ControlKeeper® M

WARNING
HAZARDOUS VOLTAGES. DISCONNECT FROM SUPPLY BEFORE REMOVING COVERS.
NO USER SERVICEABLE PARTS INSIDE. SERVICE BY QUALIFIED PERSONNEL ONLY.

SAFETY INSTRUCTIONS

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Only Qualified Electricians should install the Lighting Control Equipment
- Install in accordance with National Electrical Code (NEC) or other codes that may apply
- Turn power OFF at circuit breakers before removing the chassis covers or when installing or wiring high voltage components
- All new wiring must be fully verified before applying power
- Document all wiring that is terminated to relays and other components for ease of future servicing and programming
- Ensure that high voltage and low voltage wiring remains separated and enters through the designated high and low voltage areas
- All ControlKeeper® M enclosures exceed the weight limit for one person lifting – always use at least two people when lifting and mounting
- Equipment should not be mounted in locations where it will be readily subjected to tampering by unauthorized personnel
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition
- Do not use this equipment for other than intended use and at the listed voltage
- Servicing of equipment should be performed by qualified service personnel

SAVE THESE INSTRUCTIONS
**General Information**

**Cabinet Dimensions**

18 circuit cabinet
Weight
Packed: 55 lbs
Unpacked: 50 lbs

CKM18:
31”H X 24”W X 6”D
(up to 18 relays)

36 circuit cabinet
Weight
Packed: 75 lbs
Unpacked: 70 lbs

CKM36:
40”H X 24”W X 6”D
(up to 36 relays)

48 circuit cabinet
Weight
Packed: 100 lbs
Unpacked: 90 lbs

CKM48:
48.25”H X 24”W X 6”D
(up to 48 relays)

**General Reference Overview**

**Mounting the Enclosure**

The ControlKeeper® M consists of an outer enclosure and interior insert that contains all of the enclosure components. In some cases, the outer enclosure may ship separately from the interior. If your enclosure does not have the interior components installed upon shipment, you will need to install the interior in the enclosure on site once conduit connections are completed.

The ControlKeeper® M is available in three different enclosure sizes: 18 size, 36 size and 48 size. It can be configured with different relay types as needed to achieve your lighting needs.

**Location and Spacing**

The ControlKeeper® M models are all fully convection cooled; therefore it is vitally important to ensure that each unit is installed in a ventilated location that permits sufficient airflow and provides the correct operating conditions.

**Ambient Atmosphere Requirements**

Temperature 32° F to 122° F (0° C to +50° C)
Humidity 0 to 95% non-condensing
Mounting the Enclosure

Mounting Considerations
- A minimum of 14 inches (360 mm) must be maintained from the front of the chassis to any other components or walls. Please make sure to check and follow local code requirements if additional clearance is needed per code in your area.
- Allow adequate space for future maintenance of the unit. Do not install in a location that will later be difficult to access.
- The ControlKeeper® M is designed to be mounted vertically.
- During operation, the ControlKeeper® M will produce audible noise caused by circuit relays within the unit. Take these matters into consideration when deciding on a suitable mounting position.
- Use suitable conduits and couplers to link the raceways to the controller chassis.

Accessing the Mounting Holes
The mounting holes are located within the rear panel of the ControlKeeper® M enclosure. To access the mounting holes (and circuit wiring terminals) it is necessary to remove the front cover panel.

To Remove the Front Cover Panels
CAUTION: If removing panels on a previously installed ControlKeeper® M, ensure that all incoming power circuits are turned OFF first.
1. Open the hinged panel door.
2. Remove the two upper and two lower security screws that hold the main panel in place. Loosen the keyed bolts on the outer front panel.
3. Carefully lift and remove the front panel from the keyed bolts.

To Remove the Interior Insert
If your enclosure shipped with the interior insert installed, it is recommended that this be removed from the outer enclosure during the initial connection rough-in to protect components from metal fragments.

1. Loosen the interior mounting bolts located on the back wall of the enclosure.
2. Slide the interior assembly up until the keyed holes are free of the mounting bolts.
3. Remove the interior assembly from the enclosure, setting aside in a protected location.

