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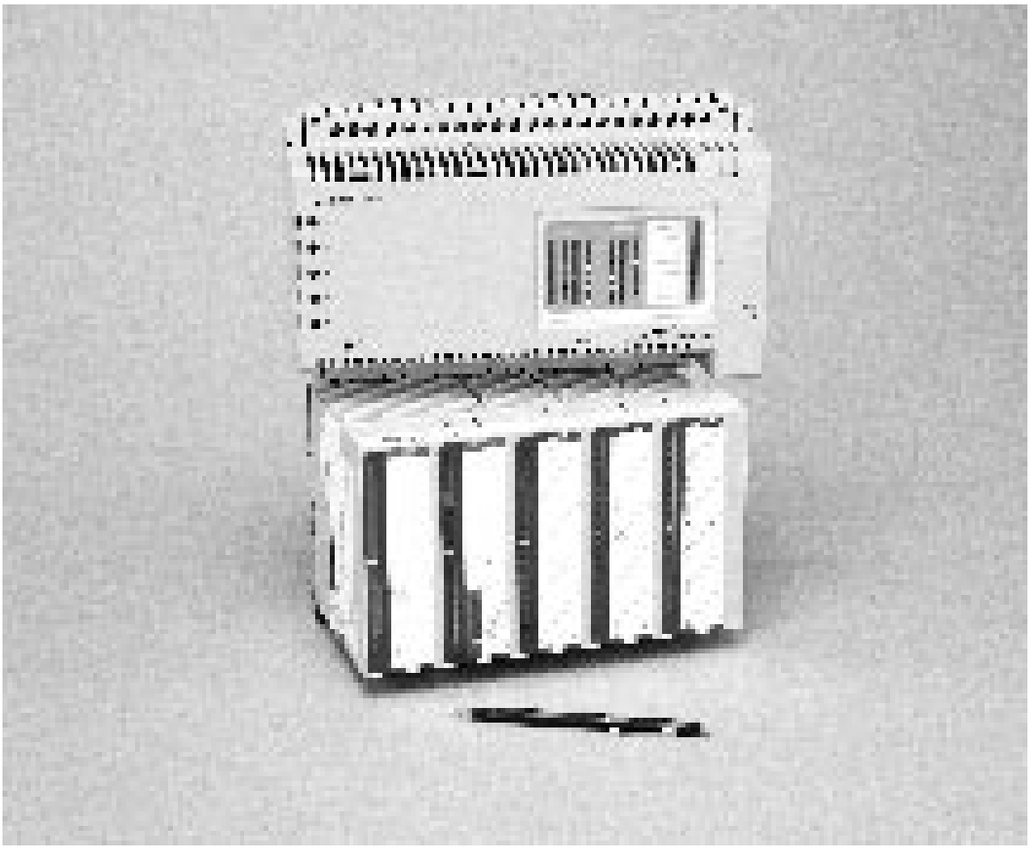
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2 Modicon Micro and 984/A120 Compact Programmable Logic Controllers



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Modicon Micro and 984/A120 Compact

The fixed I/O Modicon Micro, equipped with the Modicon 984 Family functionality, and the widely accepted, modular Modicon 984/A120 Compact are ideal for OEMs who need cost-effective control but want the superior technology, performance, and quality afforded by Modicon products.

The Micro and 984/A120 Compact are also the answer for users who need low-end controller compatibility to the larger systems in their plant or want a better alternative to unwanted OEM-supplied micro PLCs.

These controllers are the right solution for users and OEMs alike who want simple high-performance networking connectivity to either Human-Machine interfaces or computers in a CIM environment.

984 compatibility for easy application transport

Programs that are written for the Modicon Micro and 984/A120 Compact can be used in all 984 Family controllers, so retro-fitting, upward integration, and intergration to larger controllers is no longer a complicated and arduous task. Creating program libraries of proven control sequences increases engineering's productivity.

Same software across entire family

Because they are compatible with the Modicon 984 Family, the Modicon Micro and 984/A120 Compact do not necessitate program software and programming style changes in return for an automation solution in a small footprint.

Built-in Modbus, the de facto industry standard

All Modicon Micros and 984/A120 Compacts feature built-in Modbus communications interfaces. Standard on all 984 Family controllers, the Modbus network provides a cost-effective master-slave protocol for data transfer and programming. Modbus enables you to link Modicon programmable controllers with computer terminals or Modicon programming panels for supervisory control, data aquisition, and programming capabilities. You can link up to 247 nodes, communicating at data rates of up to 19,200 baud using media such as twisted pair cable, common carrier phone lines, or microwave transmission.

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Modicon Micro

With the simplicity of a self-contained system package, the compatibility of 984 Family functionality, and the performance of lightning quick throughput, the Modicon Micro offers the intelligent solution for your small machine control needs. In fact, the Modicon Micro brings together the best features of fixed I/O micro PLCs and larger modular PLCs.

- **All-in-one package**
  Power supply, CPU, memory, I/O and communications are contained in a single housing measuring 10 inches long by 6.25 inches high, by an amazing 3 inches deep that can be DIN rail or panel mounted.

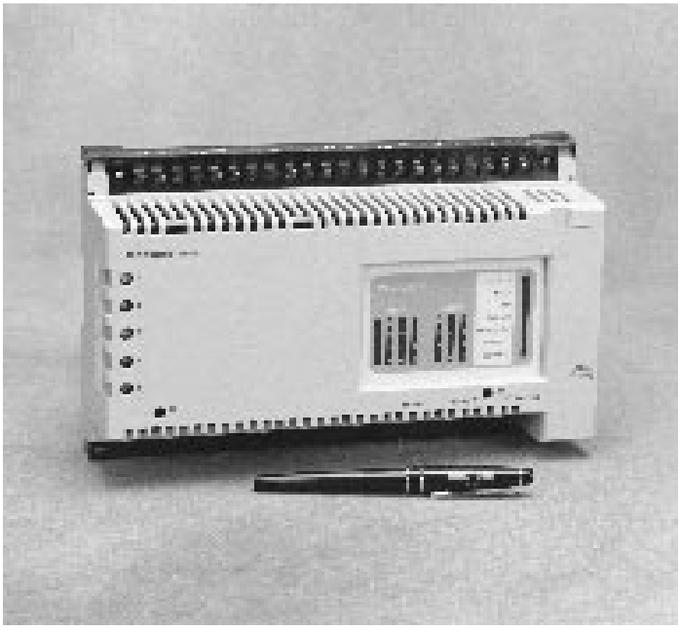
- **High speed throughput**
  High speed inputs, interrupt processing, and immediate updating of outputs can realize a throughput of less than 2 milliseconds. One of these inputs can be configured as a 5 kHz high speed counter.

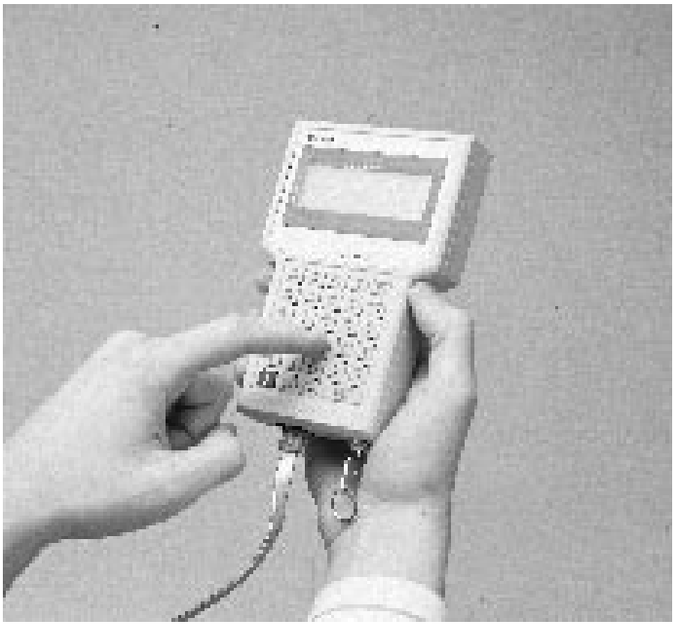
- **Plug-and-play communications**
  On-board serial communication ports for simple connection to computers, HMI, modems, printers, barcode readers, and instrumentation via ASCII or Modbus.

- **Choice of system expansion**
  Expanding your system capacity can be achieved in two ways; by simply linking up to 4 Micros, configured as "children", to one Micro "parent" over a single cable, high speed I/O Expansion Link, or by utilizing A120 Series I/O, to grow your system modularly in smaller increments with greater I/O options.

- **Built-in non-volatile memory**
  Programs stored in battery or capacitor-backed RAM can be backed up in safe and secure, built-in Flash-PROM.

- **Hand Held Programmer**
  Specifically designed as a low cost programming tool for the Modicon Micro, the HHP (VPU 192) can configure, program and monitor your application. For more information see VPU 192 Hand Held Programmer in Section 6 of this catalog.





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Modicon Micro Technical Specifications

Environmental	
Operating Temperature	0…60°C
Storage Temperature	-40…+85°C
Relative Humidity	0 - 95% noncondensing
Altitude	15,000 ft. (4500 m)
Shock	30 g for 11 ms, 3 pulses/axis for up to 18 pulses
Vibration	10...62 Hz @ .075 mm displacement
Amplitude	62...500 Hz @ 1 g
Duration	23 min @ 2 sweeps/axis on 3 mutually orthoganal axes at a rate of 1 octave/min
Dimensions	
Height	6.25 in (159 mm)
Width	10 in (254 mm)
Depth	3 in (76 mm)
Weight	3.2 lbs (1.45 kg)
Agency Approvals	UL, CSA, FM, CE

Modicon Micro Controllers

	Memory (Words)			Inputs/Outputs Maximum		Ports			Expansion	
Model (110-)	**Logic**	**Reg-isters**	**Scan Time**	**A120 Discrete I/O**	**Total Bits In/Out**	**Modbus /ASCII Ports**	**I/O Expansion Link**	**A120 Series I/O Expansion**	**Total 120 Racks**	**Total Micros on Expansion Link**
CPU 311 00 CPU 311 01 CPU 311 02 CPU 311 03 CPU 411 00 CPU 411 01 CPU 411 02 CPU 411 03	1K	400	4.25 ms/K	None	512/512	1	1 port	No	None	5
CPU 512 00 CPU 512 01 CPU 512 02 CPU 512 03 CPU 612 00 CPU 612 03 CPU 612 04	2K 8K	1820 1920	2.5 ms/K	256 any mix	512/512	2 2*	1 port	Up to 15 modules	3 subracks added to Micro	5 in addition to A120 I/O expandability of the Parent CPU

* Comm port 2 suppports XMIT Block, Modbus Master

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Four Levels of Functionality with the Modicon Micro

1. In the first level is the CPU 311 with the following feature set:

- 1 k words user logic
- 400 words data
- 16 discrete inputs
- 4.25 - 5 ms per K logic scan
- Modbus/ASCII port
- 12 discrete outputs
- Basic 984 instruction set
- 4 models
- High speed I/O Expansion port

Model	Power Supply	Discrete Inputs (16)	Discrete Outputs (12)
110 CPU 311 00	115/230 Vac (24 Vdc output for all DC inputs)	24 Vdc Sink or Source	Relay
110 CPU 311 01	115 Vac	115 Vac	8 Triac/4 Relay
110 CPU 311 02	230 Vac	230 Vac	8 Triac/4 Relay
110 CPU 311 03	24 Vdc	24 Vdc Sink or Source	24 Vdc Source

2. In the second level is the CPU 411 with the folllowing feature set:

- All features found on the CPU 311
- Time of day clock
- 2-3 ms throughput with interrupt processing (depending on interrupt program)
- 2 high speed DC inputs
- 4 models

Model	Power Supply	Discrete Inputs (16)	Discrete Outputs (12)
110 CPU 411 00	115/230 Vac (24 Vdc output for all DC inputs)	24 Vdc Sink or Source	Relay
110 CPU 411 01	115 Vac (24 Vdc output for all DC inputs)	115 Vac	8 Triac/4 Relay
110 CPU 411 02	230 Vac (24 Vdc output for all DC inputs)	230 Vac	8 Triac/4 Relay
110 CPU 411 03	24 Vdc	24 Vdc Sink or Source	24 Vdc Source

3. In the third level is the CPU 512 with the following feature set:

- 2 K words user logic
- 1920 words data
- 16 discrete inputs
- 12 discrete outputs
- 2.5 ms per K logic scan
- 120 Series I/O bus connector
- 3 high speed DC inputs (2 on AC versions)
- Enhanced 984 instruction set (including PID II and floating point math)
- 2 Modbus/ASCII ports
- 1-15 ms throughput with interrupt processing (depending on size of interrupt program)
- Time of day clock
- 4 Models
- High speed I/O Expansion port

Model	Power Supply	Discrete Inputs (16)	Discrete Outputs (12)
110 CPU 512 00	24 Vdc	24 Vdc Sink or Source	Relay
110 CPU 512 01	115 Vac (24 Vdc output for all DC inputs)	115 Vac	8 Triac/4 Relay
110 CPU 512 02	230 Vac (24 Vdc output for all DC inputs)	230 Vac	8 Triac/4 Relay
110 CPU 512 03	24 Vdc	24 Vdc Sink or Source	24 Vdc Source

4. In the fourth level is the CPU 612 with the following feature set:

- All features found on the CPU 512
- 4 analog inputs - 2 analog outputs
- 2 models

Model	Power Supply	Discrete Inputs (16)	Discrete Outputs (12)	Analog Inputs (4)	Analog Outputs (2)
110 CPU 612 00	24 Vdc	24 Vdc Sink or Source	Relay	± 10V 16 bit 4-20 mA 14 bit	0-10V, 4-20mA 12 bit
110 CPU 612 03	24 Vdc	24 Vdc Sink or Source	24 Vdc Source	± 10V 16 bit 4-20 mA 14 bit	0-10V, 4-20mA 12 bit

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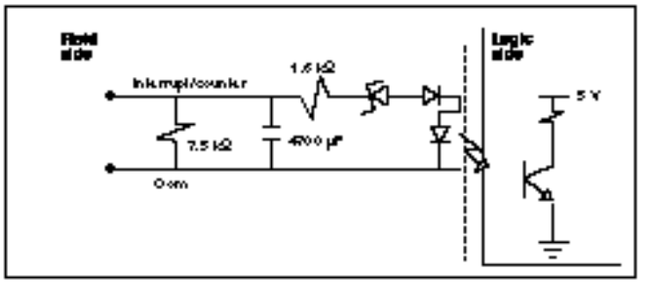
User-selectable High-speed Counter/Interrupt Inputs

Electrical Characteristics

ON Level	15 ... 30 Vdc
OFF Level	0 ... 5 Vdc
Minimum ON State Current	6 mA @ 24 Vdc
Maximum OFF Current	0.7 mA @ 5 V
Maximum Input Voltage	30 Vdc
Input Impedance	1.95kΩ when on @ 24 Vdc

Circuit Characteristics

Simplified Schematic



Isolation Method	Optocoupler
Channel-to-Bus	500 Vdc
Group-to-Group	500 Vdc
Addressing	1 register in
Maximum Cable Length	50 m
Response Time	
OFF to ON	10…20 µs
ON to OFF	10…20 µs
Required Cable Type:	Shielded twisted pair, for noise immunity
Wire size	20 AWG
Up-counter Positive Edge Trigger	
Maximum Counter Rate	5 kHz
Pulse Duration	> 100 µs
Interrupt Voltage Level	To assure reliable system operation, interrupt voltage must be brought from OFF to ON and maintained ON for 350 µs minimum. Any pulse duration < 20 µs is filtered.

24 Vdc Input

Electrical Characteristics for Source (True High) Inputs

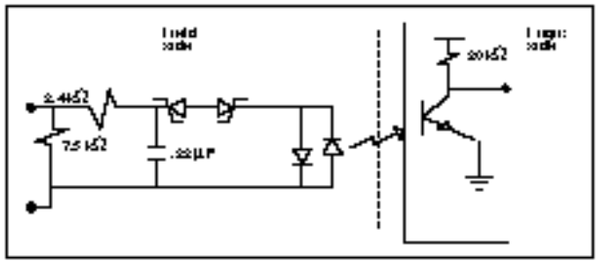
ON Level	15…30 Vdc, source impedance <1.5 kΩ
OFF Level	0…5 Vdc
Minimum ON State Current	3.4 mA @ 15 Vdc
OFF Current	0.6 mA @ 5 Vdc
Maximum Input Voltage	30 Vdc
Input Impedance	3.0 kΩ when on @ 24 Vdc

Electrical Characteristics for Sink (True Low) Inputs

ON Level	Source G to (Source Voltage - 15 V)
OFF Level	Source Voltage to (Source Voltage - 5V)
Minimum ON State Current	3.4 mA @ 24 Vdc
OFF Current	0.7mA @ 24 Vdc
Maximum Input Voltage	30 Vdc
Input Impedance	1.8 kΩ

Circuit Characteristics

Simplified Schematic



Isolation	
Method	Optocoupler
Channel-to-Bus	1780 Vac, 2500 Vdc
Group-to-Group	1780 Vac, 2500 Vdc
Response time	
ON to OFF	2 ms
OFF to ON	2 ms
Maximum Wire Length	100 m
Wire Size	14 AWG

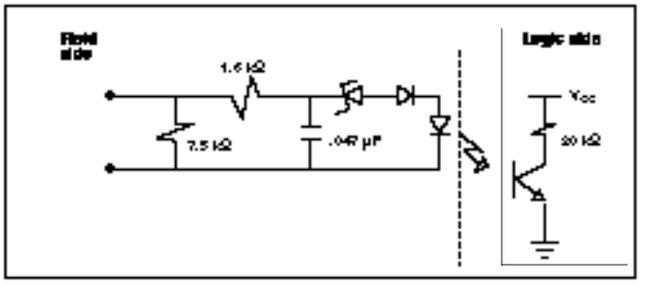
Dedicated High-speed Interrupt Inputs

Electrical Characteristics

ON Level	15 ... 30 Vdc
OFF Level	0 ... 5 Vdc
Minimum ON State Current	6 mA @ 15 Vdc
Maximum OFF Current	0.3 mA @ 5 Vdc
Maximum Input Voltage	30 Vdc
Input Impedance	1.95 kΩ when on @ 24 Vdc

Circuit Characteristics

Simplified Schematic



Isolation Method	Optocoupler
Channel-to-Bus	500 Vdc
Maximum Cable Length	50 m
Required Cable Type	Shielded twisted pair, for noise immunity
Wire Size	20 AWG
Interrupt Voltage Level	To assure reliable system operation, interrupt voltage must be brought from OFF to ON and maintained ON for 350 µs minimum-any pulse duration < 50 us is filtered

24 Vdc (FET) Outputs

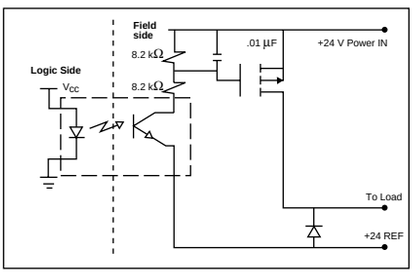
Electrical Characteristics

Working Voltage Range	20…30 Vdc
Continuous	32 V for 10 s
Maximum	56 V for 1.5 ms
ON Current	0.5 A / channel 2 A / group 6 A total
Surge Current	5 A for .5 ms @ 6 pulses/min.
Minimum Load Current	10 mA
Maximum OFF Leakage Current	1 mA @ 30 V
ON State Voltage Drop	0.4 V @ .5 A
Maximum Switching Rate	4 Hz inductive
Recommended External Fuse Size	User-installed 1.5 A fuse in the field wiring between the output terminal screw and the load.
Total Current /Group	2 A @ 60°C

Caution: Internal overload protection is not provided for these outputs. External fusing is required.

