

# TRIPMASTER MOD

## Modular EPO Control for Industrial Duty

### FEATURES

- ◆ 4,8,12,16 or 20 EPO Relay Outputs.
- ◆ Heavy Duty 10 Amp Relay Outputs.
- ◆ 3 Independent EPO Input Channels
- ◆ High speed EPO Inputs.
- ◆ Time Delay protected EPO Inputs.
- ◆ Field Adjustable Time Delays.
- ◆ Field Selectable Outputs.
- ◆ 24VDC output to REPO Switch Lamps
- ◆ Key locked EPO Safe/Armed switch (for maintenance work on the EPOCC without tripping the shunt)
- ◆ Audible Alert in Safe Mode.
- ◆ Expanded Remote Alarm Outputs

### OPTIONS

- ◆ TM-BTY Battery Backup
- ◆ TM-TD Time Delay (s) 1-30 second time delay to prevent accidental shunt tripping
- ◆ TM-AD Internet remote alert for Emails, Text Messages, SNMP and MODBUS



The TripMaster MOD (Modular) Emergency Power Off Control Center (EPOCC) is designed to handle heavy switching loads with field selectable versatility to provide the best EPO solution for any facility. The EPOCC simplifies designing EPO control systems by providing individual relay outputs for as few as 4 outputs to as many as 20 isolated high current relay outputs different systems in the data center.

The standard design of the TM-MOD eliminates the problems found when using custom designed and site built EPO control systems. The TM-MOD is a perfect control for EPO operations. Three independent EPO inputs allows the customer or engineer to easily choose one input for EPO buttons, another for fire panel input and still another for a time protected input to prevent accidental shutdown. All EPO inputs can be protected using multiple time delays and each can be field selected for the best protection timing.

The relay output modules provide four Form "C" non-powered relay contacts on each board. Each relay contact is protected with individual MOVs for a lifetime of dependable relay operation. The 10 amp continuous duty contacts can control virtually any emergency shut down duty. Each relay output is isolated making it easy to mix control voltages without risky onsite wiring kluges. Simple select the number of epo control required and use the number of relay output boards to provide the emergency control. Should the facility grow in the future simply add additional relay output boards.

### EPO OPERATION

When a remote EPO switch or fire alarm contact is activated a latching relay senses the signal and locks all the output relays modules on that EPO channel in the EPO position. Once in an emergency position, the TM-MOD will require a manual reset to return to normal operation.

### Battery Backup

Each TM-MOD is supplied with a DC voltage power supply that provides an input for standard batteries. The TM-MOD also provides charging for the batteries.

### Time Delay

The TM-MOD can be equipped with up to three optional adjustable time delays for the EPO latching circuit. The Time delay (TM-TD) will prevent accidental shunt tripping by delaying the EPO shutdown input. This will prevent accidental shut down due to human error when depressing control buttons next to exit doors.

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## EPO SELECT SWITCH

Operator selectable with the provided key allows the TM-MOD to be placed in the ARMED, OFF or SAFE mode. Armed is for normal operation, OFF disables the panel, SAFE is used for field testing without EPO outputs activating.



## CONTROL BOARD

The control board supplies all the field terminal blocks for connecting input power, EPO input devices, batteries, alarm outputs and strobe and horn controls. The control board connects and controls the downstream EPOB output boards and connects the optional time delays to the proper EPO input channel.

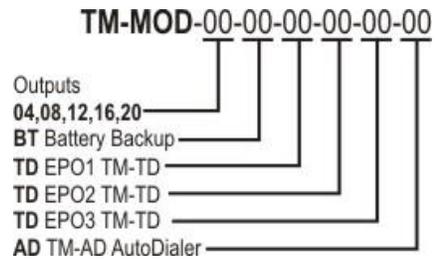
## EOPB OUTPUT BOARDS

These heavy duty relay output control boards provide 4 isolated and protected Form C relay outputs per board. The EPOBs are daisy chained together to supply up to 20 total industrial duty outputs for controlling the critical systems in the facility. Each EPOB can be selected to operate on any or all three EPO input channels by using the jumpers provided. This feature allows each EPOB to operate it's control outputs in combination with other EPOBs according to the EPO inputs.