To Mount the Enclosure
1. Choose a dry location convenient to the circuit breaker panel that meets the operating temperature requirements.
2. Mount the panel on a firm surface using the predrilled holes.
3. Connect the enclosure to the circuit breaker panel using conduit.
4. Remove all cuttings and dirt.

Note: Make certain that high voltage and low voltage load wiring enters the enclosure separately. High voltage wiring should be brought into the enclosure through the left and right sides or the top right and top left wiring channels. The main lug wiring should be brought in from the bottom. Low voltage wiring can be brought into the enclosure from the top-middle location of the enclosure.
**To Install the Interior Panel Insert**

Once conduit drilling and connection is completed, it will be necessary to install the interior insert containing the ControlKeeper® M components in the enclosure.

1. Loosen the interior mounting bolts located on the back wall of the enclosure.
2. Carefully place the interior assembly over the mounting bolts aligning the keyed holes over the mounting bolts.
3. Slide the keyed holes down and tighten the mounting bolts securely.

**To Replace the Front Panels**

1. Carefully place the front panel over the keyed bolts; verify alignment.
2. Install the security screws behind the hinged panel door.
3. Tighten the front panel bolts.

**High Voltage Wiring**

Whenever working on high voltage circuits or components, ensure that all power is OFF at feeding circuit breakers.

**Wiring the Main Power Supplies**

The main power supplies provide power to the components within the ControlKeeper® M enclosure. Universal power supplies are used that accept a single phase power circuit from 120 VAC – 347 VAC. It is recommended that a dedicated branch circuit be provided to supply power. Power supply wiring may enter from the left, right or bottom of the enclosure.

Wiring harnesses have been provided for connection to the main power supplies. Connect the two white wires to your incoming neutral wire. Connect the two black wires to the incoming hot wire (120 VAC – 347 VAC). Ensure that the system power ground is connected for safety purposes.

**Connecting Relay Loads**

The relay cards will be pre-mounted on the interior insert per the order specifications. Unless otherwise specified, electrically held relays (single pole) will be provided for connection to lighting loads. Two pole relays and latching single pole relays may also be installed per the order specifications.

Prior to relay connection, test the load directly connected to the branch circuit breaker to verify that there are no shorts. Remove all wire cuttings from the enclosure.

ControlKeeper® M relays have built in power metering functionality. In addition, new variable relay timing technology monitors each individual relay for optimal closure based on the connected load characteristics. All single pole relays will require the connection of a neutral reference wire for proper operation of power metering and variable relay timing technologies. This connection is not for termination of the load neutral wire. Load neutral wires should be terminated to the neutral bus bar of the feeding electrical panel.

All wiring for relay loads should enter from the left, right or bottom panels of the enclosure. The top-left and top-right corners may also be used for high voltage access.

Relays are numbered alternating from left to right from the top to bottom. For instance, relay 1 will be the relay in the top left position, relay two is the relay in the top right position, relay 3 will be the next row down on the left, etc. See the diagram on the next page for clarification. Regardless of cabinet size, i.e. 18, 36, or 48 size, the relay numbers will always start at the top of the enclosure with odd relays on the left and even relays on the right.
Two pole relays which take up two relay positions will operate off of only one of the relay positions. If the card is located on the right (even numbered side), the card will operate by commanding the bottom relay position, i.e. if installed in location 6 & 8, the control relay will be relay 8. If the card is located on the left (odd numbered side), the card will operate by commanding the top relay position, i.e. if installed in slot 1 & 3, the control relay will be relay 1.

