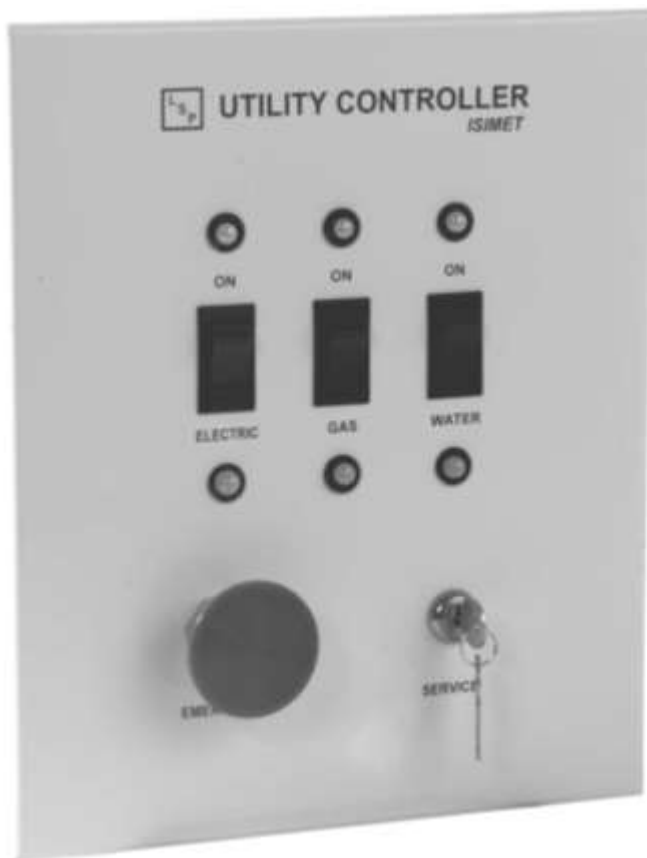


***ISIMET***  
**RA Series**  
**Remote Access Systems**  
**Utility Controller**  
**Multi-Pack Application**



**Installation,  
Maintenance,  
Operations,  
and Start-up  
Instructions**



**The RA Controller is designed to meet the needs of a school or science facility that wishes to upgrade the present control of the science classroom utilities without refurbishing the entire room.**

## **ISIMET**

RA Series Utility Controller

Installation, Maintenance, Operations, and Startup Instructions

### **About this Manual**

This manual describes the installation requirements and operating procedures for a Multi-Pack Unit Application. This System provides for remotely located "HUB" Controllers with an independent Wall Panel located in an independent operating environment such as science classroom. In this manual, The Utility Controller refers to this "HUB" while the Wall Panel and Box and wiring connections are referred to as the module.

### Installation Work Sheet

A separate set of installation work sheets for the individual modules are provided with this Manual. We recommend that you fill in these sheets upon completion of the installation to aid you during start-up of the unit.

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Patent 6,757,589 B1

6,990,393 B2

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### **Warranty:**

**ISIMET will repair or replace any defective parts or workmanship of this product for a period of one year from date of installation. The Primary Operating P.C. Board has a two year limited warranty. Damage caused by incorrect installation or improper usage is not warranted. Failure to follow recommended installation, operation, and/or maintenance procedures listed in this manual may void product warranty. Recovery rights shall be limited to the total sum of the amounts paid for the product by the purchaser.**

### **Limits of Liability:**

**ISIMET's liability shall be limited to costs of repair or replacement parts. The Laboratory Service Panel and Utility Controller are not intended for usage other than those expressly described in this manual. ISIMET shall not be liable for damage or injury caused by the improper use of the product.**

**ISIMET does not warrant against or assume liability for failure of operation or lack of notification to secondary integrated monitoring systems. The system should be thoroughly tested and adjustments made at time of initial operation. Periodic testing should be conducted by the user to assure that all components function and operate according to specifications.**

**Care should be taken in the installation of this product. ISIMET shall not be liable for damage or injury caused from the improper installation of the product.**

**Warranty is Subject to Compliance with Specific Installation Requirements.**

### **EXTENDED WARRANTY:**

**ISIMET will extend the warranty period of the products when installation complies with all start up procedures and that a factory authorized agent either performs or is in attendance during start-up of the system(s). Controllers, Companion and Accessory Panels will be extended to a period of five years from date of installation. Except for ISIMET FLA, DLA, RLA and other Units where automation systems are not common, Control System(s) must be interfaced with a building automation system or other ISIMET approved time sequencing control for "non-use" system shutdown. All operating components of the system must be ISIMET provided. Prescribed routine maintenance procedures must be performed per ISIMET recommendations.**

**All Start-up and Routine Maintenance Documentation shall be per Factory Recommendation.**

**Further, required start-up and maintenance procedures must be performed as directed upon all affected systems. This warranty shall only become enforceable upon issuance of application specific Extended Warranty Document. A copy of this document should be maintained at all times at the location of the warranted systems.**

### **DISCLAIMER OF IMPLIED WARRANTY:**

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# General Product Information

The RA Series of Utility Controller is a safety device that grants local, absolute authority to the instructor to determine those utilities that are to be used during the class-day for experiment while restricting unauthorized student use of laboratory devices. The device regulates the control of various utility services, such as domestic water, natural gas, and electrical outlets within a science classroom. A keyed switch provides for security against unauthorized use of the system. Intended as an upgrade to present control of the science classroom utilities without the refurbishing of the entire room.

## Construction:

All electrical components are pre-assembled, wired, and mounted. The Electronic Controller is assembled within the Utility Controller compartment. The Wall Panel and Box are provided separately for field wiring connections to the Controller.

**Caution:** Do not drop the assembly or expose to the environment.

## Assembly, Compliance and Registration Information

All Utility Controllers are assembled to permit limited field configurations of the operating system. A Configuration information sheet should be included with this packet. Options requiring additional instructions and/or assembly parts are shipped within the component package. Refer to Equipment Specifications to verify that ALL components conform to these requirements.

The output circuits of the Controller provides 24 VAC control signals to solenoids and relays to activate and engage the various utilities. *ISIMET* provides a full line of Companion Enclosures and fittings. It is recommended that these items be included in the system design, but when the installer elects to provide these fitting from other sources, that compliance with product specifications be confirmed prior to installation.

Enclosed with this Manual is a separate registration form. The front of the form is for equipment warranty registration. The back is a copy of the equipment start-up checklist. To ensure proper warranty of the product, it is important that you complete both sides of the form and either mail or fax to *ISIMET* within 30 days of installation.

## Pre-Installation Information

The RA Utility Controller assembly includes four components: the Utility Controller "HUB" with solid door panel, the Wall Panels, the Wall Boxes and the interconnect cables. The Controller is provided with a loose protective cover that can be installed over the enclosure opening if the solid door is to be removed for protection during construction phases of the facility so that no debris enters the enclosure. A second wrap protects the PCB. Care should be taken to assure that neither is removed until final assembly and testing. Surface mount styles are not provided with the door cover.

## Locating and Positioning the Utility Controller

Prior to installation, verify ADA (Americans with Disabilities Act) dimensions and compliance requirements. For best results: Install the Wall Panel in the room where the utility services are controlled, at or near an exit and accessible to occupants of the room.

Mount the vertical center of the service switches on the Wall Panel to the ADA-required maximum height.

The Utility Controller HUB may be positioned either concealed above the Wall Panel in the ceiling or remotely in a storage or science prep room.

## Trim Kit (Non-Surface Mount only)

A Trim Kit is provided with non-surface mounted hub unit, is either flush or semi-recessed, and is provided with separate installation instructions. Verify installation requirements prior to installation of the unit. Store the Trim Kit in a protected location, out of the weather, until installation.

## Upon Receipt of Product

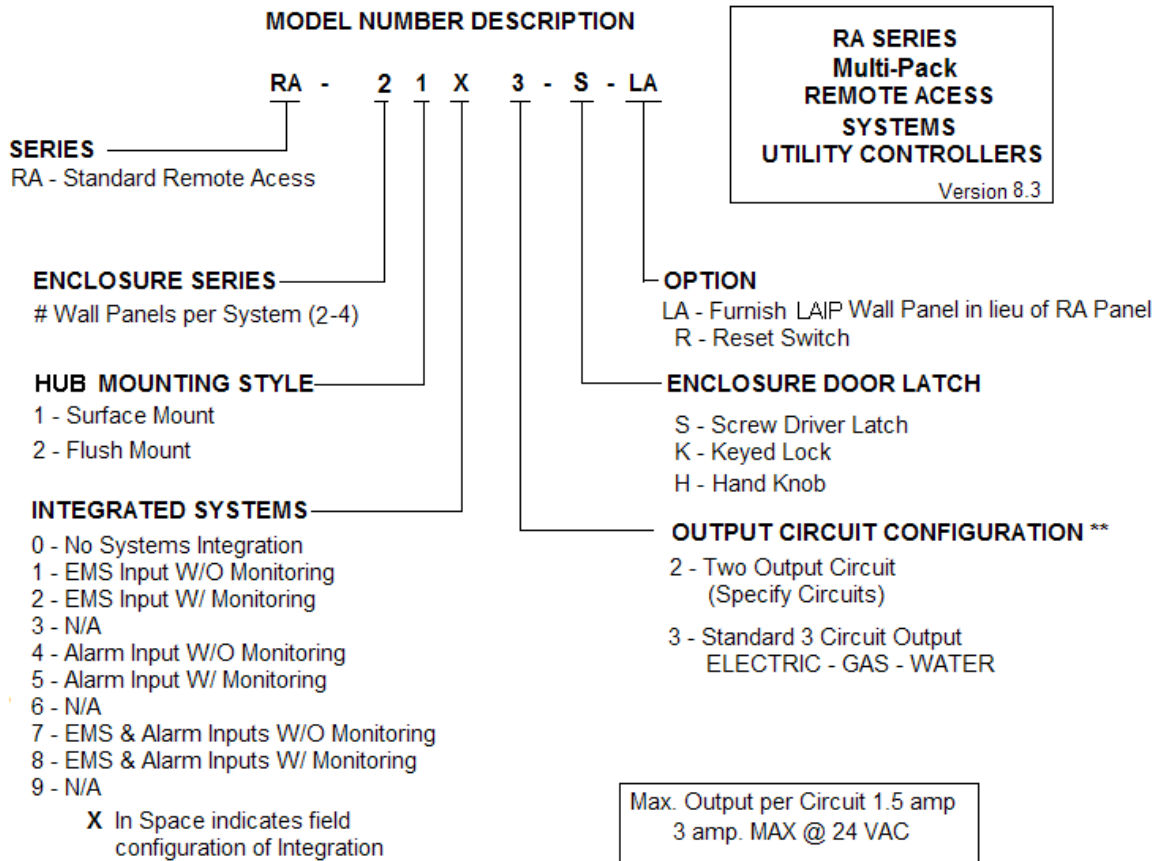
Each Utility Controller is assembled specifically for an individual application.