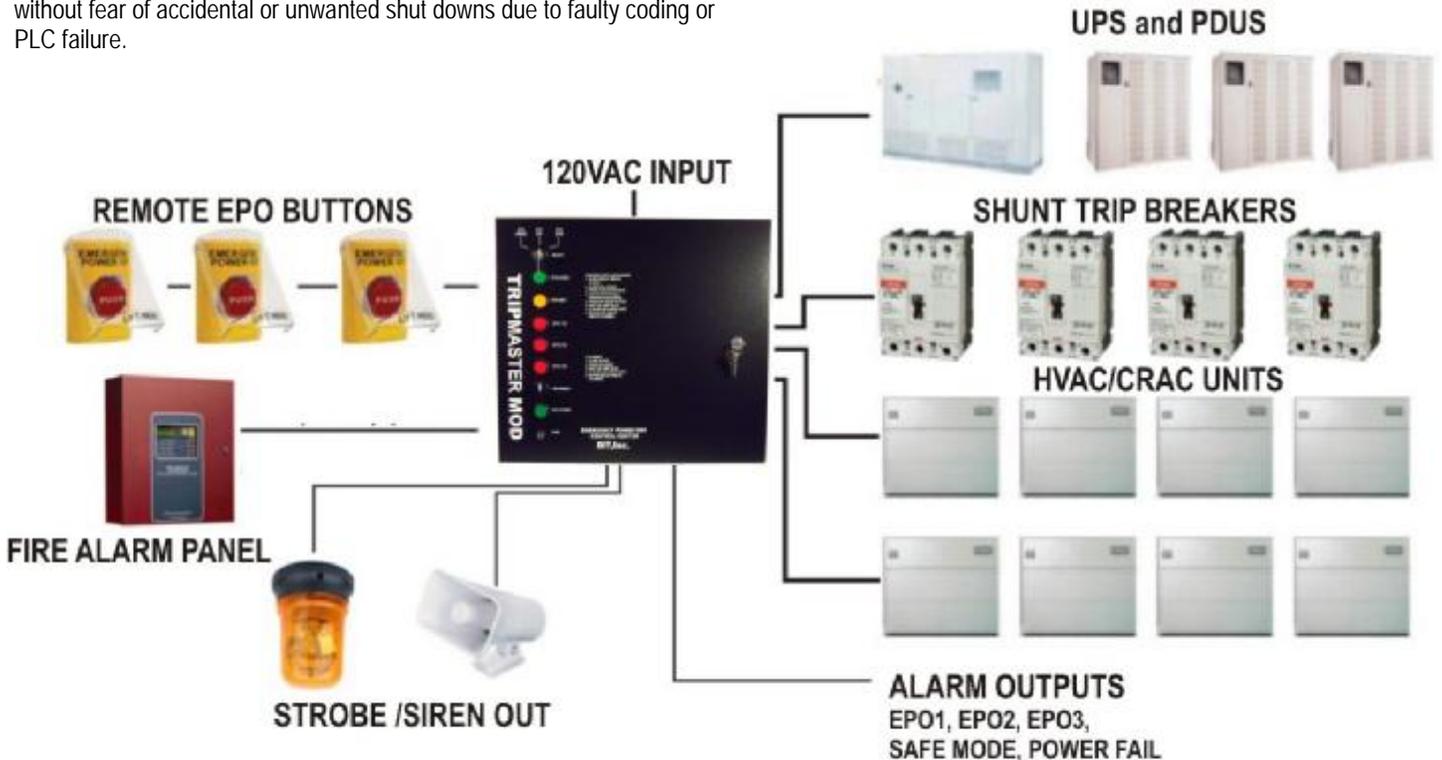
## EPO Input Channels

The TM-MOD provides three individual EPO channels for shut down control. All channels can be instant or time delayed. Time delays are field selectable from 0-30 seconds. Each EPO input channel can be selected to operate the EPO output boards. Now the door push buttons can operate HVAC and exhaust fans while the Fire panel can add power shut down for UPSs, PDUs and building Switch Gear. Now it's all selectable in the field without fear of accidental or unwanted shut downs due to faulty coding or PLC failure.

## SPECIFICATIONS



TM-BTY	Sealed lead Acid Batteries
TM-TD	Adjustable Time Delay
TM-AD	Ethernet AutoDialer
Electrical	
Power	120VAC @ 3 amps
Relay Outputs	120VACV@10AMPS Cont.or 20
EPO Inputs	3 Independent
Control Switches	
EPO Reset	Push button
EPO Select	Key Lock Switch
Remote Switches	
EPO Input type	N/O Dry Switch or Relay
Dimensions	
TM-MOD 4, 8, 12,	H 17.0" W 19.0" D 3.50"
TM-MOD 16, 20	H 24.0" W 19.0" D 3.50"
Electrical Knockouts	1/2" on Top and Bottom
Environmental	
Temperature	0-125 F
Humidity	5-95%Rh Non-condensing
Color	Black Box/Black Front



## Control Board Components

TB4 Power Input 24VAC from transformer supplied.

TB5 24VDC Battery Input for battery backup.

TB1 EPO 1 Input Normally Open dry contact input. A contact closure will initiate the EPO sequence for this input only.