Circuit Characteristics

Simplified Schematic



Isolation:	
Channel-to-Bus	1780 Vac, 2500 Vdc
Group-to-Group	500 Vac
Response times	
ON to OFF	1 ms
OFF to ON	1 ms
Maximum Wire Length	100 m
Wire Size	14 AWG

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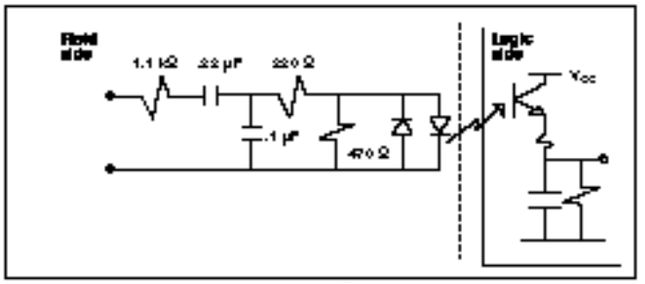
115 Vac Inputs

Electrical Characteristics

ON Level	79…132 Vac with source impedance of 6.2 kΩ @ 60 Hz
OFF Level	0…20 Vac
Min. ON State Voltage	79 Vac with source impedance <62 kΩ @ 60 Hz
Max. Input Voltage	132 V
Max. OFF State Input Current	1.7 mA @ 20 V
Max. ON State Input Current	6.5 mA @ 79 V
Input Impedance	12 kΩ @ 60 Hz

Circuit Characteristics

Simplified Schematic



Isolation Method	Optocoupler
Channel-to-Bus	1780 Vac, 2 kV DC
Group-to-Group	1780 Vac, 2 kV DC
Addressing	16 discrete bits in 1 register in
Max. Wire Length	100 m
Wire Size	20 AWG
Response Time	
ON to OFF	25…30 ms
OFF to ON	25…30 ms

Relay Outputs

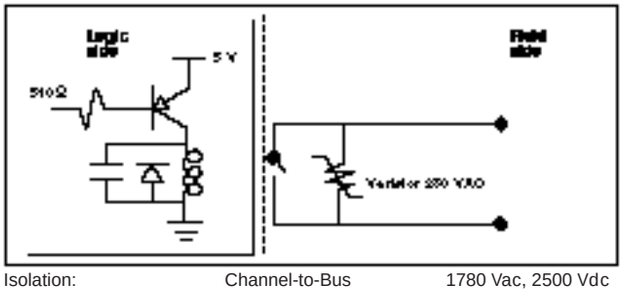
Electrical Characteristics

Working Voltage Range	24…250 Vac, 24…30 Vdc
Max. Load Current	2 A/channel
Surge Current	20 A for 1 cycle
VA Rating	500 VA
Min. Load Current	20 mA
Max. Switching Rate	5 Hz
Required External Fuse Size	User-installed 3 A fuse in the field wiring between the output terminal screw and the load

Caution: Internal overload protection is not provided for these outputs. External fusing is required.

Circuit Characteristics

Simplified Schematic



Isolation:	Channel-to-Bus	1780 Vac, 2500 Vdc
	Group-to-Group	1780 Vac, 2500 Vdc
Operating Cycles:	Mechanical	20,000,000
	Electrical	100,000
Response Times:	ON to OFF	10 ms
	OFF to ON	10 ms
Max. Wire Length:	100 m	
Wire Size:	One Wire	14 AWG
	Two Wires	20 AWG

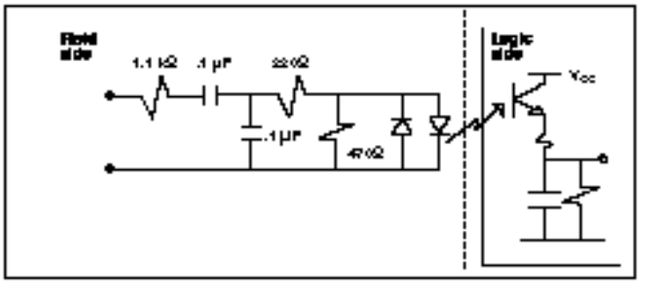
230 Vac Inputs

Electrical Characteristics

ON Level	164…253 Vac with source impedance of 6.2 kΩ
OFF Level	0…40 Vac
ON State Current	10 mA @ 230 Vac, 60 Hz
OFF Current	1.7 mA maximum
Max. Input Voltage	253 V
Input Impedance	22 kΩ @ 50 Hz

Circuit Characteristics

Simplified Schematic



Isolation Method	Optocoupler
Channel-to-Bus	1780 Vac, 2500 Vdc
Group-to-Group	1780 Vac, 2500 Vdc
Max. Wire Length	100 m
Wire Size	14 AWG
Response Time	
ON to OFF	25…30 ms
OFF to ON	25…30 ms

Triac Outputs

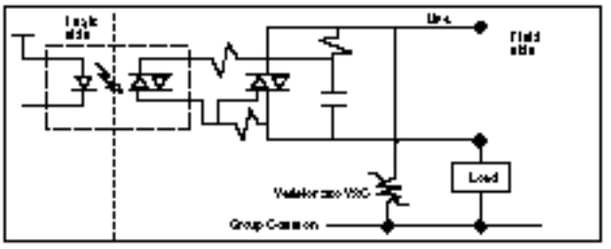
Electrical Characteristics

Working Voltage	
Continuous Range	24…250 Vac
Maximum	500 Vac for 1 cycle
Frequency of Operation	47…63 Hz
Max. Load Current	0.5 A/channel
Surge Current	5 A for 1 cycle
Min. Load Current	50 mA
Max. OFF State Leakage Current	1.5 mA
ON State Voltage Drop	1.5 V
Max. Switching Rate	20 Hz
Max. Rate of Applied DV/DT	30 V/ms
Required External Fuse Size:	User-installed 0.7 A fuse in the field wiring between the output terminal screw and the load

Caution: Internal overload protection is not provided for these outputs. External fusing is required.

Circuit Characteristics

Simplified Schematic



Isolation:	Method	Optocoupler
	Channel-to-Bus	1780 Vac, 2500 Vdc
	Group-to-Group	1780 Vac, 2500 Vdc
Response times:	ON to OFF	8 ms
	OFF to ON	8 ms
Max. wire length:	100 m	
Wire size:	One wire	14 AWG
	Two wires	20 AWG

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Analog Inputs
Technical Specifications and Wiring Diagrams

Input Points

Number	4
Types	Current inputs, 20 mA full scale Voltage inputs, 10 V full scale

Group Isolation

Input-to-Bus	500 Vdc
Channel-to-Channel	25 Vdc

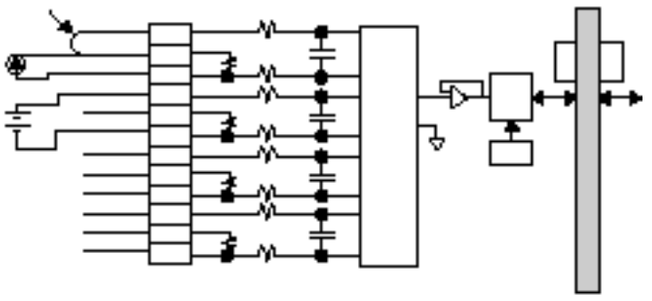
Range

Current	4…20 mA
Voltage	±10 V
Input Impedance	
Current Mode	250 Ω
Voltage Mode	10 mΩ
Max. Differential Voltage	50 V
Over-current Protection	25 mA maximum (in current mode)

Conversion

Type of Conversion	Sigma Delta
Resolution	16 bits for ±10 V inputs 15 bits for 0…10 V inputs 13-14 bits for 1…5 V inputs (4 ... 20 mA inputs)
Accuracy (% of Full Scale)	1% over temperature for voltage inputs (does not include 250Ω error)
Update Time	51 ms/channel
Differential Nonlinearity	Monotonic conversion

Circuit Characteristics
Simplified Schematic



Analog Outputs
Technical Specifications and Wiring Diagrams

Output points

Number	2
Types	Current outputs Voltage outputs

Group isolation

Bus-to-Output	500 Vdc

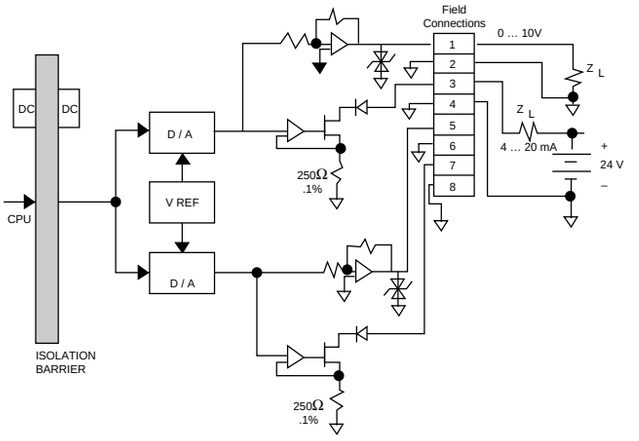
Range

Current	4…20 mA
Loop Supply Voltage	
Max.	30 V
Min.	12 V
Voltage	0…10 V
Output Loads	10 mA max. 0.1 µF max.

Conversion

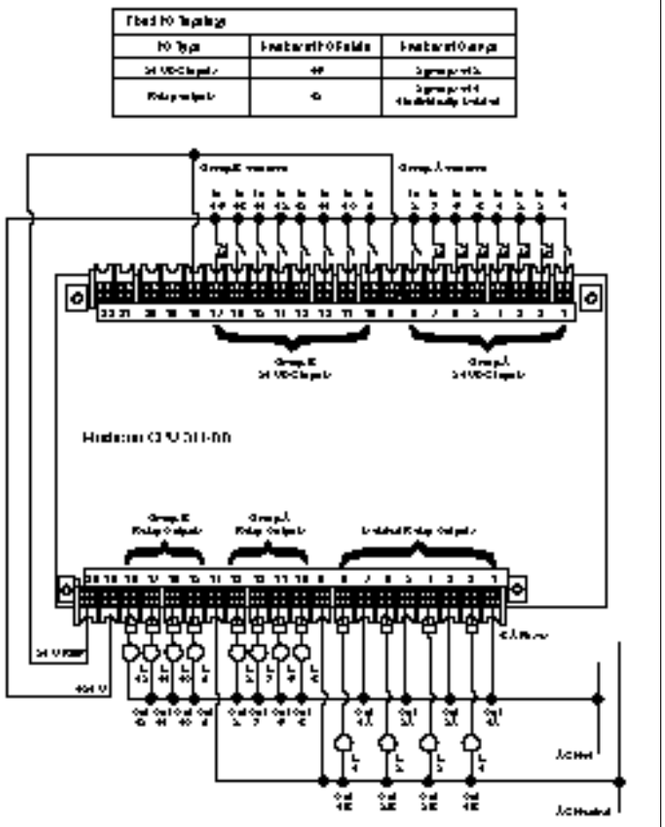
Resolution	12 bits
Accuracy	1% over temperature for voltage outputs
Linearity @ 25°C	±.05%
Differential Nonlinearity	Monotonic
Output Errors Between	0...60°C
Linearity	±.05%
Differential Nonlinearity	Monotonic
Update Time	10 ms/channel

Circuit Characteristics
Simplified Schematic

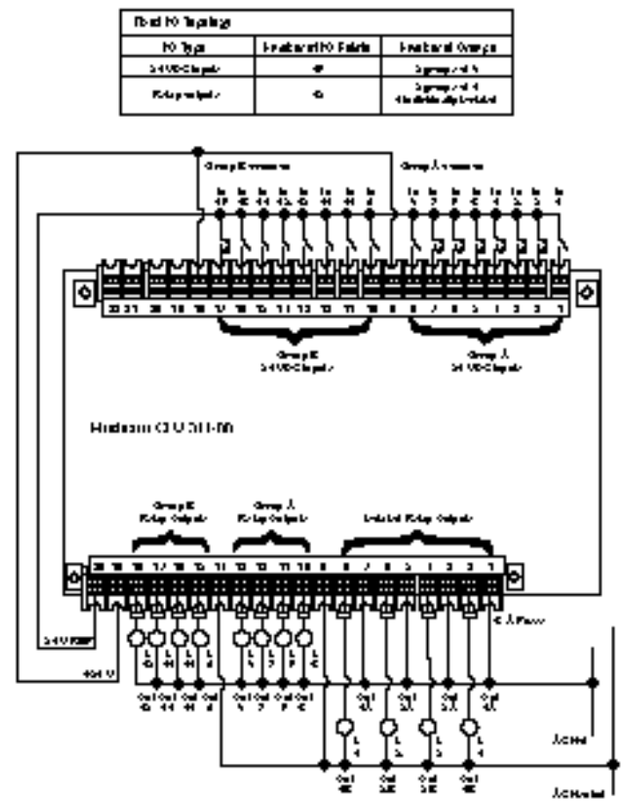


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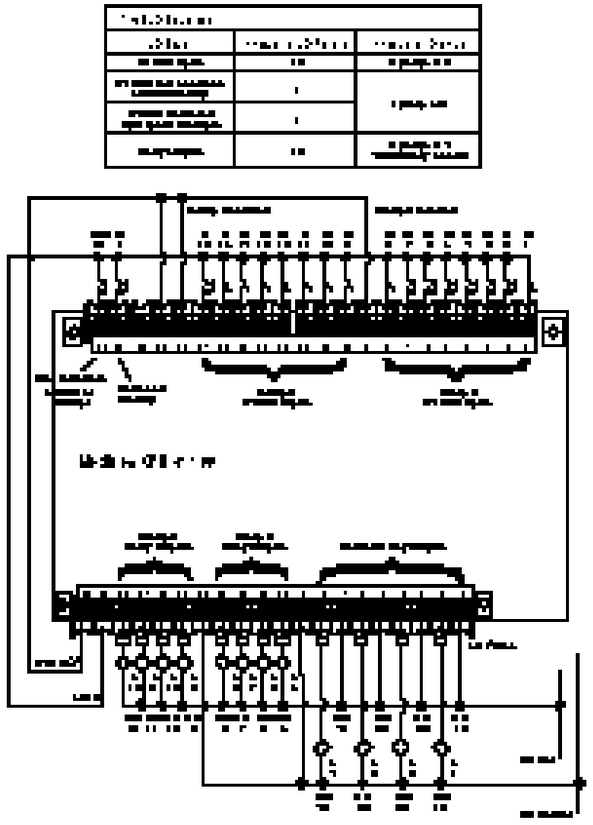
CPU 311-00 Wiring Diagram with Source-configured Inputs (under 115/230 Vac Power)



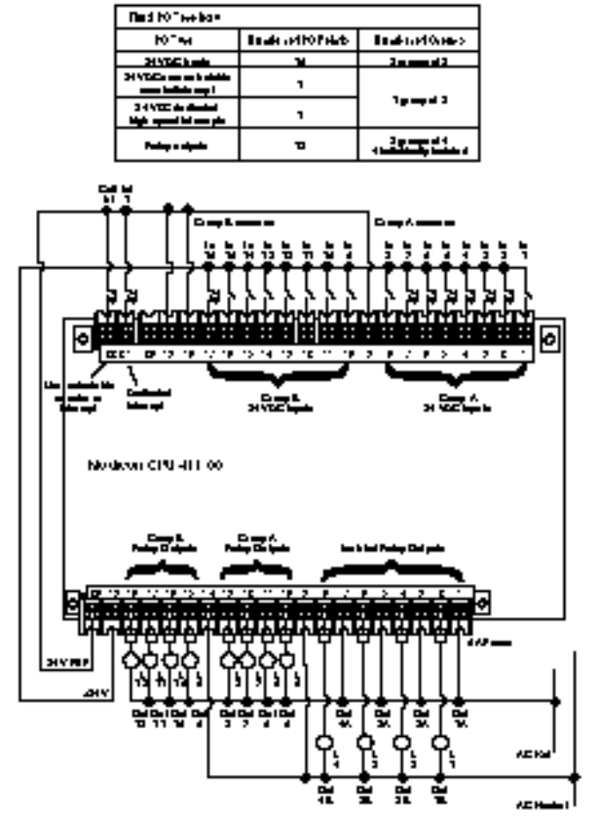
CPU 311-00 Wiring Diagram with Sink-configured Inputs (under 115/230 Vac Power)



CPU 411-00 Wiring Diagram with Source-configured Inputs (under 115/230 Vac Power)

