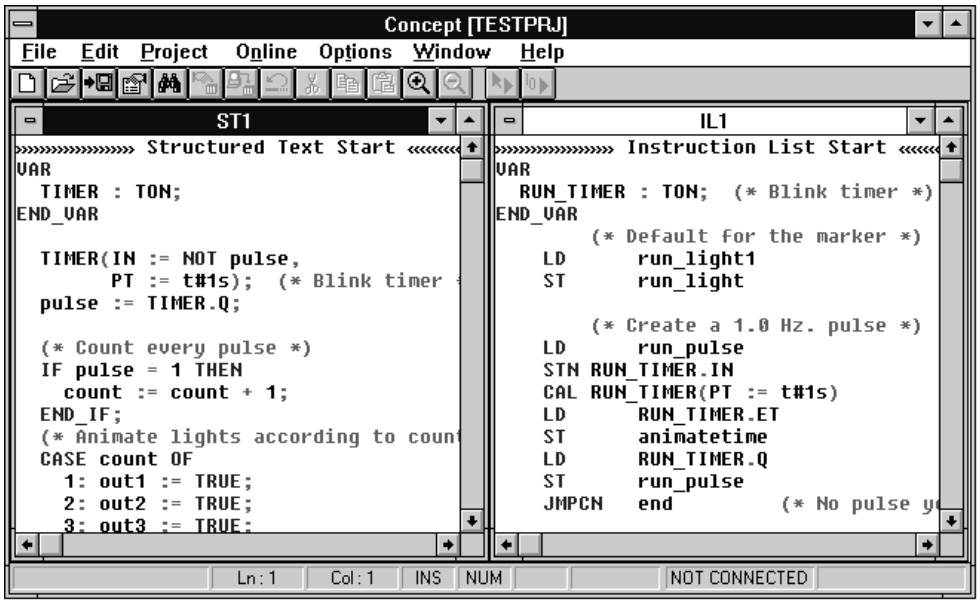
IL is a text-based language, and standard Windows word processing tools can be used to generate code. The IL editor also provides several word processing commands. Keywords, separators and comments are spell-checked automatically as they are entered. Errors are highlighted in color.

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.



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

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

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

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.

COMM

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

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

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

The fuzzy library contains EFBs for fuzzy logic.

ANA_IO

The ANA_IO library is used to process analog values.

Programming software

ProWORX
General features; References

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 software

Description	License type	Reference	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 Tool Kit Version 2.5		**372 SPU 470 01 V25**	-

Note: All versions of Concept software version 2.5 are shipped with the software in 4 languages: English, French, German, and Spanish.

The EFB Tool Kit is only available in English.

Programming Software

Concept and ProWORX References (continued)

Concept Upgrade Support Program

Description	License type	Reference	Weight kg
Concept XL V2.2 to Concept XL V.2.5	single-user license	**372 ESS 474 01**	-
	three-user license	**372 ESS 474 03**	-
	ten-user license	**372 ESS 474 10**	-
	network license	**372 ESS 474 00**	-
Concept S V2.2 to Concept S Version 2.5		**372 ESS 471 01**	-
Concept M V2.2 to Concept M Version 2.5		**372 ESS 472 01**	-
Modsoft to Concept XL Version 2.5		**372 ESS 485 01**	-
Concept EFB Tool Kit V 2.x to V 2.5		**372 ESS 470 01**	-

ProWORX software

Description	License type	Reference	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**	-
	three-user license	**372 SPU 680 01 NSTH**	-
	ten-user license	**372 SPU 680 01 NSTE**	-
	twenty-user license	**372 SPU 680 01 NSTW**	-
ProWORX NxT Lite Offline/Online	single-user license	**372 SPU 610 01 NLDV**	-
	three-user license	**372 SPU 610 01 NLTH**	-
	ten-user license	**372 SPU 610 01 NLTE**	-
	twenty-user license	**372 SPU 610 01 NLTW**	-
ProWORX Upgrades Modsoft upgrade to ProWORX NDEV	single-user license	**372 SPU 684 01 NXUP**	-
	three-user license	**372 SPU 684 01 MSTH**	-
	ten-user license	**372 SPU 684 01 MSTE**	-
	twenty-user license	**372 SPU 684 01 MSTW**	-
ProWORX Plus upgrade to NxT NDEV	single-user license	**372 SPU 684 01 NXPW**	-
	three-user license	**372 SPU 684 01 NPTH**	-
	ten-user license	**372 SPU 684 01 NPTE**	-
	twenty-user license	**372 SPU 684 01 NPTW**	-

Documentation

Description	Number of volumes	Reference (1)	Weight kg
Concept Installation Instructions	1	**840 USE 492 0x**	-
Concept User Manual	3	**840 USE 493 0x**	-
Concept IEC Block Library	13	**840 USE 494 0x**	-
Concept 984 LL Block Library	2	**840 USE 496 0x**	-
Concept EFB Tool Kit User Manual	1	**840 USE 495 01**	-
ProWORX NxT Programming Software User Manual		**372 SPU 680 01 NMAN**	

(1) x = 0 in this position indicates English language; 1 indicates French language; 2 indicates German language; 3 indicates Spanish language.

User documentation and product certification

References

User documentation

Description		Order No.
Compact Automation Platform Controllers User Guide		**890 USE 108 00**
Compact Automation Platform I/O Modules User Guide		**890 USE 109 00**
Starling Associates Gas Flow Loadable Function Block User Guide		**890 USE 137 00**
Modbus Protocol Reference Guide		**PI-MBUS-300**
Modbus Plus Network I/O Servicing Planning Guide	English language	**840 USE 104 00**
	French language	**840 USE 104 01**
Modbus Plus to Sy/Max Gateway Programmable Bridge Mux User Guide		**840 USE 110 00**
Quantum/Compact Transmit Loadable Function Block User Guide		**840 USE 113 00**

Product certification

In some countries, certification of certain electrical components is enforced by the 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 organization	Country
CSA	Canadian Standards Association	Canada
ED	European Directive	Europe
GL	Germanischer Lloyd	Germany
UL	Underwriters Laboratories	USA

Key	Classification standard
UL	UL 508
CSA	CAN/CSA C22.2 No. 142
GL	Germanischer Lloyd, Part 1
ED	EN 50081-2
	EN 50082-2
	EN 61131-2
RRS	Railroad standard EN 50155

Schneider Alliances

Program overview

www.schneideralliances.com

The **Schneider Alliances** partnership program is an answer to the many customers which are expecting from their preferred vendors much more than simple products : complete integrated and validated automation solutions. **Schneider Alliances** is both an industrial and commercial program between Schneider and its partners providing hardware or software automation products, system integration or services complementary to the Schneider offering.

