DiT Incorporated

Integrated Monitoring Solutions for Today's Technology Facilities

TRIPMASTER **XL**

EPO Control Center Operation Manual

FEATURES

- 20 EPO Relay Outputs
- 4 EPO Inputs
- Individual EPO Relay overrides.
- 12VDC output to REPO Switch Lamps
- Key locked EPO inhibit switch (for maintenance work on the EPOCC without tripping the shunt)

OPTIONS

- TM-BTY 12 VDC Battery Backup
- TM-TD Time Delay 1-30 second time delay to prevent accidental shunt tripping
- TM-AD Internet remote alert for Emails, Text Messages, SNMP and MODBUS
- SFO1 EPO Inhibited alarm output contact
- SFO2 Audible Alarm w/Silence Button
- SFO3 Normally Closed EPO Input
- SFO6 EPO TD Active alarm output contact

RECOGNIZED COMPONENT
INFORMATION TECHNOLOGY EQUIPMENT
51814
CONFORMS TO UL STD 1950

GENERAL

The TripMaster XL is designed to provide a simple "Off the Shelf" solution for emergency power off (EPO) control requirements. The TM-XL simplifies designing EPO control systems by providing individual relay outputs for up to 20 different systems in the data center.

The standard design of the TM-XL eliminates the problems found when using custom designed and site built EPO control systems. The TM-XL is a perfect add-on to control EPO operations from a single output of a fire suppression or detection system. The TM-XL provides 20 outputs. Up to 20 systems can be controlled with the TM-XL's Form "C" non-powered relays. Each relay outputs is isolated making it easy to mix control voltages without risky onsite wiring kluges.

EPO OPERATION

When a remote EPO switch is activated a latching relay senses the signal and locks all the output relays in the EPO position. Once in an emergency position, the TM-XL will require a manual reset to return to normal operation.

Battery Backup

Each TM-XL is supplied with a DC voltage power supply that provides an input for standard 12VDC batteries. The TM=XL also provides charging for the batteries.

Time Delay

The TM-XL can be equipped with an optional adjustable time delay in the EPO latching circuit. The Time delay (TM-TD) will prevent accidental shunt tripping by delaying the shutdown. This will prevent accidental shut down due to human error when depressing control buttons next to entrance doors. The (TM-TD) is available as an option.

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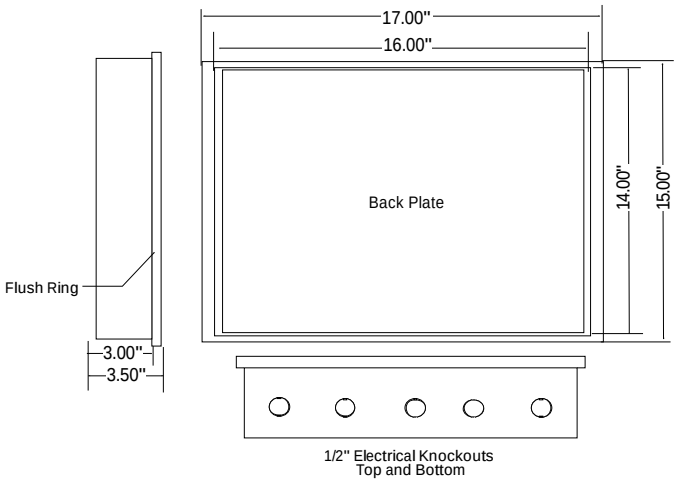
Made in USA America

Dimensions:



SPECIFICATIONS

Model Number	
TM-XL	20 Relay Model
TM-BTY	Sealed lead Acid 12VDC Battery
TM-TD	Time delay Timer

Electrical	
Power	24VAC @ 40V
EPO Outputs	Form "C" Relay Contacts
No. of Outputs	20 120VACV@2AMPS
No. EPO Inputs	4

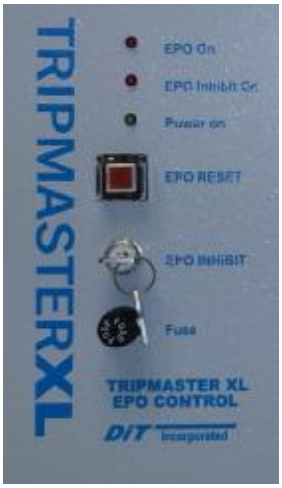
Control Switches	
EPO Reset	Push button
EPO Inhibit	Key Lock Switch

Remote Switches	
EPO Input type	N/O Switch or Relay
Remote Reset	Normally Closed

Environmental	
Temperature	0-125 F
Humidity	5-95%Rh Non-condensing

Wiring Schedule

Input Type	Wire Type	No. Condct.	Wire Size
EPO Input	THHN	2	18-22 Stranded
Remote Reset	THHN	2	18-22 Stranded
Relay Output	THHN	2	18-22 Stranded
Power Input	THHN	3	14-16 Stranded



EPO On Led– Lights when the EPO lock relay is energized.

