



## MegaPower 168

### MATRIX SWITCHER/CONTROLLER SYSTEM

The MegaPower 168 Matrix Switcher/Controller System is ideal for small to mid-size applications that require high-end features and plug-and-play capability. Mount the system; connect cameras, monitors, and keyboards; and apply power. The result is a complete functioning CCTV system. Default performance parameters allow the MegaPower 168 to be used the moment power-up and self-check functions are completed. In addition to the standard matrix switcher features offered with our largest systems (such as macro control, recorder control, choice of keyboards), the MegaPower 168 offers several innovative features.



### FEATURES

- Modular microprocessor-based, high-density matrix architecture
- Matrix sizes up to 168 video inputs by 24 video outputs
- Looping video inputs available via optional loop panels
- User defined macros
- Recorder control (VCRs and digital recorders)
- See through front panel for LED diagnostics
- DC power supply backup capability
- Provides fixed and variable-speed pan/tilt and dome control
- Optional multi-protocol Control Code Module
- Integral video loss detection
- Windows® 95/98 and NT® 4.0 based system setup software
- Parallel printer port
- 4096 Preset titles, 128 Alarm titles
- Integral color bar test pattern
- Individual monitor tours
- 64 system tours, 64 salvos and 35 event timers
- Automatic alarm call-up of up to 1024 alarm inputs
- System partitioning of inputs, outputs, and keyboards
- System priority levels and user passwords
- 25 alarm display/clearance modes
- Eight flexible RS-232 inputs, expandable to 32

The bays have been designed with a see through front panel to allow the user to view the diagnostic LEDs on each module. The front and the back of each module is also colored coded so that modules can be easily identified. On-screen text includes identification of pre-programmed presets and alarm events via a user defined title. Video loss detection is standard on all video inputs. An on-board video pattern-generator enables a color bar pattern to be called to all monitors for consistent display adjustment.

The MegaPower 168 is delivered as a pre-configured one-bay system with a maximum size of 168 inputs by 12 outputs, or as a two-bay system with a maximum size of 168 inputs by 24 outputs. Eight expandable RS-232 inputs are provided for the connection of keyboards, alarm, or computing devices. For convenience, a parallel printer port is also provided. The Windows® based System Setup Software, provided with the system, greatly simplifies the process of customizing and archiving MegaPower 168 operational parameters.

## FEATURES

### Flexible Configurations

Modular, high-density, pre-packaged systems in any combination of 12 video input and 6 video output increments (up to a maximum system configuration of 168 video inputs by 24 video outputs).

### RS-232 Communications

Eight ports allow standard communication with keyboards, alarm interface units, computers, etc. Each port is individually programmable for data rates of 300, 1200, 2400, 4800, 9.6k, 19.2k, or 38.4k baud. Each port can expand to four ports with optional port expander. This expands the available RS-232 ports to a maximum of 32.

### Selectable On-Screen Text

Each monitor can display the date/time, video input number, user-definable video input or Preset title (16 characters), alarm title (48 characters), and monitor status. Three date formats are provided: MM/DD/YY, DD/MM/YY, or YY/MM/DD. The on-screen text uses white characters with black outline to optimize viewing on diverse contrast scenes. For increased visibility, all alarm titles appear on a colored background. The user can turn the following displays on and off: the video input number and monitor status, the video input/Preset title, and the date/time. Text controls include incremental horizontal/vertical positioning and display brightness—all adjustable via the keyboard.

### Macro Control

The system's powerful macros allow each operator to customize his or her own AD2088 workstation to perform a multitude of tasks via simple, easy to remember keystrokes that are intuitive to that operator. Once macros have been programmed for a keyboard, that set of macros is stored locally.

Each keyboard can be programmed differently to accommodate individual user preferences, needs and requirements. Alternatively, a set of macros can also be "copied" from one keyboard to another. Macros allow for unsurpassed ease of use, even with the most complex and demanding installations.

### Recorder Control

Users can control all of the standard recorder functions directly from any suitably equipped keyboard — play, stop, pause, record, rewind, fast forward and eject — for both VCRs and digital recorders.