The **Schneider Alliances** partnership program is comprised of :

- Products vendors :
  Design and distribute hardware or software automation products complementary to the Schneider offering and well integrated in Schneider solutions and architectures. This **Schneider Alliances** product offering includes industrial devices, communication hardware and software, HMI and supervisory software, application software packages, development and test tools, ...
  The design and manufacturing of these products may require a transfer of technology from Schneider.

- System integrators :
  Provide custom automation solutions for a specific project bringing together Schneider products and third party devices and equipment. They deploy their industry and application expertise to the implementation, installation and management of complete automation projects.

Thanks to **Schneider Alliances**, customers are able to choose among the best in class products with a assurance of proper integration within Schneider architectures. They also have access to a network of system integrators specialized in their industry and able to achieve their automation project in the best conditions of time and cost.

The **Schneider Alliances** partners network is a win-win association which brings to everyone, products vendor or system integrator, more business and turnover.

Schneider Alliances

Partnership directory

Products partnership

Company \ Product category	Communication interface boards	Communication software	Communication hardware	HMI/3perator panel	HMI/SCADA	Programming software	Electrical I/O interface	Pneumatic I/O interfaceHMI/3e	Motion/axis control	Miscellaneous sensor	Miscellaneous actuator	Automation controller	Services	Miscellaneous software	Miscellanel/3 hardware	I/3
A																
ABB Industrial Systems									■						■	
ABB Power T&D Co.,					■										■	
ABB Robotic										■						
ACC Systemes					■											
Acuity Imaging, Inc.											■					
AFCON					■											
Applicom International	■															
Arc Informatique					■											
Areal					■											
Aro											■					
ARORA Software		■			■											
ARTEC Systems		■														
Asco Joucomatic								■								
AspenTech					■											
Atlas Copco									■							
Automated Mining Systems			■													
Automated Solutions, Inc.		■														
Automation & Control Technologies, Inc.														■		
Automation & Systèmes	■												■			
Automation Science, Inc.					■											
AVG Automation	■									■						
B																
Beckwood Services, Inc.															■	
Bihl & Wiedemann			■													
Bitronics, Inc.											■					
BLH Electronics, Inc.											■					
C																
Cape Software														■		
Ci Technologies Pty Ltd.					■											
CimQuest, Inc.- Products Group		■														
Cimtech					■											
Codra					■											
Commercial Timesharing, Inc.		■														
Control Techniques Drives, Inc.									■							
ControlSoft, Inc.														■		
Curry Controls Company			■													
Cutler-Hammer, Inc.				■												
CyberLogic Technologies, Inc.		■														
Cycle Software, Inc.		■														
D																
Danfoss Electronic Drives									■							
Data-Linc Group			■													
Delta Computer Systems, Inc.										■						
DLRA Projects (Pty) Ltd.					■											
Doble Engineering														■		
E																
ELECTRO Industries / Gaugetech											■					
Endress + Hauser			■													
Escort Memory Systems			■													
Etic			■													
ExperTune, Inc.		■														

Schneider Alliances

Partnership directory

Products partnership

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F															
Festo								■							
Fiber Options, Inc.			■												
Fisher Rosemount			■												
FORTH, Inc.														■	
Foxboro Company	■														
G															
Gensym Corporation		■													
Georges Renault (GRIN)											■				
GSE Systems, Inc.															■
H															
Hewlett Packard		■													
Hilco Technologies, Inc.					■										
Hilscher GmbH	■														
Hirschmann			■												
HMS Fieldbus Systems AB	■														
Honeywell													■		
Honeywell Industrial Automation															■
I															
Iconics, Inc.					■										
Indramat										■					
Industrial Systems Monitoring/AdVoTech				■											
Integrated Control Technology Inc.			■												
Integrated Industrial Technologies, Inc.										■					
Intellution					■										
IPAC Technologies, Inc.		■													
Itmi Aptor			■												
K															
Kuka										■					
M															
Mac Valves, Inc.								■							
MagneTek, Inc.									■						
Mauell Corporation							■								
MDT Software														■	
Mettler-Toledo, Inc.											■				
Mitsubishi Electric Automation Inc.									■						
N															
Nemasoft, Inc.					■										
NexxCorp Information Systems, Inc.		■													
Niobrara Research & Development Corp.	■		■												
NovaTech, LLC	■														
P															
Panel-Tec, Inc.	■														
Parker								■							
ProSoft Technology, Inc.	■														
Prosyst														■	

Schneider Alliances

Partnership directory

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R															
RACO Manufacturing & Engineering				■											
Robicon									■						
S															
SAF Drive Systems Ltd.												■			
Schweitzer Engineering Lab., Inc.	■														
Sciaky											■				
Secheron Ltd.	■														
Silicomp													■		
Simulation Sciences					■										
SISCO, Inc.														■	
Sofrel Telecontrol					■										
Spectrum Controls, Inc.				■			■								
S-S Technologies Inc.	■	■												■	
Steeplechase Software														■	
SWAC				■											
T															
TA Engineering Co., Inc.					■										
Tasnet, Inc.	■														
Toshiba									■						
TR Electronic											■				
TURCK, Inc.	■														
W															
Weed Instrument			■												
Wonderware					■										
X															
Xycom, Inc.				■											