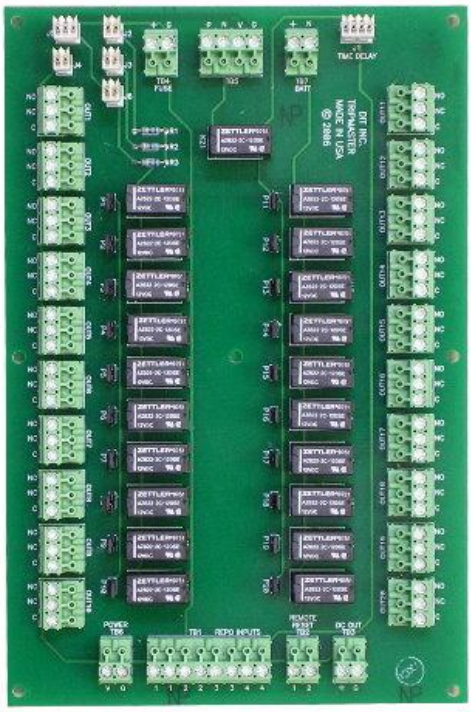
EPO Inhibit On Led– Lights when the EPO Inhibit switch is locked out.

Power On Led– Lights when power is on to the TM-XL

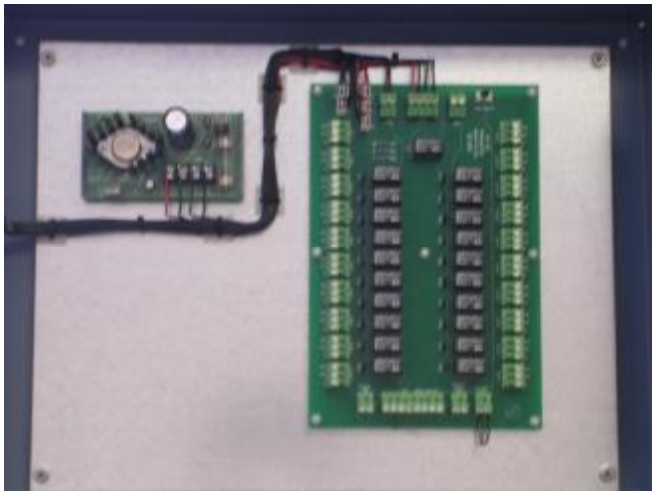
EPO Reset Switch– Press the Reset switch to reset the TM-EPOCC after an EPO shutdown.

EPO Inhibit Key Lock Switch– Turning this switch horizontal locks out the EPO output relays from the locking relay preventing the EPO output relays from latching.

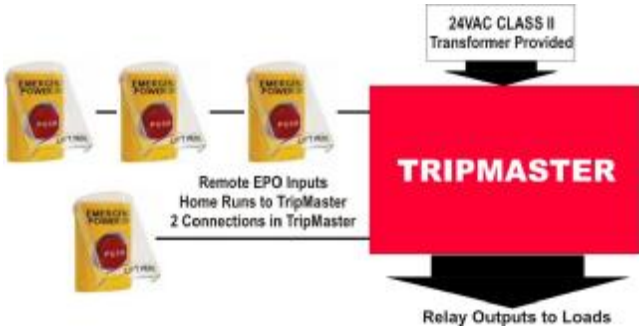
Fuse– 2 Amp power fuse.

