Control488/16™

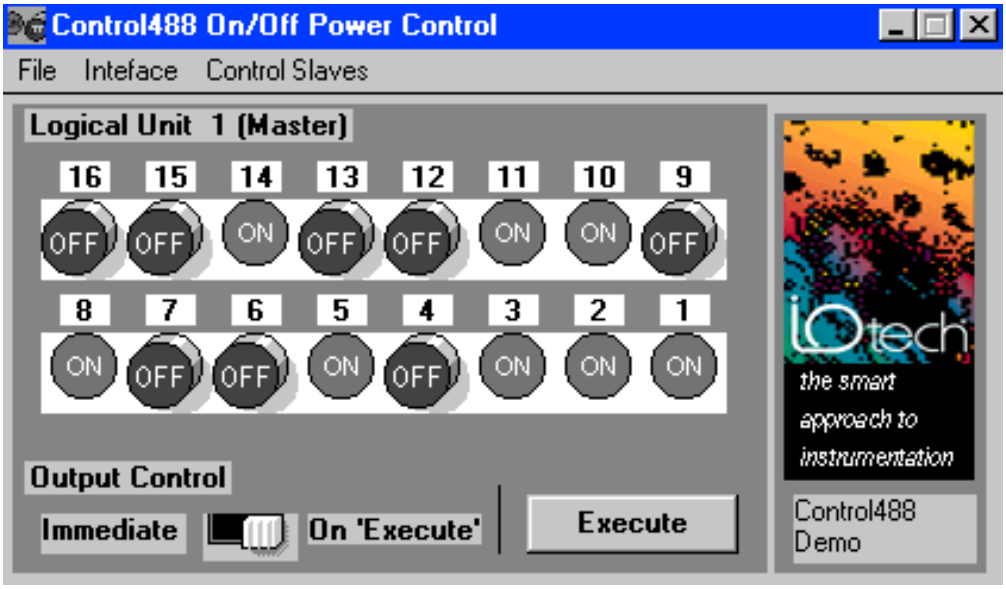
16-Channel Power Control Interface with IEEE 488 & RS-232

The Control/16 series controls and senses AC and DC power

Features

- **Accepts up to 16 OPTO-22® series or compatible modules for sensing & switching AC & DC voltages**
- **Includes Window Panels software for quick setup & easy operation**
- **Allows configuration of modules on a per-channel basis**
- **Accommodates both G1 (unfused) & G4 (fused) modules**
- **Provides automatic channel sequencing for host-independent operation**
- **Stores default configuration & switch settings in nonvolatile memory**
- **Supports master/slave mode for system expansion up to 256 channels from either a single IEEE 488 address or a single RS232 port**
- **Permits control of slave units from the Control488/16 master or from a parallel (LPT) port or 8-bit digital I/O port**
- **500 VCM isolation between the analog inputs & the chassis, the digital control lines, & the power line, as well as 500V input/output isolation**
- **Removable screw-termination panels for convenient signal access**

The Control488/16 and Control/16 are modular 16 channel instruments that can be populated on a per-channel basis with OPTO-22 or compatible digital signal conditioning modules for sensing or switching AC and DC voltages. More specifically, the input modules sense 12 to 280 VAC or 2.4 to 280 VDC signals, and the output modules switch signals up to 3A at 240 VAC or 1A at 200 VDC. These modules can be configured on a per-channel basis to meet application requirements, such as monitoring proximity and limit switches and controlling relays and solenoids for test automation. To facilitate applications with high-channel requirements, the Control488/16 series offers a master/slave architecture that supports expansion up to 256 channels; the series also provides a wide range of programmable functions, such as I/O configurations, sequence intervals, trigger modes, and default power-up configuration.