Check components for damage. Notify *ISIMET* immediately of any damaged components.

Check package and product name plates to determine if all components were shipped correctly.

Store uninstalled components in a protected environment, out of the weather.

**Figure 1**



# RA Series Utility Controller Multi-Pack Illustration and Parts List

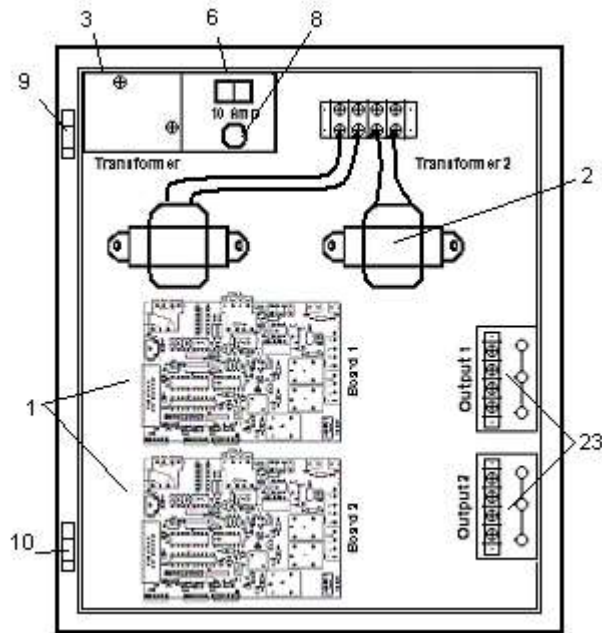


Figure 2 - Utility Controller "HUB"

## Utility Controller Primary Components

- 1 - Electronic Controller PCB
- 2 - 24 VAC Transformer
- 3 - Wiring Junction Cover
- 6 - Control Switch
- 8 - Fuse Holder FH – 2
- 9 - Upper Hinge Pin Assembly
- 10 - Lower Hinge Pin Assembly
- 23 - Output Terminals

Designator after part description references the component part number.

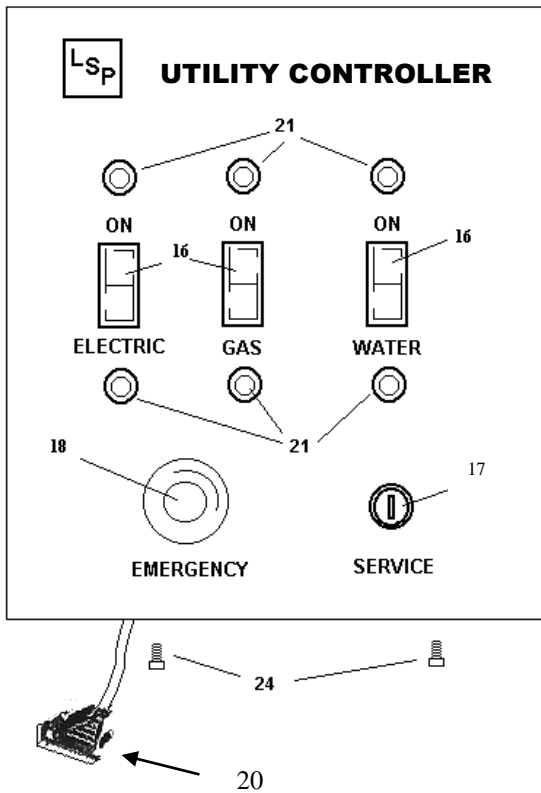
## Fuse Specifications

Fuse 1	5 X 20mm .....	3 Amp	PC Board
Fuse 2	3AG .25" X 1.25" .....	15 Amp	Control Panel
Fuse 3	2 AG .177" X .57" .....	500 mA	PC Board

pcb Fuse 1 is Slow Blow. Verify actual Fuse rating on Fuse label in enclosure.

# Wall Panel Illustration and Parts List

Figure 3 - Wall Panel



## Wall Panel Primary Components

- 16 - Service Switch ( 3 ) S - 4
- 17 - Keyed Switch S - 1
- 18 - Panic Button S - 5

- 20 - Wall Panel Plug
- 21 - LEDs
- 24 - Panel Mounting Set Screws

Designator after part description references the component part number.

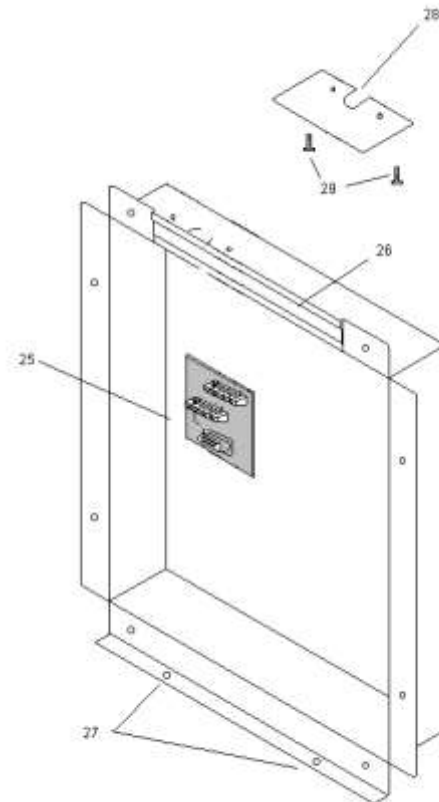
**Note:** Units having Auxiliary Circuits will have an additional Service Switch. Fan Circuits will have a green LED incorporated in the switch, placed adjacent to the Panic Button.

Figure 4 – Wall Box

## Wall Box Primary Components

- 25 - Interconnect Board
- 26 - Mounting Flange
- 27 - Set Screw Inserts
- 28 - Cover Plate
- 29 - Cover Plate Screws

Designator after part description references the component part number.



## RA Series Custom Assemblies:

The RA Series (Multi-Pack Unit) may be provided with an optional LA Series wall panel and plate in lieu of the standard RA Series panel. This option permits the use of two (2) rather than the standard three (3) output circuits in applications mandating limited numbers of controlled services.

Where this option is provided, then installation instructions are provided separately and the product number will bare an “LA” suffix.

## Installing the Utility Controller HUB

There are two options for mounting the Utility Controller: Flush Mounted and Surface Mounted.

CAUTION: Provided mounting hardware must be used.

### Flush Mounted HUB (Figure 5)

Prior to installation:

- The Utility Controller "HUB" easily mounts between two 11" spaced wall studs within a minimum 3 5/8" wall cavity for semi-recess installations or 4" for flush mounting. If stud spacing is greater than that required for the mounting of the controller, add studs to insure a secured mounting.
- The studs should be facing to facilitate securing the controller.
- Predetermine wall finish so that the face lip of the enclosure aligns flush with the finished wall surface.

To install:

1. Using the self-starting screws (13), mount the flanges at each side and at the top and bottom of the enclosure.
2. Attach the enclosure to the wall studs with field-provided sheet metal screws. (See Figure 5)
3. Level the Controller.

#### Notes:

- The Door Panel, when mounted onto the Controller HUB, should protrude beyond the wall surface about 1/4". Care should be taken at installation time to ensure that this occurs.
- A Flush Mounting Trim Flange is provided with each flush mounted unit. Separate installation instructions and hardware are included with this kit. Semi and Flush Trim adds 3.5 inches to both Height and Width Wall Surface dimensions.
- It is the responsibility of the installer to verify finish wall dimensions.