TB2 EPO 2 Input Normally Open dry contact input. A contact closure will initiate the EPO sequence for this input only.

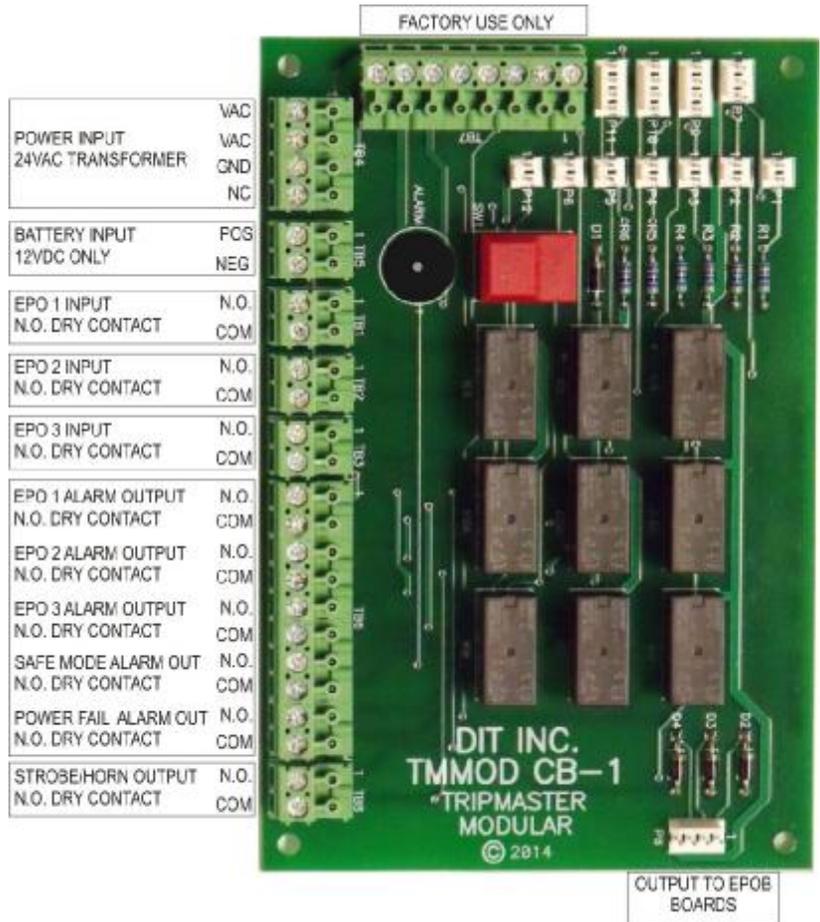
TB3 EPO 2 Input Normally Open dry contact input. A contact closure will initiate the EPO sequence for this input only.

TB6 Remote Alarm Outputs for signaling other alarm or building control systems on the TripMaster events. Provides a Normally Open dry contact for each alarm event that closes when the alarm is active.

TB8 Strobe/Horn output. Normally Open dry contacts that will close when any EPO input is latched on.

Alarm Silence Button When the TripMaster is placed in the SAFE mode using the key lock switch the audible alert will sound indicating an Off Normal condition. Pressing the silence button will silence the audible while maintenance is performed.

P8 Output control to EPO Boards.



## EPOB EPO Board Components

TB1 EPO Relay output terminal block. 4 isolated relay outputs may be connected to facility equipment for emergency power off control.

M1-8 MOVs to protect relay contacts during switching.

K1 EPO Relay. Provides four dry relay contacts to TB1. Each relay contact is rated at 10amps/120vac continuous.

P1-2 Connectors used to connect the EPOB to the CB1 control board and pass on the connection to other EPOBs.

LED1 Lights when the K1 relay is on.

EPO Select Jumper Selects which EPO input will operate the K1 EPO relay. The K1 relay will not make close unless the jumpers are set. See the options below.



## EPO Inputs

The TripMaster Mod offers three EPO inputs. Each input is independent of the others. Each input can have an optional time delay (TM-TD) or operate instantly. All EPO inputs require a normally open (N.O.) dry contact to operate. When any EPO input is closed the CB1 control board will either start a time delay or instantly latch the input. At the end of the time delay the EPO input will latch. A LED will light on the panel and a set of remote alarm contacts will close to alert other monitoring and control systems. Depending on how the EPO Boards (EPOB) are programmed, the EPOBs selected to operate with the EPO input will close and shutdown the wired facility equipment.

Now one off-the-shelf control panel can easily shutdown the facility HVAC equipment with one EPO input while shutting down the power systems with another and finally shutting down every system when a fire alarm is present.