### Pseudo Camera Numbers

For each video input, users can assign a 4-digit number to replace the default video input number. This can aid operators in identification, such as in the case of multiple level buildings.

### Monitor Tours

A Tour is comprised of a sequence of up to 64 camera switches. An operator can define a Tour for any video output at any time. The same video input may be inserted multiple times in the same tour. Tours can be run forward or in reverse. Video inputs partitioned from a monitor are automatically skipped.

### System Tours

Sixty-four tours of video inputs or salvos may be established for callup to monitors at any time. Each tour provides 64 positions for insertion of video inputs—each with an individual dwell time, a Preset and an auxiliary action. Tours can be run forward or in reverse. They can include the same video input multiple times and/or multiple Presets and Patterns from a single camera. Tours can be connected together to form Sequences of more than 64 video inputs. Video inputs partitioned from a monitor are automatically skipped.

### Event Timers

There are 35 user-programmable times available. These times may be independently designated for multiple days of the week to automatically call up Universal Tours to video output(s). Event timers also enable you to activate and deactivate alarm contacts based on time of day.

### Salvo Switching

Salvo switching allows multiple video inputs to be called simultaneously to multiple contiguous video outputs. Sixty-four individual groups (Salvos), consisting of up to 16 video inputs (each with a Preset, Pattern and/or an auxiliary action), can be called either manually or as part of a System Tour.

### Automatic Alarm Callup—1024 Alarm Inputs

Alarm inputs can be programmed to call any video input or group of video inputs to any one or more video outputs. A Preset or Pattern and/or auxiliary action, and individual dwell time when sequencing alarms, may be defined for each alarm input. Any combination of 25 alarm display/clearance methods may be selected independently for each video output.

### Alarm Contact Tables

The 1024 alarm contacts can be associated to any video input or Salvo (each with a Preset and/or auxiliary action). Ten monitor/contact association tables are available for inclusion in the 35 event timers to activate/deactivate alarm inputs.

### Alarm Display Modes

The alarm display mode is user-selectable for each video output.

- **Hold:** Displays initial alarm until cleared. Queues subsequent alarms.
- **Sequence:** Sequences multiple alarms with individual dwell times until cleared.
- **Sequence and Display:** Displays initial alarm on one video output until alarm is cleared. Subsequent alarms are sequenced on the next video output (while they are active).
- **Block Hold:** Alarms are displayed on blocks (groups) of contiguous video outputs. A block may consist of up to 16 contiguous monitors. Multiple blocks can be defined.
- **Block Sequence:** Alarms are sequenced on blocks (groups) of contiguous video outputs. A block may consist of up to 16 contiguous monitors. Multiple blocks can be defined.

### Alarm Clearance Methods

The alarm clearance method is user-selectable for each video output.

- **Manual:** Removes an alarm only after the alarm has been manually acknowledged by an operator.
- **Clear:** Automatically removes an alarm approximately 20 seconds after the alarm input deactivates (if the alarm has not already been manually acknowledged). As a security measure, manual acknowledgment may be disabled.
- **Instant Clear:** Automatically removes an alarm when an input deactivates (if the alarm has not already been manually acknowledged). As a security measure, manual acknowledgment may be disabled.

### Status Output

System status output, parallel printer port, and RS-232 ports may be programmed to output both occurrence of and clearance of all alarm and video loss events, as well as power status and monitor messages. An alarm event message includes date/time of event, contact number, video input number, and alarm status. A video loss message includes date/time, video input number, sync loss, and detection mode.

### System Partitioning

System flexibility is further enhanced by defining authorized access to keyboards, video inputs, and video outputs. System partitioning includes the following:

- **Keyboard-to-Monitor Access:** Restricts selected keyboards from accessing selected video outputs.
- **Monitor-to-Camera Access:** Restricts selected video outputs from displaying selected video inputs.
- **Keyboard-to-Camera Access:** Restricts selected keyboards from calling or controlling selected video inputs.
- **Keyboard-to-Camera Control Access:** Allows viewing of, but restricts selected keyboards from controlling remote functions at selected camera sites.