### Surface Mounted HUB (Figure 6)

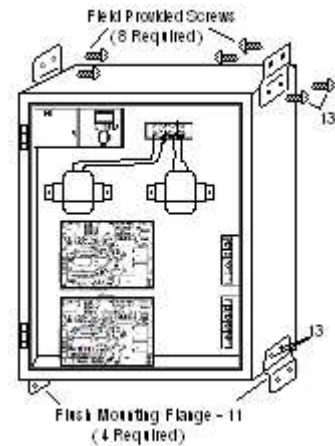
Prior to installation:

- Wall finishes must be complete.
- The wall cavity must have sufficient backing or support to ensure a firm mounting of the controller to the wall surface.

To install:

1. Secure the surface mount flanges to the back of the enclosure with the self-starting screws (13).
2. Use the field-provided screws to attach the enclosure by the flanges to the wall surface.
3. Level the Controller.
4. NOTE: If this Unit is to be mounted within a ceiling space then installation should not inhibit access to the Unit for purposes of routine maintenance. The Enclosure should be mounted in a position and location whereby service to the unit can be rendered readily from a step ladder through ceiling access.

Figure 5 - Flush Mounted



For best Flush Mounting results, recess face of enclosure's lip 1/4" behind wall finish

#### Clearance around Enclosure:

Care should be taken to allow 1/2" clearance from wall framing and sheet-rock or other wall surface material around the outer surface of the unit to permit the trim to be properly installed.

#### Semi-Recess Enclosure Placement

Note: For Semi-Recess Units, the face of the enclosure's lip should be positioned 1/4" beyond wall finish.

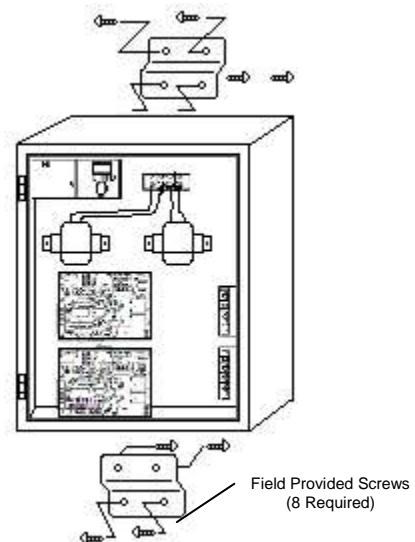


Figure 6 - Surface Mounted



# Installing the Wall Box

**CAUTION!** A wall cavity of 11.125" X 9.125" X 2" is required to mount the wall box. When making wall opening, care should be taken to assure that the box fits snugly within the opening so that over-cut will not be exposed at the perimeter of the wall panel. Verify ADA requirements before making any wall penetrations. Verify that no existing utility piping or wiring is present within the wall where the wall box is to be mounted.

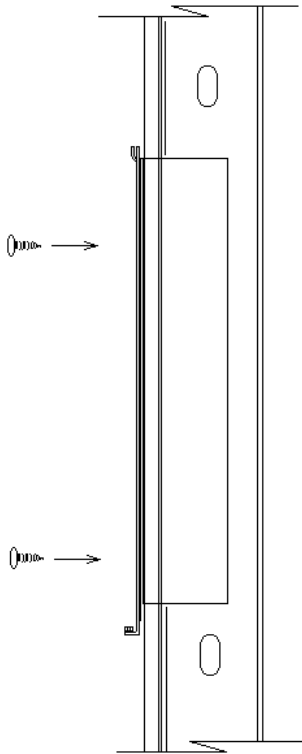


Figure 7 – Wall Box (Side View)

### Installations in Dry Wall Construction:

We recommend that the location of at least one wall stud be determined prior to making the wall opening. First mark and then cut the sheet rock at the mounting location. At least two opposing sides of the box should be affixed to wall studs. Where only one stud is present, we recommend that a second be inserted into the cavity and extended vertically away from the opening at least two feet in both directions to assure a firm mount. Refer to specific project requirements to determine actual mounting support requirements in excess of these recommended. Figures 7 (Side View) and 8 (Top View) illustrate the positioning of the Wall Box within the wall cavity. Attach the box through the sheet rock to the studs using field provided screws.

### Installations in Masonry Wall Construction:

Determine the location for the Wall Box. Mark and then cut the wall surface to the specified depth at the mounting location. Refer to specific project requirements to determine actual mounting support requirements in excess of these recommended. Attach the box to the masonry wall surface using field provided screws and either lead or plastic shields.

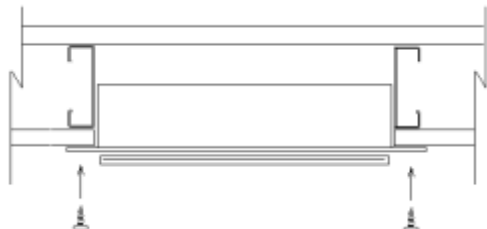


Figure 8 – Wall Box (Top View)

### Connecting the Control Cable: (25, 50, 75 lf)

A cable is provided with the HUB unit for each module for connection between the HUB and wall unit. Route the cable from the HUB unit to the Wall Box and make wiring connections to the Interconnect Board. Refer to Figure 13 - page 13 for wiring instructions and Figure 16 - page 14 for connections to the HUB Controller instructions. Affix Cover Plate over opening in box after installing cable.

**Note:** If no wall cavity is available, this cable may be surface mounted installing wire mold over the cable. The Wall Panel is provided with a knock-out at its top for this purpose. See Figure 15, page 14.

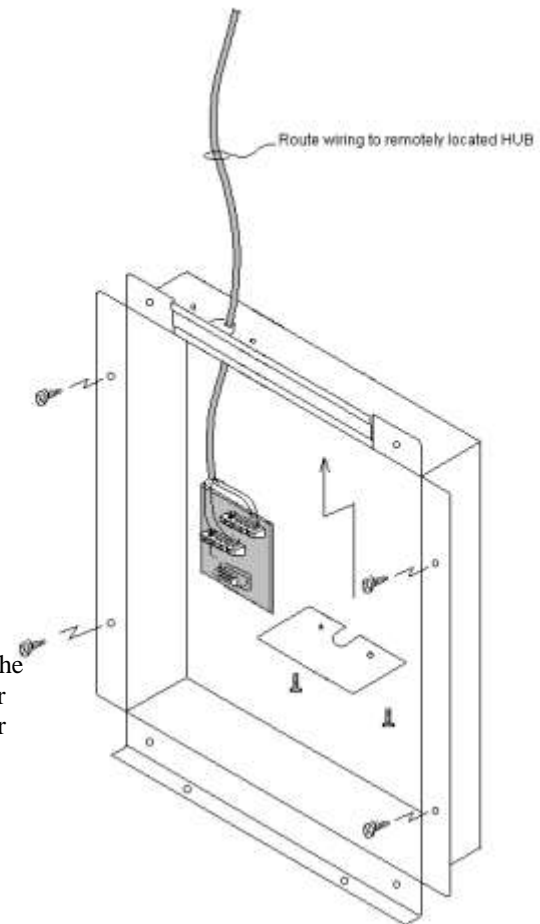
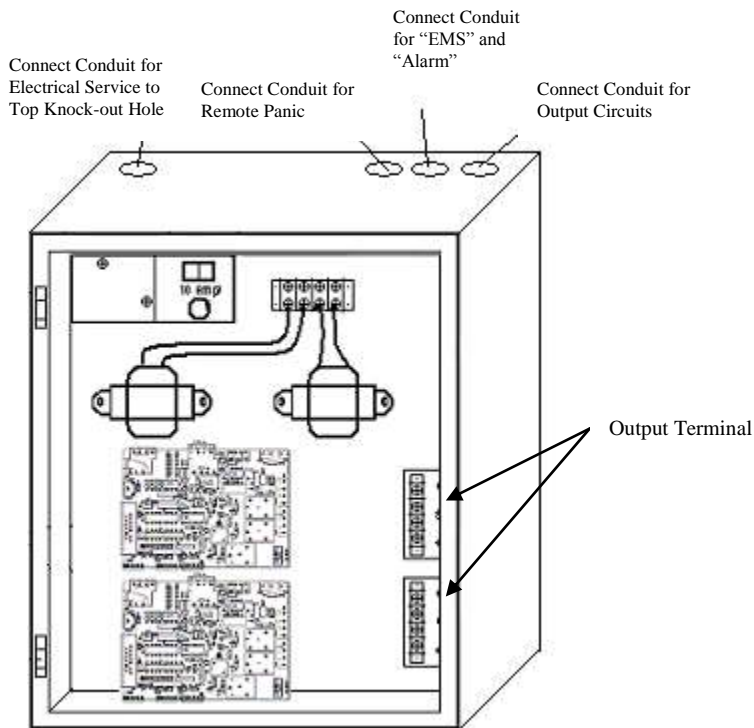


Figure 9 – Wall Box Wiring Installed

**Figure 10 –Controller knock-out Holes**



**NOTE:** This Unit is provided with an Output Terminal per pcb as shown in Figure 10.

Reset fuses may be included in the Output Terminal, and are intended to prevent circuit overload due to solenoid coil failure. Do not bypass or exceed output rating for the resets. Resets are integrally wired for specific use of the output circuit.