Time Delays allow for protection against accidental EPO events. Our delays are adjustable from 0-5minutes. They are factory set for 10 seconds. When an EPO input is present the TD starts timing. At the end of the time delay the EPO event will latch and shutdown facility equipment. If during the time delay the EPO input is reset the TD will stop and reset and NOT shutdown the wired equipment. Simple, safe assurance.

## Fire Alarm Panels

An alarm contact or module from the FACP signals the TripMaster of a shutdown.



## Remote EPO Switches

A wide variety of REPO switches can be used at exit door. They can be individual or ganged together.



## SAFE Mode

The TripMaster MOD come standard with a key locked selector switch to place the control in the SAFE mode for installation or maintenance. While in the SAFE mode no EPO output boards will operate allowing remote EPO switches to be added or tested without fear of shutdown the facility. When in the SAFE mode an LED will light on the panel front and an audible alarm will sound to alert personnel of the override. A set of contacts will also close to signal any other building monitor, guard station or BMS system of the override. To return to normal simply use the key to return to ARMED mode. An LED on the panel from indicates the system is ARMED and normal mode.

## TripMaster Auto-Dialer

The optional (TM-AD) allows the TM-MOD to remotely announce alarms using the Internet to email, cell phones, SMTP or MODBUS. This option requires an Ethernet connection to the Internet provided by others. The alarm inputs to the TM-AD are factory pre-wired. Six total alarm types can be sent to remote cell phones or tablets as text messages. Emails can be sent to remote PCs or direct connection to other facility monitoring or control systems using SMTP or MODBUS. TM-AD is field programmed via web browser and the TM-AD stores historical data logging of alarm events.

The TM-AD optional can be added at the factory on order or as a separate panel to existing field systems.

## Alarm Notifications

EPO1, EPO2 and EPO3 Activate, EPO SAFE Mode and Power Fail plus 1 spare alarm.



Notification Types  
Email, Text Message, SNMP Traps, MODBUS/TCP Slave and



## Darwell IT, Inc

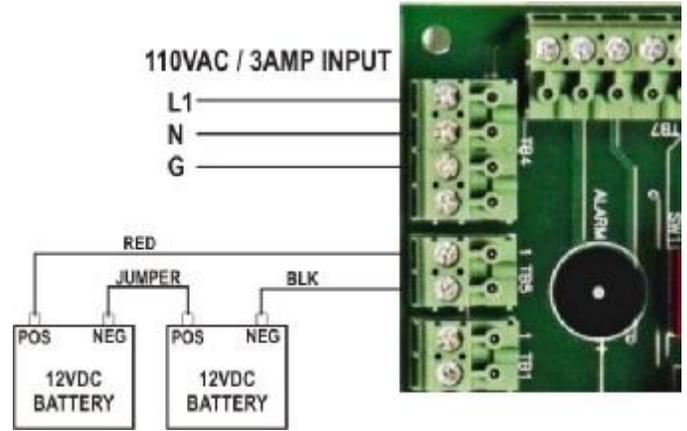
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### Power Input

The TM-MOD requires 120VAC power input. Use TB4 to connect the power to control.

### Battery Input

The TM-MOD provides TB5 for connecting back up batteries. The batteries must be 24VDC. The TM-MOD will charge the batteries when not in use.

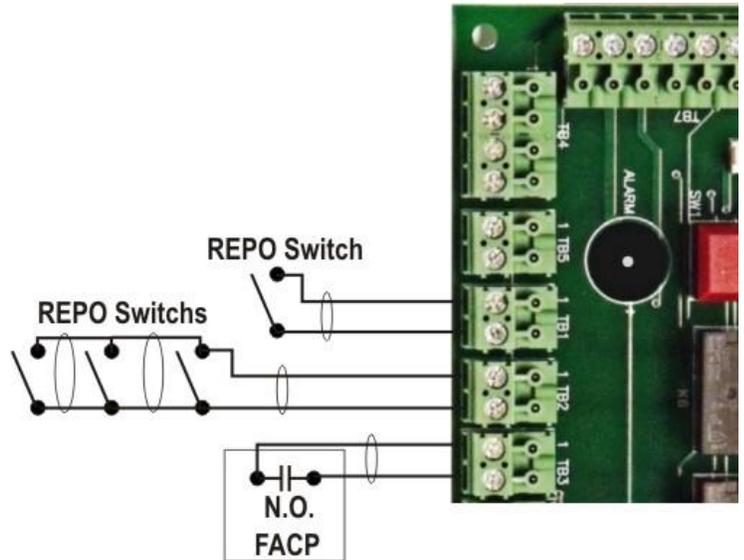


### EPO INPUTS

TB-1, TB-2, TB-3 Provides four inputs for remote EPO input devices such as REPO switches, FACP Panels or any other normally closed none powered inputs.