### Password and Priority Operation

Keyboards or users can be assigned one of eight levels of priority control of remote camera sites. Up to 64 user codes, each with a unique password, can be assigned to operators. Access to certain system features may be restricted depending on a user's priority level.

### Internal Video Loss Detection

Video loss is standard on all video inputs. Upon video loss, this feature automatically brings up a blue screen video and can be configured to alert the operator through on-screen (program monitor) and/or printer messages.

### Integral Color Bar Test Pattern

The pattern generator enables you to ensure that all of your monitors are set for consistent display attributes such as brightness and contrast.

### On-Board Diagnostics

The system's built-in diagnostics allow the user to determine the status of the system's internal components via LEDs which can be easily seen through the clear panel of the bay front panel.

### Redundant Power Supply Port

In the unlikely event of the unit power supply failing, the system will automatically switch to a user supplied DC power supply source.

## SYSTEM COMPONENT DESCRIPTIONS

### Central Processing Module (CPM)

An industry standard pSOS real-time operating system, running on a Motorola 68302 high speed 32-bit microprocessor, controls the entire switcher/controller system. It includes eight RS-232 data ports (expandable to 32).

AD168CPM-PC .....Central Processing card  
AD168CPM-BP .....Central Processing card rear panel

### Switching Bay

Up to 16 high density modules are accommodated in a single bay. The modules can be comprised of up to 15 video input modules (VIMs), one or two video output modules (VOMs), and an optional Control Code Module (CCM). The following table illustrates the possible maximum configurations for full cross-point switching and gives the number of bays that the system will occupy.

AD168EB-2 .....Matrix expansion bay

### Power Supply Module

Included in the switching bays, the power supply module supplies the system with appropriate DC voltage levels. The rear panel provides BNCs for HIGH SPEED DATA LINE input/output and external sync signal input/output. It also provides a DB25 connector for a parallel printer port, an RJ45 connector for internal ARCNET input/output, and a removable terminal screw type connector for the redundant power supply input.

AD168PSM-PC .....Power Supply card  
AD168PSM-BP .....Power Supply card rear panel

Note: 180° phase adjustable synchronization allows the installer to reference either the AC line or external vertical sync pulse to facilitate roll-free vertical interval switching. An on-screen setup mode enables the installer to match the power supply phase to the camera phase.

### Video Input Modules

The VIM card provides switching for a maximum of 12 video inputs to a maximum of 12 video outputs.

AD168VIM-1 .....Input module, level 1 (one bay)  
AD168VIM-2 .....Input module, level 1 of 2 (two bays)  
AD168VIM-3 .....Input module, level 2 of 2 (two bays)  
AD168VIM-4 .....Input module for looping, level 1 or 2  
(one/two bays)  
AD168VIM-PC .....Input card  
AD168VIM-BP1 .....VIM1 Input card rear panel  
AD168VIM-BP2 .....VIM2 Input card rear panel  
AD168VIM-BP3 .....VIM3 Input card rear panel  
AD168VIM-BP4 .....VIM4 Input card rear panel

### AD168VOM Video Output Modules

The VOM card provides six video outputs per module. Each output provides on-screen text generation.

AD168VOM-1 .....Output module (NTSC)  
AD168VOM-PC .....Output card (NTSC)  
AD168VOM-2 .....Output module (PAL)  
AD168VOM-PC2 .....Output card (PAL)  
AD168VIM-BP .....Output card rear panel

### AD168CCM Control Code Module (CCM)

The Control Code Module provides three AD Manchester code outputs, six SensorNet outputs and one SEC RS-422 output.

AD168CCM-1 .....Control code module  
AD168CCM-PC .....Control code card  
AD168CCM-BP .....Control code card rear panel

The following table illustrates the possible maximum configurations for full cross-point switching and gives the number of bays that the system will occupy.