**Single Pole Electrically Held Relay Card Notes**
- Relay ratings are 120 to 277 volt, 20 amp maximum, single pole. It is recommended that circuits be loaded to no more than 16 amps
- Relay terminal blocks have a maximum limit of 8 AWG wire
- Horsepower ratings per relay 1HP @ 120 VAC, 2HP @ 277 VAC

**Latching Relay Card Notes**
- Relay ratings are 120 to 347 volt, 20 amp maximum, single pole. It is recommended that circuits be loaded to no more than 16 amps
- Relay terminal blocks have a maximum limit of 8 AWG wire
- Horsepower ratings per relay 1HP @ 120 VAC, 2HP @ 277 VAC

**Two Pole Relay Card Notes**
- Two pole relays are available in an electrically held, normally open configuration
- Relay ratings are for two pole loads up to 480 volts, 20 amp maximum. It is recommended that circuits be loaded to no more than 16 amps
- Relay terminal blocks have a maximum limit of 8 AWG wire
- Two pole relays take up two relay slots in the enclosure
- Horsepower ratings per relay 1HP @ 120 VAC, 2HP @ 277 VAC

**Single Pole Relay Wiring**
Single pole relay options, such as the electrical held relay and latching relays, are rated for single pole loads. Connection of two pole circuits/loads to the single pole relay card will void the equipment warranty and may result in severe injury or death, and/or damage to the equipment.

**To Wire a Single Pole Load to a Relay:**
1. Connect the single pole de-energized branch circuit breaker to the relay terminal block position labeled LINE.
2. Connect the outgoing load wiring to the output terminal block position labeled LOAD.
3. Tighten down relay terminal screws, verifying that the relay wiring is secure. Verify that the terminal is tightened over the conductor, not the insulation.
4. Terminate the load neutral wire to the neutral bus bar on the feeding circuit breaker cabinet, not within the ControlKeeper® M enclosure.
5. Verify that the neutral reference wire has been connected as described below.

**Single Pole Relay Neutral Reference Wiring**
The neutral reference termination wire is used for power metering and for the patent pending variable relay timing switching technology within the relay card. In order for these items to operate properly, it is necessary to run a neutral reference wire to any single pole relay. No load current need flow through this conductor allowing it to be much smaller than the line and load conductors. The maximum gauge accepted by the neutral reference terminal is 16 AWG. The neutral reference wire is not necessary for two pole relays.
High Voltage Wiring

All Relays Fed from the Same Electrical Panel
If relays are all being fed from the same circuit breaker panel, a single neutral reference wire may be brought from the neutral bus bar of the feeding circuit breaker panel and may be jumpered to each relay card’s neutral reference terminal. The factory has pre-configured the panel for this type of installation to allow for easy neutral reference wire connection.

Relays Fed from Multiple Electrical Panels
If an enclosure is fed from multiple circuit breaker panels, it will be necessary to run a neutral reference wire from the neutral bus bar of each feeding breaker panel and terminate the appropriate neutral reference to each relay card. Change the factory pre-wired configuration of the neutral reference wire as necessary to meet your installation's requirements. See the example depicted below.

Two Pole Relay Wiring
To Wire Two Pole Load to a Two Pole Relay:
1. Connect one circuit of the de-energized two pole breaker to one of the relay terminal block LINE locations.
2. Connect the load side to the output terminal block position of the same terminal block, labeled LOAD.
3. Connect the other circuit of the de-energized two pole breaker to the other relay terminal block LINE location.
4. Connect the second load side wire to the terminal block LOAD location.
5. Tighten down relay terminal screws, verifying that the relay wiring is secure. Verify that the terminal is tightened over the conductor, not the insulation.

Two pole relays do not require a neutral reference wire.

Installing High Voltage Barriers
It may be necessary to install high voltage barriers in your enclosure to meet local or national code requirements for separation of voltages. If high voltage barriers have been ordered, they will come in a separate package from the enclosure and will need to be mounted in the enclosure in the desired locations.

High voltage barriers may be placed in between any relay card location. Please plan placement of barriers for the most convenient wire routing. For instance, if the panel is to have emergency and normal power installed and the transformer must be powered from an emergency power source, the barriers might be best installed on relay cards near the bottom of the enclosure so that all emergency power is localized in the bottom of the enclosure.