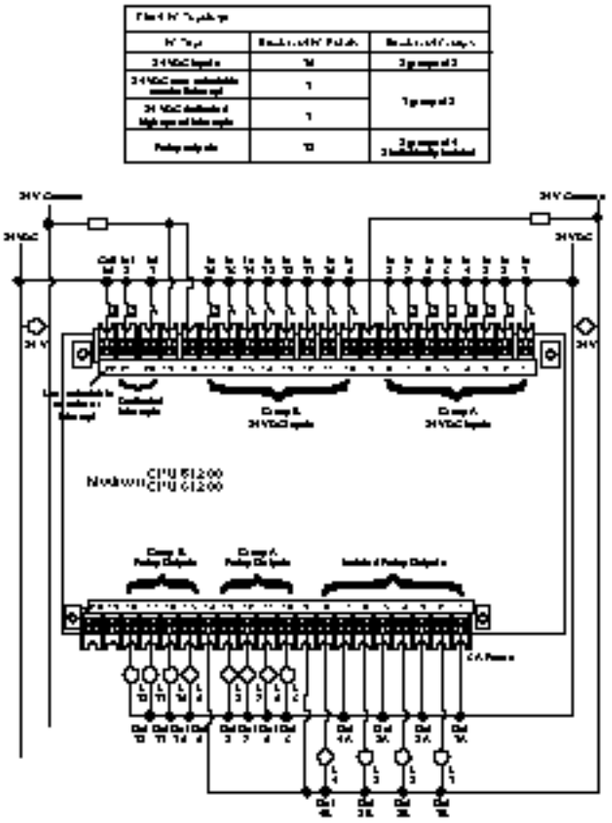


CPU 411-00 Wiring Diagram with Sink-configured Inputs (under 115/230 Vac Power)

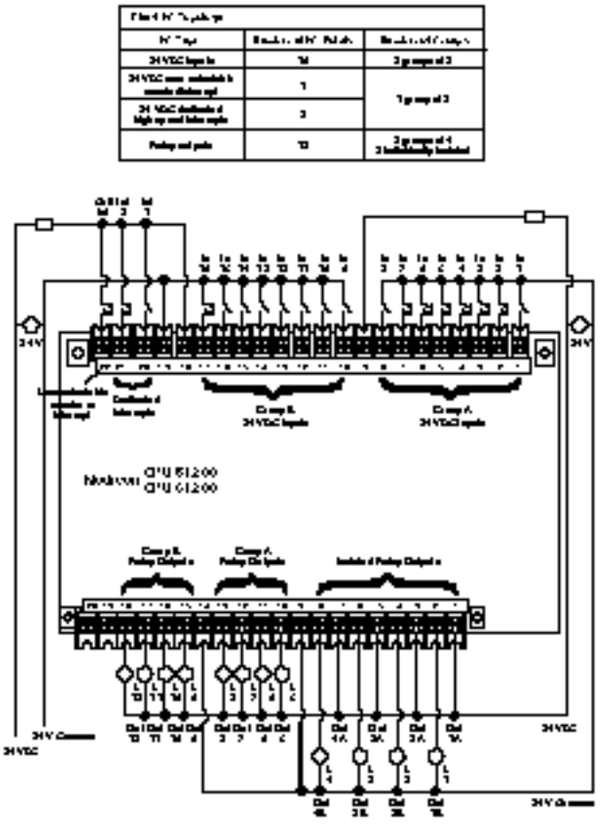


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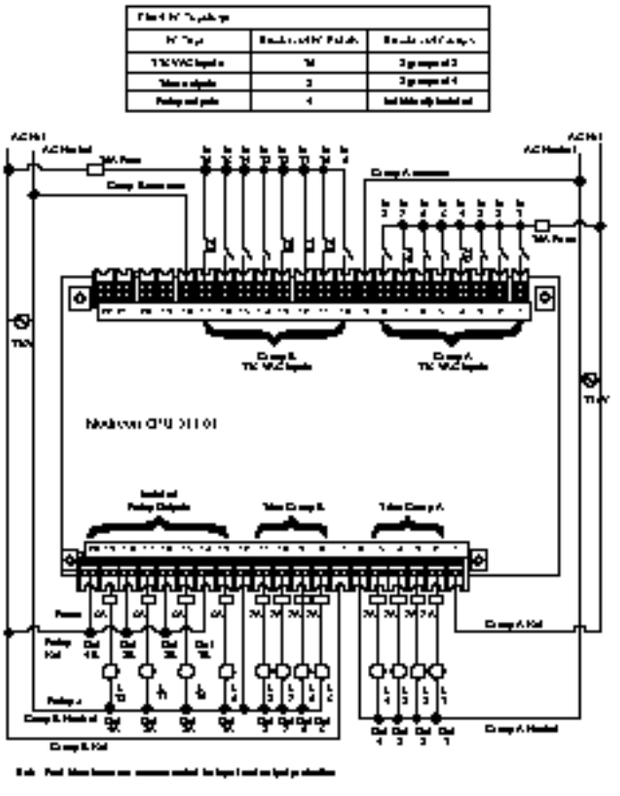
CPU 512-00/CPU 612-00 Field Wiring with Source-configured Inputs (under 24 Vdc power)



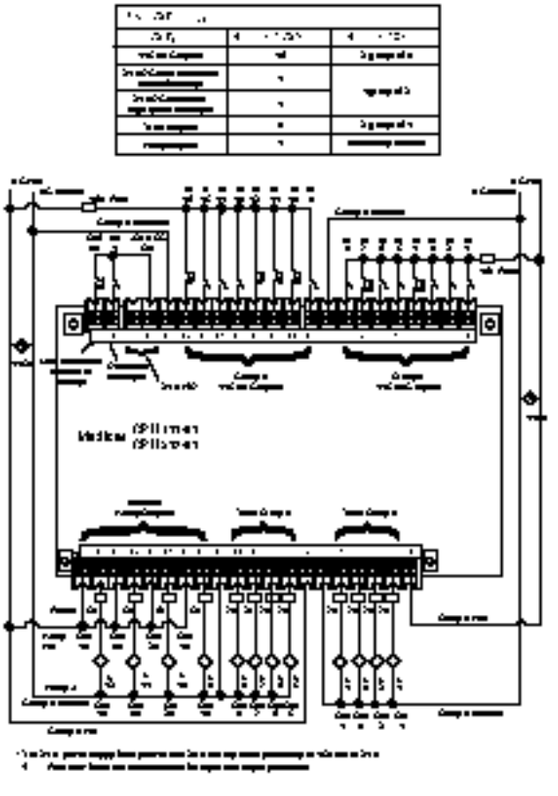
CPU 512-00/CPU 612-00/CPU 612 04 Field Wiring with Sink-configured Inputs (under 24 Vdc power)



CPU 311-01 Field Wiring with Source-configured Inputs (under 115 Vac power)

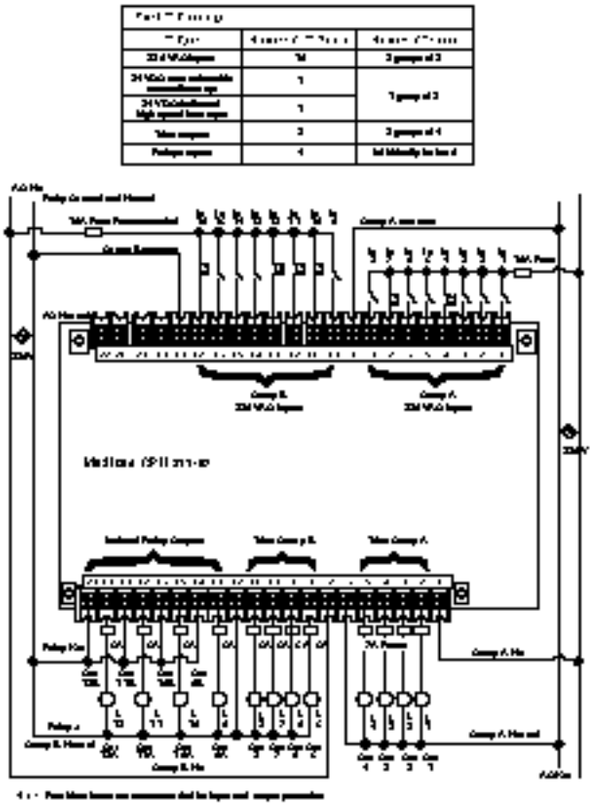


CPU 411-01/CPU 512-01 Field Wiring

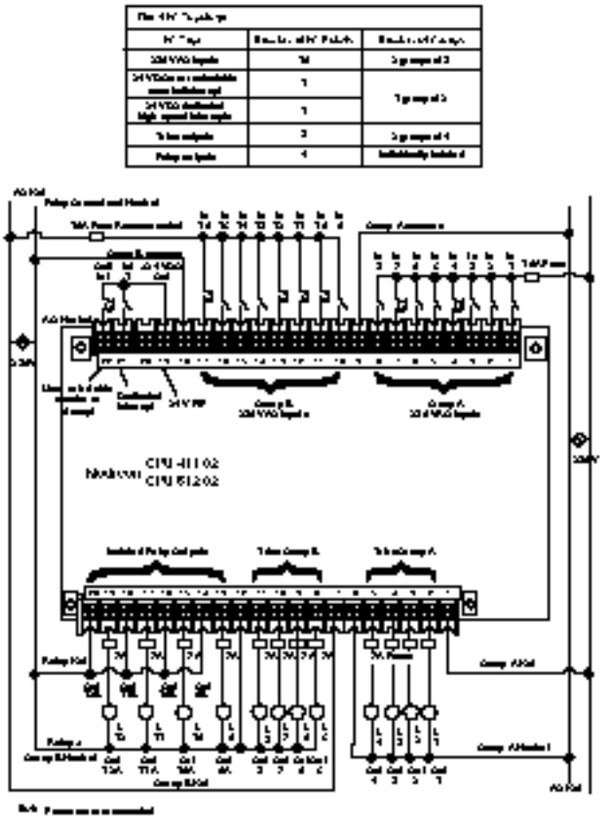


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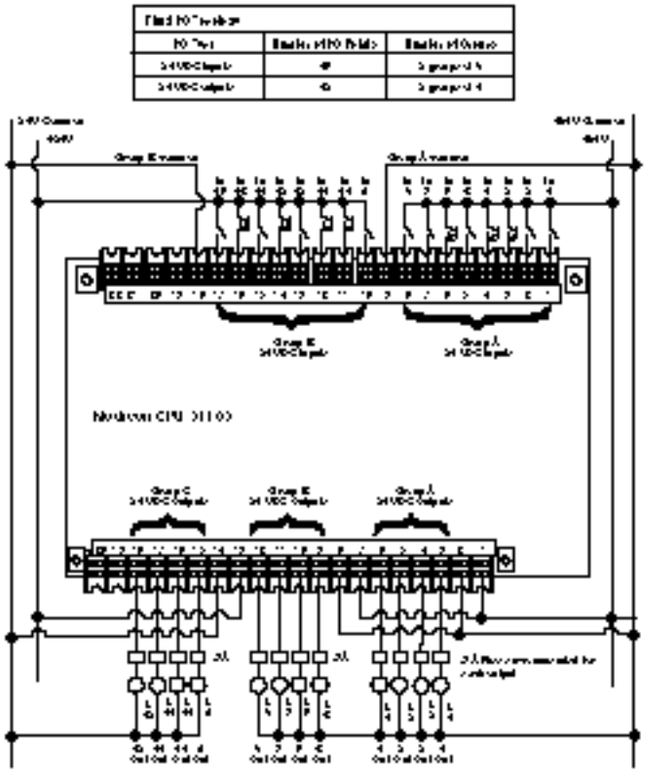
CPU 311-02 Wiring Diagram (under 230 Vac power)



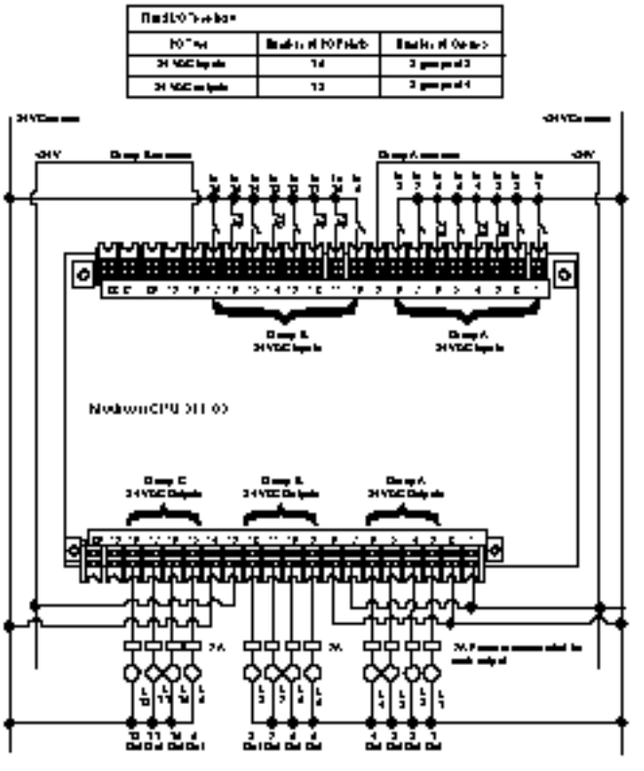
CPU 411-02/CPU 512-02 Wiring Diagram (under 230 Vac power)



CPU 311-03 Wiring Diagram with Source-configured Inputs (under 24 Vdc power)

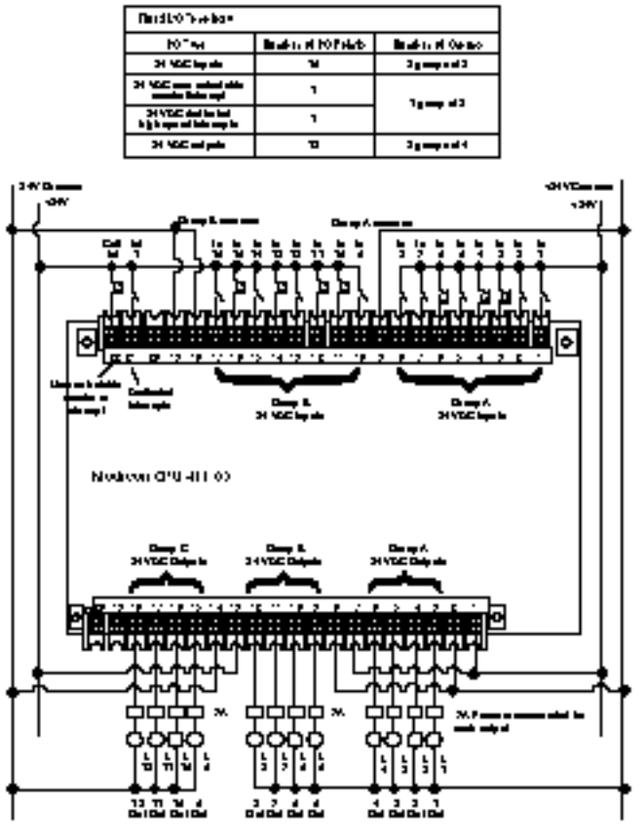


CPU 311-03 Wiring Diagram with Sink-configured Inputs (under 24 Vdc power)

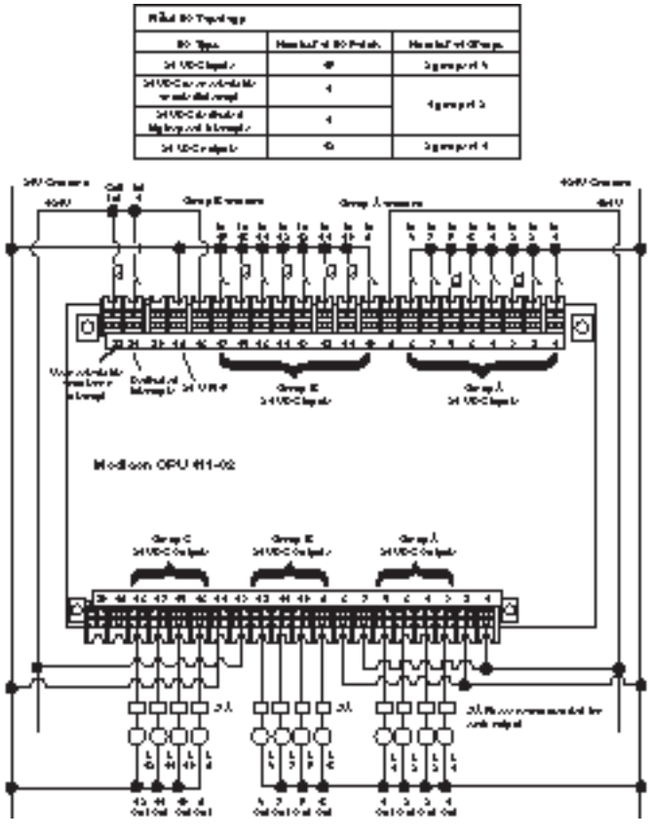


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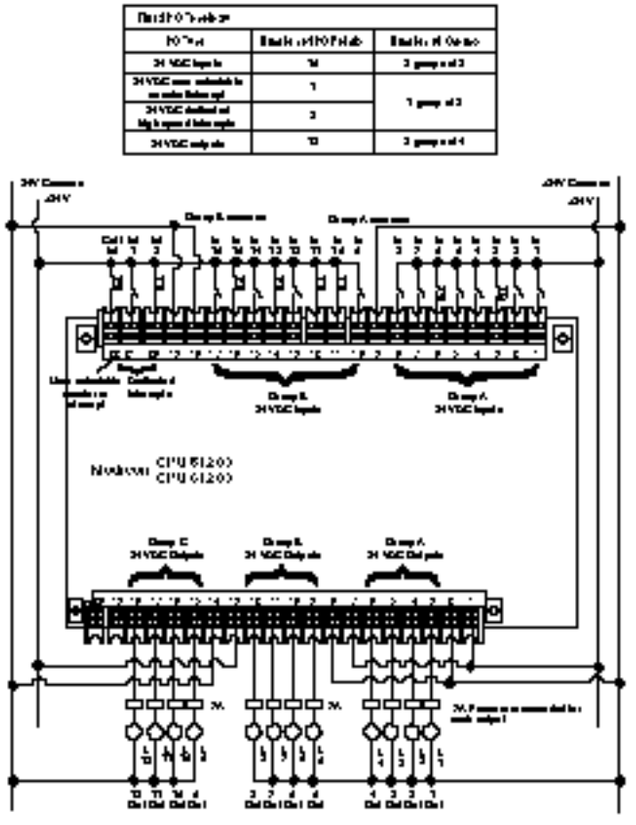
CPU 411-03 Wiring Diagram with Source-configured Inputs (under 24 Vdc Power)