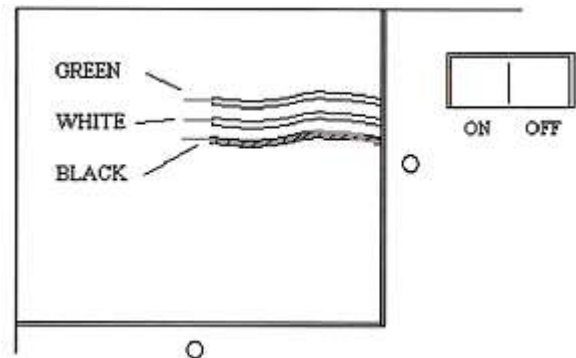
**Wiring the Utility Controller**

**Important!**

**Verify that the electrical supply is disconnected prior to connecting wiring to the Utility Controller.**

To wire the Utility Controller:

1. Remove the junction box cover (Item 3, FIG. 2) from the panel surface.
2. Make final connections to the 120 VAC electrical service within the junction box. Verify that line wiring (Black), neutral (White), and ground wire (Green) are correctly connected. Minimum recommended wire size is 14 AWG.
3. Replace the junction box cover before activating or testing the unit.



**Figure 11 - Junction Box**

**Installing the Electrical Conduit**

Several knock-out holes for connecting the conduits are located at the top and at each side of the Utility Controller.

- Connect rigid conduit for the required 120 VAC electrical service at the top right or side opening as indicated in Figure 11.
- Connect conduit for integrated services such as “EMS” (Energy Management System) and building alarm at the top of the enclosure.
- Connect conduit for the controlled utility services to the upper left top or left side of the enclosure.

**Important!**

- All local codes must be followed when connecting the conduit to the service panel.
- Do not install wiring or cable for integrated systems, LA Companion Units, remote panic assemblies or other interface wiring within conduit for either 24-vac control or 120-vac line voltage. Each wiring system should be housed in independent conduit and not bundled with wiring from other systems or control units.
- Failure to comply with these wiring specifics may create transient voltage at the pc board and cause system malfunction and/or failure.

## Connecting Controlled Utility Services

All RA series Multi-Pack Units should be provided with *ISIMET* Companion Enclosures and/or fittings. When the installation design specifies connections to existing solenoids and/or electrical contacts, that compliance with Product specifications must be confirmed prior to installation. The unit is equipped for 24 VAC output for control of the devices. Connect wiring for these devices to the output terminals on the respective PC Board.

**NOTE:** Place relays and solenoids in areas that are easily accessible for future maintenance.

### **Multi-Pack Systems CAUTION!**

All Multi-Pack Controllers integrate the control of the services from more than one classroom or Wall Panel to a single HUB and therefore, require that the installer make connections of the controlled devices for each room to that specific PCB.

Before making wiring connections at PCB, verify that correct wiring leads terminate at controlled devices for corresponding rooms or Wall Panels. Refer to the Supplemental included wiring schematic for typical Multi-Pack applications.

**WARNING:** Only *ISIMET* Companion Enclosures and Fittings should be connected to a Multi-Pack system. These systems should be designed so that operating amperage does not exceed equipment rating. Consult an *ISIMET* Service Representative if there are questions pertaining to these wiring connection requirements.

### **Auxiliary and Remote Circuits**

If the Unit is equipped with either internal or remote auxiliary circuit outputs, a supplemental wiring instruction is provided. All *ISIMET* Applications use zero differential normally closed solenoids for piping sizes through 1" and with all natural gas services. If solenoids other than those provided by *ISIMET* are used in the application, it is **STRONGLY** recommended that only this type of solenoid be provided. Additionally, it is recommended that if compliance with product specifications is not factory certified, then operating power for the solenoid should be provided from sources other than the Utility Controller.

All *ISIMET* Applications use mechanically held Square D Multi-pole Lighting Contactors to control the 120 VAC circuits to the convenience outlets. Square D - Definite Purpose Contactors are used when a controlled device load demand exceeds normal operating amperes. All E-Series Companion Enclosures are equipped with an interface relay to enable the Utility Controller's output circuit to operate the contactors. If relays or contactors other than those provided by *ISIMET* are used in the application, it is **STRONGLY** recommended that only this type of contactor be provided. Additionally, an interface relay will need to be provided to insure compliance with application installation requirements.

**Connections to "EMS" and "alarm" for Multi-Pack Units should be made at each PCB unless a central timing system or monitoring system is utilized for all modules. In such cases, the unit must be specified as such, having a local "EMS" and/or "alarm" connection as stated in this manual. Otherwise, refer to Configuration diagrams on page 20 for specific PCB connections.**

## Connecting "EMS" (energy management system)

Note: Refer to PCB "EMS" Configuration details on Figure 17, Page 15 for locations and placements of "EMS" config jumpers.

### **"EMS" Input (Central connection point)**

- The unit is factory configured to operate without an "EMS" signal. The jumper at JP 2 is placed across the right two posts.
- The Utility Controller is readily fitted for integration to a building "EMS" system. Make connections accordingly to "EMS" input posts on CON 4-a, terminal 3 & 4 (FIG. 18) on the PC Board.
- If "EMS" input is utilized for time sequence operation, move the jumper at JP 2 to the left.
- If 24-vac "EMS" input is utilized, then referring to the configuration details, remove if in place the jumper at JP 4-A.
- If 5-vdc "EMS" input is utilized, then place the jumper at JP 4-A.

### **"EMS" Monitoring Output (Central connection point)**

- Dry contact points are available on CON 4-a, terminal 1 & 2 at the PC Board, "EMS Monitoring" for integration to a building "EMS" system. These contacts close upon panic, providing an output signal to that system. Make the proper connections to these terminal posts.

**CAUTION:** Verify "EMS" input control voltage available and confirm that configuration jumpers on the PCB has been properly configured prior to placing the unit in operation. See **Start Up Test Preliminary Information** on page 15 for description of the "EMS" and "alarm" configurations and configuration diagrams on pages 20 & 21.

## PC Board LED Indicator Chart:

Refer to configuration chart on page 20 for locations

LED Description	Function	Comments regarding illumination
Panic	Indicates System is in “panic”	Unit will not function until RESET
EMS	Indicates “EMS” operation	Unit will not function unless illuminated
ALARM	Indicates System is in “alarm”	Unit will not function or reset until “alarm” signal is withdrawn
LED 6	Output Circuit 3	Indicates Output 3 is active
LED 5	Output Circuit 2	Indicates Output 2 is active
LED 4	Output Circuit 1	Indicates Output 1 is active

### Connecting Alarm Wiring

Note: Refer to PC Board Configuration details on Pages 20 & 21 for location and placement of all configuration jumpers.

#### Alarm Input (Central connection point)

- The unit will operate without an “alarm” input signal.
- Providing an input signal from the alarm system will disable the Controller upon a fire alarm.

#### Auxiliary Panic Input

- Optional Panic Input posts are available on the PCB at CON 1B (Figure 18). One or more *ISIMET* Remote Panic Buttons can be connected in parallel at posts 3 & 4 at CON 1 on each pcb. Where multiple pcb’s are utilized in the Controller then each Panic terminal must be isolated per pcb.

#### Isolated Panic Input

- A single isolated input signal, such as the *ISIMET* Emergency Shower Monitoring Station or a “user defined” monitoring device, can be connected at posts 1 & 2 at CON 1B on each pcb. Upon receipt of an input signal, the unit will be placed into “Panic”.

#### Monitoring Outputs:

- Optional 24-vac output or reconfigured dry contact points are available for monitoring by the building alarm system. The contacts close upon panic, providing an output signal to that system. Make the proper connections to these terminal posts. The unit is standard configured for dry contact output.
- If the 24-vac contact configuration is desired, refer to configuration details for placement of the jumpers at JP 11.

**CAUTION:** Verify “Alarm” and “Isolated Panic” input control voltage available and confirm that configuration jumpers on the PCB have been properly configured prior to placing the unit in operation. See **Start Up Test Preliminary Information** on page 15 for description of the “EMS” and “alarm” configurations and configuration diagrams on pages 20 & 21.

### Connecting Optional Monitoring, ADD-ON Module & Response Components:

*ISIMET* provides a full line of monitoring light arrays and panels for integration with the safety control system.

- Monitoring Lights are connected in parallel to the output circuit on the Terminals at each output source.
- The Monitoring Beacon or Remote Monitoring Station is connected at the “Alarm Monitoring” posts on the PC Board.

Wiring configurations for each optional component is provided with that device.

Refer to configuration diagrams on pages 20 & 21 and typical wiring schematics on page 22 for details on these connections.

## Removing and Reinstalling the Solid Door Panel

If the Door Panel is to be removed from the unit, refer to step by step instructions below.

In reverse order, perform steps 1 through 4 to remove the Door Panel. If the Panel is to be removed during the construction phase, the protective cover should be securely placed over the enclosure opening.

## Installing Flush Door Trim

If the Controller is Flush Mounted, a Trim Kit is provided separately. Refer to installation directions provided with that component.

### To install the Door Panel Figure 12

To install the Door Panel on the Enclosure:

1. Position the door at 90° – 100° of enclosure.
2. Slide top hinge pin onto fixed hinge post at top of door.
3. Slide lower hinge pin toward lower spring hinge mechanism with hinge pin lever in retract position.
4. With lower hinge pin in position, turn hinge pin lever outward and down, then turn inward to the extend lock position.