The high voltage barrier consists of three components; the high voltage barrier itself, a mounting screw, and a mounting clamp/washer.
To Install the Barrier:
1. Turn OFF all incoming power circuits.
2. Remove the front panel from the enclosure.
3. Insert the provided mounting clamp washer through the slot in the high voltage barrier so that the double tongue portion is through the slot.
4. Remove the relay mounting screw on one of the cards closest to where the barrier is going to mount and on the side that the mounting clamp washer will align with. Loosen the remaining mounting screws on both relay cards.
5. Insert the mounting barrier into the enclosure so that the longest, flat edge rests against the enclosure side wall and the tongue portion inserts into the space between the two relay cards. When positioned correctly, the mounting washer should align with the relay card mounting screw location.
6. Insert the screw provided in the barrier kit, through the barrier mounting washer and into the relay mounting screw location. Tighten down the connection.
7. Tighten the remaining relay mounting screws. Installation is complete.

If loads within the same enclosure are fed from more than one electrical cabinet, make sure that the neutral reference wire for each single pole relay is properly terminated to the feeding panel.

Applying Power
1. Once the wiring is complete, make certain that the enclosure is clean of any wire clippings and that no fragments are lodged in the relay circuit boards or other components.
2. Ensure that there are no loose or exposed wires
3. If not done already, ensure that the front cover panel is replaced on the enclosure chassis.
4. Apply power to the ControlKeeper® M main power supply and any desired controlled circuits.
5. Once power is applied to the unit, if your ControlKeeper® M is equipped with a display, the display should illuminate and show the main menu when the touchscreen is touched. If your unit has no display to verify that the microprocessor is operating, open the outer main hinge door and the inner hinge low voltage access door to view the main microprocessor LEDs. The main status ‘Heartbeat’ LED should be blinking, indicating that the microprocessor is running.
Lighting loads may be operated via the individual relay override switches located along the side rails of the low voltage section or by using the main motherboard override switch. Dual color LEDs will illuminate red or green next to the individual overrides indicating commanded relay state. The ControlKeeper® M does not need to be programmed to use these override methods.

Low Voltage Wiring

Low voltage wiring consists of wiring for the following items:

- Contact closure inputs
- Greengate digital switch inputs
- Analog inputs
- Network wiring
- RS-232 serial device connections
- USB software connections
- Ethernet wiring
- Lighting Relay Module accessory connection

Low voltage wiring must be separated from high voltage wiring. The top-middle section of the enclosure is reserved for low voltage entry conduit and conductors.

Test all low voltage wiring for shorts to AC ground before connection to the ControlKeeper® M panel.

The ControlKeeper® M contains an onboard 24 VDC power supply for powering peripheral devices. It is possible to exceed the amount of power available if a large number of inputs are being used. An EXPS-24V, external power supply may be provided to power additional devices.

Important: If an EXPS-24V power supply has been provided to supplement the lighting controller’s power for your installation, recommended connection of inputs vary from the below instructions. Please refer to the EXPS-24V installation instructions to ensure proper operation and avoid damage to your lighting controller.

Power down the main power supply or disconnect low voltage terminal blocks during initial low voltage wiring.
Contact Input Switch Wiring

General Information

Each ControlKeeper® M panel can be ordered with optional contact closure input wiring terminals in the low voltage section of the enclosure. These terminals are located on the Contact Closure Module (CCM).

Unless specified during ordering, the ControlKeeper® M will not come populated with a Contact Closure Module card. If a Contact Closure Module card has been ordered, it will contain up to 36 input terminals. Dependent on the type of contact being used, this allows for connection of up to 18 SPDT momentary (3-wire) or 36 SPST momentary or maintained (2-wire) switch inputs per CCM card. There are 18 provided lighted switch output (LSO) terminals on board each CCM card. The panel size will dictate the number of CCM cards an enclosure can hold.

*These figures are contingent on no other input types being connected.