Partnership products Schneider Alliances

Products directory

Company	Tel../Fax/URL	Reference	Category	Technology
ABB Industrial Systems, Inc.	Tel. +1 414-785-3416	CDI 300	Drive	Modbus Plus
16250 W. Glendale	Fax +1 414-785-0397	Advant OCS	Miscellaneous hardware	Modbus Plus
New Berlin, WI 53151 United States	URL www.abb.com			
ABB Industrial Systems, Inc.	Tel. +1 614-261-2000	ABB DCS 500	Miscellaneous hardware	Modbus
16250 W. Glendale	Fax +1 614-261-2172	Advant OCS	Miscellaneous hardware	Modbus Plus
New Berlin, WI 53151 United States	URL www.abb.com			
ABB Power T&D Co., Inc.	Tel. +1 610-395-7333	2000, 2000R series product family	Miscellaneous hardware	Modbus Plus
7036 Snowdrift Road	Fax +1 610-395-1055	REL 512/506	Miscellaneous hardware	Modbus Plus
Allentown, PA 18106	URL www.abb.com/papd	REL 356	Miscellaneous hardware	Modbus Plus
United States		REL 350/352	Miscellaneous hardware	Modbus Plus
		PRICOMT	HMI/SCADA	Modbus Plus
ABB Robotic	Tel. +33 (0)1 34 40 23 49	S4C Robot controller	Motion/axis control	Fipio
5, chemin de l'Equerre	Fax +33 (0)1 34 40 23 80			
ZI des Bethunes	URL www.abb.se/flexible			
F-95310 Saint Ouen L'Aumône France				
ACC Systemes	Tel. +33 (0)3 44 38 66 66	CEASAR	HMI/SCADA	Ethway
5 rue des aTel.iers-BP 203	Fax +33 (0)3 44 38 66 67			Uni-Tel.way
F- 60 202 Compiegne Cedex France	URL www.acc.fr			Modbus
Acuity Imaging, Inc.	Tel. +1 603-598-8400	InTel.ligent Visual Sensor (IVS)	Miscellaneous sensor	Modbus Plus
9 Townsend West	Fax +1 603-598-4684			
Nashua, NH 03063 United States	URL www.acuityimaging.com			
AFCON	Tel. +1 847-397-6900	P-CIM	HMI/SCADA	Ethway
1014 East Algonquin Road	Fax +1 847-397-6987			Fipway
Schaumburg, IL 60173	URL www.afcon-inc.com			Uni-Tel.way
United States				Modbus Plus
Applicom International	Tel. +33 (0)2 32 96 04 20	PC1000, PCI1000, PC2000,	Communication interface boards	Modbus
43 Rue Mazagran	Fax +33 (0)2 32 96 04 21	PC4000 and PCI4000		Uni-Tel.way
F-76320 Caudebec-les-Elbeufs France	URL www.applicom-int.com			Fipway Ethway
Arc Informatique	Tel. +33 (0)1 41 14 36 00	PCVUE 32, FRONTVUE,	HMI/SCADA	Modbus, Modbus Plus,
2 Avenue de la cristallerie	Fax +33 (0)1 46 23 86 02	DATAVUE		Fipway, Ethway, Uni-Tel.way,
F-92310 Sèvres France	URL www.arcinfo.com			Symax/Synet, Autres
Areal	Tel. +33 (0)1 60 63 07 52	Topkapi	HMI/SCADA	Ethway
16 Avenue Jean Moulin	Fax +33 (0)1 64 41 90 15			Fipway
F-77167 Savigny le Temple France				Uni-Tel.way Modbus
Aro	Tel. +33 (0)2 43 44 74 00	Micro 2x16 III	Miscellaneous actuator	Fipio
1 Avenue de Tours	Fax +33 (0)2 43 44 74 01	welding controller		Uni-Tel.way
F-72500 Château du Loir France	URL www.aronet.com			Modbus
ARORA Software	Tel. +1 702-348-1816	System 816	HMI/SCADA	Modbus, Modbus Plus
1755 East Plumb Lane,	Fax +1 702-348-7336	Dialer2000	Communication software	Modbus
Suite 159, Reno, NV 89502 United States	URL www.arora@sierra.net			
ARTEC Systems	Tel. +1 954-771-9007	Drivers	Communication software	Modbus Plus
5530 NE 33rd Avenue	Fax +1 954-771-9524			
Fort Lauderdale, FL 33308 United States	URL www.artec-systems.com			
Asco Joucomatic	Tel. +33 (0)1 47 14 32 00	BUSLINK and BUSLINK ISO	Pneumatic I/O interface	Fipio
32 Avenue Albert 1°-BP 312	Fax +33 (0)1 47 08 53 85	pneumatic valves		
F-92506 Rueil Malmaison France	URL www.ascojoucomatic.fr			
AspenTech	Tel. +1 281-584-1000	SetCim	HMI/SCADA	Modbus Plus
14701 St Mary's Lane	Fax +1 281-584-4329			
Houston, TX 77079-2995 United States	URL www.aspentech.com			
Atlas Copco	Tel. +41 (0)21 863 63 63	Socapel PAM	Drive	Fipio
En Montillier,4	Fax +41 (0)21 863 63 99			
CH-1303 Penthaz Switzerland	URL www.atlascopco.com/controls			
Automated Mining Systems	Tel. +1 905-713-3700	Broadband Gateway	Communication hardware	Modbus Plus
16 Mary Street, Unit 3	Fax +1 905-713-3708			
Aurora, Ontario L4G 1G2 Canada	URL www.robominer.co			
Automated Solutions, Inc.	Tel. +1 707-578-5882	ASMBPLUS.OCX	Communication software	Modbus Plus
1415 Fulton Road, #205	Fax +1 707-579-5756	ASMBSERIAL		Modbus
Santa Rosa, CA 95403 United States	URL www.automatedsolutions.com			
Automation & Control Technologies, Inc.	Tel. +1 314-993-4080 Fax +1 314-993-7183	GEMINI	Miscellaneous software	S800, Quantum
11838 Borman Dr., Suite 200	URL www.act/stl.com			
St. Louis, MO 63146-4113 United States				
Automation & Systèmes	Tel. +33 (0)4 93 07 51 07	IN'COM	Communication interface boards	Ethway, Fipway, Uni-Tel.way,
Domaine de l'Etoile	Fax +33 (0)4 93 07 52 09			Modbus, Modbus Plus
Hameau Topaze F-06610 La Gaude France		Software development	Services	Ethway, Fipway, Uni-Tel.way, Modbus, Modbus Plus