Video Outputs	Video Outputs	Control Code Modules	Number of Bays
156	6	1	1
156	12	1	1
156	18	1	2
156	24	1	2
168	12	0	1
168	24	0	2
180	6	0	1

### S3 System Setup Software

For use with computers running Windows 95/98 and NT 4.0, the software provides access to programming advanced system features, simplified system setup, archiving and retrieval of setup data.

Uploading/downloading of system setups to the MegaPower 168 system, all via RS-232, is included.

## OPTIONAL ACCESSORIES

### AD2088, AD2088R, AD2088-1, AD2088R-1, ADTTE €€

Full system keyboards allow for video switching, pan/tilt control, macro and recorder control (AD2088 only), dome control, auxiliary control, macro control, recorder control, and system programming. The keyboards support bi-directional communication with the CPM via RS-232 ASCII commands.

### AD1981, AD1981X Port Expander

Expands one RS-232 port on a system into four ports. This provides connections to multiple system keyboards.

### AD1691, AD1691F-1 Manchester Code Distributor €€

The distributor interfaces with the matrix switcher/controller system via the Manchester port to provide 64 Manchester code outputs for use by receiver/drivers and suitably-equipped pan/tilts and domes.

### AD2091, AD2091-1 Manchester Code Generator/Distributor €€

Interfaces with the matrix switcher/controller system via HIGH SPEED DATA LINE and provides 64 AD Manchester code outputs for use by receiver/drivers and suitably-equipped pan/tilts and domes. Multiple units can be cascaded together.

### AD2083-02B, AD2083-02B-1 SEC RS-422 Code Generator/Distributor €€

Interfaces with the matrix switcher/controller system via HIGH SPEED DATA LINE and provides 16 SEC RS-422 outputs for use by suitably-equipped domes. Multiple units can be cascaded together.

### AD2096A, AD2096-1 Alarm Interface €€

Supervises up to 64 alarm inputs and provides RS-232 ASCII alarm commands to the system. Alarm inputs can be programmed to call any video input, display any preset, or to initiate any auxiliary action. Up to 16 units can be cascaded on a single RS-232 line.

### AD2031, AD2031-1 Switcher Follower €€

Activates relays when designated video inputs are called to designated video outputs. It interfaces with the matrix switcher/controller system and provides up to 32 Form A relays, via HIGH SPEED DATA LINE, that can be grouped in series and addressed to a single video output, or in two groups of 16 relays for two specific video outputs. Multiple units can be cascaded together.

### AD2032, AD2032-1 Alarm Responder €€

Activates relays when associated video outputs are in their alarming condition. Interfaces with matrix switcher/controllers and provides up to 32 Form A relays via HIGH SPEED DATA LINE. Multiple units can be cascaded together.

### AD2033, AD2033-1 Auxiliary Follower €€

Activates relays when a specific auxiliary is triggered (either manually or automatically) for an associated video input. Interfaces with matrix switcher/controllers and provides up to 32 Form A relays via HIGH SPEED DATA LINE. Multiple units can be cascaded together.

### AD1983, AD1983X Code Converter

Converts Manchester code to two bytes of RS-232 control code for transmission on standard RS-232 links. RS-232 receiver/drivers may be connected directly to the link (a separate RS-232 distributor may be required), or a receiving AD1983 Code Converter may be used to convert the signal back to Manchester code for use by standard receiver/drivers.

### Recorder Control Devices €€

The series of recorder control devices allow for remote control of VCRs and digital recorders via the AD2088 Full System Keyboard. This enables users to have integrated control of the most popular types of recorders.

- The AD100XA/AD100XA-1A Recorder Controller is the CPU of the recorder interface network. Just one recorder controller can accommodate the entire network, and it enables the programming of the various recorder control devices.
- The AD100IR16/AD100IR16-1A IR Interface Module controls any recorder that has IR capability and is supplied with an IR remote (used to learn the IR commands).
- The AD100RL8/AD100RL8-1 Resistive Ladder Module controls recorders that can be controlled via resistive ladder.
- The AD100RS8/AD100RS8-1 RS-232 Module controls RS-232 VCRs and digital recorders.