The optional onboard programming display and software packages use a “CCM card # : Switch Terminal #” system to identify inputs in programming. Each CCM card contains a card # identifier LED (CCM1, CCM2, CCM3) and labeling on each wiring terminal (1-36) that will identify the input for programming. It is important to document each switch wire termination for programming purposes. CCM card terminal numbers will start in the lower left corner with terminal 1 and number left to right progressively up to terminal 36. LSO marked terminals are for landing lighted switch output wires for switches containing Eaton’s Cooper Controls approved pilot lamps or LEDs. For each wired terminal, document the type of switch inputs connected, noting the CCM card # and numbers of the wired terminals.

Wiring Detail

- Use 18 AWG twisted, unshielded wire for all low voltage dry contact closure device wiring. Maximum length for dry contact closure device wiring is 1000 feet
- If wall switches are controlling the same lighting loads and are the same physical switch type, they may be wired in parallel to the same switch terminal. Maintained switch inputs should not be wired in parallel unless they are motion sensors controlling the same relay groups
- No more than 3 incandescent or 6 LED pilot lights may be wired to any LSO channel

1. Open the inner, low voltage door.
2. Pull contact input wiring through the top-middle, low voltage section of the enclosure using appropriately sized conduit to fit your low voltage conductors. Ensure that all low voltage wiring is separated from high voltage wiring in the entry to the enclosure as well as in wiring troughs and conduit.
3. Locate the Contact Closure Modules in the low voltage section above the main motherboard.
4. Connect the conductors to the terminal blocks being careful to strip insulation only to the point of terminal block entry. (Terminal blocks are removable for ease of wiring) typical wiring for common input device types is shown on the next page.
5. For each wired terminal, document what switch input is connected noting terminal numbers and the CCM card #. Also document the type of switch connected, i.e. maintained, 3-wire momentary, or 2-wire momentary. The CCM card # can be verified by looking at the CCM Card LEDs. If using lighted switches, document the LSO terminal being used for each input.

Greengate Digital Switch (GDS) Wiring

**General Information**

ControlKeeper® M lighting panels are compatible with Greengate Digital Switches (GDS). Greengate Digital Switches are networkable, intelligent, low voltage switches. Greengate digital switches are proprietary to Eaton's Cooper Controls. Digital switches from other manufacturers are not compatible with the system. GDS Stations are available in large button and small button configurations which offer 1 to 6 buttons per station.

Each ControlKeeper® M panel has a connection terminal block which allows one GDS switch network to connect directly to the motherboard. Each GDS switch network is capable of powering and supporting up to 32 GDS stations over a 1000 foot (300 meter) distance.

The GDS network is a daisy-chain configuration with two distinct ends. The two end devices will be terminated using onboard termination jumpers. Prior to wiring, map out the proposed wiring route to ensure correct installation.

The ControlKeeper® M can be wired into the GDS daisy-chain anywhere within the network. All GDS wiring should be done using Eaton's Cooper LCCNP (non plenum), Eaton's Cooper LCCP (plenum), Belden 1502R (non-plenum) or 1502P (plenum) cable. For best network performance, one of the suggested cables should be used. If the specified cable is not used and communications problems occur that require troubleshooting assistance, additional charges will apply.
All stations and the CKM terminal block follow the same wiring scheme:

**Wiring Specifics**

To wire the GDS network to the ControlKeeper® M:

1. Open the inner low voltage door.

2. Pull GDS wiring through the top-middle, low voltage section of the enclosure using appropriately sized conduit to fit your low voltage conductors. Ensure that all low voltage wiring is separated from high voltage wiring in the entry to the enclosure as well as in wiring troughs and conduit.

3. Locate the GDS five-position terminal block located near the top middle of the main motherboard.

4. Secure conductors to the provided terminal blocks following the wiring convention shown. Insulation for each conductor should be intact up to the point where it is stripped to enter the input contacts with no stray wires. If the ControlKeeper® M is in the middle of the network, there will be two conductors under each terminal location.