Each EPO input is independent from the other EPO inputs. Normally open inputs may be run in a single pair or may be paralleled to allow multiple inputs devices on a single input line.

Each EPO input can be time delay protected or operate instantly. The time delays are optional and may not have been added to this order.

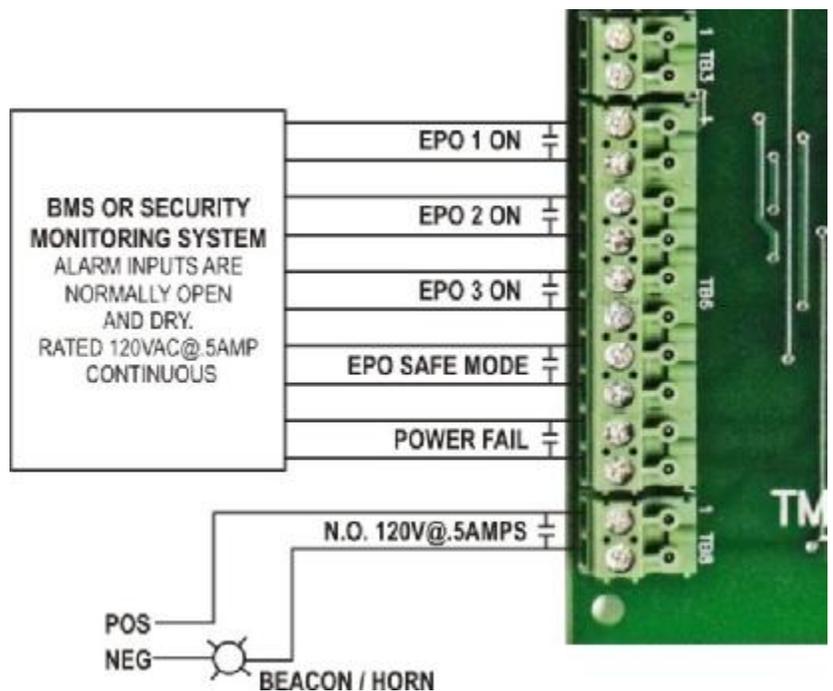


### Connecting BMS or Security Systems

The TM-MOD provides five alarm output contacts for remote monitoring. The relays are normally open and non-powered rated at 120VAC @ .5 Amp. When an alarm event is present the contacts will close signaling the remote monitoring system.

### Beacon/Horn Output

The TM-MOD provides a contact closure to operate a remote beacon or horn when the panel is in an EPO event. The relay contact is normally open and dry and closes on an EPO.



## Connecting EPO Outputs

The EPO output contacts are non-powered and rated at 120VAC @ 10 Amp. The TM-MOD provides both a normally open and normally closed contact for controlling the power shutdown of the facility equipment.

Please verify the type of contact needed for each equipment type and connect to the proper relay output contacts.

## CRAC Units

Most CRAC HVAC units provide a remote shutdown jumper on the unit for remote power off events. The CRAC unit normally requires this input to be normally closed and open to shutdown. Normally the power is 24VAC on the remote shutdown. Use the N.C. relay contact to control CRAC shutdown.

## Building HVAC Units

Most HVAC units can be controlled using the transformer Red lead to the thermostat. Breaking this lead will normally shutdown the HVAC unit. This is normally a low voltage connection and should require a N.C. contact that opens for shutdown.