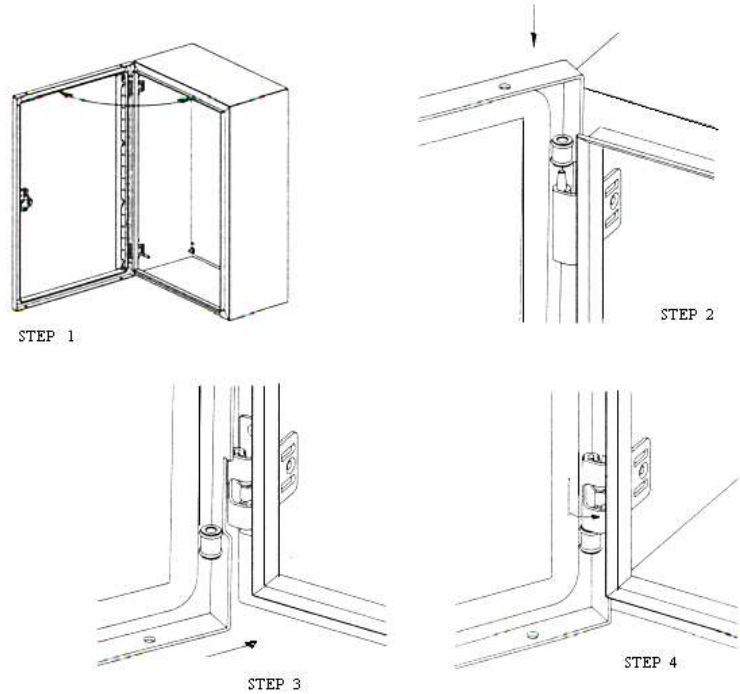


Figure 13 – Cable to Interconnection Board Configuration

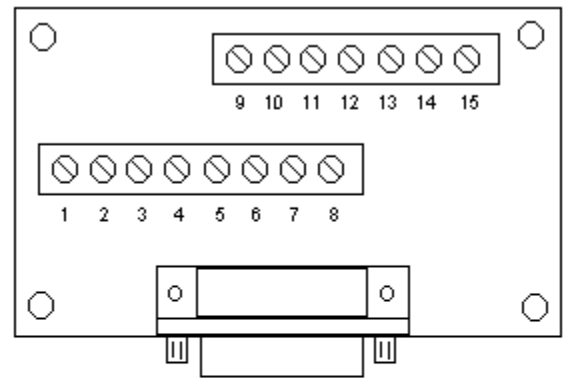
### Connecting the Cable to the Wall Box

Extend the cable from each HUB Controller PC Board to the respective Wall Box. Cut and discard any unneeded cable. Remove approximately three inches of the shielded jacket and strip each lead 1/2".

Connect each wire to the post as shown in Figure 13. Screw terminals should be tight. After cable is installed, use plastic clamp to secure cable to back of box.

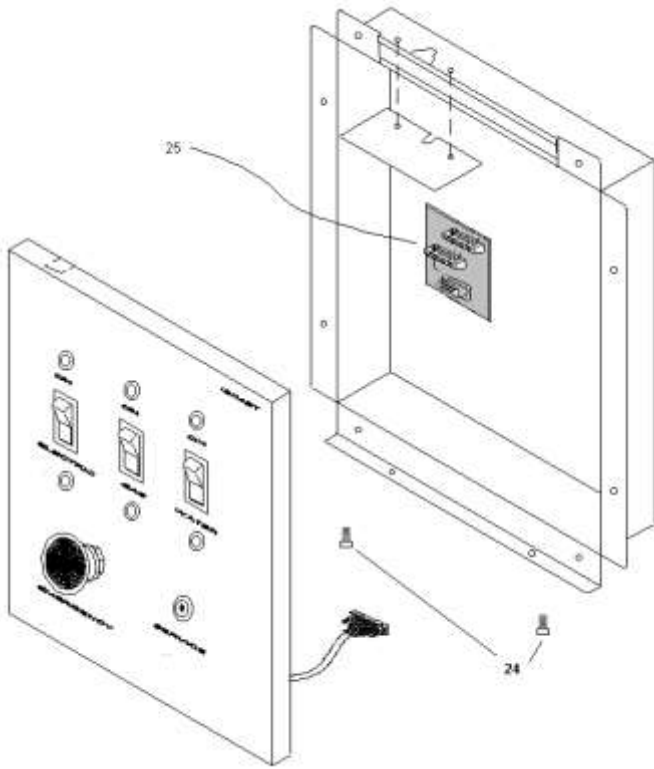
**CAUTION:** Make sure wiring is correctly terminated. Failure to confirm to this wiring to terminal configuration will result in failure of the system.

**WARNING:** Do not splice or extend cable beyond the length provided with the unit. A 75 ft. max. cable distance between HUB and Wall Module must be maintained.

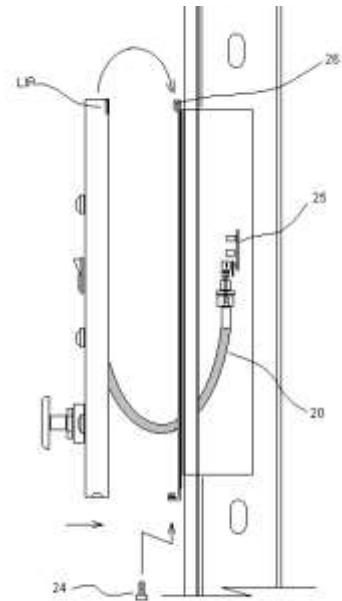


1 - WHT/BLK	6 - RED/WHT	11 - BLUE/BLK
2 - ORANGE/BLK	7 - ORANGE	12 - RED/BLK
3 - GREEN/WHT	8 - BLK	13 - GREEN
4 - BLUE/WHT	9 - GREEN/BLK	14 - BLUE
5 - BLK/WHT	10 - RED	15 - WHITE

**Figure 14 – Wall Panel Installation**



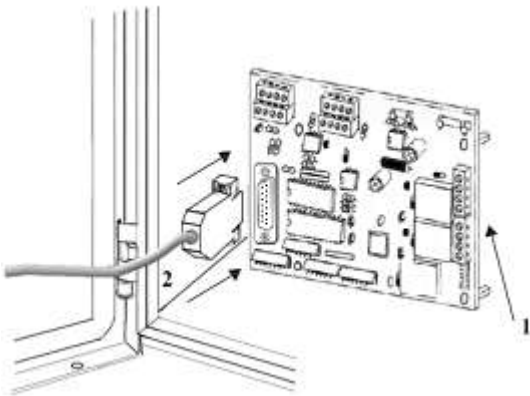
**Figure 15 – Wall Panel Installation  
Side view**



**Installing the Wall Panel:**

Hold Wall Panel in front of Wall Box. Insert plug into terminal on interface board (25) in box. Secure plug to terminal. Position the lip of panel over mounting flange (26) and allow panel to slide downward onto flange until panel rests comfortably on box surface. Bottom of panel should rest against wall. Using two panel mounting set screws (24), attach panel to box by inserting screws through holes in bottom of panel and tightening into set screw inserts.

**Figure 16 – Cable Connection to Controller**



**The Version 8 PCB has been reconfigured, placing this connector vertically along the inner side of the enclosure.**

**Connecting the Cable from the  
Wall Box at the HUB Controller**

Interconnect cables are provided for each module with the HUB so that the individual Wall Panel Switches can operate the Controller. Insert the provided rubber grommets and route the bare end of these cables through the side holes. Do not leave excess cable exposed in the enclosure. Connect the 15 pin plug to the connector on the respective PC Board terminal. Secure plug to the terminal with the provided machine screws. See Figure 16.

**Note: This 15-pin plug is polarized. Exercise caution when inserting it into the terminal.**

After making cable connection, route the cable to the wall box. We recommend that the cable be installed concealed in the ceiling area and wall cavity, but where necessary the cable may be surface mounted to the wall with wire molding used to conceal the cable from view. The cable should be secured to the building structure and not be permitted to lay loosely across lighting fixtures or other equipment located in the ceiling space.

# Start-Up Checklist

## Caution!

- **Before activating utility services and placing the Utility Controller into operation, complete the following checks and tests. Verify that ALL installation procedures and Line Voltage, EMS, Alarm, Remote Relays, and/or Solenoids conform to Equipment Specifications.**
- Examine electrical wiring at junction box to verify that ALL wiring is correctly connected.
- Examine **Terminals** to assure that wiring has been properly connected.  
Test Output circuits at output **Terminals** to verify that field wiring or connected devices are wired correctly and that no direct short exists. (A direct short in this wiring will cause damage to the unit.)
- Verify that the cable and plug from the wall box is firmly secured to its terminal.
- Examine Wall Panel factory wiring to ensure that it was not damaged or loosened during shipping or installation.
- If unit is integrated with “EMS”, verify that wiring is installed at correct terminal posts. Verify that “EMS” voltage conforms to unit specifications.
- If unit is integrated with an alarm system, verify that wiring connections, voltage requirements, and alarm system conform to unit specifications.
- If unit is integrated with a Remote Panic Button, each pcb should be connected to individual Remote Panic Buttons and this wiring should not be routed in conduit with any other control or operating power wiring.
- Remove all dust and construction debris prior to proceeding.