5. Locate the two end devices on the Greengate Digital Switch Network. These two devices should have their termination jumpers in the ‘Terminated’ position. The remaining devices on the GDS network should have their termination jumpers in the OFF position. Termination jumpers are located on the back of the GDS switch directly next to the GDS network terminal block. On the ControlKeeper® M, the termination jumper is below the GDS network wiring terminal block.
Low Voltage Wiring

6. Once installation of the GDS network is complete, run the termination verification check. Remove the GDS terminal block from the ControlKeeper® M terminal pins leaving all GDS wiring connected to the terminal block. Using an Ohm meter, measure for ohms across the CAN-H (White) and CAN-L (Blue) terminals of the disconnected terminal block. If the CKM is one of the end devices in your network, you should get a reading of 120 ohms. If the CKM is not one of the end devices in the network, you should get a reading of 60 ohms. If you get a reading other than the figures shown, double check the device terminators on each GDS and the CKM to locate the problem. The network will not work reliably if it is not properly terminated.

7. Replace the GDS terminal block on the motherboard.

8. Close the inner, low voltage door.

9. Document the GDS wiring by labeling each station location and the flow of the network wiring for ease of system programming and any future troubleshooting.

Analog Input Wiring

General Information
This section describes the wiring for analog input devices. Analog input devices must have a 0-10 VDC or 1-10 VDC output for use with these channels. +24 VDC is provided onboard for powering the analog device. Please refer to the documentation that came with your device for information on proper placement and installation of the device.

The ControlKeeper® M allows for connection of optional analog input modules. Each analog input module allows for connection of four separate analog inputs. The Analog Module connects into the Contact Closure Module (CCM) using an accessory card socket along the left side.

<table>
<thead>
<tr>
<th>CCM Card#</th>
<th>LEDs</th>
<th>Port A</th>
<th>Port B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Each CCM card in the enclosure allows for two Analog Modules. The below chart shows how many analogs could be added to a ControlKeeper® M system if additional Analog Module cards are ordered.

<table>
<thead>
<tr>
<th>Analog Module Details</th>
<th>Relay Enclosure Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Capacity Analog Modules*</th>
<th>2</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Capacity Analog Terminals</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

*Requires a CCM Card for connection. Each CCM card can support 2 Analog Modules.

The optional onboard programming display and software packages use a “CCM card #: Port: Analog terminal #” system to identify analog inputs in programming. Each CCM card contains a card # identifier LED (CCM1, CCM2, CCM3) as well as a port identification letter (A/B) for the analog module location. In addition, each Analog Module will have a labeled number associated with the wired terminals (AN1 through AN4). It is important to document each analog sensor termination location for programming purposes. CCM card port numbers are identified as Port A for the bottom Analog Module port and Port B as the top. On the Analog Module itself, analog terminal numbers will number with analog 1 at the bottom and analog 4 at the top. For each wired analog terminal, document the type of analog input connected, noting the CCM card #, Analog Module port letter, and the number of the wired terminal.

Wiring Detail
Preferred wiring is 18 AWG twisted, stranded wire. Maximum wire length should not exceed 500 feet.

1. Open the inner, low voltage door.

2. Pull analog wiring through the top-middle, low voltage section of the enclosure using appropriately sized conduit to fit your low voltage conductors. Ensure that all low voltage wiring is separated from high voltage wiring in the entry to the enclosure as well as in wiring troughs and conduit.

3. Locate the Analog Modules in the low voltage section along the left side of the Contact Closure Module boards.
4. Terminate analog input wiring to the terminal block in the configuration shown. Insulation for each conductor should be intact up to the point where it is stripped to enter the input contacts with no stray wires. The analog input terminal blocks on the Analog Modules are blocked in groups of 3 terminals. Typical wiring for most Greengate analog sensors is depicted below:

5. Document what analog input is wired to which terminals, noting the analog model being used, the wired analog terminal number, the CCM card # and port (A or B) that the Analog Module is connected to on the CCM card. The CCM card # can be verified by looking at the CCM Card LEDs. The port should be identified by silk-screened text on the motherboard near the Analog Module connection.

6. Close the inner, low voltage door.

Lighting Control Network Wiring

General Information
The ControlKeeper® M is designed to communicate with other ControlKeeper network panels using a lighting control RS-485 network for communications. This allows the panels to share information back and forth with each other and other accessory products and software packages.