## SPECIFICATIONS

### Model Numbers

Fully-configured, pre-packaged systems.

#### AD168R INPUTS-OUTPUTS

INPUTS in increments of 12 (up to 180)

In product code, insert "L" after quantity of inputs to designate looping video. For example, AD168R48L-12 designates 48 looping video inputs and 12 video outputs.

OUTPUTS in increments of 6 (up to 24)

In product code, insert "C" after quantity of outputs to designate factory-installed Control Code Module. For example, AD168R48-12C designates 48 video inputs and 12 video outputs with a factory installed CCM.

### Operational

Bandwidth	.....20 MHz
Frequency Response	.....± 1.0 dB to 6 MHz
S/N Ratio	.....-60 dB (Vp-p vs. Vrms noise)
Crosstalk	
Adjacent Channels	.....-55 dB (at 3.58 MHz)
Input to Input	.....-70 dB (at 3.58 MHz)
Differential Delay	.....± 1.0°
Differential Phase	.....≤ 0.5°
Differential Gain	.....≤ 1.5%
Tilt	.....≤ 2.0%
Gain	.....Unity ± 1 dB
Return Loss	
(Input/Output)	.....≥ 40 dB
DC Level (Video Signal)	.....0 Volts
Switching	.....Complete switching of crosspoint matrix EIA RS-170 and NTSC, CCIR and PAL
Switching Speed	.....Less than 20 ms (typical)
Phase Adjustment	.....180° vertical interval adjustment for switching bay
Non-Volatile Memory	.....Setup information saved for a minimum of five years
On-Screen Text	.....Date/time, video input number, video input or preset title (16 characters), monitor status, alarm title (48 characters)
Character Set	.....English, French, German, Spanish, Portuguese

### Electrical

Supply Voltage	.....90-264 V, 47-63 Hz (auto-sensing)
Power Requirements	.....180 watts maximum per bay
Redundant Supply Input	.....+8 VDC @ 10A -8 VDC @ 5A

### Connections

Video Inputs	.....0.5 to 2.0 Vp-p, BNC composite
Video Outputs	.....1.0 Vp-p, BNC composite
RS-232	.....Eight 8-Pin Modular RJ-45 jacks (expandable) Optional Port Expander extends each RS-232 port to four (32 ports maximum)
RS-422	.....One port through removable Eurostyle terminal screw connector
Manchester	.....Three ports through removable Eurostyle terminal screw connectors
SensorNet	.....Six ports through removable Eurostyle terminal screw connectors
Daisychain	
Manchester	.....3 domes at a maximum distance of 1.5km (5,000 ft) on one 18 AWG shielded twisted pair (STP)

RS-422 .....10 domes at a maximum distance of 1.0  
km (3,000 ft) on two 22 AWG shielded  
twisted pairs (STP)

SensorNet .....32 devices at a maximum distance of 1.0  
km (3,000 ft) on one 22 AWG unshielded  
twisted pair (UTP)

AD High Speed Data Line	.....One BNC connector
External Sync In/Out	.....Two BNC connectors
Programming Monitor	.....One BNC connector
ARCNET	.....One RJ-45 connector
Parallel Port	.....One DB25 connector
Redundant Power Supply	.....One pluggable Eurostyle terminal screw connector

### Mechanical

Mounting	.....19 in EIA rack mount, 5-U high
Dimensions (H x W x D)	.....222 x 432 x 406 mm (8.75 x 17 x 16 in)
Unit Weight	.....18.2 kg (40 lbs), fully loaded bay
Color	.....Black

### Environmental

Operating Temperature	.....0° to 50° C (32° to 122° F)
Humidity	.....5 to 95% RH (non-condensing)
Storage Temperature	.....-40° to 70° C (-40° to 155° F)

### Regulatory

Emissions	.....FCC Part 15, Subpart B Class A CE: EN55022 Class B
Immunity	.....CE: EN50082-1
Safety	.....UL1950 cUL: CSA C22.2 No. 950-95 CE: EN60950

## BASIC SYSTEM DIAGRAM