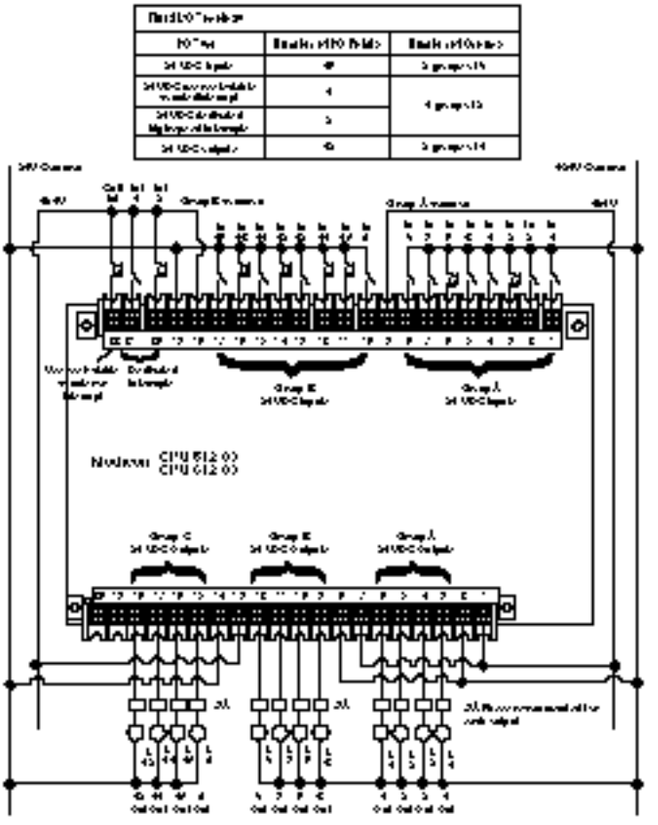
CPU 411-03 Wiring Diagram with Sink-configured Inputs (under 24 Vdc Power)



CPU 512-03/CPU 612-03 Wiring Diagram with Source-configured Inputs (under 24 Vdc Power)

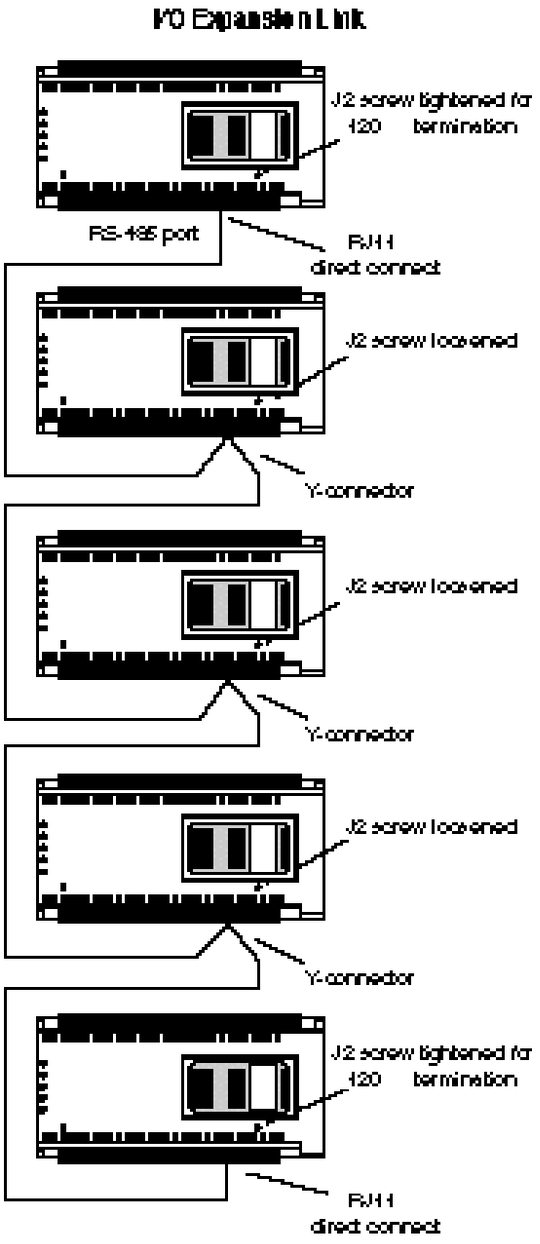


CPU 512-03/CPU 612-03 Wiring Diagram with Sink-configured Inputs (under 24 Vdc Power)

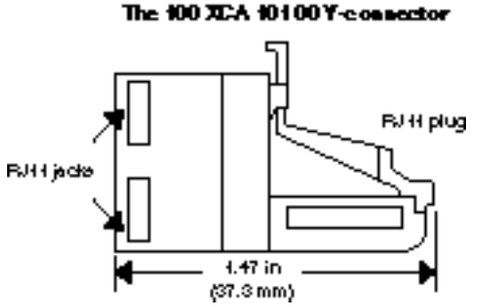


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Modicon Micro I/O Expansion Link



Up to five Modicon Micros can be interconnected by the high speed I/O Expansion Link. The link contains one Micro configured as a "parent" PLC and one to four Micros configured as "child" PLCs. The parent and last child on the link are terminated by an internal resistor while the middle children are daisy-chained using a Y-connector. The link uses standard, yet highly secure and noise resistant, foil-shielded, flat telephone cables with male RJ11 connectors on each end.



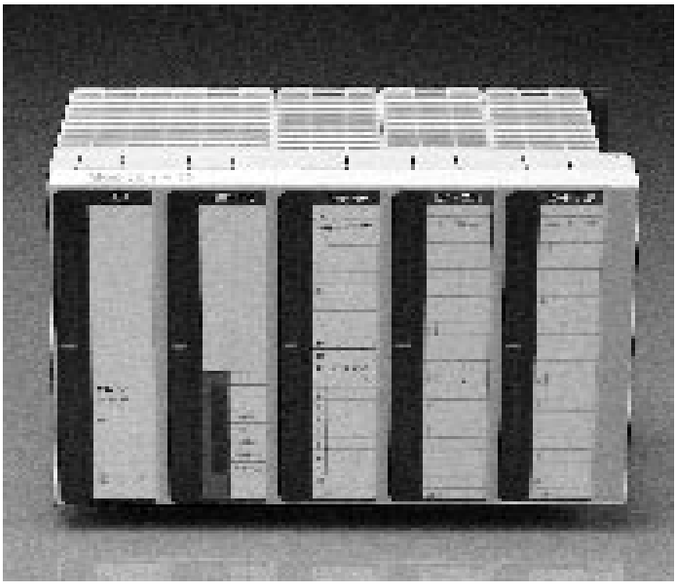
I/O Expansion Link Characteristics	
Number of PLCs	2-5
Physical Comm Port	RS-485
Cable Type	Six position line long body
Connector Type on the Cable	RJ11 male on both ends
Network Data Rate	125 kbyte (+)
Length of Network	500 m maximum 61 cm minimum

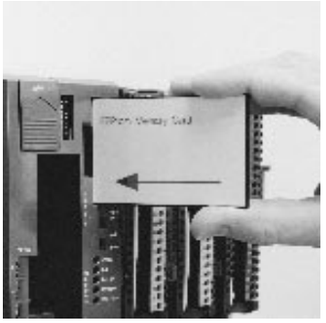
I/O Expansion Link Cables	
Length	**Part Number**
61 cm (24 In.)	110 XCA 171 01
3 M (10 ft.)	110 XCA 171 02
6 m (20 ft.)	110 XCA 171 03

Additional information can be found in 890 USE 145 00 Modicon Micro PLC H/W Users guide or 890 USE 146 00 Modicon Micro Controllers Ladder Logic Users guide

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984/A120 Compact





Modicon 984/A120 Compact PLCs combine 984 Family performance with special features to meet the requirements of micro to small control applications.

A modular PLC for OEMs and End Users alike

The 984/A120 Compact PLCs offer the performance of the larger 984 slot and chassis-mount PLCs in a micro size package. The Modicon 984/A120 Compact provides powerful, versatile, and highly compatible solutions in the micro to small application ranges.

The Modicon 984/A120 Compact has the versatility of a fully modular construction, unequalled high speed peer-to-peer networking, and the power of 984 Family ladder logic functionality along with optional C language programming for custom OEM solutions that easily integrate into overall plant automation hierarchies. The 984/A120 Compact enables you to solve difficult control problems better and more efficiently than any other small, modular PLC available.

The performance of a large PLC

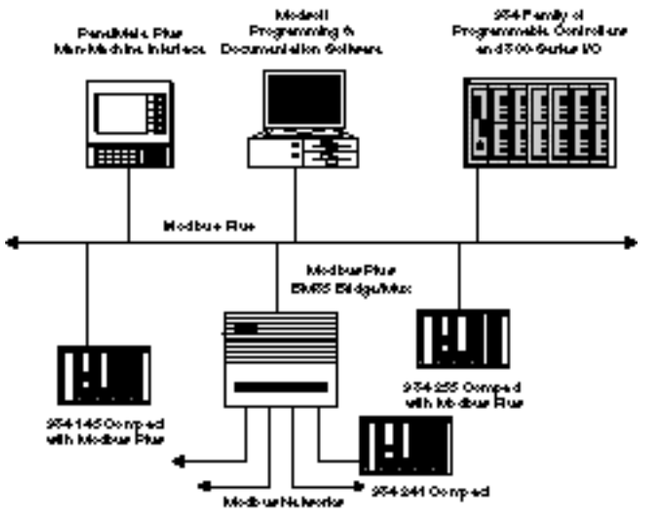
The Modicon 984/A120 Compact Family puts the power and performance of the larger 984 PLCs into a small, modular package. Although compact in size, they pack in many features of traditional medium and large class controllers:

- Up to 16k words of user logic
- Up to 24k words of data storage
- EEPROM memory option for non-volatile program storage
- Over 70 software instructions
- Standard Modbus communication interface
- Modbus Plus peer-to-peer communication interface

The 984/A120 Compact is available in nine models, supporting 1.5k to 16k words of program memory. All memory sizes are supported by battery-backed RAM. An EEPROM card is available for non-volatile memory backup or program portability. This card is removable from the front of the CPU. It is useful for non-volatile memory backup, program archiving, or for easy program exchange between PLCs.

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Representative Modicon Control System Solution



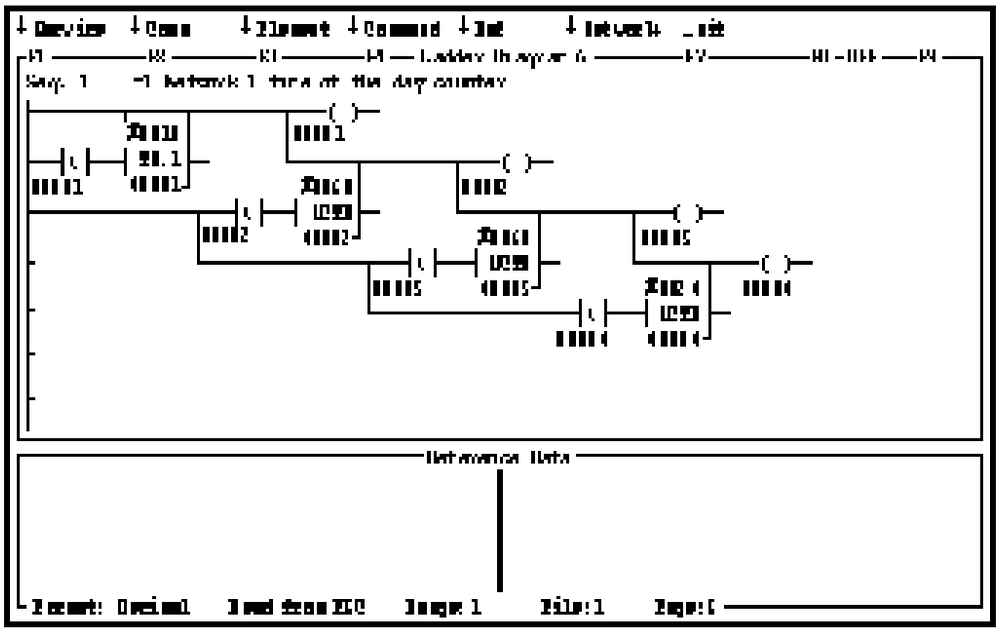
Like all Modicon 984 PLCs, the 984/A120 Compact user programs are compatible with all other 984 and Quantum controllers. The 984/A120 Compact Family shares the identical base instruction set as all 984s, permitting easy program integration to any other 984. Also, the 984/A120 Compact offers enhanced functions, including floating point math, trigonometric functions, PID, and subroutines. Over 70 instructions are available in this micro-sized controller.

The 984/A120 Compact also provides built-in networking capability. Every 984/A120 Compact includes a built-in Modbus interface, providing a cost-effective method for networking controllers and connecting to programming panels, operator interfaces, and host computers. The CPU-131, CPU-141, CPU-241 and CPU-251 each have a second Modbus port enabling added connectivity to MMI and/or modem communications while maintaining access for a programmer or second communications device. The CPU-145, 245, and 255 provide 1 standard Modbus port and 1 built-in Modbus Plus interface to provide direct access to a high performance peer-to-peer communication network for control interlocking and high-speed data acquisition applications.

The following manuals are recommended for use with Compact controllers and A120 I/O:

890 USE 108 00	984/A120 Compact Programmable Controllers User Guide
890 USE 109 00	A120 Series I/O Modules User Guide
GM-A120-LDR	Modicon Compact Ladder Logic Manual

984/A120 Compacts Use Standard 984 Family Modsoft Programming Software



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984/A120 Technical Specifications

Power Requirements

Integral Power Supply	
Input	20 - 30 Vdc @ 1A Full Load
Output	5 Vdc @ 2.5A to the I/O Bus
P120 AC Power Supply Module	
Input	95 - 270 Vac, 47/63 Hz
Output	24 Vdc @ 1A
P120 DC Power Supply Module	
Input	102…150 Vdc
Output	24 Vdc @ 1.5A

Environmental

Temperature, Operating	0 - 60°C
Humidity, Operating	0 - 95% non-condensing
Temperature, Storage	– 40 - +85°C, IEC 68-2-14
Humidity, Storage	0 - 95% non-condensing
Altitude	15,000 feet (4500 m)
Shock	30 G's, 11 msec, 3 pulses/axis
Vibration	10 - 57 Hz: 0.075 mm DA 57 - 150 Hz: 1 g

Dimensions

Height	5.6 in (142 mm)
Width	8.4 in (213 mm)
Depth	5 in (127 mm)
Weight	1.0-1.2 lb (455-540g)
Agency Approvals	UL, CSA, FM, CE

Specially designed for space efficiency

Although the 984/A120 Compact offers the performance of a larger PLC, it is specifically designed for the micro-to-small application. Small in size, its packaging includes the CPU, built-in power supply, and up to 256 I/O in less than 1.5 square feet of panel space. With a depth of less than 5.5 inches, it will fit comfortably in an 8 inch deep panel enclosure.

The primary subrack houses the controller with built-in 24 Vdc power supply and an additional three slots for I/O modules. If required, an optional 120 Vac power converter can occupy one slot. Three additional expansion subracks can be connected, providing up to 18 slots for I/O modules. Subracks can be mounted side-by-side, with no additional hardware. Or they can be mounted in two tiers by using a single bus extension cable. DIN rail mounting makes for a fast, secure installation.

A full complement of discrete I/O modules is available in densities of 4, 8, or 16 points. Analog I/O, high speed counter/position detection modules, and single axis servo motion control modules are also available.

984/A120 Compact Controllers

	Memory (Words)					Ports			Input / Output Maximum			
			Extended		Scan	Modbus	Modbus+	I/O	Discrete	Total Bits**	Total	# Local
Controller Model	**Logic***	**Registers**	**(6X)**	**Total**	**Time**	**Port**	**Port**	**Series**	**I/O**	**I/O**	**Drops**	**Racks**
PC-A984/A120 (CPU 120)	1.5k	1920	—	3.5k	5 ms/k	1	—	A120	256 any mix	512/512	1	4
PC-A984-130 (CPU 130)	4k	1920	—	6k	5 ms/k	1	—	A120	256 any mix	512/512	1	4
PC-A984-131 (CPU 131)	4k	1920	—	6k	5 ms/k	2	—	A120	256 any mix	512/512	1	4
PC-A984-141 (CPU 141)	8k	1920	—	10k	5 ms/k	2	—	A120	256 any mix	512/512	1	4
PC-A984-145 (CPU 145)	8k	1920	—	10k	5 ms/k	1	1	A120	256 any mix	512/512	1	4
PC-E984-241 (CPU 141)	8k	1920	—	10k	2.5 ms/k	2***	—	A120	256 any mix	512/512	1	4
PC-E984-245 (CPU 145)	8k	1920	—	10k	2.5 ms/k	1***	1	A120	256 any mix	512/512	1	4
PC-E984-251 (CPU 251)	16k	1920	24k	42k	2.5 ms/k	2***	—	A120	256 any mix	512/512	1	4
PC-E984-255 (CPU 255)	16k	1920	24k	42k	2.5 ms/k	1***	1	A120	256 any mix	512/512	1	4

* Includes memory configuration and I/O Traffic Cop. (888 words minimum – 1k words maximum)

** Includes analog in/out at 16 bits each plus discrete in/out at one bit each.

*** Comm port 1 supports XMIT Block, temporary Modbus Master

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A120 Series I/O Technical Specifications

(Reference 890 USE 109 00, Modicon A120 Series I/O Module User Guide for Complete Module Specifications)

