



Middle Atlantic Products, Inc.

middleatlantic.com

# USC Universal Sequencing Controller

EIA/TIA Compliant

## USC-6R Universal Sequencing Controller for MPR Modular Power System

### Features

- Provides 6-step sequencing to remote switchable modules via 12 volt DC and/or switch closure
- Adjustable start delay times
- Adjustable sequence intervals
- Up to 3 units may be daisy-chained together
- UL Listed in the US and Canada



FRONT



BACK

### Architects' and Engineers' Specifications

One rackspace universal sequencing controller shall be Middle Atlantic Products model # USC-6R. Sequencing up and down shall be controlled locally via integral front system switch or remotely via single pole, double throw, center off, momentary switch. A rear mounted, three-position (up, common, down) terminal block shall accept connection of remotely controlled switch. Six yellow LED lights shall indicate channel status. One green LED light shall indicate power status. Remote status indication shall be connected via RJ-45 on the rear of the unit. The USC-6R shall accept daisy-chaining of up to three units to provide a maximum 18 channels of sequencing. A start delay switch on the rear of the unit shall facilitate programming of the daisy-chained, sequencing function. An interval delay switch shall adjust the sequencing interval to 1, 3 or 6 seconds between steps. Six controlling outputs shall be 12 VDC and/or dry relay contact closure. Each USC-6R shall be capable of controlling up to 12 modules. The USC-6R shall be warrantied to be free from defects in material and workmanship under normal use and conditions for a period of 3 years. The USC-6R shall be UL Listed in the US and Canada.

#### OPTIONS

- USC-SWL remote wallplate switch and LED status indicator panel
- USC-KL remote wallplate key switch and LED status indicator panel
- USC-SW remote wallplate switch panel
- USC-K remote wallplate key switch panel
- S-DEC remote Decora® switch panel, mounts in Middle Atlantic Products Decora® openings only
- K-DEC remote Decora® key switch panel, mounts in Middle Atlantic Products Decora® openings only



USC-SWL

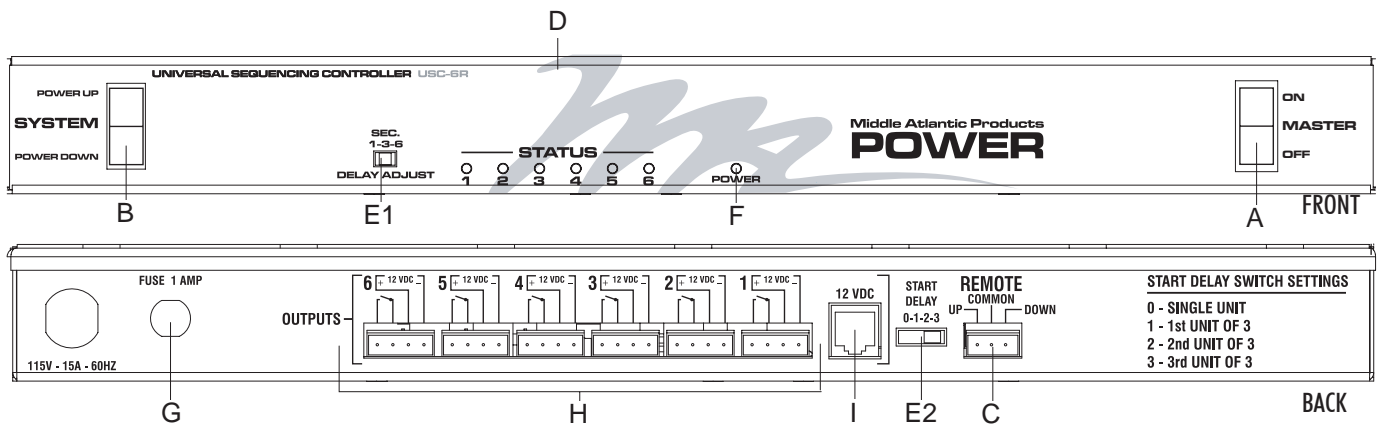


USC-KL

customizable specification clips available at [middleatlantic.com](http://middleatlantic.com)

### Engineered Mounting Solutions

US: New Jersey • California • Illinois • Voice: 973-839-1011 Fax: 973-839-1976 • [middleatlantic.com](http://middleatlantic.com)  
 Canada: Ontario • British Columbia • Voice: 613-836-2501 Fax: 613-836-2690 • [middleatlantic.ca](http://middleatlantic.ca)