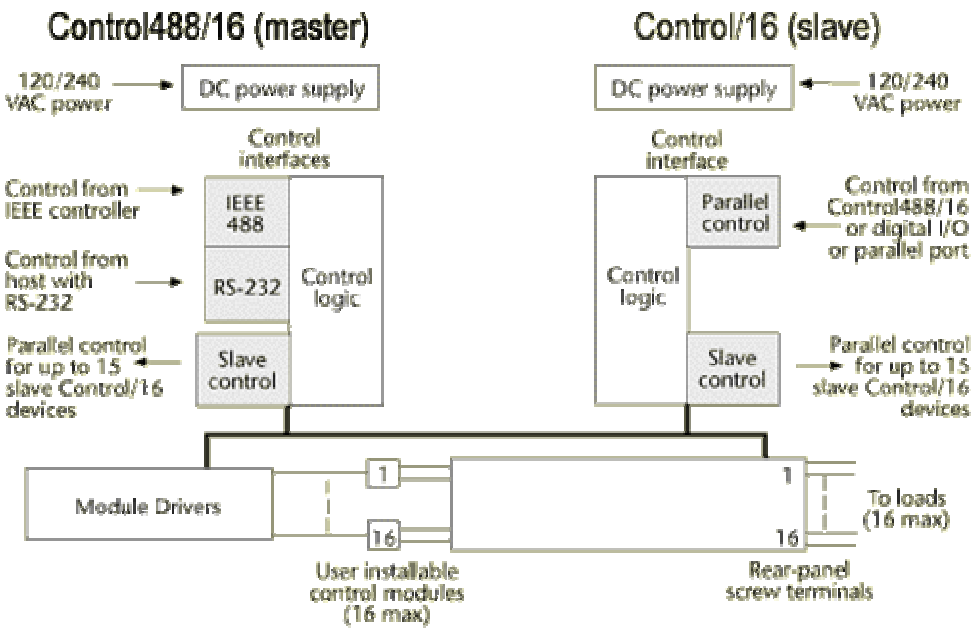
Control488/16 Window Panel

Stand-Alone Operation

The Control488/16 and the Control/16 can be programmed to automatically step through a sequence of up to 1100 channel settings. Each step specifies the active and inactive channels and the trigger interval by which the setting is to be repeated. This high level of programmability frees the controlling computer for other tasks, and provides application-specific monitoring and control schemes for fast response times.

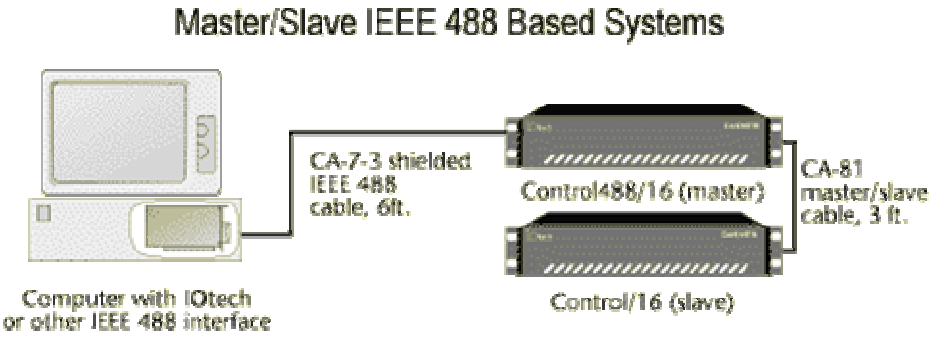
Multiple Trigger Modes

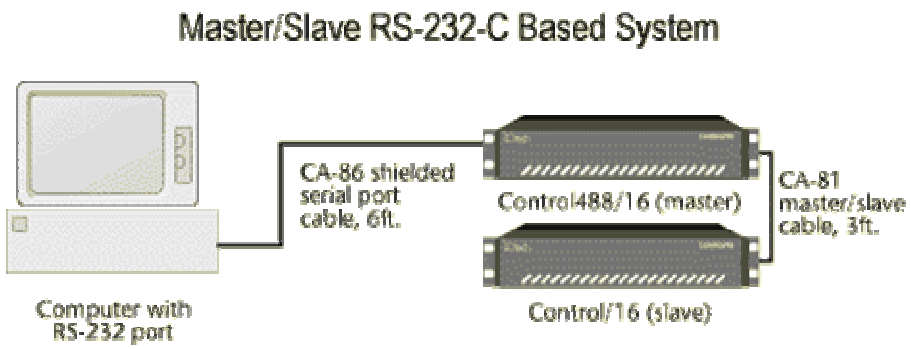
The Control488/16 and the Control/16 can be triggered by any one of 10 trigger sources, including IEEE 488 Group Execute Trigger (GET), external TTL input, and timebase interval. These triggers initiate the units' channel output sequence, which can be executed either for a specified cycle count or continuously. A trigger output delay signal, programmable from 10 µs to 60 s; specifies the delay between the update of outputs and the generation of a TTL output pulse. Together these programmable trigger functions allow the Control488/16 series to respond to asynchronous external events and to be integrated with other control devices with widely varying response times.