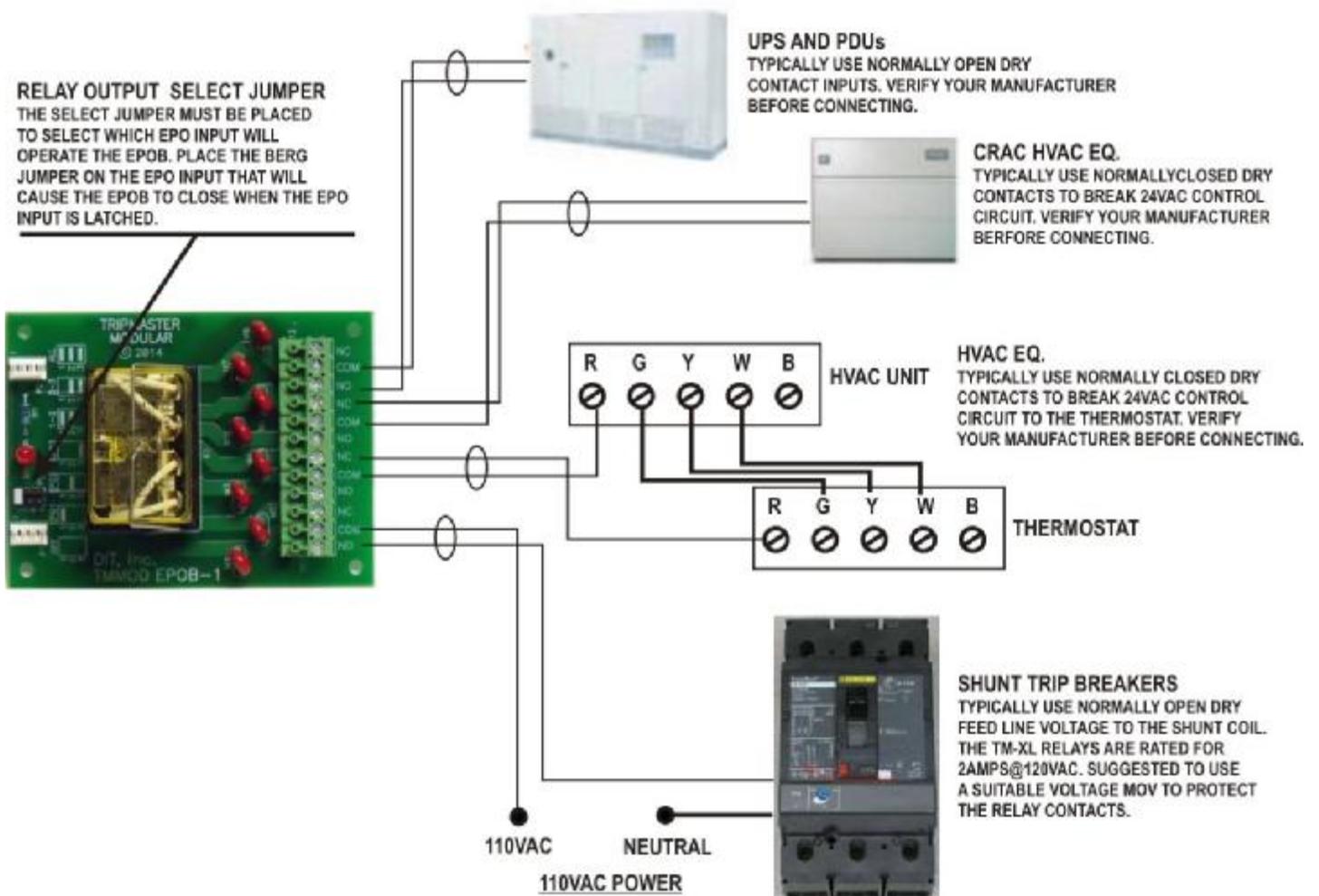
## UPS and PDUs

Most data center power equipment will provide a specific contact connect for remote emergency power off. Consult the equipments operation manual to locate the proper contact terminals. Generally the EPO shutdown terminals are low voltage and DC current. Closing a contact across the input terminals will initiate an EPO shutdown. Use the N.O. contact to control the power unit. When the contact closes at the TM-MOD it will shutdown the power units.

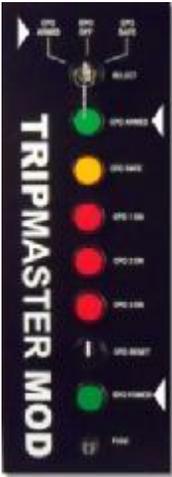
## Shunt Trip Breakers and MPB Control

Shunt trip breakers usually use a 120VAC trip coil for shutdown. The coil requires a Line and Neutral connect to trip. Only one side will be switched through the TM-MOD's relay contact. **Do not** connect the Line and Neutral across the relay contact. Use the N.O. contact and route the Line side or switch leg through the relay contact and to the shunt trip breaker. When the contact closes the trip voltage will be applied to the trip coil of the breaker.

**MOV Protection** – Each output contact is protected with a MOV to prevent flashing on the relay contacts during make/break events. Each contact, N.O. or N.C. are protected.



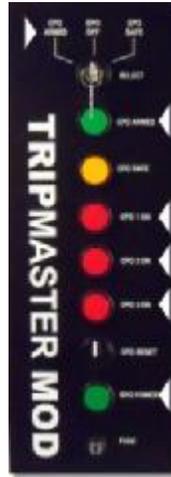
## Front Display and Control



### Armed Mode

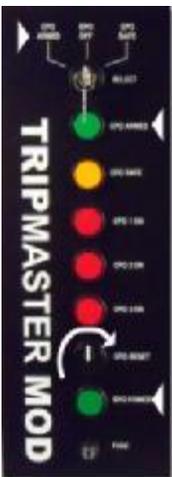
The TM-MOD is in the normal operating mode in the ARMED position. The enter ARMED:

1. Turn the keyed Select Switch to the ARMED position.
2. The ARMED led will light.
3. Power ON led will be lit.



### Armed Mode / EPO Active

When any EPO input is active and has latched on the associated EPO ON led will light.