Model	Voltage Range (Max Current/Point)	Number Input Points	Number Output Points	Points per Common	I/O Power Required mA @ 5V Internal	Required Addressing I/O Bits
Discrete Input						
AS-BDEO-216	24 Vdc non-isolated, True High	16	0	8	<15	16/0
AS-BDEP-208	230 Vac	8	0	8	<30	8/0
AS-BDEP-210[1]	115 Vac	8	0	8	<35	8/0
AS-BDEP-211[2]	115 Vac individual isolation	8	0	1	<35	8/0
AS-BDEP-214[2]	12-60 Vdc	16	0	8	<22	16/0
AS-BDEP-215[2]	5 V TTL, True Low	16	0	8	<25	16/0
AS-BDEP-216	24 Vdc, True High	16	0	8	<15	16/0
AS-BDEP-217[2]	24 Vdc, True Low	16	0	8	<25	16/0
AS-BDEP-218[1]	115 Vac	16	0	8	<50	16/0
AS-BDEP-220	24 Vdc fast response, True High	16	0	8	<25	16/0
AS-BDEP-257	66-154 Vdc	16	0	8	<25	16/0
AS-BDEP-296	60 Vdc	16	0	8	<25	16/0
AS-BDEP-297	48 Vdc	16	0	8	<25	16/0
Discrete Output						
AS-BDAO-216[1]	24 Vdc (0.5A) non-isolated	0	16	16	<30, up to 4.25 A @ 24 V ext.	0/16
AS-BDAP-204	Relay NO (2A)	0	4	1	<25, 150 @ 24 V ext.	0/8
AS-BDAP-208	Relay NO (2A)	0	8	1	<60, 150 @ 24 V ext.	0/8
AS-BDAP-210[1]	24-230 Vac (1A)	0	8	4	<70	0/8
AS-BDAP216N	24 Vdc (0.5A), True High	0	16	8	<50	0/16
AS-BDAP-217[2]	5-24 Vdc (0.3A), True Low	0	16	8	<60	0/16
AS-BDAP-218[1]	24-230 Vac (0.5A)	0	16	8	<175	0/16
Combo Discrete						
AS-BDAP-212	24 Vdc in/relay out	8	4	8/1	<25, 150 @ 24 V ext.	8/8
AS-BDAP-220	24 Vdc in/24 Vdc 2A, output	8	8	8/8	<60	8/8
AS-BDAP-252	24 Vdc in/relay out, Extended Temperature	8	4	8/1	<15, <150 @ 24 V ext.	8/8
AS-BDAP-253	66-154 Vdc in/relay out, Ext. Temperature	8	4	8/1	<15, <70 @ 24 V ext.	8/8
AS-BDAP-292	60 Vdc in/relay out	8	4	8/1	<25, <150 @ 24 V ext.	8/8
Analog Input						
AS-BADU-204	±500 mV, Pt100, 11 bit + Sign	4	0	4	<50	64/0
AS-BADU-205	±10 V, ±20 mA, 12 bit + Sign	4	0	4	<50	64/0
AS-BADU-206[1]	±1V, ±10V, ±20 mA 11 bit + Sign 0...1V, 0...10V, 0.2...1V, 2...10V, 4...20 mA, 0...20 mA 12 bit	4	0	4	<100 mA, <100 mA @ 24V ext.	80/16
AS-BADU-211[2]	Thermocouple Type J,K,E,R,S,B,T RTD 3 or 2/4 wire 100Ω 385 or 392, ±50,500,2000,5000,10000 mVdc 4...20 mA 12 bit, ±20 mA (16 bit & IEEE754)	8	0	1	<80 mA, <167 mA @ 24V ext.	48/48
AS-BADU-212[2]	Thermocouple Type J,K,E,R,S,B,T RTD 3 or 2/4 wire 100Ω 385 or 392, ±50,500,2000,5000,10000 mVdc 4...20 mA 12 bit, ±20 mA (16 bit & IEEE754) 600 mA max. backplane current	8	0	1	≤600 mA	48/48
AS-BADU-214[2]	0...0.5V, 0...1V, 0...5V, 0...10V, 0.1...0.5V, 0.2...1V, 1...5V, 2...10V, ±0.5V, ±1V, ±5V, ±10V, 0...5 mA, 0...10 mA, 0...20 mA, 1...5 mA, 2...10 mA, 4...20 mA, ±5 mA, ±10 mA, ±20 mA, RTD - Pt100, 200, 500, 1000, Ni500, 1000 0...100Ω, 0...200Ω, 0...500Ω, 0...1000Ω, 0...2000Ω, 15 bit	8	0	8	<100, <150 mA @ 24 V ext.	48/32

[1] Module requires PC-(A or E)984-xxx controller for operation

[2] Module requires loadable driver from software diskette, Part # SW-IODR-001

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A120 Series I/O Technical Specifications

(Reference 890 USE 109 00, Modicon A120 Series I/O Module User Guide for Complete Module Specifications)

Model	Voltage Range (Max Current/Point)	Number Input Points	Number Output Points	Number per Common	I/O Power Required mA @ 5V Internal	Required Addressing I/O Bits
Analog Output						
AS-BDAU-202	±10 V, ±20 mA, 11 bit Plus Sign	0	2	1	<60, <150 @ 24 V ext.	0/32
AS-BDAU-204[2]	±1V, 5V, 10V 0…1V, 0…5V, 0…10V 12 bit 4…20mA, 0…20mA 12 bit	0	4	2	<1mA, 200mA @ 24 Vdc	16/96
AS-BDAU-208[1]	±10 V, 11 bit Plus Sign	0	8	8	≤30, ≤120 @ 24 V ext.	0/128
Intelligent						
AS-BMOT-201[2]	Single axis Motion, Incremental Encoder in/ ±10 Velocity/Current Command out	5	1	5/1	<300 mA, 200 mA @ 24 Vdc	96/96
AS-BMOT-202[2]	Single Axis Motion, Resolver and Incremental Encoder in/DNP out	5	1	5/1	<600 mA, 200 mA @ 24 Vdc	96/96
AS-BVIC-200[2]	Variable Reluctance Coil Input (0.025 to 36 Vac) 0...10 kHz	4	0	0	<25 mA, <70 mA @ 24V ext.	48/48
AS-BVIC-205[2]	High Speed Input (5 Vdc) 0...25 kHz	4	0	0	<1 mA, <90 mA @ 24V ext.	48/48
AS-BVIC-212[2]	High Speed Input (12 Vdc) 0...25 kHz	4	0	0	<1 mA, <90 mA @ 24V ext.	48/48
AS-BVIC-224[2]	High Speed Input (24 Vdc) 0...25 kHz	4	0	0	<1 mA, <90 mA @ 24V ext.	48/48
AS-BZAE-201	High speed counter, 50 kHz @ 24 V, 500kHz @ 5V, Relay NO,2A, output	1	2	1/1	<100, <30 @ 24 V ext. Sensor PS @ 5 V & 24 V ext.	48/48
AS-BZAE-204[1]	High speed counter, one 1-10 kHz, three 1 kHz, 5/24 V, Four outputs 24 V, 0.5 A	4	4	4	<100,1A @ 24V ext.	96/16
Driver Software						
SW-IODR-001	Module Driver Software - Required only where noted.					
Power Converters						
AS-P120-000	105…240 Vac In, 24 Vdc @ 1.0 A Out					
AS-P120-125	105…150 Vdc In, 24 Vdc @ 1.5 A Out					
Cables						
AS-WBXT-201	Tiered Configuration Bus Extension Cable					
Special						
AS-BNUL-200	Module for prewiring up to 16 pt spare slot	N/A	N/A	N/A	0	0/00
AS-BNUL-202	16 pt. <50 V (6A) wiring connection mux	N/A	N/A	N/A	0	0/00
AS-BSIM-203	Analog simulator (reqs Analog in and out)	N/A	N/A	N/A	0, <50 mA @ 24V ext.	0/00
AS-BSIM-216	Discrete simulator reqs 24 Vdc Discrete Input	N/A	N/A	N/A	0, <25 mA @ 24V ext.	0/00
AS-0SIM-011	Eight Toggle Switch Input Simulator for Use With 24 Vdc Inputs	—	—	—	—	—
AS-OTBP-000	Terminal Block Pulling Tool					
EEPROM Memory Options (NOT Required for PLC Operation)						
AS-MEEP-000	32K Byte Memory Card					
AS-MEEP-001	8K Byte Memory Card					
Manuals						
890 USE 108 00	984/A120 Compact Programmable Controller User Guide					
890 USE 109 00	Modicon A120 Series I/O Modules User Guide					
GM-A120-LDR	Modicon Compact Ladder Logic Manual					

[1] Module requires PC-(A or E)984-xxx controller for operation

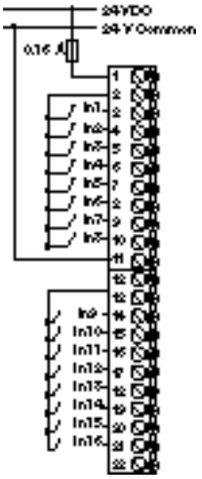
[2] Module requires loadable driver from software diskette, Part # SW-IODR-001

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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

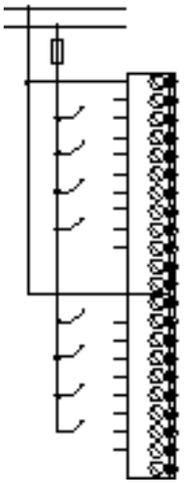
Specification	BDEO-216
Description	24 Vdc Input
Number of Points	2 groups, 8 per group
Operating Voltage	24 Vdc, +25%/15%
Isolation	None
Number of Groups	1
Points per Group	16
ON Conditions	+12 Vdc...+30 Vdc
OFF Conditions	-2 Vdc...+5 Vdc
ON Current	7 mA @ 24 Vdc
Response Time	4 ms typical
Power Required	
Internal	<15 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEO-216
Wiring Diagram



Specification	BDEP-208
Description	230 Vac Input
Number of Points	8
Operating Voltage	230 Vac ±15%, 47-63 Hz
Isolation	Optocoupler on each input
Number of Groups	1
Points per Group	8
ON Conditions	195 Vac...265 Vac
OFF Conditions	0 Vac...90 Vac
ON Current	1 mA/Input Min.
OFF Current	0.5 mA/Input Max.
Response Time	
OFF to ON	25 ms
ON to OFF	50 ms
Power Required	
Internal	<30 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-208
Wiring Diagram

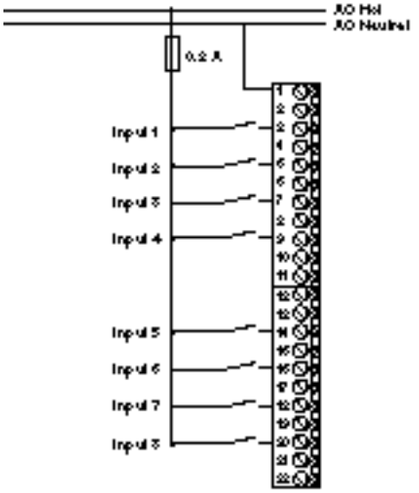


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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDEP-210
Description	115 Vac Input
Number of Points	8
Operating Voltage	115 Vac ±15%, 47-65 Hz
Isolation	1.8 kV Field-to-Bus
Number of Groups	1
Points per Group	8
ON Conditions	80 Vac...132 Vac
OFF Conditions	0 Vac...35 Vac
ON Current	6 mA/Input Min.
OFF Current	3 mA/Input Max.
Response Time	
OFF to ON	10 ms
ON to OFF	40 ms
Power Required	
Internal	<35 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.55 lbs (.25 kg)
Agency Approvals	UL, CSA, CE

BDEP-210
Wiring Diagram

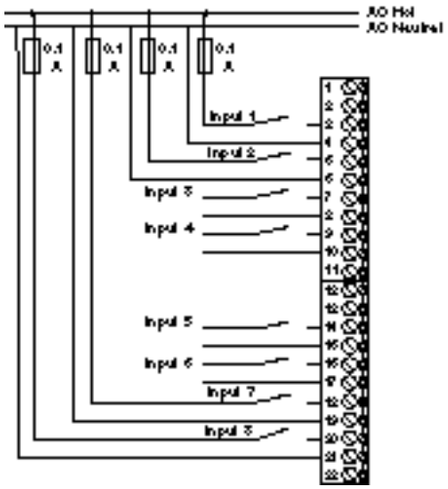


Note:

Module Requires PC-(A or E)984-xxx or
Micro 512/612 controller for operation.

Specification	BDEP-211
Description	115 Vac Isolated Input
Number of Points	8
Operating Voltage	115 Vac ±15%, 47…65 Hz
Isolation	Optocoupler on each point
Number of Groups	8
Points per Group	1
ON Conditions	80 Vac...132 Vac
OFF Conditions	0 Vac...35 Vac
ON Current	15.5 mA @ 115 Vac
OFF Current	3 mA Max.
Response Time	
OFF to ON	10 ms
ON to OFF	40 ms
Power Required	
Internal	<35 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-211
Wiring Diagram



Note:

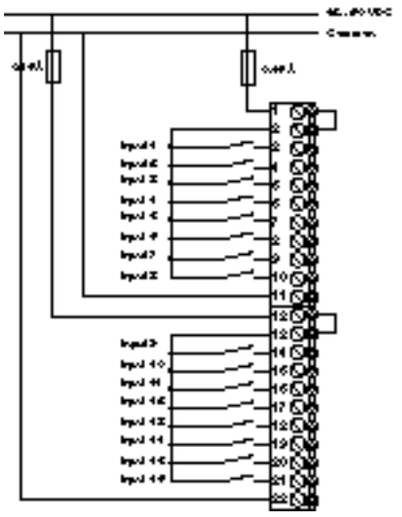
A software loadable driver (SW-IODR-001)
is required for proper operation.

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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDEP-214
Description	+12…60 Vdc Input
Number of Points	16
Operating Voltage	-6…+75
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+11…+30 Vdc @ 24 Vdc
OFF Conditions	-3…+5 Vdc @ 24 Vdc
ON Current	+6…+7.1 mA @ 24 Vdc
OFF Current	+1.7…+2.9 mA @ 24 Vdc
Response Time	4 ms typical
Power Required	
Internal	<22 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.57 lbs (.26 kg)
Agency Approvals	UL, CSA, CE

BDEP-214
Wiring Diagram

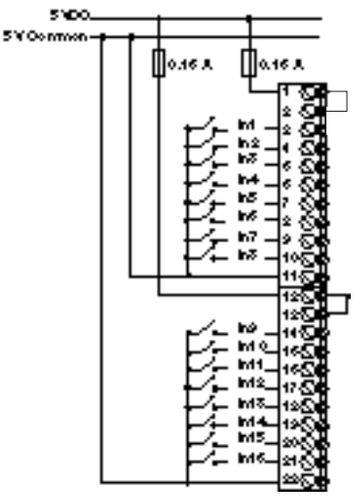


Note:

A software loadable driver (SW-IODR-001)
is required for proper operation.

Specification	BDEP-215
Description	5 V TTL True Low
Number of Points	16
Operating Voltage	5 Vdc
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
True Conditions	-1 Vdc...+2 Vdc
False Conditions	+4 Vdc...+5 Vdc
True Current	3.5 mA @ 0 Vdc
Response Time	1 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-215
Wiring Diagram



Note:

This module is a TRUE LOW input. i.e. when the input
is pulled low, the data to the CPU is read as a 1.

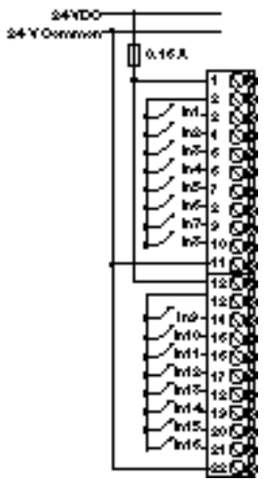
A Software Loadable Driver (SW-IODR-001)
is required for proper operation.

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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

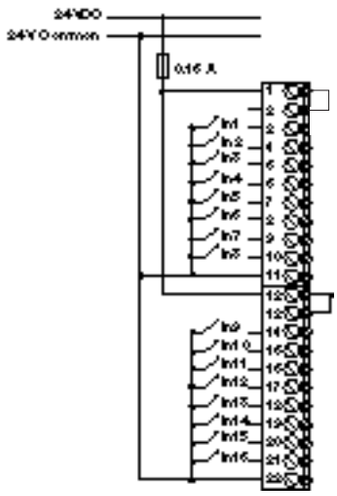
Specification	BDEP-216
Description	24 Vdc Input
Number of Points	16
Operating Voltage	24 Vdc +25%/-15%
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+12 Vdc...+30 Vdc
OFF Conditions	-2 Vdc...+5 Vdc
Wetting Current	7mA @ 24 Vdc
Response Time	4 ms typical
Power Required	
Internal	<15 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, FM, CE

BDEP-216
Wiring Diagram



Specification	BDEP-217
Description	24 Vdc True Low input
Number of Points	16
Operating Voltage	24 Vdc ±15%
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
False Conditions	≥ External source minus 6 Vdc
True Conditions	≤ External source minus 12 Vdc
True Current	7 mA @ 0 Vdc
Response Time	4 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-217
Wiring Diagram



Note:

A Software Loadable Driver (SW-IODR-001) is required for proper operation.

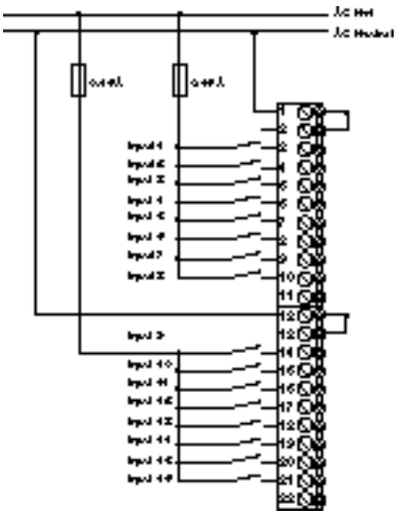
This module is a TRUE LOW input. (*i.e.* when the input is pulled low, the data to the CPU is read as a 1.)

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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDEP-218
Description	115 Vac Input
Number of Points	16
Operating Voltage	115 Vac ±15%, 47-63 Hz
Isolation	Optocoupler, 1.8Kv Field-to-Bus
Number of Groups	2
Points per Group	8
ON Conditions	80 Vac...132 Vac
OFF Conditions	0 Vac...35 Vac
ON Current	15.5 mA @ 115 Vac
OFF Current	3 mA Max.
Response Time	
OFF to ON	10 ms
ON to OFF	40 ms
Power Required	
Internal	<50 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.66 lbs (.3 kg)
Agency Approvals	UL, CSA, CE

BDEP-218
Wiring Diagram

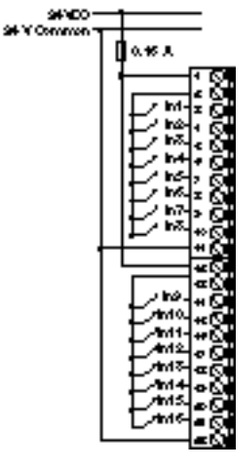


Note:

Module requires PC-(A or E)984-XXX or
Micro 512/612 controller for operation.