The RS-485 network is a daisy-chained network with a distinct beginning and end device. Every device on the Greengate lighting control network must be assigned a unique address. Devices may be addressed from 1-254 using the onboard network address switches. The two end devices must be terminated using the onboard termination jumpers. The termination jumper should be removed on all devices in the middle of the network wire.

Wiring Detail
The lighting control network is an RS-485 daisy-chained network. Recommended cable type is Belden 9841. The RS-485 network may be run up to a maximum length of 4000 feet and 35 devices before a repeater is necessary. The definition of a device is any component that has a connection to the RS-485 network, i.e., lighting panel, gateway or other accessory.

Two terminal blocks are located at the top of the ControlKeeper® M main motherboard for connection to the network wire.

Wiring the Network
1. Before wiring, select the two panels that are going to be the end panels of the network and plan a wiring scheme accordingly. Panels should be daisy-chained, not Star or T-Tapped.

2. Pull the Belden 9841 twisted pair wiring in conduit along the planned route, making certain that it is separate from any high voltage wiring. Pull the network wire into the enclosure through the low voltage compartment.

3. Terminate conductors securely to the provided network termination points as shown, observing polarity. Insulation for each conductor should be intact up to the point where it is stripped to enter the input contacts with no stray wires.

4. Verify that the shield wire has been tied through but not connected to the network terminal block or ground point in any location. The shield should be left floating.
Set the Network Termination Jumper

1. Determine if the panel is an end device or is located in the middle of the network.

2. If in the middle of the network, locate the network termination jumper directly below the network terminal block and make sure the jumper is removed from the pins. (It is recommended to leave the jumper sleeve hanging over one of the pins in case it is necessary in the future).

3. If located at the end of the network, make sure the termination jumper is in place over both pins.

Set the Network Address

The steps below will walk you through the addressing and proper termination of the ControlKeeper® M.

1. Open the inner, low voltage door to access the main motherboard.

2. Locate the address switches located at the bottom of the motherboard.

3. Set an address for the panel that is different from the addresses of other panels in the network. Valid addresses are 1-254. The address is calculated by adding the binary value of switches set to the ON position. A chart of addresses 1-50 is shown below for quick reference.

4. Once the address is set, press the ‘Reset’ button to initialize the new address with the controller.
5. If the panel has an onboard display, in the top left corner of the main display, select the ‘Panel’ button.

6. At the top left corner of the of the ‘Panel’ menu screen, select the ‘Refresh’ button in order for the display to recognize the new panel address.

**Additional Low Voltage Connections: RS-232, USB and Ethernet**

The ControlKeeper® M motherboard allows for RS-232, USB and Ethernet Port connections. These ports are identified in the graphic below.

- **RS-232**
  The RS-232 connection may be used for accessory devices or software packages that connect via RS-232 methods. If using a device or software packages that communicates using this method, a special cable for connection will be provided at the time of order shipment. Connect the cable and device according to the provided device instructions to the RS-232 port identified.

- **USB**
  The USB connection can be used with specified Greengate Software packages. If connecting with a software package that allows for USB connection, connect the USB cable provided to the connector identified.

- **Ethernet**
  Each ControlKeeper® M panel has an onboard ethernet port located on the main motherboard. This ethernet port can be used for:
  - Connection to software packages purchased with the system
  - Gathering power metering data into purchased software packages or a third party system

If you are using the ethernet port for connection to Greengate Software Packages, it is recommended that one Ethernet port be used per software package, i.e. if you are running Vision-Touch and Keeper Enterprise Software, you would need to configure unique IP addresses at two different panel locations, one for each software package. Optionally, an Ethernet Interface Module (EIM) could be used instead of the onboard Ethernet port.

If you are using the ethernet port to gather real-time power metering data, it will be necessary to have a connection and configure ethernet settings for every panel being metered. Power metering data does not pass through the Greengate Lighting Network and is only accessible from the local panel via ethernet connection. If accessory software packages have been purchased with the system, they may require additional Ethernet Interface Modules for access.