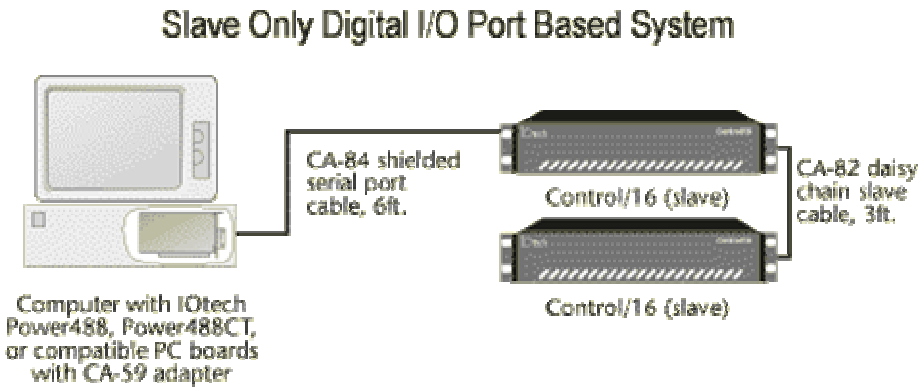


System Configurations

The Control488/16 series master/slave architecture enables a single IEEE 488 address or RS-232-C port to control a total of 16 control units (1 master unit and 15 slave units) with as many as 256 I/O lines. The Control488/16 master unit can be controlled from the IEEE 488 bus, RS-232-C port, LPT port, or digital I/O port such as that found on IOtech's Power488 series IEEE 488.2 interfaces. The Control/16 slave can be controlled from the Control/16 master unit, an LPT port, or a digital I/O interface. For safety, slave unit default configurations are restored only after the master unit verifies the presence of the units included in its default configuration.

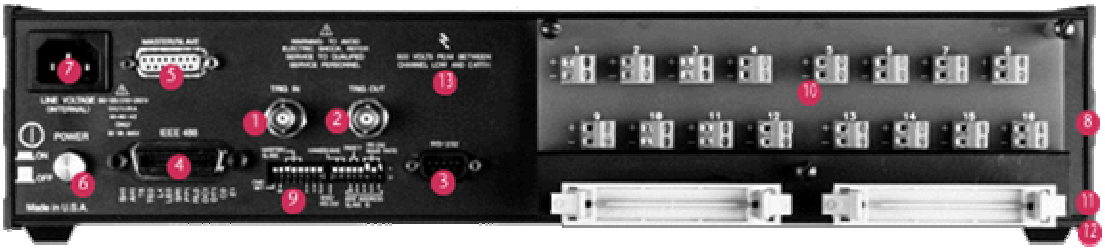






Control488/16 Back Panel

1. **Trigger input (BNC) connector:** initiates scan rates from 250 µs to 60s, depending on external TTL trigger input
2. **Trigger output (BNC) connector:** generates a TTL output pulse from 10 µs to 60s after trigger recognition
3. **RS-232-C (DB9 female) connector:** 300 to 38,400 baud rates with selectable parity stop bits and XON-XOFF or DTR/CTS handshaking; supports communication up to 1000 feet (Control488/16 master only)
4. **IEEE 488 connector:** provides full IEEE 488 control (Control488/16 master only)
5. **Master/slave (DB15 female) connector:** used to daisy-chain up to 15 Control/16 slave units to expand capacity to 256 channels (Control488/16 master only)
6. Power on/off switch
7. **Power input connector:** internally configurable for either 105-125 or 210-250 VAC, 50/60 Hz, plus fuse circuit breaker



8. Standard 2U (3.75") high rack-mountable aluminum case
9. **DIP switches:** easy-to-access switches for selecting communication interface settings, command set, channel grouping, output configuration, and master/slave operation
10. **Digital input/output (removable screw-termination panel) assembly:** provides easy-to-access termination for up to 16 digital I/O lines
11. **Socketed motherboard:** accommodates up to 16 OPTO-22G1 and G4 or compatible modules, configurable on a per channel basis
12. **Cooling fan:** supports 50°C operating environment
13. 500 VCM isolation

Module Selection

A wide selection of OPTO-22 or compatible modules (NEMA ICS 2-230-.02) are available for use with the Control488/16 series. These modules provide the signal conditioning necessary to switch AC or DC loads and to sense AC or DC voltages.