## Start Up Test Preliminary Information

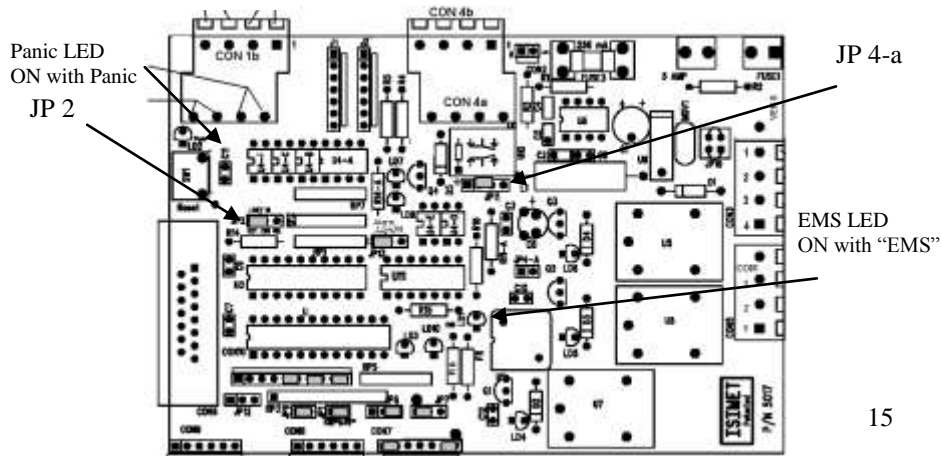
### Caution!

- Do not proceed with equipment start-up until the Start-Up Checklist has been completed.
- Before commencing these Start-Up tests, turn the control switch to the OFF position.
- If the unit is integrated with a building alarm system, disconnect wiring from posts “alarm monitoring”.  
This unit was factory tested, but the manufacturer recommends that the installer perform these tests to ensure that the unit did not sustain damage during shipment or installation.
- Perform Start-Up Tests with the Door Panel open.
- The unit is factory configured to accept a 24 VAC “EMS” timing control input signal and is set to LOW at JP 2 (jumper is at the right two posts) so that the unit can operate without an “EMS” signal. If “EMS” is active at the time of this test, place the jumper across the left two posts.
- With the control switch ON, “EMS” LED on the PCB should illuminate. If yes, the remainder of the “EMS” test can be skipped. If not, check circuitry for proper operating power at CON 3, posts 1 & 2. 24 VAC should be present. Next, check the PCB fuse. If the fuse is functional, then 5 VDC should be read across the 2 pins on CON 2. Care should taken not to short across these two pins. If not, re-verify that fuse 1 is operational and if so, then contact an *ISIMET* factory representative.
- If the “EMS” signal is provided as 5 VDC, place a jumper at JP 4a. Caution: DO NOT leave this jumper in place if the unit will be time controlled by a 24 VAC input signal. Additional jumpers are provided with the keys in the door packet.

**Figure 17 – PCB “EMS” Configuration**

Refer to PCB Configuration for more detail on integrated input signals.

**Note:** All other PC Board configurations are discussed on pages 20 & 21.



# Start-Up Tests

## A. Testing the Control Wiring and Service Switches

1. Turn the control switch to the **ON** position. (Item 6 on FIG. 2) It should be illuminated. If it is not, check current at wiring within the junction box. Voltage should read 120 VAC. If it does not, consult an electrician before continuing this testing.
2. Turn the first service switch to the **ON** position. The other switches should be **OFF**. (Items 16, FIG. 3)
3. Insert the key at the keyed service switch and turn clockwise and release. The green indicating light above the service switch should be illuminated. This indicates that the service is active. Also, the corresponding LED on the PCB will illuminate.
4. Using testing probes, verify that the corresponding terminal posts on the corresponding PCB are energized. Turn the switch **OFF**. Note: The PC Board is equipped with a 5 X 20 mm -5 amp output fuse. If no voltage is present at the posts, check for a damaged fuse.
5. Turn all service switches **ON**. Again engage the keyed service switch. All services should be **ON**. All green indicating lights should be illuminated. Verify **ALL** power loads with test probe.
6. Turn service switches **OFF**.

## B. Testing the Alarm System

1. If the unit is integrated with an alarm system:
  - a. Verify that the alarm system is **OFF** or that the unit has not been fully integrated with the alarm system.
  - b. Disconnect the alarm wiring from “alarm monitor” on the PCB. (Figure 18)
  - c. Press and release the red panic button. **ALL** door panel indicating lights should be illuminated. **If not integrated with an alarm system, skip the remainder of this test.**
  - d. Use test probes to check current at ‘alarm monitor’ posts on the PC Board. Dependent on configuration, either continuity or 24 VAC should be present across these posts while in “Panic”.
2. Press the reset switch on the PC board. The Door Panel indicators should **ALL** lose illumination with switches in the **OFF** position.
3. Re-check continuity or voltage. None should be evident.

**Reset Configuration:** The unit requires reset by re-keying the door key switch. Placing a jumper across JP 1 will permit reset from the door key switch.

**Remote Panic Assembly:** The unit will accept integration of an *ISIMET* Remote Panic Assembly. If one is provided, wiring connections can be made at CON 1B on the PCB. Directions are provided with that remote assembly.

## C. Testing the “EMS” and alarm Input signals

The unit has been factory tested to assure that both “EMS” and “alarm” Inputs perform correctly. Field verify that jumpers on the PC Board are correctly configured to accept correctly provided input signals. Verify that the “EMS” LED is illuminated.

## D. Testing the Building’s Utility Systems

1. Turn **ALL** control switches **ON** and engage the keyed service switch.
2. Field-test **ALL** utility and appliance outlets to confirm that services have become active.
3. Turn the switch for each utility to **OFF**. Verify that the specific utility outlets are not active or “**ON**”.

## E. Test Completion

The unit should now be fully operable. If it is not, contact an *ISIMET* Service Representative.

1. Turn the Control Switch **OFF**.
2. Verify that all PCB jumpers are correctly configured for the intended application.
3. Reconnect **ALL** integrated services.
4. Replace **ALL** panels and covers.
5. Turn the Control Switch **ON**.
6. Close and lock the Door Panel.



## Equipment Operation

**Note:** The Utility Controller should be operated by an instructor possessing only the service switch key. Once the unit has been thoroughly tested, the installer should provide keys on separate rings to the property owners, administrators or their representatives. The Utility Controller is intended to function as a control system for the utility services and devices located within the room. The keyed switch provides for security against unauthorized use of the services.

### To Activate One or More of the Services Controlled by the Unit:

1. Turn **ON** the corresponding switch for the service you wish to activate.
2. Insert the key in the switch labeled “SERVICE” and turn to the right and release. The service has been activated and the green light “LED” above the switch will illuminate.
3. Remove the key and place it in a secured location.
4. Fan circuit will operate without re-keying after first keying of the unit once EMS is active.

### To Turn a Service OFF:

Turn the appropriate switch to **OFF**. It is not necessary to reinsert the key.

#### Notes:

- You must reinsert the key to reactivate services that were deactivated by turning the switch to **OFF**.
- A service left **ON** remains **ON** until its switch is turned **OFF**.

### In Case of an Emergency:

Press the red panic button on the wall panel. This will disable the panel and **ALL** services. All LEDs on the wall panel will be illuminated. If the unit is integrated with the building alarm, an alarm signal will be sent to that system. Once the panic button is pressed, either the door panel must be opened in order to press the reset switch located within the panel; or if configured for re-keying, the wall panel keyed switch will reset from panic. Also, the wall panel LEDs will remain lit until reset is accomplished.

### If You Cannot Activate the Services:

Check for one of these signals: There may not be an electronic signal from the building “EMS” (Energy Management System); there may be an “Alarm” signal from the building alarm system; there may be an Isolated Panic Signal from an integrated system; or the system may be in the “panic” state. When the unit is integrated with either this “EMS” and/or the Alarm system, a second level of security is in place because, without an electronic activation signal from the “EMS” or a signal from the Alarm, the unit **WILL NOT** function. Unauthorized access to the services is prevented during times when the building or classroom is normally unoccupied.

### At the End of the Day:

*ISIMET* recommends that each service switch on the wall panel be turned **OFF** prior to exiting the room. Also, the service key should be removed and placed in a secured location. The unit, when integrated with an “EMS”, provides a secondary safety feature that automatically turns **OFF** any services left **ON** at the end of the “EMS” cycle. If, when re-entering the room, you notice that a Red LED is illuminated, you will be reminded that that service was previously left active after exiting the room.

### If an ISIMET Integration Interrupt & Time Control Device is Connected to the Unit:

This timer will provide the electronic signal necessary to activate the unit and can be provided in lieu of “EMS”. The On/Off enabling function is similar to that of “EMS” integration. Refer to **Equipment Specifications** to determine whether a timer is provided.

## Troubleshooting

**If the Utility Controller fails to energize, follow these procedures:** Refer to LED Config. Chart on page 12.

- Verify that the Controller has correct line voltage connected. With the control switch (6) in the **ON** position, the switch should be illuminated. If it is not, check the wiring connections. Remove the wiring junction-box cover and examine wiring connections.
- Examine the removable fuse on the Service Panel. If it is damaged, replace it. Verify fuse rating with **Equipment Specifications**. Multi-Pack Models use a 5 mm fuse for PC Board fuse 1 and 500 mA for fuse 3, and 15 amp fuse at the Control Panel fuse holder.
- Verify that the Wall Panel plug is securely connected to the terminal.
- Check the wiring terminals on the wall panel to verify that none have become damaged or disconnected during installation. Reconnect, if necessary.
- If “EMS” is integrated, verify that the Controller is receiving the correct volt signal at pcb, “EMS Input” connector. Refer to **Equipment Specifications** and the “EMS” connection section of this manual for these requirements and additional tests to conduct. In most cases, the failure of the system is the result of a lack of proper signaling from an “EMS”. The “EMS” LED on the PCB should be illuminated.
- If either the “panic” or “alarm” LED is illuminated, the system will not function. Verify that no input signal has disabled the unit. If the “panic” LED is **ON**, press the panic reset switch on the PCB or re-key the corresponding Panel.
- With Door Panel switches in the **ON** position and the keyed switch activated, check the Door Panel LEDs.