Partnership products Schneider Alliances

Products directory

Company	Tel./Fax/URL	Reference	Category	Technology
Automation Science, Inc. 150 Buckskin Drive Weston, MA 02193 United States	Tel. +1 508-358-4186 Fax +1 508-358-4186	OMNIRAMA	HMI/SCADA	Modbus Modbus Plus
AVG Automation	Tel. +1 630-668-3900	Resolver	Motion/axis control	Modbus Plus
343 St. Paul Boulevard	Fax +1 630-668-4676	Interface-DeviceNet Scanner	Communication interface boards	Quantum
Carol Stream, IL 60188 United States	URL www.AVG.net	Module		
Beckwood Services, Inc. P.O. Box 985, 27 Hale Spring Road - Plaistow, NH 03865 United States	Tel. +1 603-382-3840 Fax +1 603-382-3852 URL www.beckwood.com	DeviceNet interface	Miscellaneous hardware	Autres
Bihl & Wiedemann Kaefertaler Str. 164 Mannheim, D-68167 Germany	Tel. +49-621-339-2723 Fax +49-621-339-2239 URL www.bihl-wiedemann.de	AS-i/Modbus Plus Gateway 1090/1091	Communication hardware	Modbus Plus
Bitronics Inc. P.O. Box 22290 261 Brodhead Road Lehigh Valley, PA 18002 United States	Tel. +1 610-865-2444 Fax +1 610-865-2743 URL www.bitronics.com	MultiComm Power Meter & Power Plex Digital Transducer	Miscellaneous sensor	Modbus
BLH Electronics, Inc. 75 Shawmut Road Canton, MA 02021 United States	Tel. +1 781-821-2000 Fax +1 781-828-1451 URL www.blh.com	LCp-100, LCp-200, DXp-40 Weight indicator controllers	Miscellaneous sensor	Modbus Modbus Plus
Cape Software 333 N. Sam Houston Pkwy, Suite 290, Houston, TX 77060 United States	Tel. +1 281-448-5177 Fax +1 281-448-2607 URL www.capesoftware.com	VP Link	Miscellaneous software	Modbus Plus
Ci Technologies Pty Ltd. Pymble NSW 2088 Australia	Tel. + 61 2-9855-1000 Fax + 61 2-9488-9164 URL www.cit.com.au	Citect	HMI/SCADA	Modbus Plus
CimQuest, Inc.- Products Group 518 Kimberton Road, Suite 325 Phoenixville, PA 19460 United States	Tel. +1 610-935-8282 Fax +1 610-935-1902 URL www.cimquest.com	IN-GEAR ActiveX	Communication software	Modbus Modbus Plus
Cimtech 20 rue de l'industrie B-1400 Nivelles Belgium	Tel. +32 (0) 67 88 36 66 Fax +32 (0) 67 88 36 88 URL www.cimview.com	CIMVIEW	HMI/SCADA	Ethway Fipway Uni-Telway Modbus
Codra 10 Avenue de Norvège, Narvik F-91953 Courtaboeuf Cedex France	Tel. +33 (0)1 60 92 34 34 Fax +33 (0)1 60 92 34 35 URL www.codra.fr	Panorama	HMI/SCADA	Ethway Fipway Uni-Telway Modbus, Modbus Plus Autres
Commercial Timesharing, Inc. 2650 South Arlington Road Akron, OH 44319 United States	Tel. +1 330-644-3059 Fax +1 330-644-8110 URL www.comtime.com	SA85 for Windows NT/Unix	Communication software	Modbus Plus
Control Techniques Drives, Inc. 359 Lang Boulevard Grand Island, NY 14072 United States	Tel. +1 716-773-2321 Fax +1 716-774-8327 URL www.ctdrives.com	Unidrive, Mentor II/ Quantum III	Drive	Modbus Plus
ControlSoft, Inc.	Tel. +1 216-397-3900	INTUNE V4	Miscellaneous software	Modbus
14077 Cedar Avenue, Suite 200 Cleveland, OH 44118 United States	Fax +1 216-381-5001 URL www.controlsoftinc.com	MANTRA NT	Miscellaneous software	Modbus Modbus Plus
Curry Controls Company P.O. Box 5408 1019 Pipkin Road Lakeland, FL 33811 United States	Tel. +1 941-646-5781 Fax +1 941-646-3899 URL www.currycontrols.com	Modpac Plus RF Modem	Communication hardware	Modbus Modbus Plus
Cutler-Hammer, Inc.	Tel. +1 614-882-3282	PanelMate 500	HMI/operator panel	Modbus Plus
P.O. Box 6166 173 Heatherdown Drive Westerville, OH 43081 United States	Fax +1 614-895-7111 URL www.cutlerhammer.com	AMI 6000	HMI/operator panel	Modbus Plus
CyberLogic Technologies, Inc.	Tel. +1 248-740-9842	MBX Driver	Communication software	Modbus, Modbus Plus
340 East Big Beaver Rd	Fax +1 248-740-9821	Remote MBX Driver	Communication software	Modbus, Modbus Plus
Suite 208	URL www.cyberlogictech.com	Virtual MBX Driver	Communication software	Modbus, Modbus Plus
United States		MBX Bridge	Communication software	Modbus, Modbus Plus
Cycle Software, Inc.	Tel. +1 617-576-6900	Live Data	Communication software	Modbus, Modbus Plus
130 Prospect Street, Suite 202 Cambridge, MA 02139 United States	Fax +1 617-576-6501 URL www.livedata.com	Live Data Quantum	Communication software	Quantum
Danfoss Electronic Drives 2995 Eastrock Drive Rockford, IL 61109 United States	Tel. +1 815-398-2770 Fax +1 815-398-2869 URL www.danfoss.com	VTL Series 5000	Drive	Modbus Plus