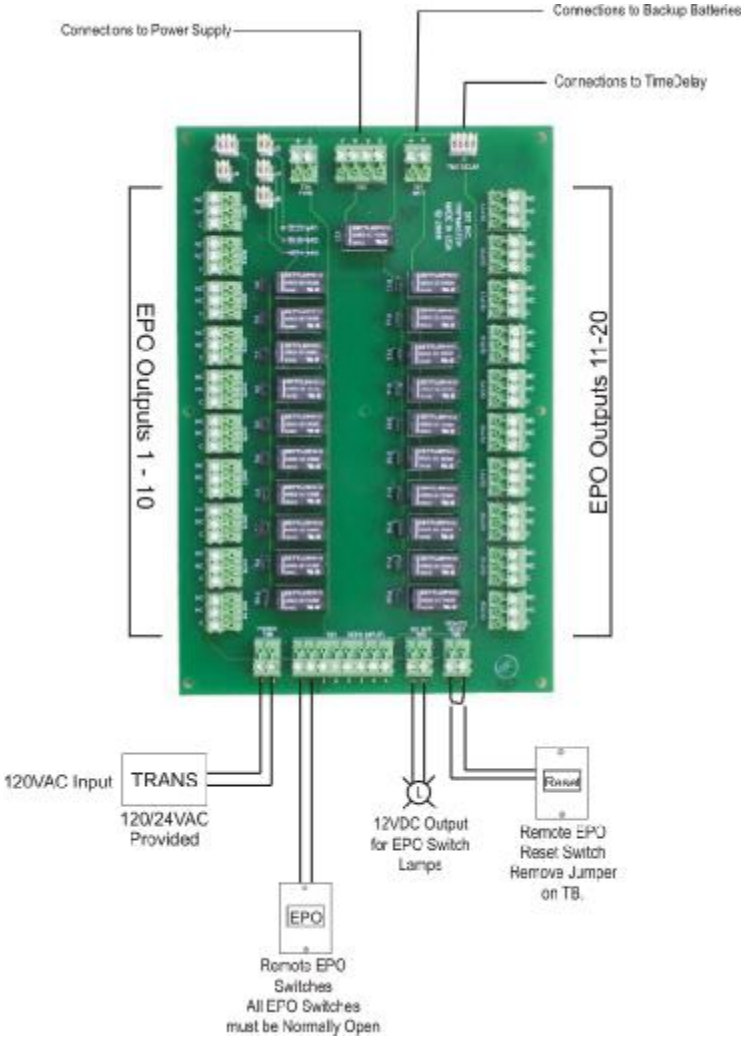


Main Control Board with 20 EPO Output relays.



The Main Control Board and DC Power Supply





The Main Control Board (MCB)
The MCB is the main connection point for the Tripmaster XL. All the power, EPO switches and EPO outputs come from this board.

EPO Outputs- The EPO Outputs are non-powered form C relay outputs.

Power Transformer-The Transformer is provided with the Tripmaster. It is a 120VAC input and a 24VAC output.

EPO Input Switches– All EPO inputs should be non-powered, normally open and momentary push button switches.

EPO Lamp Power - TB4 provides 12VDC to power lamps in the EPO switches if the switches provide lamps.

Remote Reset - TB3 allows for a remote EPO Reset switch to be installed. If a remote switch is used it must be normally closed non-powered. Remove the factory jumper on TB3 to use a remote reset switch. Do Not remover the Jumper or the TM-XL will not lock on in an EPO condition.

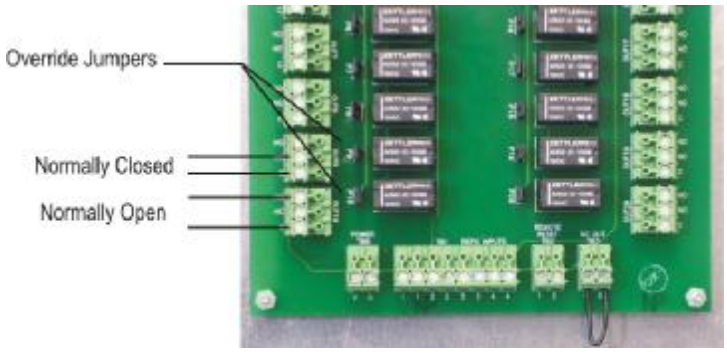
TimeDelay - The optional TimeDelay plugs into J1. If the TD is not used a jumper is in J1. Do not remove this jumper or the jumper or the TM-XL will not operate.

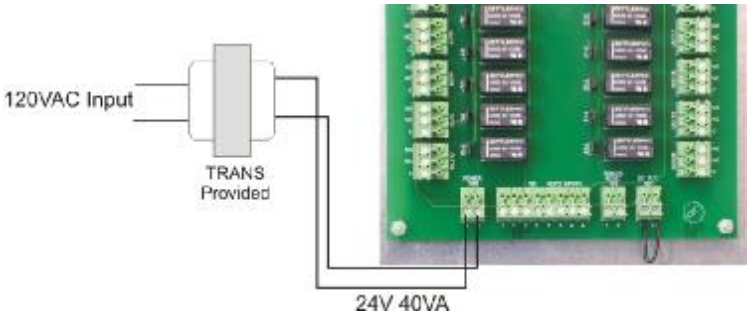
Battery Connection– This terminal block is used to connect the Optional backup batteries tot the MCB. Be sure and follow the polarity on the terminals.

Connecting EPO Outputs
The EPO output relays are non-powered and rated at 120VAC @ 1 Amp. The TM-XL 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.

Override Jumpers– Each output relay has a small jumper that can be pulled to take that relay out of the system. This jumper is designed to be used for temporary maintenance overrides.





Power Transformer
The power transformer is provided and can be installed either inside or outside the EPO enclosure. The primary voltage to the transformer is 120VAC. The transformer outputs 24VAC @ 40VA.

Face Plate Components

EPO On Led– Lights when the EPO lock relay is energized.

EPO Inhibit On Led– Lights when the EPO Inhibit switch is locked out.

Power On Led– Lights when power is on to the TM-XL

EPO Reset Switch– Press the Reset switch to reset the TM-XL after an EPO shutdown.