**Specifications:**

- A. **The Master Power Switch Circuit Breaker:** (with indicator light): Switches power from the line cord to the rest of the unit and additionally provides overload protection (rated at 15 Amps at 120 VAC). Also provides "power on" indication via the illuminated switch actuator.
- B. **The System Switch:** (single pole, double throw, center off, momentary): Initiates system start for system sequence up and down. When the master switch (described above) is on, depressing the top of the system switch initiates the power up sequence. Outputs will activate in ascending order from 1 to 6. The sequence interval delay and start delay are determined by the "delay adjust" settings (described later). Depressing the bottom of the system switch initiates the power down sequence. Outputs will deactivate in descending order from 6 to 1. The "delay adjust" settings also function in the "sequence down" mode.
- C. **Remote Control Terminal Block:** This terminal block (located on the rear of the unit) is wired parallel to the system switch. This provides remote control of the system switch functions. This terminal block has three positions: system up, common, system down. A separately provided, single pole, double throw, center off, switch may be connected to this terminal block and installed in a remote location providing a secondary control location. If multiple sequencers are used, the remote control switch may be connected to the terminal block on any sequencer in the system. This is not limited to one remote location. Several remote switches can be installed if multiple control locations are required. It is recommended that a "momentary" switch be used, since a control switch left in either the up or down position would "lock out" all other switches installed on the system, including the system switch on the unit. This, however may have an advantage if the installation requires a "lock out" function in a specific location. A key type switch can be installed for added security (see "USC-KL"). Standard telephone cable may be used for the connection of the remote control switch(s) (500' max with 22-gauge wire). Longer distances can be achieved by increasing the wire gauge. The voltage on the remote control circuits is 5 VDC (class 2 wiring).

**HINT:** To ensure a good, longer lasting connection when connecting wires to a screw-type terminal block, do not twist or tin (solder) the conductors on stranded wires

Another function of the remote control terminal block is to provide a connection point to allow "daisy chaining" of up to three sequencers together. They function as three separate controllers, controlled by a single actuation of any system switch or they can be programmed to act as a single 18 channel controller (3 units with 6 channels each). This programming function is described later, see "delay adjust switches".

- D. **Status Indicators:** 6 yellow LED indicators are provided to allow visual monitoring of the outputs. As each output is activated, the corresponding channel LED illuminates (1 to 6) thus allowing the operator to monitor the status of the sequence operation. Conversely, the LEDs will turn off sequentially (6 to 1) during the "sequence down" operation.
- E. **Delay Adjust Switches:** There are two delay adjust switches on the unit: Interval Delay (between sequence steps) and Start Delay (both up and down system start)
  1. **(Interval) Delay Adjust Switch:** 3 position switch providing 1, 3 and 6 second delay between sequence steps. The switch actuator is a slide type, and is located on the front of the unit. The delay is common to all channels (1 through 6).
  2. **Start Delay Switch:** Mounted on the rear of the unit. This switch is a 4 position slide switch (switch positions 0-1-2-3) providing a delay on both "system up" and inversely on "system down" operation. This allows the interconnection of up to three, 6 channel sequencers to operate as a single 18 channel unit, by delaying the start of sequencer #2 until sequencer #1 has completed it's sequence function. Then subsequently initiating the start of sequencer #3. At the same time individual units are selectively programmed to initiate the "sequence down" function in reverse order. (i.e. unit #3 will begin sequence down first, then unit #2, then unit #1, "first on – last off"). Switch position #0 is for single sequencer (no start delay, up or down).

The sequencing functions are controlled by elapsed time, not by a "trigger pulse", therefore, sequence interval and start delay time settings provide great latitude when interconnecting ("daisy chaining") up to three units together. This "elapsed time" programming method eliminates many of the problems experienced when a "trigger" pulse is sent from one sequencer to the next.

The start delay is directly proportional to the interval delay, (the longer the interval delay, the longer the start delay). When "daisy chaining" 2 or 3 sequencers together it is important to set the interval delay the same on all units to provide proper synchronization.



- F. Green LED "Ready" Indicator: This LED, located on the front panel, will be illuminated when the master power switch is turned on. When a start delay function is selected via the "start delay switch", this light will blink indicating that the unit has received a command to initiate a sequence up or down. The LED will blink for the duration of the selected start delay time (from the time sequence is initiated to the time first channel output is energized). This LED also serves as a DC power supply fuse indicator.
- G. DC Power Supply Fuses: In addition to the master switch/circuit breaker, the DC power supplies are protected by two fuses. One located internally, which powers internal voltages, and one located on the rear panel for 12 VDC which connects to controlled devices. An overload on the external customer provided wiring will have no effect on the internal voltage power supply or its associated fuse. Each sequencer can control up to 12 modules.
- H. Plugable Terminal Block Outputs: The control outputs, located on the rear of the unit, are provided via "plugable" terminal blocks, which allow for pre-wiring prior to installation of the controller. This feature allows fast and simple controller installation and reduces risk of potential damage due to premature controller installation. Additionally, if controller replacement is necessary, it can be replaced without rewiring of control circuits, just "plug and play".

Each output has 3 connection options:

- 12 VDC output (individual channel terminal block).
- Contact closure (individual channel terminal block).
- 12 VDC output (all channels and (+) and (-) constant). Terminated in a RJ-45 jack.

Each channel has a plugable terminal block output, consisting of 4 terminal positions. Terminals (1) and (2) provide a dry switch closure and terminals (3) and (4) provide 12 VDC output. These outputs activate simultaneously and can be used at the same time (i.e.: one output can be used for control and the other can be used to monitor sequence status). These outputs are electrically isolated from each other via a double pole electro-mechanical relay. Maximum total load on the external 12 VDC section is 1.5 Amps. Maximum load on each switch closure is 5 Amps.