Partnership products Schneider Alliances

Products directory

Company	Tel./Fax/URL	Reference	Category	Technology
Data-Linc Group 2635 151st PL. NE Redmond, WA 98052 United States	Tel. +1 425-882-2206 Fax +1 425-867-0865 URL www.data-linc.com	FDM7000, MDL500 FSK, LCM100 FSK, SRM6000, DLM4000-DL, DLM4000-LL, CCS9000, LLM1 100 Bell 202 FSK,	Communication hardware	Modbus
		SRM6200E	Communication hardware	Ethway
Delta Computer Systems, Inc.	Tel. +1 360-254-8688	MMC120 00 2 axis	Motion/axis control	Quantum
11719 Northeast 95th Street,	Fax +1 360-254-5435	MMC188/40/41 4 axis	Motion/axis control	S800
Suite D Vancouver, WA 98682 United States	URL www.deltacompsys.com	RMC100 2/8 axis	Motion/axis control	Modbus Plus
DLRA Projects (Pty) Ltd. P.O. Box 483 - 108 Hendrick Verwoerd Dr., Randburg Pinegowrie 2123 South Africa	Tel. +27 11-886-4704 Fax +27 11-886-5739 URL www.dlra.co.za	Adroit	HMI/SCADA	Modbus Plus
Doble Engineering 85 Walnut Street Watertown, MA 02473 United States	Tel. +1 617-926-4900 Fax +1 617-926-0528 URL www.doble.com	INSITE	Miscellaneous software	Modbus Plus
ELECTRO Industries/Gaugetech	Tel. +1 516-334-0870	Futura+ Series	Miscellaneous sensor	Modbus, Modbus Plus
1800 Shames Drive	Fax +1 516-338-4741	DWVA 300	Miscellaneous sensor	Modbus
Westbury, NY 11590 United States	URL www.electroind.com	DMMS 300+	Miscellaneous sensor	Modbus, Modbus Plus
Endress + Hauser 3 rue du Rhin F-68330 Huningue France	Tel. +33 (0)3 89 69 67 68 Fax +33 (0)3 89 69 48 02 URL www.endress.com	ZA 674 gateway	Communication hardware	Fipio
Escort Memory Systems	Tel. +1 831-438-7000	CM900	Communication hardware	Compact
3 Victor Square	Fax +1 831-438-5768	CM1000	Communication hardware	S800
Scotts Valley, CA 95066 United States	URL www.ems-rfid.com	CM41/CM42	Communication hardware	Modbus Plus
Etic 13, Chemin du Vieux Chêne ZIRST 4201 38942 Meylan Cedex France	Tel. +33 (0)4 76 04 20 00 Fax +33 (0)4 76 04 20 01	FT300 UTW remote control front end	Communication hardware	Uni-Telway
ExperTune, Inc. 4734 Sonseeahray Drive Hubertus, WI 53033 United States	Tel. +1 414-628-0088 Fax +1 414-628-0087 URL www.expertune.com	PID analyser tuner	Communication software	Modbus
Festo	Tel. +33 (0)1 49 35 23 23	type 02, 03 and 04B (ISO),	Pneumatic I/O interface	Fipio
5 Rue Montgolfier	Fax +33 (0)1 49 35 23 33	type 10 (CPV) and 12 (CPA)	Pneumatic I/O interface	Fipio
F-93116 Rosny sous Bois France	URL www.festo.com			
Fiber Options, Inc.	Tel. +1 516-567-8320	2291M	Communication hardware	Modbus Plus
80 Orville Drive, Suite 102 Bohemia, NY 11716 United States	Fax +1 516-567-8322 URL www.fiberoptions.com	2281M	Communication hardware	Autres
Fisher Rosemount 1 Rue Traversière, Silic 125 F-94523 Rungis Cedex France	Tel. +33 (0)1 49 79 73 00 Fax +33 (0)1 49 79 73 99 URL www.frco.com	MG-HRT-WF-002-FR Hart / Fipio gateway	Communication hardware	Fipio
FORTH, Inc. 111 N. Sepulveda Blvd., Suite 300 Manhattan Beach, CA 90266 United States	Tel. +1 310-372-8493 Fax +1 310-318-7130 URL www.forth.com	Express	Miscellaneous software	Modbus Plus
Foxboro Company 33 Commercial Street Foxboro, MA 02035 United States	Tel. +1 508-543-8750 Fax +1 508-549-4800 URL www.foxboro.com	Intelligent Automation Series	Communication interface boards	Modbus Modbus Plus
Gensym Corporation 125 Cambridge Park Drive Cambridge, MA 02140 Etats-Unis	Tel. +1 617-547-2500 Fax +1 617-547-1962 URL www.gensym.com	G2 Real-time Expert System	Communication software	Modbus Plus
Georges Renault (GRIN) 99 Route de Clisson F-44230 Sebastien sur Loire France	Tel. +33 (0)2 40 80 20 00 Fax +33 (0)2 40 33 27 07	SMA 68000 screwing controller	Miscellaneous actuator	Uni-Telway
GSE Systems, Inc. 9189 Red Branch Road Columbia, MD 02145 United States	Tel. +1 410-772-3500 Fax +1 410-772-3611 URL www.gses.com	SNCC D/3	Miscellaneous hardware	Modbus Plus S800
Hewlett Packard 2, avenue du Lac F- 91040 Evry France	Tel. +33 (0)1 69 82 60 60 Fax +33 (0)1 69 91 84 32 URL www.hp.com	Driver HP UX	Communication software	Ethway
Hilco Technologies, Inc. 3300 Rider Trail South Suite 300 Earth City, MO 63045-1338 United States	Tel. +1 314-298-9100 Fax +1 314-298-1729 URL www.hilco.com	Monitrol	HMI/SCADA	Modbus Plus