Specification	BDEP-220
Description	24 Vdc High Speed Input
Number of Points	16
Operating Voltage	24 Vdc, +25%/-15%
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+12 Vdc...+30 Vdc
OFF Conditions	-2 Vdc...+5 Vdc
ON Current	7 mA @ 24 Vdc
Response Time	0.5 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-220
Wiring Diagram

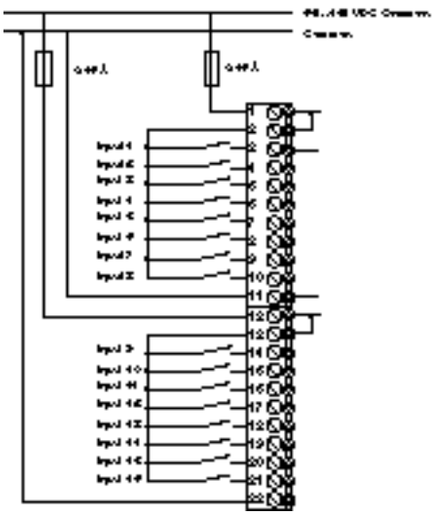


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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDEP-257
Description	110 Vdc ±40% Input
Number of Points	16
Operating Voltage	66…154 Vdc
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+55...+170 Vdc
OFF Conditions	-2...+10 Vdc
ON Current	2.2 mA @ 140 Vdc
Response Time	4 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-257
Wiring Diagram

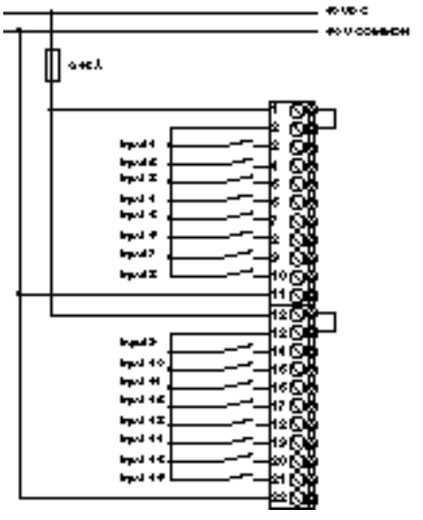


Note:

This module is I/O mapped as a DEP-216.

Specification	BDEP-296
Description	60 Vdc Input
Number of Points	16
Operating Voltage	60 Vdc ±15%
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+30 Vdc…+70 Vdc
OFF Conditions	-4 Vdc…+13 Vdc
ON Current	7 mA @ 60 Vdc
Response Time	4 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-296
Wiring Diagram



Note:

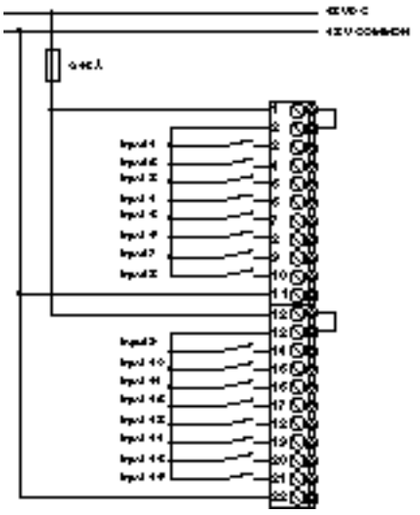
This module is I/O mapped as a DEP-216.

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Discrete Input Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDEP-297
Description	48 Vdc Input
Number of Points	16
Operating Voltage	48 Vdc ±15%
Isolation	Optocoupler on each input
Number of Groups	2
Points per Group	8
ON Conditions	+29 Vdc...+56 Vdc
OFF Conditions	-3 Vdc...+10 Vdc
ON Current	7 mA @ 48 Vdc
Response Time	4 ms typical
Power Required	
Internal	<25 mA @ 5V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDEP-297
Wiring Diagram



Note:

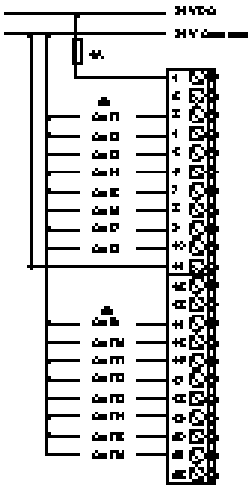
This module is I/O mapped as a DEP-216.

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Discrete Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDA0-216
Description	24 Vdc (Source) Output
Number of Points	16
Operating Voltage	24 Vdc, +25%/-15%
Isolation	None
Number of Groups	1
Points per Group	16
ON Current (Cont.)	
Max. per Point	.5 A
Max. per Group	4 A
Max. per Module	4 A
ON Conditions	Source minus 3V
OFF Conditions	0 Vdc ... 2 Vdc
Leakage Current	< 1 mA
Response Time	<1 ms typical
Power Required	
Internal	<30 mA @ 5 V
External	20…30 Vdc, 4.25A @ 30 Vdc
Dimensions	
Space Required	1 slot
Weight	.55 lbs (.25 kg)
Agency Approvals	UL, CSA, FM, CE

BDAO-216
Wiring Diagram



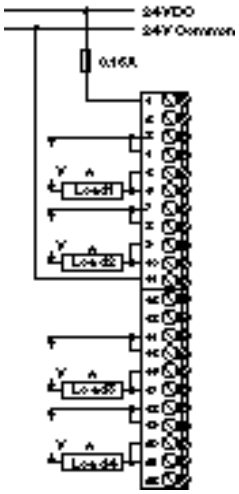
Note:

Module requires PC-(A or E) 984-xxx or
Micro 512/612 controller for operation.

* Clamping diode recommended across each load

Specification	BDAP-204
Description	Relay (NO) Output
Number of Points	4
Operating Voltage	24 - 154 Vdc, 24 - 250 Vac
Isolation	Relay contact
Individually isolated	
Number of Groups	4
Points per Group	1
ON Current (Cont.)	
Max. per Point	2 A
Wetting Current	5 mA for closed contacts
Leakage Current	1 mA
Response Time	10 ms typical
Power Required	
Internal	25 mA @ 5 V
External	150 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	.52 lbs (.24 kg)
Agency Approvals	UL, CSA, CE

BDAP-204
Wiring Diagram



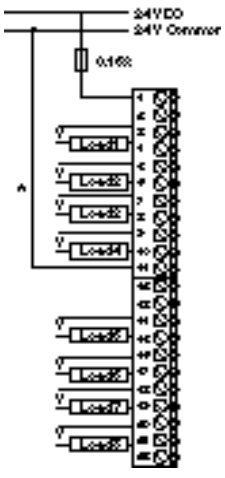
* Clamping diode or snubber circuit recommended

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Discrete Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAP-208
Description	Relay (NO) output
Number of Points	8
Operating Voltage	24 - 154 Vdc, 24 - 250 Vac
Isolation	Relay contact
Individually isolated	
Number of Groups	8
Points per Group	1
ON Current (Cont.)	
Max. per point	2A
Wetting Current	5 mA for closed contacts
Leakage Current	1 mA
Response Time	10 ms typical
Power Required	
Internal	60 mA @ 5 V
External	150 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	.52 lbs (.24 kg)
Agency Approvals	UL, CSA, CE

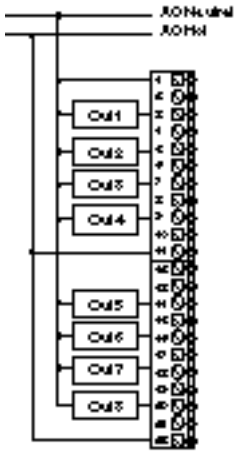
BDAP-208
Wiring Diagram



* Clamping diode or snubber circuit recommended

Specification	BDAP-210
Description	AC output
Number of Points	8
Operating Voltage	24-230 Vac*
Isolation	Optocoupler, 1.5K Vac
Field-to-Bus	
Number of Groups	2
Points per Group	4
ON Current (Cont.)	
Max. per Point	1.5 A
Max. per Group	4.0 A
Max. per Module	8.0 A
ON State Voltage Drop	1.5 Vac RMS Max.
Leakage Current	3.75 mA
Response Time	8.34 ms Max.
Power Required	
Internal	<70 mA @ 5 V
Dimensions	
Space Required	1 slot
Weight	1 lbs (.45 kg)
Agency Approvals	UL, CSA*, CE

BDAP-210
Wiring Diagram



Notes:

Fusing on each output is recommended

Module requires PC-(A or E)984-xxx
or Micro 512/612 controller for operation.

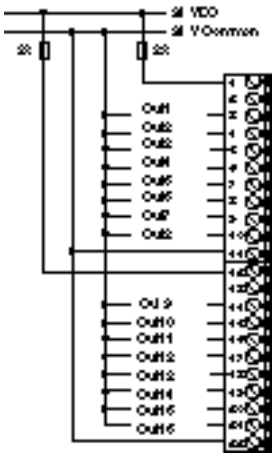
* Valid IEC 1131, UL, CSA Range	24-230 Vac
Valid VDE 0160	24-115 Vac

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Discrete Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAP216N
Description	24 Vdc (Source) with Short circuit protection
Number of Points	16
Operating Voltage	24 Vdc
Isolation	Optocoupler on each output
Number of Groups	2
Points per Group	8
ON Current (Cont.)	
Max. per Point	.5 A
Max. per Group	2 A
Max. per Module	4 A
ON Conditions	+21 Vdc...+24 Vdc
OFF Conditions	0 Vdc...+2 Vdc, <1 mA
Response Time	<1 ms typical
Power Required	
Internal	<50 mA @ 5 V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

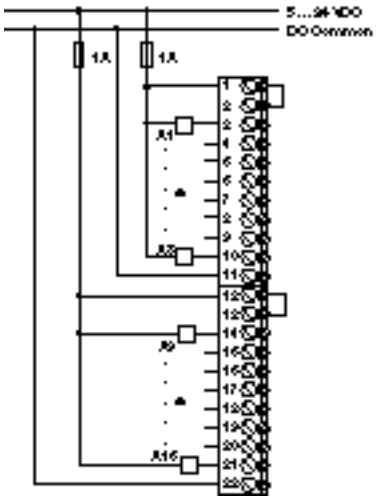
BDAP-216
Wiring Diagram



* Clamping diode or snubber circuit reccomended

Specification	BDAP-217
Description	+5…+24 Vdc (Sinking) output
Number of Points	16
Operating Voltage	+5…+24 Vdc
Isolation	Optocoupler on each output
Number of Groups	2
Points per Group	8
ON Current (Cont.)	
Max. per Point	.3 A
Max. per Group	.8 A
Max. per Module	1.6 A
ON Conditions	≤0.7 V
OFF Conditions	External source
Response Time	1 ms typical
Power Required	
Internal	<60 mA @ 5 V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BDAP-217
Wiring Diagram



Notes:

A software loadable driver (SW-IODR-001) is required for proper operation

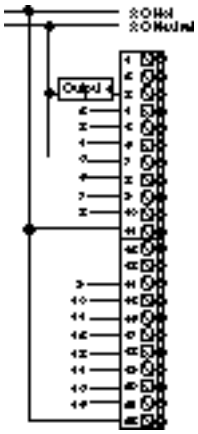
* Clamping diode or snubber circuit recommended

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Discrete Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAP-218
Description	24…230 Vac Triac
Number of Points	16
Operating Voltage	*24-240 Vac, 47…63 Hz
Isolation	Optocoupler, 1.7 Kv Field-to-Bus
Number of Groups	2
Points per Group	8
ON Current (Cont.)	
Minimum/Point	20 mA
Max. per Point	.5 A
ON State Voltage Drop	1.5 Vac RMS Max.
Leakage Current	3.75 mA Max.
Response Time	<8.34 ms typical
Power Required	
Internal	175 mA @ 5 V
Dimensions	
Space Required	1 slot
Weight	2 lbs (900 kg)
Agency Approvals	UL, CSA, CE

BDAP-218
Wiring Diagram



Note:

Fusing on each output is recommended

Module requires PC-(A or E)984-xxx
or Micro 512/612 controller for operation.

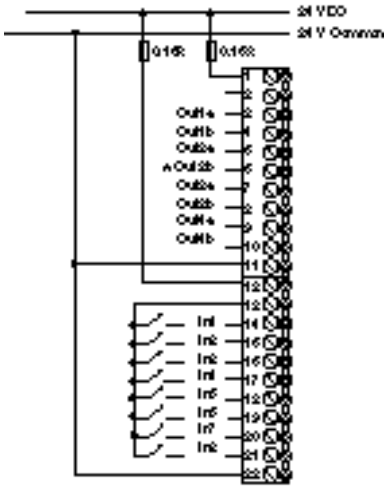
* Valid IEC 1131, UL, CSA Range	24-230 Vac
Valid VDE 0160	24-115 Vac

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Combination Discrete Input/Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAP-212	
Description	Combination 24 Vdc In/Relay Out	
Number of Points	8 in	4 out
Operating Voltage	24 Vdc +25%/-15%	24 - 110 Vdc 24 - 250 Vac
Isolation	Optocoupler	Relay contact
Number of Groups	1	4
Points per Group	8	1
ON Current (Cont.)		
Max. per Point		2 A
ON Conditions	+12 Vdc…+30 Vdc	
OFF Conditions	-2 Vdc…+5 Vdc	
Wetting Current	7 mA @ 24 Vdc	5 mA
Leakage Current	1 mA	
Response Time	4 ms typical	10 ms typical
Power Required		
Internal	<25 mA @ 5 Vdc	– –
External	– –	150 mA @ 24 Vdc
Dimensions		
Space Required	1 slot	
Weight	.4 lbs (.19kg)	
Agency Approvals	UL, CSA, CE	

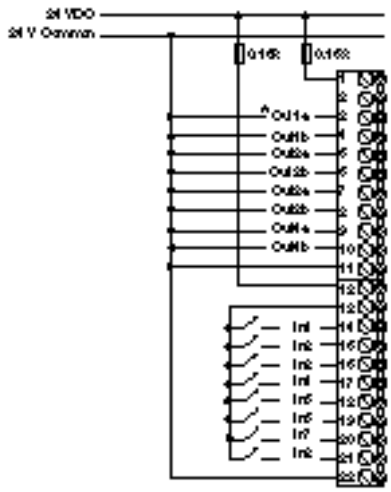
BDAP-212
Wiring Diagram



* Clamping diode or snubber circuit recommended on outputs

Specification	BDAP-220	
Description	24 Vdc Input, 24 Vdc Output (Source)	
Number of Points	8 in	8 out
Operating Voltage	24 Vdc, +25%/-15%	24 Vdc
Isolation	Optocoupler	Optocoupler
Number of Groups	1	1
Points per Group	8	8
ON Current (Cont.)		
Max. per Point		2 A
Max. per Group		8 A
Max. per Module		8 A
ON Conditions	+12 Vdc…+30 Vdc	External Supply -0.4
OFF Conditions	-2 Vdc…+5 Vdc	0 Vdc... 2 Vdc, < 1 mA
ON Current	7 mA @ 24 Vdc	5 mA Min.
Response Time	4 ms typical	<1 ms typical
Power Required		
Internal	<60 mA @ 5 Vdc	
Dimensions		
Space Required	1 slot	
Weight	.5 lbs (.22 kg)	
Agency Approvals	UL, CSA, FM, CE	

BDAP-220
Wiring Diagram



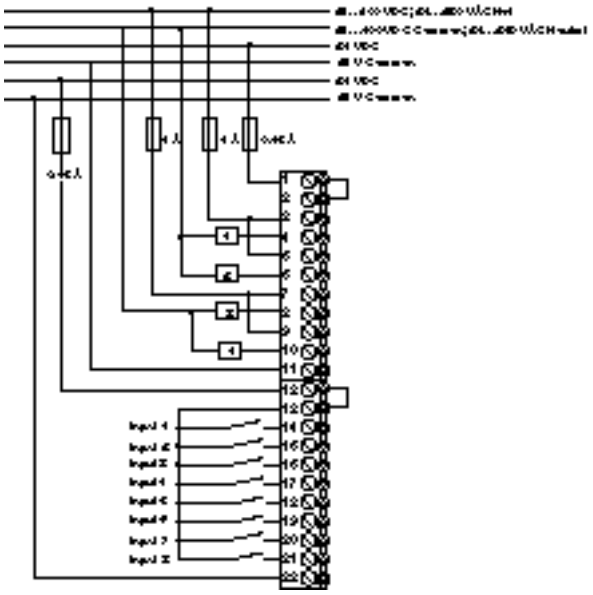
* Clamping diode recommended

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Combination Discrete Input/Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

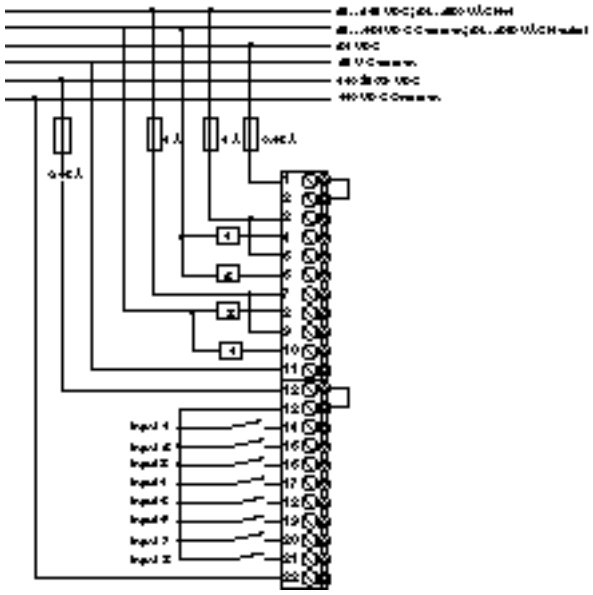
Specification	BDAP-252	
Description	Extended temperature 24 Vdc In/Relay Out	
Number of Points	8 in	4 out
Operating Voltage	24 Vdc, +25%/-15%	24…110 Vdc, 24…250 Vac
Isolation	Isolated from output group	Relay contact individually isolated
Number of Groups	1	4
Points per Group	8	1
ON Condition	+12…+37 Vdc	
OFF Conditions	-2…+5 Vdc	
ON Current (Cont.)	4 mA @ 24 Vdc	2A
Wetting Current		5 mA
Response Time	7 ms typical	10 ms typical
Power Required		
Internal	<15 mA @ 5 Vdc	
External	150 mA @ 24 Vdc	
Dimensions		
Space Required	1 slot	
Weight	.52 lbs (.24 kg)	
Agency Approvals	UL, CSA, CE	