### **If Wall Panel LEDs are illuminated:**

1. Check current at service utility Terminal on each PCB (refer to configuration diagram on page 20). You should read the correct voltage at these terminal posts. If not, check Fuse 1 on the PCB. Fuse is 5 amp.
2. If you do not read the correct voltage, contact an **ISIMET** Service Representative.
3. If you read the correct voltage, test the remote relay and/or solenoids to verify that they are operational.

### **If Wall Panel LEDs are not illuminated:**

1. Examine the PCB. One PCB mounted LED (LED 5, 6, or 7) should be illuminated. If it is not, check the removable panel mounted fuse. It is a 500 mA fuse (fuse 3).
2. If the fuse is damaged, replace it.
3. If the LED still does not illuminate, contact an **ISIMET** Service Representative.

In many cases, failure of the system is the result of improper connection of a remote service or device, such as a remote relay, solenoid, “EMS”, or building alarm. Refer to **Equipment Specifications** to confirm that correct connections to these services and devices have been made.

### **Notes:**

- It is not uncommon for the Utility Controller to enter the “Panic State” when first activated when the control switch is turned **ON** and an input signal is received. Pressing the RESET Switch will immediately return the controller to the correct “Waiting State”.
- Damage to the Electronic Controller and other components can occur from improperly connecting the services, overloading the output circuits, or failing to follow all start-up tests and checklists.
- In **ALL** cases, if the system fails or you have questions about the equipment, contact an **ISIMET** Service Representative.
- If the results of all test procedures is positive, but utilities will not activate, **ISIMET** recommends that you examine and test the various utility services controlled by the unit to verify that they are operational and active.

### **CAUTION:**

The output circuits of the Controller provides 24 VAC control signals to solenoids and relays to activate and engage the various utilities. **ISIMET** provides a full line of Companion Enclosures and fittings. It is recommended that these items be included in the system design, but when the installer elects to provide these fitting from other sources, that compliance with Product specifications be confirmed prior to installation.

If utilities or controlled devices remain operational after the service switch is disengaged, check for the following before placing the unit into full operation:

- A defect in the remote relay or solenoid
- Tampering
- The remote relay unit has a control switch with a manual operation position and the switch is in the manual position.

If utilities or devices continue to be active or if you have a question about the operation of the unit, contact an **ISIMET** Service Representative immediately.

## Equipment Maintenance

- ❑ The Utility Controller should have semi-annual inspections.
- ❑ **ISIMET** recommends opening the service panel and turning **OFF** the control switch prior to long periods of inactivity in the building.
- ❑ Prior to anticipated activity within the building, **ISIMET** recommends that you conduct a brief test of the control system by performing Start-Up Test Procedure A and Step 1 of Procedure B on page 16 of this manual.
- ❑ If examination of the unit indicates tampering, **ISIMET** recommends that you first review the Start-Up Checklist, then conduct **ALL** Start-Up tests.
- ❑ The Door Panel lock is not keyed the same as the keyed service switch. **ISIMET** recommends that the door panel key be kept separate from the service switch key and in a secured location. The door panel key should be available only to those needing access to the interior of the unit for the purposes of maintenance or service. **ISIMET** recommends that the door panel remain locked unless service is preformed.

If you have any questions regarding the operation and maintenance of the Utility Controller, please contact an **ISIMET** Service Representative.

The enclosure has a NEMA 1 rating. It is not intended for use in wet areas. Exercise caution to prevent exposure of the interior compartment of the enclosure to moisture. If moisture is present within the enclosure, **ISIMET** recommends that that control switch be turned **OFF**, power be disconnected from the unit until the source of the moisture is determined, and all moisture is removed from the compartment.

The electronic controller (PCB) is sensitive to moisture, dust, debris and other air-borne particles. Do not expose the interior compartment of the enclosure. During the semi-annual inspection, if dust or other material is present, **ISIMET** recommends that you remove all foreign matter before operating the unit.

If the Unit fails to operate, we recommend that you check the power supply to the unit. With the control switch in the ON position, it should be illuminated if power is on to the unit. If not, check the service breaker.

If the control switch is illuminated, check the fuse on the control panel at fuse holder. If the fuse is not damaged, and the “EMS” LED on the circuit board is not illuminated, then you should verify that the unit is receiving the proper “EMS” and “alarm” signals. We recommend that you perform the Start-Up Checklist and Start-Up Tests.

If the unit still does not function, we recommend that you check the two fuses on the circuit board. The input fuse is a 2AG 500 mA. The output circuit fuse is a 5 mm fuse. The unit will not function with either fuse damaged. If damaged, replace the fuse.

If the unit still fails to operate, we recommend that you contact your local Service Representative.

## Removing the Door Panel

Before removing the Door Panel, turn power OFF at the control switch.

Follow steps 1 – 4 in reverse as shown in Figure 12.

## Instructions for Re-coating the Enclosure

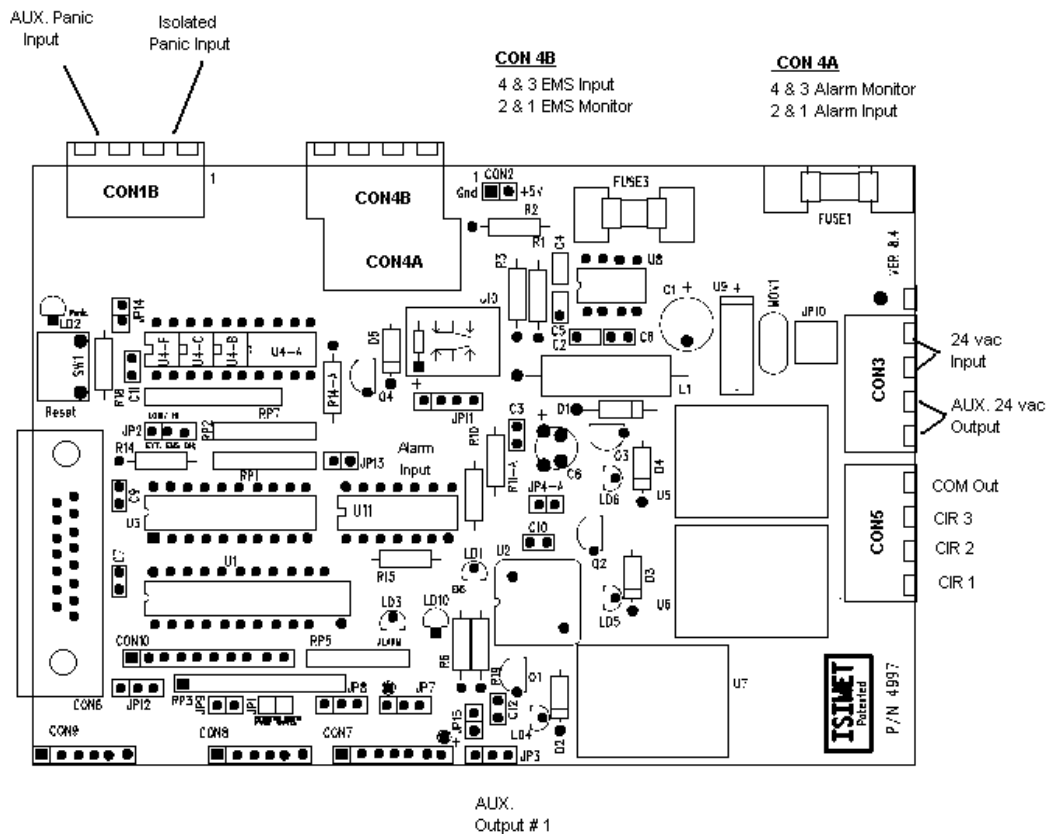
If the finish surface of the enclosure or door panel becomes scratched, follow this procedure to repair the surface.

- Most standard, good quality paints can be used to re-coat the polyester powder finish.
- For best results, correct surface preparation before re-coating is essential. Follow instructions provided by your paint manufacturer.
- Wipe surfaces to be painted with either xylene or lacquer thinner solvent.
- Allow surface to flash dry prior to painting.
- Follow paint manufacturer’s instructions for applying paint.
- Allow paint to cure adequately. Consult the paint manufacturer for proper cure time and hardness.

# ISIMET Utility Controller PCB Version 8.4 - Jumper Configuration

## Optional Input / Output Signal Configurations

Figure 18



### Jumper Post – Connection Configuration

CON 2 - Aux. 5 VDC Output

(Use only by Written Instruction)

Caution: DO NOT Place a Jumper Across this Connector.

JP 1 - Key Reset Option

Jumper in Place = Standard (Allows Key Switch to Reset after Panic)

Jumper Removed = Requires Reset Only by Switch on PC Board

JP 4a - CON 4a EMS Input Pins 4 & 3

Place Jumper Only When Input is 5 VDC; Otherwise Remove Jumper

JP 2 - EMS Active Option

RIGHT = No EMS Signal Required for Operation

LEFT = EMS Signal Required for Operation

CON 10 LS series RF Input  
Standard config.