Partnership products Schneider Alliances

Products directory

Company	Tel./Fax/URL	Reference	Category	Technology
Hilscher GmbH Rheinstrabe 78 Hattersheim, D-65796 Germany	Tel. +49 6190 9907 0 Fax +49 6190 9907 50 URL www.hilscher.com	KPO 104-MBP, PVK 20-MBP CIF 30-MBP, SCA-MBP	Communication interface boards	Modbus Plus
Hirschmann PO Box 1649 D-72606 Nürtingen Germany	Tel. +49 7127 14 1479 Fax +49 7127 14 1495 URL www.hirschmann.com	OZD FIP	Communication hardware	Fipio, Fipway
HMS Fieldbus Systems AB	Tel. +46 (0)35 168 200	AnyBus AB64	Communication interface boards	Fipio
Pilefeltsgatan 73	Fax +46 (0)35 168 210	AnyBus Data Transfer	Communication interface boards	Modbus
S-302 50 Halmstad Sweden	URL www.hms.se			Modbus Plus
Honeywell Parc Technologique Bât. Mercury BP 87 F-91193 Gif sur Yvette France	Tel. +33 (0)1 60 19 80 00 Fax +33 (0)1 60 19 81 81 URL www.honeywell.com	Excel 500	Automation controller	Fipway
Honeywell Industrial Automation 16404 N. Black Canyon Highway Phoenix, AZ 85053 United States	Tel. +1 602-313-5000 Fax +1 602-313-4990 URL www.iac.honeywell.com	SCAN 3000	Miscellaneous hardware	Modbus Modbus Plus
Iconics, Inc. 100 Foxborough Boulevard Foxborough, MA 02035 United States	Tel. +1 508-543-8600 Fax +1 508-543-1503 URL www.iconics.com	GENISIS-32	HMI/SCADA	Modbus Plus
Indramat Dr Nebel strasse, 2 D-97816 Lohr am Main Germany	Tel. +49 (0)93 5240 0 Fax +49 (0)93 5240 4885 URL www.indramat.com	MTC 200 CNC	Motion/axis control	Fipway
Industrial Systems	Tel. +1 205-824-0222	Voice MMI	HMI/operator panel	Modbus, Modbus Plus
Monitoring/AdVoTech 3201 Lorna Road Birmingham, AL 35216 United States	Fax +1 205-824-0291 URL www.voicemmi.com	ISM communicator	HMI/operator panel	Modbus
Integrated Control Technology Inc. 871 Turnpike Street, Suite 208 North Andover, MA 01845 United States	Tel. +1 978-557-5882 Fax +1 978-557-5884 URL www.ictglobal.com	IBS-802 gateway Interbus-S	Communication hardware	Modbus Plus
Integrated Industrial Technologies, Inc.	Tel. +1 412-828-1200 Fax +1 412-828-0320	IFC 020 2-Axis resolver	Motion/axis control	Quantum
221 Seventh Street, Suite 200 Pittsburgh, PA 15238 United States	URL www.i2t-inmotion.com	SCM 020/120 Stepper Motor Control	Motion/axis control	Quantum Compact
Intellution 1 Edgewater Drive Norwood, MA 02062 United States	Tel. +1 781-769-8878 Fax +1 781-769-1990 URL www.intellution.com	Fix Dmacs	HMI/SCADA	Modbus Plus
IPAC Technologies, Inc.	Tel. +1 219-464-7212	IPACT SA85 Device Driver	Communication software	Modbus Plus
260 South Campbell Valparaiso, IN 46385 United States	Fax +1 219-462-5387 URL www.ipact.com	IPACT Communication Library	Communication software	Modbus Plus
Itmi Aptor 61 Chemin du Vieux Chêne F-38244 Meylan France	Tel. +33 (0)4 76 41 40 00 Fax +33 (0)4 76 41 28 05	CIU communicator	Communication hardware	Ethway Fipway
Kuka 1 Rue Blaise Pascal F-91380 Chilly Mazarin France	Tel. +33 (0)1 69 79 80 00 Fax +33 (0)1 69 79 80 01 URL www.kuka.com	KR C1 robot controller	Motion/axis control	Fipio
Mac Valves, Inc. 30569 Beck Road Wixom, MI 48393-7011 United States	Tel. +1 248-624-7700 Fax +1 248-624-0549 URL www.macvalves.com	Air Valve Interface	Pneumatic I/O interface	Modbus Plus
MagneTek, Inc.	Tel. +1 414-782-0200	GPD 515	Drive	Modbus Plus
16555 W Ryerson Road New Berlin, WI 53151 United States	Fax +1 414-782-1283 URL www.magnetek.com	GPD333AC	Drive	Modbus Plus
Mauell Corporation	Tel. +1 717-432-8686	DI64 Plus 99-61-886	Electrical I/O interface	Modbus Plus
31 Old Cabin Hollow Road	Fax +1 717-432-8688	DO128 Plus 99-61-P91N	Electrical I/O interface	Modbus Plus
Dillsburg, PA 17019-8815 United States	URL www.mauell-us.com			
MDT Software	Tel. +1 678-297-1050	Mass Autosave	Miscellaneous software	Modbus
2520 NorthWinds Parkway	Fax +1 678-297-1003			Modbus Plus
Suite 100 Alpharetta GA678/297-1000 United States	URL www.mdtsoft.com			
Mettler-Toledo, Inc. 350 West Wilson Bridge Road Worthington, OH 43085 United States	Tel. +1 614-438-4511 Fax +1 614-438-4770 URL www.mt.com	Jaguar Weigh Scale	Miscellaneous sensor	Modbus Plus
Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway Vermon Hills IL60061 United States	Tel. +1 847-478-2000 Fax +1 847-478-0327 URL www.meau.ea.com	FR-A500	Drive	Modbus Plus