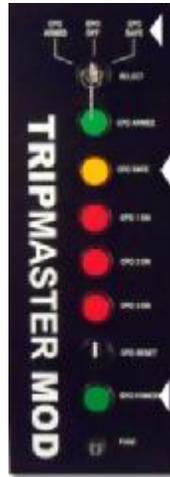


### Armed Mode / Resetting EPO ON

To return to normal after an EPO event the TM-MOD must be reset.

1. Turn the keyed SELECT switch to the SAFE Position.
2. Turn the RESET switch to the right.
3. All EPO ON leds will turn off. The EPOB output relays will reset to normal. Wait to be certain that no EPO leds turn back on.
4. Return the keyed SELECT switch to the ARMED position.

Note: If time delays are installed on the EPO inputs wait for 30 seconds before returning to ARMED Mode.

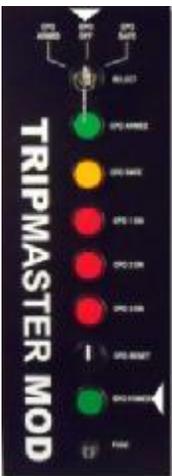


### Safe Mode

The Safe Mode allows the EPO inputs to be worked on or maintained without accidentally shunt tripping any EPOB output relays.

1. Turn the keyed Select switch to the SAFE position.
2. The SAFE MODE led will light.
3. To return to normal turn the keyed Select switch to ARMED position.

Note: When in the Safe mode if any EPO ON leds are lit Do Not Return to ARMED before Resetting the TM-MOD. Follow the Resetting EPO instructions.

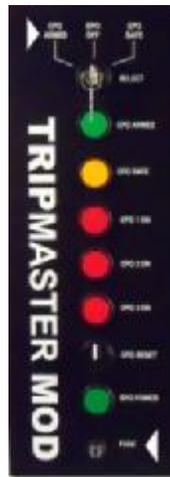


### EPO Off Mode

When in the EPO OFF position the TM-MOD is shutdown and no EPO inputs or EPOB outs will operate. When in this mode only the Power On led will be lit.

Before returning to the ARMED Mode:

1. Turn the Select switch to the Safe position.
2. If no EPO On leds light turn the Select switch to the ARMED position.

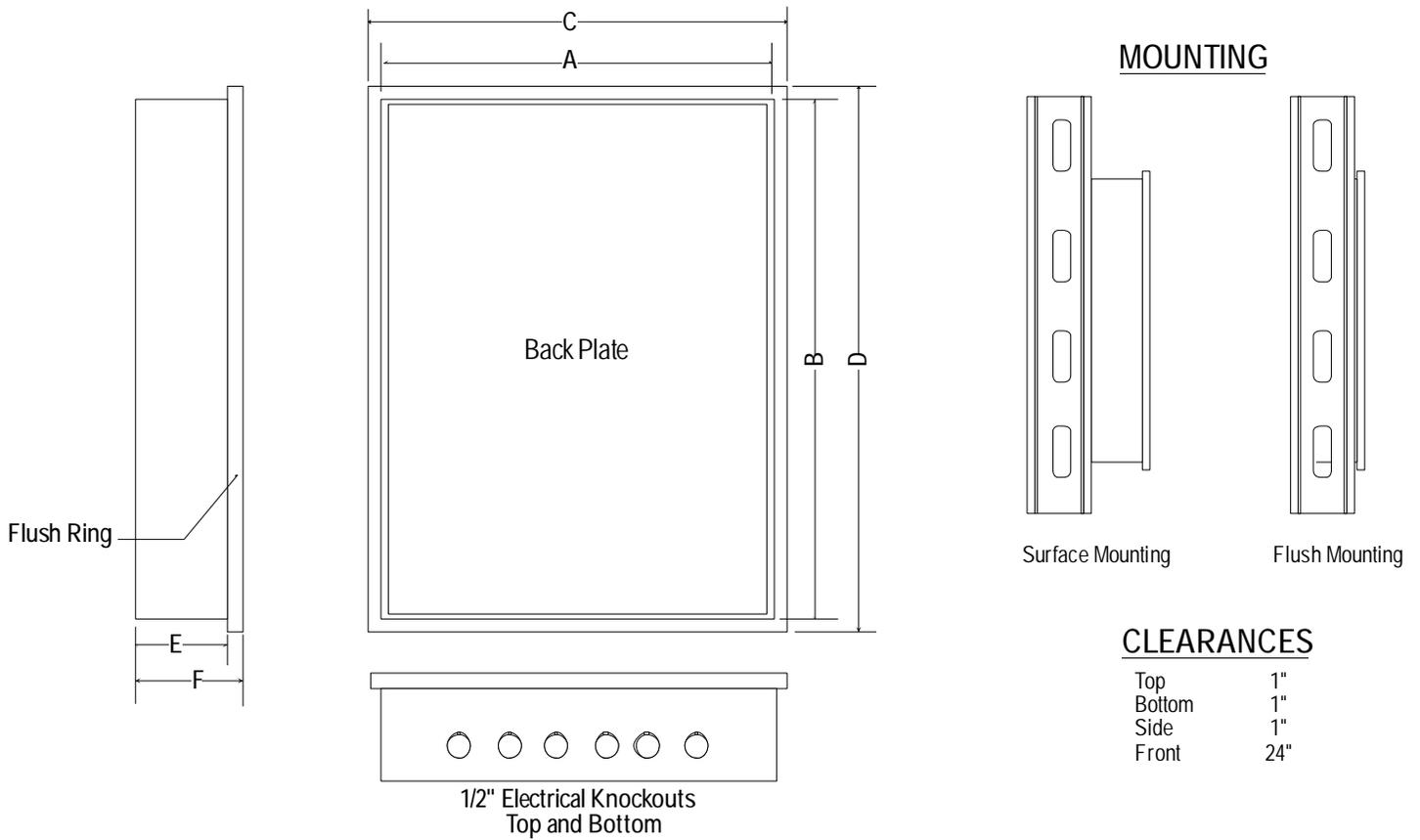


### Power Fail

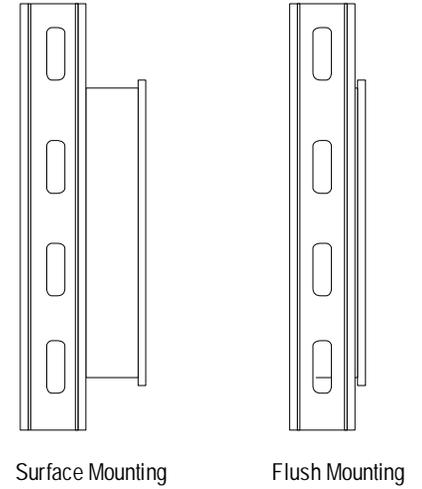
The TM-MOD will have no leds lit on the front. Check the main power feed and the fuse.

## MOUNTING INSTRUCTIONS

The TM-MOD-DPs are designed for surface or semi-flush mounting. Mounting holes are provided in the back of the enclosure for surface mounting and an option flush-mounting ring is available for semi-flush mounting.



### MOUNTING



### CLEARANCES

Top	1"
Bottom	1"
Side	1"
Front	24"

### DIMENSIONS

	TM-MOD-04-12	TM-MOD-16-20
A	18.00"	18.00"
B	16.00"	24.00"
C	19.00"	19.00"
D	17.00"	25.00"
E	3.00"	3.00"
F	3.5"	3.50"

## LIMITED WARRANTY

DARWELL Integrated Technology, Inc. (DARWELL or D,I.T. ) warrants each of its products to be free from manufacturing defects in materials and workmanship for twelve months following the date of manufacture. DARWELL will, within said period, at its option, repair or replace any product failing to operate correctly, without charge to the original purchaser or user.

This warranty shall not apply to any equipment of any part thereof which has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to accident, nuisance, flood, fire, or acts of God, or on which any serial numbers have been altered, defaced, or removed. Seller will not be responsible for any dismantling, reassembly, or reinstallation charges.

There are no warranties, express or implied, which extend beyond the description of the face hereof. There is no express or implied warranty of merchantability or a warranty of fitness for a particular purpose. Additionally, this warranty is in lieu of all other obligations or liabilities on the part of DARWELL.

This warranty contains the entire warranty. This is the sole warranty and any prior agreements or representations, whether oral or written, are either merged herein or are expressly canceled. DARWELL neither assumes, nor authorizes any other person purporting to act on its behalf to modify, to change, nor to assume for it, any other warranty or liability concerning its products.

In no event shall DARWELL be liable for an amount in excess of DARWELL's original selling price of the product, or for any commercial loss or damage, whether direct, indirect, incidental, consequential, or otherwise arising out of any failure of the product. Seller's warranty, as herein and above set forth, shall not be enlarged, diminished, or affected by and no obligation or liability shall arise or grow out of Seller's rendering of technical advice or service in or service in connection with Buyer's order of the goods furnished hereunder.

### **RMA Instructions**

1. Contact DiT, Inc at 1-214-607-9991 for RMA number.
2. Return defective product to : DiT, Inc, 371 CR 3201, Campbell, Texas, 75422.
3. Do not return any product without RMA number.