RF Input Module not available on Multi-Pack Units.

Jumpers across pins 5 & 6; 7 & 8; 9 & 10

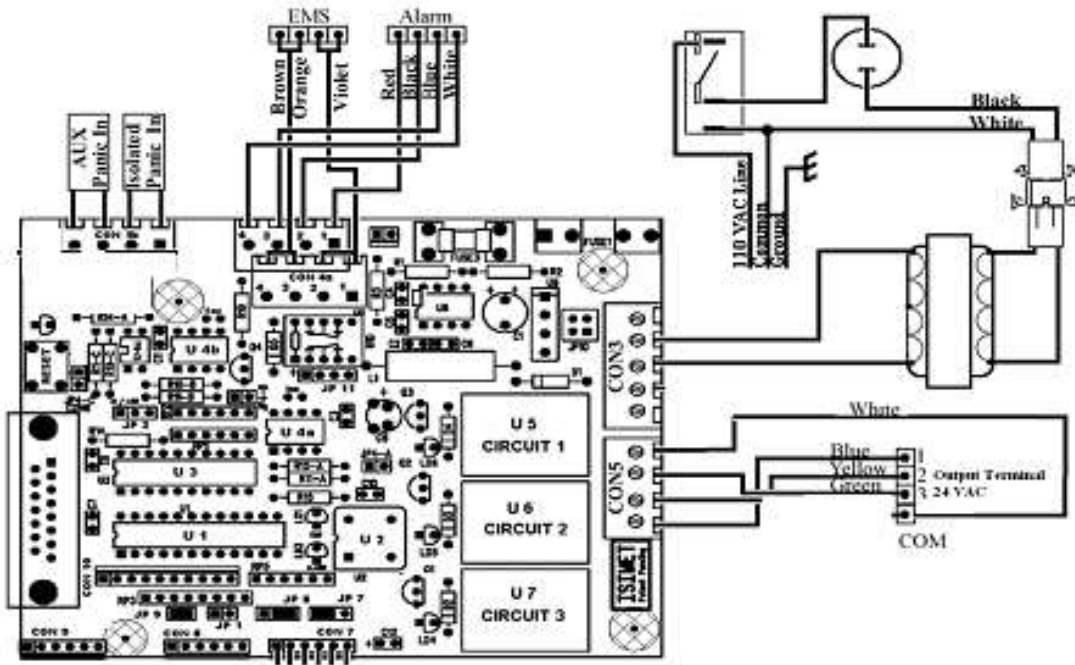
## Optional Input / Output Signal Configurations

JP 11 -	Panic Output	<p>1 – jumper placed, center posts only- dry contact standard config.          (dry contact connection points @ “alarm monitoring” posts @ Terminal 3)          Application: Provides for dry contact point for use by building alarm system.</p> <p>2- jumpers placed, one each @ posts 1 &amp; 2 and 3 &amp; 4- config.          (24-vac output signal is provided @ “alarm monitoring”)          Application: Provides signal for ISIMET Monitoring Beacon or Remote Monitoring Station.</p>
CON 1b	AUX. Panic Input	<p>Connect leads from added Remote Panic Buttons or other monitoring components.          Application: ie. <i>ISIMET</i> Shower Monitor Unit without “Time Delay” feature</p>
	Isolated Panic Input	<p>Connect input signal leads from panic signal source          Application: ie. <i>ISIMET</i> Shower Monitor Unit with “Time Delay” feature</p>
CON 9 (JP 9)	<u>JP 9</u> Jumper in place	<p>Provides connection point for optional output circuit where panic is omitted from unit          Application: LA Companion Controller.</p>
JP 12	Panic Input	<p>Configures CON 6 for Momentary Panic Input (factory configuration only)</p>

**NOTE:** “User Defined” Applications refer to integration with other types of facility control and/or monitoring systems where either 24 vac or 5 vdc input control signals are required. Not intended for uses where operational power is required. When in question as to compatibility between the ISIMET Control System and desired integrated system, contact an ISIMET Sales Representative or the factory.

# Electrical Schematic

Figure 19-Wiring Diagram



## Typical Installation Configurations:

The system is designed to operate all output circuits at 24 VAC. Typically, operating and control power for solenoids are provided through output circuits. Output circuits controlling electrical outlets are intended to provide control power only, and an interface relay is provided for that purpose. Consult installation instructions for the various companion enclosures provided with the unit.

Electrical – 120 VAC, 15 amp dedicated circuit, 14 AWG minimum

Natural Gas - 5 oz. max.

Domestic Water

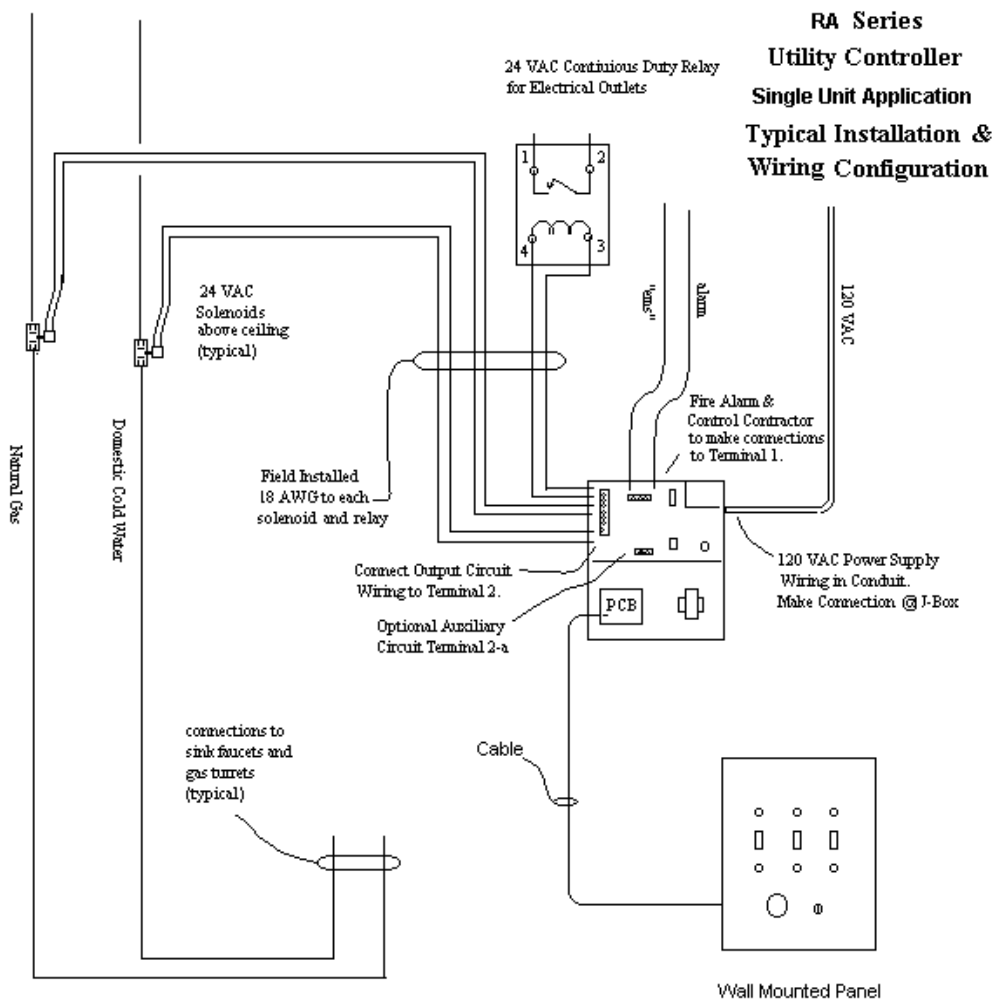
Other Services: Refer to special instructions enclosed where applicable.

Output relay rating max. 1.5 amp at 24 VAC 18 AWG minimum

### CAUTION!

- ❑ Installation must comply with all local codes and ordinances.
- ❑ Connect only 120 VAC to this equipment.
- ❑ Refer to Model Number Description for Model Designators.

Where controlled devices are not provided by *ISIMET*, output circuits should only provide control power and not operating power. Refer to compliance statements provided with the unit in cases where components are provided by others or contact *ISIMET* for additional instructions.



**Figure 20**



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**CAUTION:**

**ISIMET DOES NOT** recommend that service to emergency and/or safety devices, such as emergency showers and eyewashes, be controlled by the Utility Controller System or Solenoids. Such devices are intended to operate independent of restrictive authority operation as is the case with the design of this unit. **ISIMET** makes available components for the monitoring of such safety devices. Please contact **ISIMET** regarding any questions regarding this type of application.

**ISIMET** believes that sole and local authority means that the primary operator or the instructors should have the sole authority to start and stop the utility services within the immediate area of use during normal usage. This should distinguish this type of operating environment from that where a single emergency shut-down device is located remotely from the areas of use. As an example, the **ISIMET** system is not specifically intended for use in applications where a master shut-down and re-instate device is located away from areas of normal use. **ISIMET's** opinion is that in such cases there is risk that the operator of the system during re-start may inadvertently activate utilities in an unoccupied area that is remote from the present occupancy, thus creating the risk of fire or where the utility is fuel gas.

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Integrating  
Mechanical and Electrical  
Technology**