Partnership products Schneider Alliances

Products directory

Company	Tel./Fax/URL	Reference	Category	Technology
Nemasoft, Inc. 124 Washington St., Suite 201 Foxboro, MA 02035 United States	Tel. +1 508-698-3611 Fax +1 508-698-3782 URL www.nemasoft.com	Paragon 500/550, AutoNet, PowerVIEW	HMI/SCADA	Modbus Modbus Plus
NexxCorp Information Systems, Inc. 235 Beatty Avenue Oshawa, Ontario L1H 3B4 Canada	Tel. +1 905-433-7566 Fax +1 905-579-5699	ModLINX	Communication software	Modbus Modbus Plus
Niobrara Research &	Tel. +1 417-624-8918	MEB-TCP	Communication hardware	Modbus Plus
Development Corp. P.O. Box 3418	Fax +1 417-624-8920 URL www.niobrara.com	Bridge PMN Modbus Plus to POWERLOGIC	Communication hardware	Modbus Plus
2400 Tanyard Road		QSPXM Seriplex Master	Communication interface boards	Quantum
Joplin, MO 64803		QUCM Universal Communications	Communication interface boards	Quantum
United States		MUCM-B	Communication interface boards	Momentum
NovaTech, LLC 13604 West 107th Street Lenexa, KS 66215 United States	Tel. +1 913-451-1880 Fax +1 913-451-2845 URL www.novatech-llc.com	Modem Micro PLC	Communication interface boards	Autres
Panel-Tec, Inc.	Tel. +1 256-534-8132	BG-3500	Communication interface boards	Modbus Plus
P.O. Box 23942607 Leeman Ferry Road, Suite 7 Huntsville, AL 35804 United States	Fax +1 256-534-4769 URL www.panel-tec.com	MD-3000	Communication interface boards	Modbus Plus
Parker Rue Henri Becquerel F-27031 Evreux France	Tel. +33 (0)2 32 23 34 00 Fax +33 (0)2 32 28 98 07 URL www.parker.com	Valvetronic 164	Pneumatic I/O interface	Fipio
ProSoft Technology, Inc. 9801 Camino Media, # 105 Bakersfield, CA 93311 United States	Tel. +1 805-664-7208 Fax +1 805-664-7233 URL www.prosoft-technology.com	SCANport Communication Adapter 1560-MBP	Communication hardware	Modbus Plus
Prosyst 70 Rue Jean Jaures 59770 - Marly France	Tel. +33 (0)3 20 90 43 33 Fax +33 (0)3 20 90 43 34 URL www.prosyst.fr	SIMAC	Miscellaneous software	Modbus Plus
RACO Manufacturing & Engineering 1400 62nd Street Emeryville, CA 94608 United States	Tel. +1 510-658-6713 Fax +1 510-658-3153 URL www.racoman.com	Verbatim Gateway	HMI/operator panel	Modbus Plus
Robicon 500 Hunt Valley Drive New Kensington, PA 15068 United States	Tel. +1 724-339-9500 Fax +1 724-339-8100 URL www.robicon.com	Clean Power, 454, Perfect Harmony	Drive	Modbus Modbus Plus
SAF Drive Systems Ltd. 88 Ardelt Avenue Kitchener, Ontario N2C 2C9 Canada	Tel. +1 519-743-5491 Fax +1 519-743-3610 URL www.safdrives.com	SAFphire - Programmable Linear Controller	Automation controller	Modbus Modbus Plus Symax/Synet
Schweitzer Engineering Laboratories, Inc. 2350 NE Hopkins Court Pullman, WA 99163-5603 United States	Tel. +1 509-332-1890 Fax +1 509-332-6187 URL www.seline.com	SEL-2711	Communication interface boards	Modbus Plus
Sciaky 119 Quai Jules Guesde, BP 43 F-94401 Vitry sur Seine France	Tel. +33 (0)1 45 73 43 00 Fax +33 (0)1 46 82 58 80 URL www.sciaky.com	CPS2000 RL2	Miscellaneous actuator	Fipio
Secheron Ltd. 14 Avenue de Secheron Geneva 21 Switzerland	Tel. +41 22 739 4111 Fax +41 22 738 7305 URL www.secheron.com	VMB OZ	Communication interface boards	Modbus Plus
Silicomp 195 Rue Lavoisier F-38330 Montbonnot St Martin France	Tel. +33 (0)4 76 41 66 66 Fax +33 (0)4 76 41 66 67 URL www.silicomp.com	Software development	Services	Fipio Fipway
Simulation Sciences 2500 City West Boulevard, Ste. 1200, Houston, TX 77042 United States	Tel. +1 713-683-1710 Fax +1 713-683-6613 URL www.simsci.com	AIM AIM\AT	HMI/SCADA	Modbus Modbus Plus
SISCO, Inc. 6605 19 1/2 Mile Road Sterling Heights, MI 48314-1408 United States	Tel. +1 810-254-0020 Fax +1 810-254-0053 URL www.sisconet.com	AX-S4 MMS	Miscellaneous software	Modbus Modbus Plus
Sofrel Telecontrol 2 rue du Plessis	Tel. +33 (0)2 99 04 89 00 Fax +33 (0)2 99 04 89 01	SOFREL S50, RTU for technical facilities	HMI/SCADA	Uni-Telway Modbus
F-35770 Vern sur Seiche France		SOFREL S50 Thermix, RTU for HVAC applications	HMI/SCADA	Uni-Telway Modbus
Spectrum Controls, Inc.	Tel. +1 425-746-9481	140 ACI 051 : 32-Ch analog input	Electrical I/O interface	Quantum
P.O. Box 5533 2700 Richards Road, Suite 200 Bellevue, WA 98005 United States	Fax +1 425-641-9473 URL www.spectrumctls.com	SOI-260	HMI/operator panel	S800

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Products directory

Company	Tel./Fax/URL	Reference	Category	Technology
S-S Technologies Inc.	Tel. +1 519-725-5136	Universal Communication System	Communication interface boards	Modbus
50 Northland Road	Fax +1 519-725-1515	Modicon RIO Interface Card	Communication interface boards	S800
Waterloo, Ontario N2V 1N3	URL www.sstech.on.ca	QNX 4.X Device Administrator	Communication software	Modbus Plus
Canada		PICS Simulation software	Miscellaneous software	Autres
		X-Link	Communication software	Modbus, Modbus Plus
Steeplechase Software	Tel. +1 734-975-8100	Visual Logic Controller - VLC-PDK	Miscellaneous software	Autres
1330 Eisenhower Place	Fax +1 734-975-8123			
Ann Arbor, MI 48108	URL www.steeplechase.com			
United States				
SWAC	Tel. +49 89 316 8660	BTK 16, 32, 64, BT.GDA	HMI/operator panel	Modbus Plus
Odenpullach 1	Fax +49 89 316 866 80			
82041 Oberhaching	URL www.swac.de			
Germany				
TA Engineering Co., Inc.	Tel. +1 925-376-8500	AIMAX for Windows	HMI/SCADA	Modbus
1150 Moraga Way	Fax +1 925-376-4977			Modbus Plus
Moraga, CA 94556	URL www.ta-eng.com			
United States				
Tasnet, Inc.	Tel. +1 727-544-1555	Substation Automation and	Communication interface boards	Modbus
5271 102nd Ave. North	Fax +1 727-545-8975	Communication Software Systems		
Pinellas Park, FL 33782	URL www.tasnet.com			
United States				
Toshiba	Tel. +1 713-466-0277	G3 Inverter	Drive	Modbus Plus
13131 West Little York Rd	Fax +1 713-466-8773			
Houston, TX 77041	URL www.toshiba.com			
United States				
TR Electronic	Tel. +49 (0) 7425 228 0	CE65 absolute rotary encoders	Miscellaneous sensor	Fipio
Eglishalde, 6	Fax +49 (0) 7425 228 33	LA 68K linear absolute coders	Miscellaneous sensor	Fipio
D-78647 Trossingen	URL www.trelectronic.com			
Germany				
TURCK, Inc.	Tel. +1 612-553-7300	Sensoplex MC	Communication interface boards	Modbus Plus
3000 Campus Drive	Fax +1 612-553-0708			
Plymouth, MN 55441	URL www.turck.com			
United States				
Weed Instrument	Tel. +1 512-434-2844	Fiber Optic Modem 6000 EoTec	Communication hardware	Modbus
P.O. Box 300	Fax +1 512-434-2851			Modbus Plus
707 Jeffrey Way	URL www.weed instrument.com			S800
Round Rock, TX 78680-0300				
United States				
Wonderware	Tel. +1 949-727-3200	Intouch	HMI/SCADA	Ethway
100 Technology Drive	Fax +1 949-727-3270			Fipway
Irvine, CA 92718	URL www.wonderware.com			Uni-Telway
United States				Modbus Plus
Xycom, Inc.	Tel. +1 734-429-4971	34XX	HMI/operator panel	Uni-Telway
750 North Maple Road	Fax +1 734-429-1010			Modbus
Saline	URL www.xycom.com			Modbus Plus
Michigan MI 48176				
United States				