RJ-45 Jack Output: This output is connected in parallel to the 12 VDC output on the individual channel terminal blocks. It provides a convenient connection point for utilization devices or status monitor indicators. Positions 1 through 6 output +12 VDC corresponding to sequence channels 1 through 6, position 7 is -12 VDC (common), and position 8 is a +12 VDC, parallel to the green "LED ready indicator" circuit, which is photo optically isolated from the internal 12 VDC supply.

This jack can be used in addition to, or instead of the individual channel terminal blocks, however, care should be taken not to exceed the load restriction of 1.5 Amps total. This jack may be connected to USC-KL remote wallplate key switch or USC-SWL remote wallplate switch.

- J. USC-KL: This is a key switch and LED status indicator panel. It is designed to be installed in a single gang electrical box. The key switch terminates in a 3 position terminal block, and the LED status indicators terminate in a RJ-45 jack. This unit is optional and must be purchased separately.

USC-K: This key switch panel is designed to be installed in a single gang electrical box. The key switch terminates in a 3 position terminal block. This unit is optional and must be purchased separately.

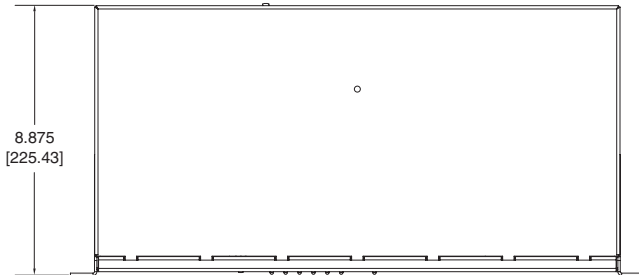
- K. USC-SWL: This is a switch and LED status indicator panel. It is designed to be installed in a single gang electrical box. The switch terminates in a 3 position terminal block, and the LED status indicators terminate in a RJ-45 jack. This unit is optional and must be purchased separately.

USC-SW: This switch panel is designed to be installed in a single gang electrical box. The switch terminates in a 3 position terminal block. This unit is optional and must be purchased separately.

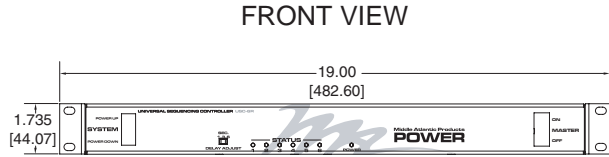


# USC-6R Universal Sequencing Controller basic dimensions

All dimensions in inches unless otherwise noted [All bracketed dimensions are in millimeters]



TOP VIEW



FRONT VIEW



BACK VIEW

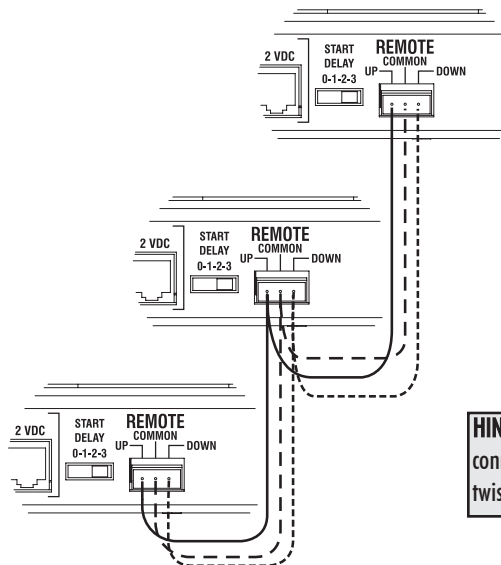
## USC-6R remote control terminal block connections

The remote terminal block on the rear of the USC-6R has two functions:

1. Enables the interconnection of up to three USC-6R's to function as a single 18 step unit. Allows up to three USC-6R sequencer to operate under control of the system switch on any sequencer in the group (dependent on delay start switch settings.)
2. Allows the connection of a customer provided remote control switch.

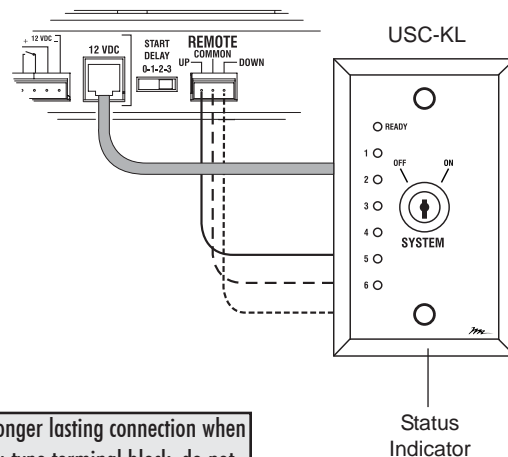
Note: The above described interconnections (1 & 2), may be used simultaneously.

### Function #1



### Function #2

For remote control use.  
USC-KL, USC-SWL or optional customer provided single pole, double throw center off, momentary switch



**HINT:** To ensure a good, longer lasting connection when connecting wires to a screw-type terminal block, do not twist or tin (solder) the conductors on stranded wires