BDAP-252
Wiring Diagram



Specification	BDAP-253	
Description	Extended temperature 110 Vdc ±40% Input/Relay Output	
Number of Points	8 in	4 out
Operating Voltage	+66…+154 Vdc	+24…+154 Vdc, 24…250 Vac
Isolation	Isolated from output group	Relay contact individually isolated
Number of Groups	1	4
Points per Group	8	1
ON Condition	+55…+170 Vdc	
OFF Conditions	-2…+10 Vdc	
ON Current (Cont.)	2.2 mA @ 110 Vdc	2A
Wetting Current		5 mA
Response Time	6 ms	10 ms
Power Required		
Internal	<15 mA @ 5 Vdc	
External	+110 Vdc ±40%, 70 mA @ 24 Vdc	
Dimensions		
Space Required	1 slot	
Weight	.52 lbs (.24 kg)	
Agency Approvals	UL, CSA, CE	

BDAP-253
Wiring Diagram

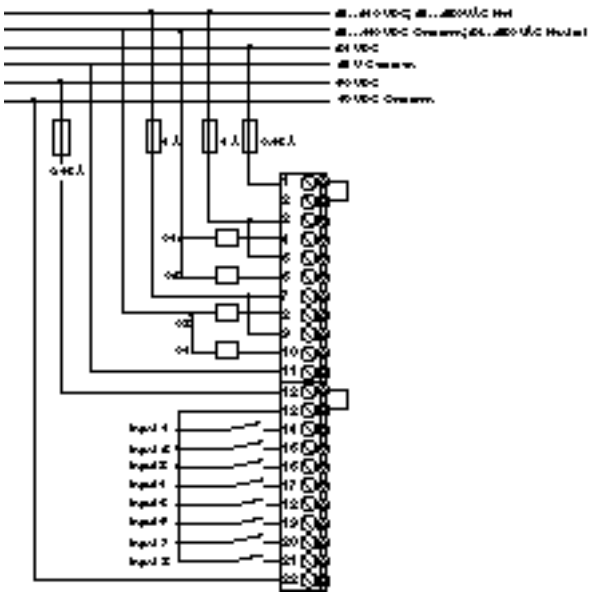


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Combination Discrete Input/Output Modules
Technical Specifications and Wiring Diagrams
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAP-292	
Description	60 Vdc Isolated In/Relay Out	
Number of Points	8 in	4 out
Operating Voltage	60 Vdc	24…110 Vdc, 24…250 Vac
Isolation	Isolated from output group	Relay contact individually isolated
Number of Groups	1	4
Points per Group	8	1
ON Condition	+35…+70 Vdc	
OFF Conditions	-4 ... +13 Vdc	
ON Current (Cont.)		2A
Wetting Current		1 mA
Response Time	4 ms typical	10 ms typical
Power Required		
Internal	<25 mA @ 5 Vdc	
External	<150 mA @ 24 Vdc <150 mA @ 60 Vdc	
Dimensions		
Space Required	1 slot	
Weight	.52 lbs (.24 kg)	
Agency Approvals	UL, CSA, CE	

BDAP-292
Wiring Diagram



Note:

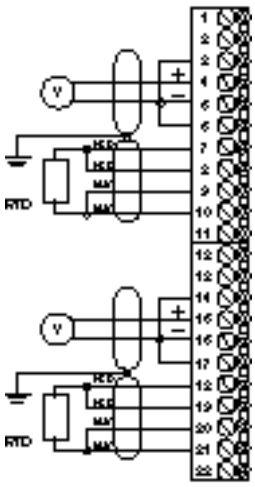
This module is I/O mapped as a DAP-212.

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Analog Input Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BADU-204
Description	Voltage (2 pole) Input
Pt 100 RTD (4 Pole) Input	
Number of Channels	4
Operating Range	
Voltage/Temperature	± 500 mV/-200…+850° C
Isolation	None
Number of Groups	1
Points per Group	4
Input Impedence	>10 M Ω
Resolution	12 bit + sign
Accuracy	0.4% of Full Scale
Conversion Time	
50 Hz	80 ms/channel
60 Hz	66 ms/channel
Power Required	
Internal	<50 mA @ 5 V
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, FM, CE

BADU-204
Wiring Diagram

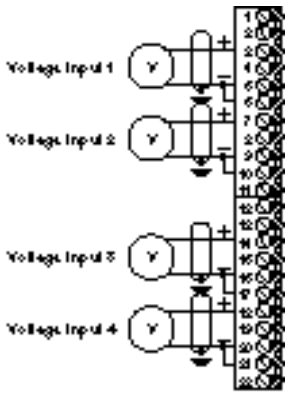


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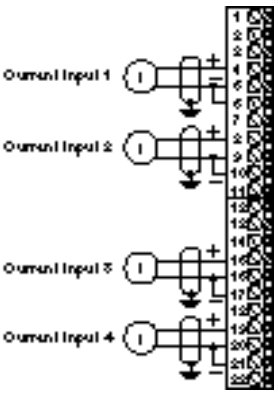
Analog Input Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BADU-205
Description	Voltage/Current (2 Pole) Input
Number of Channels	4
Operating Range Voltage/Current	 ±10 V/±20 mA
Isolation	None
Number of Groups	1
Points per Group	4
Input Impedence (Voltage)	50 kΩ
Input Impedence (Current)	50Ω
Resolution	12 bit + sign
Accuracy	0.5% of Full Scale
Conversion Time 50 Hz 60 Hz	 80 ms/channel 66 ms/channel
Power Required Internal	 <50 mA @ 5 V
Dimensions Space Required Weight	 1 slot .5 lbs (.22 kg)
Agency Approvals	UL, CSA, FM, CE

BADU-205
Wiring Diagram
Voltage Mode



BADU-205
Wiring Diagram
Current Mode

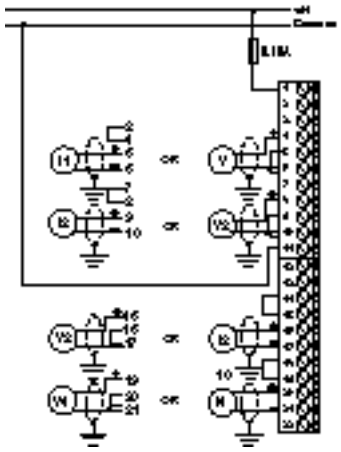


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Analog Input Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BADU-206
Description	Voltage/Current (2 Pole) Input
Number of Channels	4
Operating Range	
Voltage	±1, ±10 Vdc, 0…1, 0 …10, 0.2…1 2.0…10 Vdc
Current	±20, 4…20, 0…20 mA
Isolation	Channel - Bus: 500 V Channel - External Supply: 500 V Channel - Channel: None
Number of Groups	1
Points per Group	4
Input Impedence	
Voltage	>1 M Ω
Current	50 Ω
Resolution	11 bit + sign
Accuracy	0.4% of Full Scale Voltage 0.56% of Full Scale Current
Conversion Time	10 ms for all channels, Max.
Power Required	
Internal	<100 mA @ 5 V
External	<100 mA @ 24 V
Dimensions	
Space Required	1 slot
Weight	.725 lbs (.33 kg)
Agency Approvals	UL, CSA, FM, CE

BADU-206
Wiring Diagram



Note:

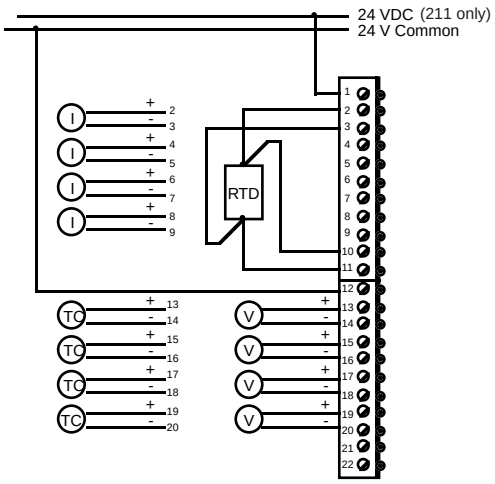
Module requires PC-(A or E)984-xxx or
Micro 512/612 controller for operation.

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Analog Input Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BADU-211	BADU-212
Description	Universal Analog Input Thermocouple, RTD, Voltage, & Current	**All current specs are identical except as noted below.**
Operating Range	Thermocouple types: J, K, T, E, R, S, & B RTD: 3- or 2/4-wire, 100 Ω, 385 or 392 alpha Bipolar Voltage: 50, 500, 2000, 5000, & 10000 mVdc Current: 4 - 20 & ±20 mA	
Isolation	Channel - Common: Opto-Coupler (500 V) Channel - Channel: 30 V	
Number of Groups	2	
Points per Group	Up to 4 thermocouple, voltage, or current inputs or 1 RTD input in either group	
Resolution	Up to 16-bit	
Accuracy	Thermocouple: ±1.2° C (Type E), ±1.5° C (Type J), ±3.0° C (Type T), ±1.5° C (Type B), ±7.0° C (Types S, R), CJC accuracy ± 1.7° C typ RTD: ±0.40° C Voltage: ±0.11% ... ±0.40% of Full Scale Current: ±0.20% of Full Scale Total accuracy is the sum of error for all components in the circuit.	
Nominal Single-Channel Update	(Integration time x 1.5) + 10 msec) Available integration times are 33.3, 40, 50, 60, 100, & 200 msec	
Power Required		
Internal	<1mA (TTL Loading)	450 mA nominal/600 mA max
External	4 VA @ 20 - 30 V (200 mA maximum)	Not required
Dimensions		
Space Required	1 Slot	
Weight	0.8 lbs (0.36 kg)	
Agency Approvals	CE, UL, CSA, FM	

BADU-211, 212
Wiring Diagram



Note:

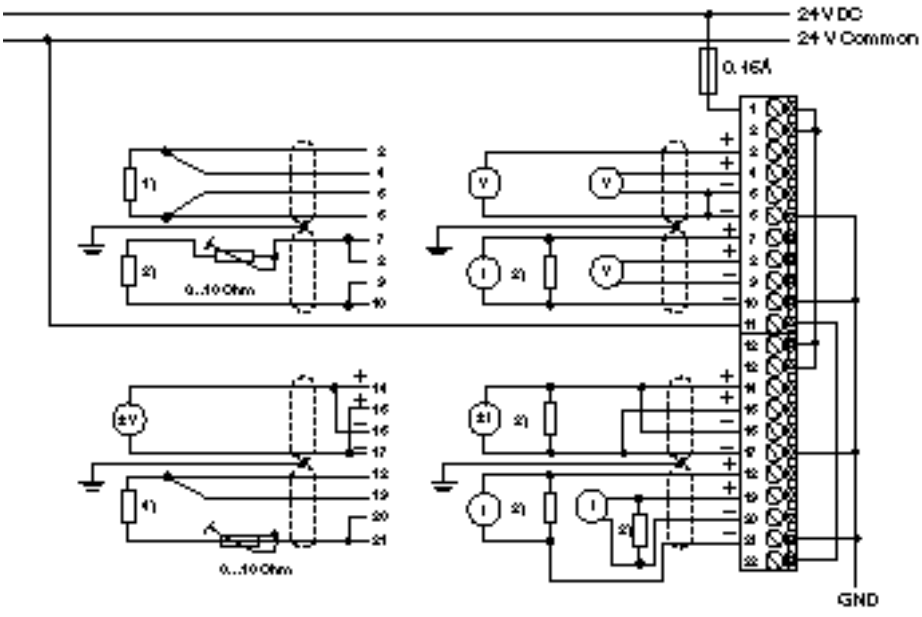
A software loadable driver (SW-IODR-001) is required for proper operation.

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Analog Input Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BADU-214
Description	Voltage/Current/RTD/Resistance Input
Number of Channels	4 Four Wire/8 Two Wire or Combinations
Operating Ranges	
Voltage	0…0.5, 0…1, 0…5, 0…10V, 0.1…0.5, 0.2…1, 1…5, 2…10V, ±0.5, ±1, ±5, ±10V
Current	0…5, 0…10, 0…20 mA, 1…5, 2…10, 4…20 mA, ±5, ±10, ±20 mA
RTD Temperature	-160/-60…+160°C, -200…+320°C, -200…+640°C
Resistance	0…100, 0…200, 0…500, 0…1000, 0…2000 Ω
Isolation	None
Number of Groups	1
Points per Group	4…8
Input Impedence	
Voltage	>1 M Ω
Current	50 or 100 Ω via external resistor
RTD	>1M Ω
Resistance	>1M Ω
Resolution	.003% to .3% of final value 13…15 Bit + sign depending on range and scale
Accuracy	
Voltage	±0.01…±.35 depending on range
Current	±0.01…±0.35 depending on range
RTD	0.3…1.6°C depending on range, not including detector error
Resistance	0.1…0.3% depending on range
Conversion Time	300 ms for all inputs
Power Required	
Internal	<100 mA @ 5 Vdc
External	<150 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, CE

BADU-214
Wiring Diagram



1) Four-wire RTD (Pt100…1000, Ni 100…1000) or resistance (0…2000 Ω)
2) External reference resistance 50 or 100 Ω, 0.1%,0.125 W for current measurement
3) Two-wire RTD (Pt 100…1000, Ni 100…1000) with 10 Ω compensation
4) Three-wire RTD (Pt 100…1000, Ni 100…1000) with 10 Ω compensation

Note:

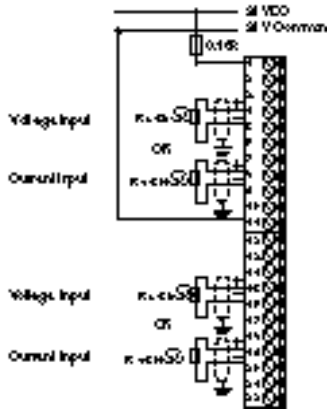
A software loadable driver (SW-IODR-001) is required for proper operation.

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Analog Output Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

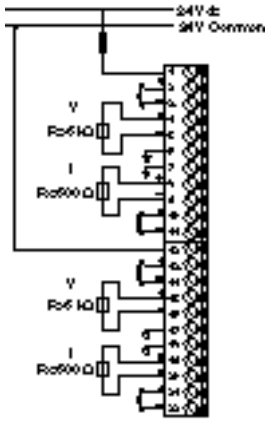
Specification	BDAU-202
Description	Voltage/Current Output (2 Pole)
Number of Channels	2
Operating Range	
Voltage/Current	±10 V/±20 mA
Isolation	Channel - Channel: 700V Channel - Bus: 700V
Number of Groups	2
Points per Group	1
Input Impedence	<500 Ω @ ±20 mA >5 KΩ @ ±10 V
Data Range	0…4000 Counts
Resolution	11 bit + sign
Accuracy	±0.4% of Full Scale
Output Error Range	±0.6% @ 0…60°C
Conversion Time	1 ms/channel typical
Power Required	
Internal	60 mA @ 5 V
External	150 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CSA, FM, CE

BDAU-202
Wiring Diagram



Specification	BDAU-204
Description	Voltage/Current Output (2 Pole)
Number of Channels	4
Operating Range	
Voltage	Bipolar: ±1, ±5, & ±10 Vdc Unipolar: 0…1, 0…5, & 0…10 Vdc
Current	Unipolar: 0…20 & 4…20 mA
Isolation	Channel 1,2 - Channel 3, 4: ≥ 500 Vdc Channel - Bus: ≥ 500 Vdc
Number of Groups	2
Points per Group	2
Impedence	Current: <500 Ω @ ±20 mA Voltage: >5000 Ω @ ±10 V
Resolution	12 bit
Display Format	12-bit unsigned count (0…4095)
Accuracy @ 25°C	±0.2% of Full Scale
Linearity	±LSB
Conversion Time	<5 ms per channel
Fault Detection	Open circuit in current mode
Power Required	
Internal	<1 mA (TTL Loading)
External	200 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	.5 lbs (.22 kg)
Agency Approvals	UL, CUL, FM, CE

BDAU-204
Wiring Diagram
Counting



Note:

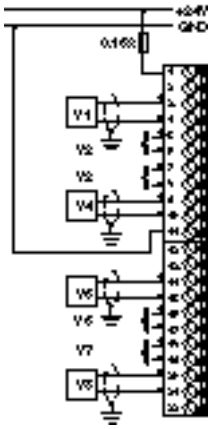
A software loadable driver (SW-IODR-001) is required for proper operation.

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Analog Output Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BDAU-208
Description	Voltage Output (2 Pole)
Number of Channels	8
Operating Range	±10 V
Isolation	
Channel to Bus	700 V
Channel to External Supply	700 V
Channel to Channel	None
Number of Groups	1
Points per Group	8
Load Impedence	>3.3 kΩ
Resolution	11 bit + sign
Accuracy	0.1% of Full Scale
Conversion Time	<1ms for All Outputs
Power Required	
Internal	≤30 mA @ 5 V
External	≤120 mA @ 24 Vdc
Dimensions	
Space Required	1 slot
Weight	0.77 lbs (.35 kg)
Agency Approvals	UL, CUL, FM, CE

BDAU-208
Wiring Diagram



Note:

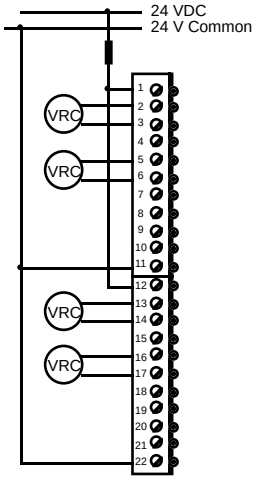
Module requires PC-(A or E)984-xxx or
Micro 512/612 controller for proper operation.

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Intelligent Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	**BVIC-2xx**
Description	High-Speed Counter Variable Reluctance Coil Input (flowmeters, positive displacement meters, AC waveforms, etc.) TTL (5 Vdc) Input 12 Vdc Input 24 Vdc Input
Number of Points	4
Voltage Range	BVIC-200: VRC (0.025 Vac min…36 Vac Peak) BVIC-205: TTL (5 Vdc) BVIC-212: 12 Vdc BVIC-224: 24 Vdc
Frequency Range	VRC inputs: 0 - 10.0 kHz Vdc inputs: 0 - 25.0 kHz Minimum pulse width: 20 usec Overspeed: 12.5 kHz detection
Data Formats	Accumulated, scaled accumulated, rate (Hz) & scaled rate
Accuracy	Accumulated data: ± 1 count Rate data: ±0.10% of full scale ±1 count
Power Required	
Internal	<1 mA @ 5 Vdc (TTL Loading)
External	1.68 VA @ 20 - 30 V (90 mA maximum)
Dimensions	
Space Required	1 Slot
Weight	.7 lbs (.30 kg)
Agency Approvals	UL, CE, CSA, FM

BVIC-2xx
Wiring Diagram



Note:

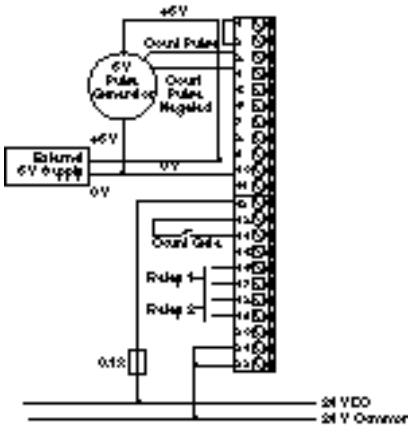
A software loadable driver (SW-IODR-001) is required for proper operation.