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Algeria	■ Schneider Electric Bureau de Liaison Algérie 04 rue du Berry - El Mouradia 16070 Algiers	Tel: (213) 269 80 03 Fax: (213) 269 80 02
Argentina	■ Schneider Argentina Viamonte 2850 1678 Caseros (provincia B. Aires)	Tel: (54) 17 16 88 88 Fax: (54) 17 16 88 77
Australia	■ Schneider PTY Ltd 2, Solent circuit Norwest Business Park NSW 2143 Baulkham Hill	Tel: (61) 298 51 28 00 Fax: (61) 296 29 83 40
Austria	■ Schneider Austria Ges.m.b.H. Birostrasse 11 1239 Wien	Tel: (43) 1 610 540 Fax: (43) 1 610 54 65
Belgium	■ Schneider MGTE N.V. - S.A. Dieweg 3 1180 Brussels	Tel: (32) 2 373 7711 Fax: (32) 2 375 3858 www.schneider.be
Brazil	■ Schneider Electric Brazil S.A. Avenida Das Naçoes Unidas 23223 Jurubatuba CEP 04795-907 São Paulo-SP	Tel: (55) 115 24 52 33 Fax: (55) 115 22 51 34
Bulgaria	■ Schneider Electric Expo 2000 Boulevard Vaptzarov 1407 Sofia	Tel: (359) 2 919 42 Fax: (359) 2 962 44 39
Cameroon	■ Schneider Electric SA - Cameroun BP12087 16, rue de l'hôtel de ville Douala	Tel : (237) 30 13 99 Fax : (237) 43 11 94
Canada	■ Schneider Canada 19, Waterman Avenue M4 B1Y2 Toronto - Ontario	Tel: (1) 416 752 8020 Fax: (1) 416 752 4203 www.schneider.ca
Chile	■ Schneider Electric Chile S.A. Avda. Presidente Eduardo Frei Montalva, 6115-B Conchali Santiago	Tel: (562) 623 59 59 Fax: (562) 623 59 76
China	■ Schneider Beijing Landmark bldg-Room 1801 8 North Dong Sanhuan Rd, Chaoyang District 100004 Beijing	Tel: (86) 10 65 90 69 07 Fax: (86) 10 65 90 00 13
Columbia	■ Schneider De Colombia S.A. Calle 45A#102-45 Santafe de Bogota Bogota	Tel: (57) 14 13 91 81 Fax: (57) 14 13 90 12
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Cuba	■ Schneider Electric Bureau de Liaison de La Havane Calle 36- N°308-Apto1- Entre 3ra y 5ta Avenida Miramar - Playa Habana	Tel: (53) 724 15 59 Fax: (53) 724 12 17
Czech Republic	■ Schneider Electric AS KOVO Building - Jankovcova 2 170 88 Praha 7	Tel: (420) 2 66 78 36 21 Fax: (420) 2 78 30 71
Denmark	■ Schneider Electric A/S Baltorpbakken 14 DK - 2750 Ballerup	Tel: (45) 44 68 7888 Fax: (45) 44 68 5255
Dominican Republic	■ Schneider Electric Calle Proyecto 27 de Febrero N° 5 Apto 102, Miraflores Santo Domingo	Tel: 1 (809) 686 82 66 Fax: 1 (809) 686 81 89
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
Egypt	■ Schneider Egypt 68, El Tayaran Street Nasr City Cairo	Tel: (20) 24 01 01 19 Fax: (20) 24 01 66 87
Finland	■ Schneider Electric Oy Sinikalliontie 16 02630 Espoo	Tel: (358) 9 527 000 Fax: (358) 9 5270 0376 www.schneider.fi
France	■ Schneider Electric 43-45 bd Franklin Roosevelt 92500 Rueil Malmaison	Tel: 33 (0)1 41 29 80 00 Fax: 33 (0)1 41 29 81 95
France	■ Schneider Electric World Trade Centre 5, place R.Schuman 38050 Grenoble	Tel: 33 (0)4 76 57 60 60 Fax: 33 (0)4 76 90 49 64

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Germany	■ Schneider Electric GmbH Gothaer Straße 29 D-40880 Ratingen	Tel: (49) 2102 4040 Fax: (49)2102 404256 www.schneiderelectric.de
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Hong Kong	■ Schneider Electric (Hong Kong) Ltd 20/F, Cornwall House-Taïkoo Place 979 King's Road Quarry Bay - Hong Kong	Tel: (852) 25 65 06 21 Fax: (852) 28 11 10 29
Hungrary	■ Merlin Gerin Vertesz XI Kerulet, Fehérvari ut 108 - 112 1116 Budapest	Tel: (36) 1 206 14 10 Fax: (36) 1 206 14 51
India	■ Schneider Electric India Pvt Ltd. D-27-South Extention Part II 110 049 New Dehli	Tel: (91) 116 25 76 58 Fax: (91) 116 25 80 80
Indonesia	■ Schneider Indonesia Ventura Building 7th Floor Jalan R.A. Kartini - Kav.26 Cilandak 12430 Jakarta	Tel: (62) 217 50 44 06 Fax: (62) 217 50 44 15
Iran	■ 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 Celbridge - Co. Kildare	Tel: +353(0) 1 627 40 30 Fax: +353(0) 1 627 08 59 www.schneiderelectric.ie
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