IP addresses are configured in the ControlKeeper® M through the optional onboard interface or alternately through the Keeper Enterprise Software.

If using the Ethernet port, pull CAT5 or higher standard Ethernet cable from the LAN to the Ethernet connector.

**UL 924 Compliance – Lighting Relay Module**

With the addition of the Lighting Relay Module (LRM) accessory, the ControlKeeper® M lighting control enclosure has been approved in compliance with UL 924. If using the Lighting Relay Module, it will be necessary to wire the panel power supply to an emergency power source. The contact closure from the Lighting Relay Module connects into the main ControlKeeper® M motherboard’s external override connector identified below. The connection wires from the LRM to this connector are considered low voltage and should enter the cabinet through the low voltage area. Please refer to the Lighting Relay Module’s installation instructions for further details.
Operating Details

Manually Controlling Relays
Hardware relay overrides can be done at the panel level or at the individual relay level. The panel does not need to be programmed for these devices to operate.

Panel Override Switch:
On the panel level, the main ControlKeeper® M motherboard offers a ALL OFF, AUTO, ALL ON override switch. This switch operates as a master override. When this switch is in the ALL OFF or ALL ON position, while commands will process in the software status of the ControlKeeper® M, the commands are not passed on to the relays. When the switch is moved to the AUTO position, the software status of the relays will regain control.

If the ALL OFF or ALL ON is used, the relay status LEDs will flash. The color of the LED will indicate the software status of the relay, not the physical ON or OFF status of the relay.

Relay Override Button:
To override individual relays, each relay has a pushbutton override available in the low voltage section of the enclosure. Press this override button to toggle the state of the relay. This is a temporary override of the lighting load that will stay in effect until the next command is received.

The individual relay override switch allows you to also perform a ‘Flash-to-Find’ feature.

Prior to using ‘Flash-to-Find’ mode, verify the type of load being controlled. If the load being controlled requires a re-strike period or strike delay, it is not recommended that flash-to-find be used.

To activate the ‘Flash-to-Find’ mode, press and hold the push button for approximately 5 seconds until the relay cycles. Let go of the push button once this occurs. At this point, the relay will automatically cycle on and off every 3-5 seconds making it easy to locate the load in the facility. To cancel ‘Flash-to-Find’ mode, briefly press and release the individual relay pushbutton.

System reset and restore defaults commands
Under certain circumstances, you may want to reset the ControlKeeper® M. There are two different types of reset commands available: A reset command and a restore factory defaults command.

Reset command
A reset command is used to initialize a new panel address with the panel. It can also be used as a troubleshooting technique if the panel is not responding and the motherboard ‘Heartbeat’ LED is not flashing. The reset command will not cause loss of panel programming.
To Perform a Reset Command:
1. Open the inner, low voltage door.
2. Press and release the ‘Reset’ button on the main motherboard.

Restore Factory Defaults
A ‘Restore Factory Defaults’ command is used to remove all programming from a ControlKeeper® M unit. It should be done before programming the unit for the first time or when asked to by a Technical Support representative. Please use caution with this command! When performing a ‘Restore Factory Defaults’ command, all relay loads will turn OFF. Use the main motherboard override switch to keep lighting on if necessary.

To perform a restore default command:
1. Open the inner, low voltage door to access the main motherboard.
2. Press and hold down the left-most reset button labeled ‘Reset’.
3. Still holding down the ‘Reset’ button, press and hold down the right-most reset button, labeled ‘C’.
4. While continuing to hold down the ‘C’ button, release the ‘Reset’ button.
5. Continue to hold down the ‘C’ button until you see the Heartbeat LED begin to flash.
6. Release the ‘C’ button.

Programming
The ControlKeeper® M is programmed either through the optional onboard touchscreen or through the optional Keeper Enterprise Software. Please refer to the respective programming guide for details on programming the controller. It is recommended that a ‘Restore Factory Defaults’ command be performed on the controller prior to initial programming.
WARRANTIES AND LIMITATION OF LIABILITY

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