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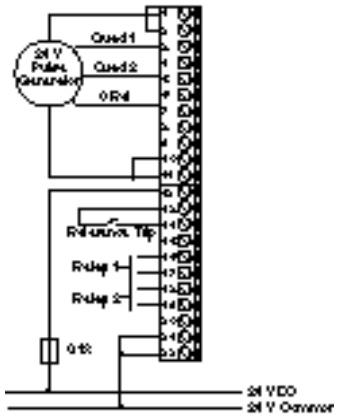
Intelligent Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BZAE-201	
Description	Counter/Positioner with 2 Relay Outputs (NO)	
Number of Points	1 Counter/1 Gate	2 Relay Outputs
Operating Voltage	5/24 V Count Signal	24 - 60 Vdc
	24 Vdc Count Gate	24 - 250 Vac
Isolation		Relay contact
Counter Type	Pulse or Quadrature	
Count Frequency		
5 V	500 kHz	
24 V	50 kHz	
Number of Groups	1	1
Points per Group	1	2
Wetting Current		5 mA
Response Time	4 ms (Gate)	10 ms typical
Power Required		
Internal	≤ 100 mA @ 5 V	
External	30 mA @ 24 V	
Dimensions		
Space Required	1 slot	
Weight	.7 lbs (.3 kg)	
Agency Approvals	UL, CSA, FM, CE	

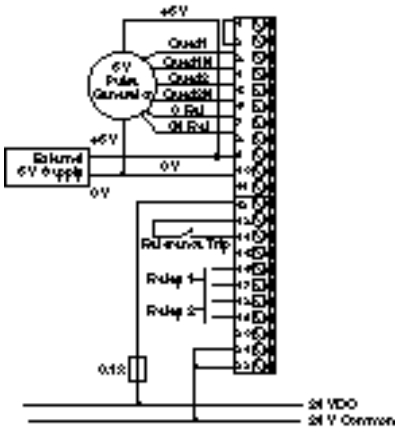
BZAE-201
Wiring Diagram
Counting



BZAE-201
Wiring Diagram
Positioning (24V)



BZAE-201
Wiring Diagram
Positioning (5V)

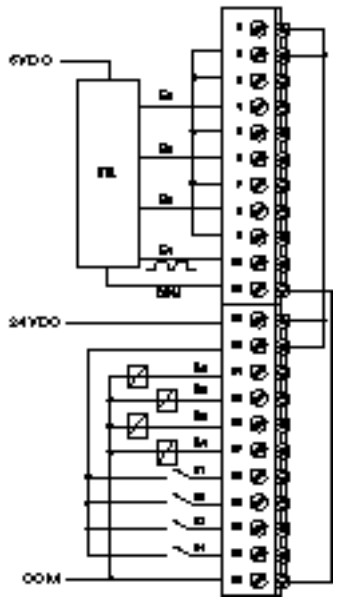


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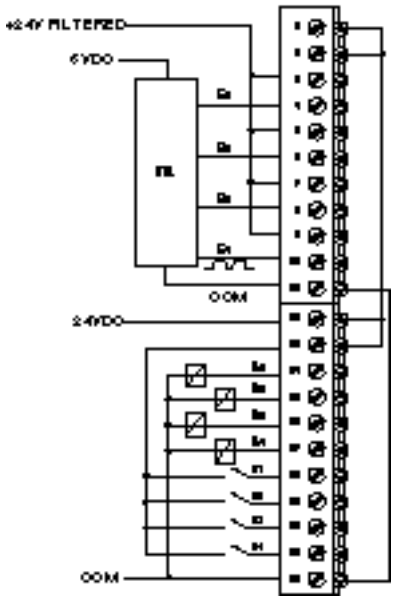
Intelligent Modules
Technical Specifications and Wiring Diagram
(Reference 890 USE 109 00 for Complete Specifications)

Specification	BZAE-204	
Description	High Speed Counter with 24 Vdc Outputs	
Number of Points	4 Counters/4 Gates	4 Outputs
OperatingVoltage	5/24 V Count Signal	24 Vdc
	24 Vdc Count Gate	
Isolation	Optocoupler	Semiconductor
Counter Type	Pulse	
Count Frequency		
5 V	1 kHz (10kHz on input 1 @ 5 Vdc)	
24 V	1 kHz	
Number of Groups	1	1
Points per Group	4	4
ON Current (Cont.)		
Max. per Point		.5 A
Max. per Group		1 A
Max. per Module		1 A
Current	≤ 2.5 mA / 7 mA	500 mA
Leakage Current		1 mA
Response Time	4 ms (Gate)	<1 ms
Power Required		
Internal	< 100 mA @ 5 V	
External	Count Inputs	10 mA @ + 5 Vdc
	Count Inputs	25 mA @ 24 Vdc
	Gate Inputs	30 mA @ 24 Vdc
	Outputs	1A @ 24 Vdc
Dimensions		
Space Required	1 slot	
Weight	.7 lbs (.3 kg)	
Agency Approvals	UL, CSA, FM, CE	

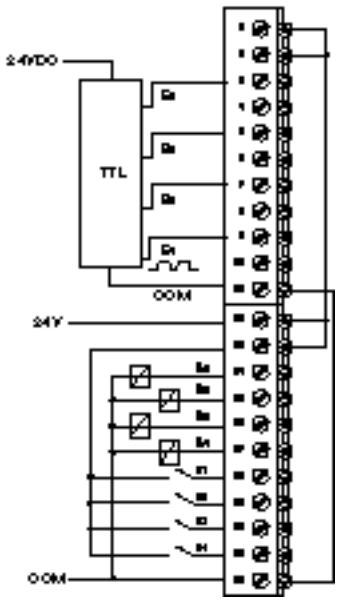
BZAE-204
Wiring Diagram
5 V Inputs



BZAE-204
Wiring Diagram
5 V Inputs (High Interference)



BZAE-204
Wiring Diagram
24 V Inputs



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Motion Modules
Technical Specifications*

MOT-20x Motion Module Technical Specifications

Motion	
Absolute Positioning Range	2^{32} bits; in., mm, or other units
Speed Range	2^{32} to 1; counts/sec, in/sec, mm/sec, RPM, etc.
Digital Servo Loop	
Position Loop Update	1 msec
Velocity Loop Update	0.5 msec
Communication Update	0.25 msec
Potentiometer Adjustments	None: Parameters set in software
Feedback	
Encoder (Two Channels)	Encoders supplied by customer Used for position and velocity
Type	Differential
Voltage	5 volt ±20%
Impedance	145 Ω, nominal
Frequency	
Nominal	200 KHz
Maximum	500 KHz
Input Multiplier	4X
Maximum Speed	Encoder dependent, 2 MHz internal pulse rate max.
System Accuracy	Encoder dependent; 0.5 arcmin max.
Source Power Supplied	
by Module	5 Vdc ±10% @ 75 mA max.
Resolver (-202 only)	Modicon “T” type brushless Used for position, velocity and commutation
Maximum Speed	6,000 RPM, motor/drive dependent
Resolution	65535 (16 bit) counts/revolution (max.)
System Accuracy	
Typical	±10 arcmin
Worst Case	±15 arcmin
Position Repeatability	±3 arcmin
Servo Interface	-201 Bipolar current or velocity command (±10 V, 3 mA max., 12 bit resolution) for DC or hydraulic drives. -202 3-phase bipolar commutated current command compatible with all Modicon Cyberline drives or Bipolar current or velocity. command (±10 V, 3 mA max., 12 bit resolution) for DC or hydraulic drives.
Drive Enable Output	Form "C" relay contact, 30 Vdc @ 0.5 A resistive max.
Drive Fault Input	True High with internal pullup, TTL compatible
I/O	
Digital Inputs	5 (24 Vdc, ±20%)
Digital Outputs	1 (24 Vdc, ±20%, 150 mA max.)
Analog Output	±10 V, 3 mA max., 12 bit resolution
Communications	
Communications Port	RS-232 serial, Modbus slave
Baud Rate	300-9600 baud, software selectable (9600 default)
Connector	D9, female
Backplane	I/O bus, 6 input/6 output registers
Power required	
Internal (Without encoder or	
Modbus Port Load)	300 mA @ 5V (-201) 600 mA @ 5V (-202)
External	24 Vdc, ±20% @ 200 mA max. (for I/O only)
Dimensions	
Space Required	1 slot (-201) 2 slots (-202)
Weight	0.8 lbs (.36 kg) (-201) 1.4 lbs (.64 kg) (-202)
Agency Approvals	UL, CSA on MOT 201 & MOT 202, CE on MOT 201 only.

Notes:
A software loadable driver (SW-IODR-001) is required for proper operation.Reference Chapter 5 for Motors, Drives, and Power Supplies for use with the BMOT-2xx Motion Modules.

* Reference Chapter 5 for wiring diagrams or 890 USE 109 00 for Complete Specifications.

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MOT-201 Wiring Information
(Reference 890 USE 109 00 for Complete Wiring Diagrams)

Discrete Wiring
Connector (J1) **Included in bezel**

Connector Pin	Function
7	Analog output
8	Analog output return
9	+5 Vdc
10	Encoder Power
11	Encoder Power return
13	24 Vdc Power
14	24 Vdc Power
15	+Travel limit/Aux in 1
16	- Travel limit/Aux in 2
17	Home/Aux in 3
18	Jog - / Aux in 4
19	Jog + /Aux in 5
20	Aux 1 output
21	24 Vdc Common
22	24 Vdc Common

Modbus Connector (J2) **D-sub type, female**

Connector Pin	Function
1	Shield
2	Receive
3	Transmit
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	+5Vdc

Drive Connector (J3) **Shielded AMP MT-type**

Connector Pin	Function
1	+Velocity command
2	Common
3	- Velocity command
4	Drive fault return (Remote common)
5	Drive fault input
6	Drive enable contact (NC)
7	Drive enable contact (NO)
8	Drive enable common
9	Common
10	Key

Encoder Feedback
Connector (J4) **Shielded AMP MT-type**

Connector Pin	Function
1	Encoder Power
2	+ Phase A
3	+ Phase B
4	+ Mark
5	
6	Key
7	- Phase A
8	- Phase B
9	- Mark
10	Encoder Power return

Encoder Feedback
Connector (J5) **Shielded AMP MT-type**

Connector Pin	Function
1	Encoder Power
2	+ Phase A
3	+ Phase B
4	+ Mark
5	
6	Key
7	- Phase A
8	- Phase B
9	- Mark
10	Encoder Power return

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MOT-202 Wiring Information
(Reference 890 USE 109 00 for Complete Wiring Diagrams)

Discrete Wiring Connector (J1) included in bezel

Connector Pin	Function
7	Analog output
8	Analog output return
9	+5 Vdc
10	Encoder Power
11	Encoder Power return
13	24 Vdc Power
14	24 Vdc Power
15	+ Travel limit/Aux in 1
16	- Travel limit/Aux in 2
17	Home/Aux in 3
18	Jog - / Aux in 4
19	Jog + /Aux in 5
20	Aux 1 output
21	24 Vdc Common
22	24 Vdc Common

Modbus Connector (J2) D-sub type, female

Connector Pin	Function
1	Shield
2	Receive
3	Transmit
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	+5Vdc

Encoder Feedback Connector (J4) Shielded AMP MT-type

Connector Pin	Function
1	Encoder Power
2	+ Phase A
3	+ Phase B
4	+ Mark
5	
6	Key
7	- Phase A
8	- Phase B
9	- Mark
10	Encoder Power return

Encoder Feedback Connector (J5) Shielded AMP MT-type

Connector Pin	Function
1	Encoder Power
2	+ Phase A
3	+ Phase B
4	+ Mark
5	Key
6	
7	- Phase A
8	- Phase B
9	- Mark
10	Encoder Power return

Drive Connector (J6) Shielded AMP MT-type

Discrete Wiring Connector (J8) Included in bezel

J6 Pin	J8 Pin	Function
1	1	Phase A current command
2	2	Phase B current command
3	3	Phase C current command
4	4	Remote common
5	5	Drive fault input
6	6	Drive enable contact (NC)
7	7	Drive enable contact (NO)
8	8	Drive enable common
9	9	Common
	10	Shield
10		Key

Resolver Feedback Connector(J7) Shielded AMP MT-type

Discrete Wiring Connector (J8) Included in bezel

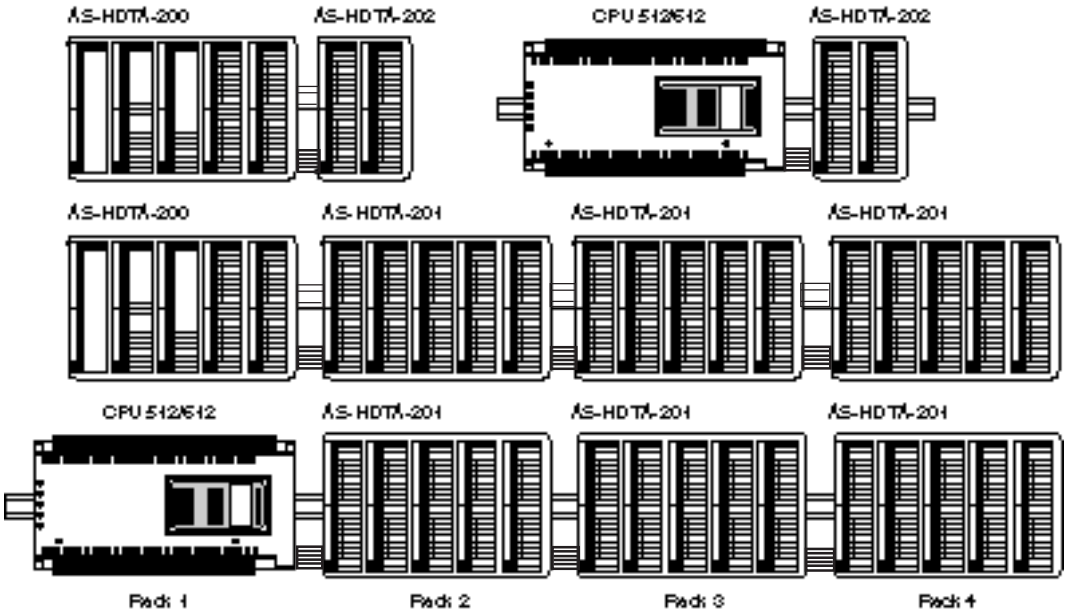
J7 Pin	J8 Pin	Function
2	12	Reference output high
7	13	Reference output low
4	14	Shield
3	15	Sine input high
8	16	Sine input low
	17	Shield
5	18	Cosine input high
10	19	Cosine input low
1	20	Thermistor input high
6	21	Thermistor input low
9		Key

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Modicon Micro and 984/A120 Compact Mounting Configurations

Modicon Micro and 984/A120 Compact A120 I/O Expansion

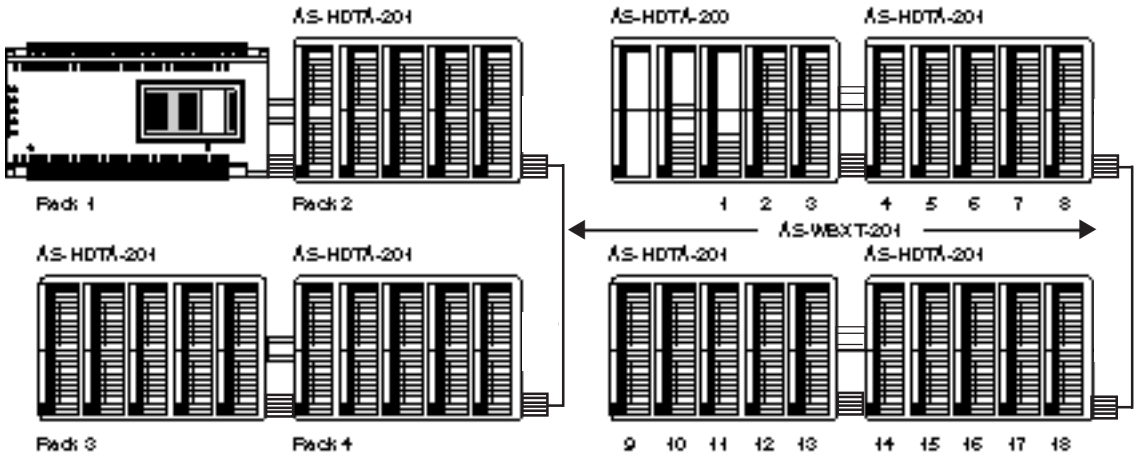
Linear Configurations



The AS-HDTA-200 (a.k.a. DTA 200) is the primary base plate for mounting 1 CPU and up to 3 I/O modules. The DTA 200 sub-rack or a Modicon Micro CPU 512/612 can be expanded by a maximum of three DTA 201 expansion subracks.

This allows expansion to the maximum of 18 I/O slots on the 984/A120 Compact and 15 on the Modicon Micro (256 discrete inputs/outputs, any mix). The DTA 202 expansion sub-rack provides two slots for I/O modules and must be the last rack in a 2, 3, or 4 rack linear system. (One DTA 202 sub-rack per system; only in a linear configuration.)

Tiered Configurations (Tiered configurations require the use of 1 AS-WBXT-201 Expansion Cable)



15 I/O Modules maximum **18 I/O Modules maximum**

Dimensions	Height		Width		Depth
AS-HDTA-200	142 mm	x	213.4 mm	x	31mm
AS-HDTA-201	142 mm	x	213.4 mm	x	31mm
AS-HDTA-202	142 mm	x	91.5 mm	x	31mm

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Notes

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