OPTO-22® Modules Switch Modules

	AC Control			DC Control		Dry-Contact
Module	**PCAC1**	**PCAC2**	**PCAC3**	**PCDC1**	**PCDC2**	**PCDC3**
Operating voltage	12-140 VAC	240-280 VAC	240-280 VAC	5-60 VDC	5-200 VDC	0-100 VDC 0-130 VAC
Nominal line voltage	120 VAC	240 VAC	120-240 VAC	60 VDC max	200 VDC max	100 VDC max 130 VAC max
Isolation	4000V RMS	4000V RMS	4000V RMS	4000V RMS	4000V RMS	4000V RMS
Current rating @ 45°C	3A	3A	3A	3A	1A	1.5 A max
Turn-on time	½ cycle 0 current	½ cycle 0 voltage	½ cycle 0 current	100 µs	100 µs	750 µs
Turn-off time	½ cycle 0 current	½ cycle 0 current	½ cycle 0 current	750 µs	750 µs	750 µs
Contact mode	Normally open	Normally open	Normally closed	Normally open	Normally open	Normally open

OPTO-22® Modules Sense Modules

	AC Control				DC Control	
Module	**PSAC1**	**PSAC2**	**PSAC3**	**PSAC4**	**PSDC1**	**PSDC2**
Input voltage range	10-32 VAC	35-60 VAC	90-140 VAC	180-280 VAC	2.5-2.8 VDC	4-16 VDC
Input current @ max line	25 mA	6 mA	11 mA	6.5 mA	30 mA	45 mA
Input allowed for output	1 mA 3V	0.8 mA 9V	3 mA 45V	1.7 mA 80V	0.2 mA 1V	0.7 mA 1V

Turn-on time	5 msec	10 msec	20 msec	20 msec	1 msec	0.05 msec
Turn-off time	5 msec	10 msec	20 msec	20 msec	1.5 msec	0.1 msec

Specifications

Control488/16 & Control/16:
Power: 90 to 125 or 210 to 240 VAC, 50/60 Hz
Dimensions: 425 mm wide x 90 mm high x 305 mm deep (16.75" x 3.5" x 12")

Control488/16 Interfaces

IEEE 488 Interface: SH1, AH1, T6, TE0, L4, LE0, SR1, PP1, RL0, DC1, DT1, C0, and E1
RS-232 Interface (EIA RS-232-C): AB, BA, BB, CA, CB
Baud Rates: 300, 1200, 2400, 4800, 9600
Parallel Interface: 8-bit (7 data plus strobe), TTL levels

Control/16 Interface: 8-bit (7 data plus strobe), TTL levels
Slave Control Output: 8-bit parallel TTL

Ordering Information

Description	Part No.
16 channel programmable controller with IEEE 488 and RS-232 control, rack-mount kit, & Window Panels software	Control488/16
16 channel slave controller with 8-bit digital word control, rack-mount kit, & Window Panels software	Control/16
AC control module 12-140 VAC (normally open)	PCAC1
AC control module 24-280 VAC (normally open)	PCAC2
AC control module 24-280 VAC (normally closed)	PCAC3
DC control module 5-60 VDC (normally open)	PCDC1
DC control module 5-200 (normally open)	PCDC2
AC/DC input module 12-32 VAC/DC	PSAC1
AC/DC input module 35-60 VAC/DC	PSAC2
AC/DC input module 90-140 VAC/DC	PSAC3
AC/DC input module 180-280 VAC/DC	PSAC4
DC input module 2.4-28 VDC	PSDC1
DC input module 4-15 VDC	PSDC2

Optional spare signal termination panel	STP3
Optional fuse kit package for G1 (unfused) modules	FKP1
Control488/16 to Control/16 slave cable, 3 ft	CA-81
Control/16 to Control/16 daisy-chain slave cable, 3 ft	CA-82
PC printer port to Control/16 slave cable, 6 ft	CA-83
Power488/MetraByte PIO-12 to Control/16 slave cable, 6 ft	CA-84
Shielded IEEE 488 cable, 6 ft	CA-7-3