EPO Inhibit Key Lock Switch– Turning this switch horizontal locks out the EPO output relays from the locking relay preventing the EPO output relays from latching.

Fuse– 2 Amp power fuse.

Normal State
With the TM-XL powered and in normal the face plate will look like this.

The Power On led will be lit and no others.

EPO State
With the TM-XL powered and in the EPO lockout condition the face plate will look like this.

The Power On led will be lit.

The EPO On led will be lit.

EPO Inhibit ON State
With the TM-XL powered and in EPO Inhibit the face plate will look like this.

The Power On led will be lit and no others.

EPO Inhibit On led will be lit.

WARNING

EPO Inhibit ON State
With the TM-XL powered and in EPO Inhibit the face plate will look like this.

Sometimes when replacing the lamps in the remoter EPO switches, replacing the cover will trip the EPO circuit.

If the EPO On led is lit press the EPO Reset switch **BEFORE** returning the EPO Inhibit switch to normal position.

Sequence of Operation Standard TM-XL

1. With the TM-XL powered and in the normal condition.
2. A remote EPO button is pressed.
3. The TM-XL will set the EPO Lock relay R21 to the latched state.
4. R-21 will latch on all 20 of the EPO outputs relays.
5. The EPO On led will light.
6. All EPO will remain locked on until the EPO Reset switch is pressed.

Sequence of Operation with Optional Time Delay

1. With the TM-XL powered and in the normal condition.
2. A remote EPO button is pressed.
3. The TM-DLY will start timing out to the preset time.
4. The TM-DLY relay will close.
5. The TM-DLY will set the EPO Lock relay R21 to the latched state.
6. R-21 will latch on all 20 of the EPO outputs relays.
7. The EPO On led will light.
8. All EPO will remain locked on until the EPO Reset switch is pressed.

Wiring

All wiring must meet local and national electrical codes.

Wiring Schedule

Input Type	Wire Type	No. Condct.	Wire Size
EPO Input	THHN	2	18-22 Stranded
Remote Reset	THHN	2	18-22 Stranded
Relay Output	THHN	2	18-22 Stranded
Power Input	THHN	3	14-16 Stranded

Mounting the TM-XL

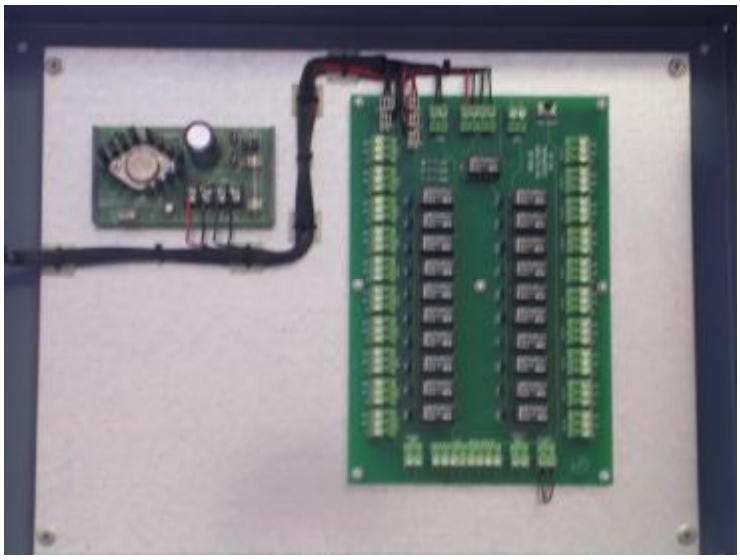
The TM-XL can be mounted surface or flush. Four 1/4" mounting holes are provided in the back of the EPOCC for mounting screws.

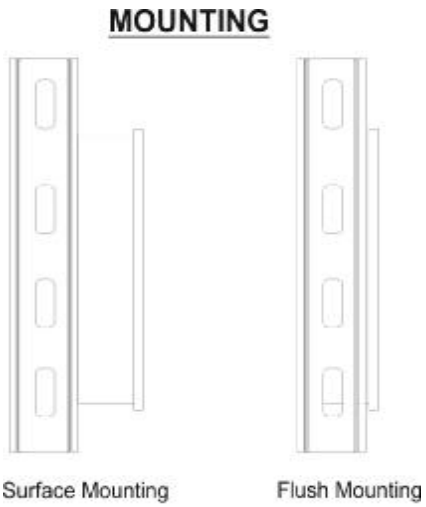
When flush mounting the TM-XL a built-in flush ring is provided around the door of the enclosure.

TripMaster XL Power Transformer

The TM XL comes with a multi tap input transformer.

Primary		Secondary	
Common	White	Yellow	Common
110VAC	Black	Blue	24VAC
208VAC	Red		
240VAC	Orange		





CLEARANCES

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

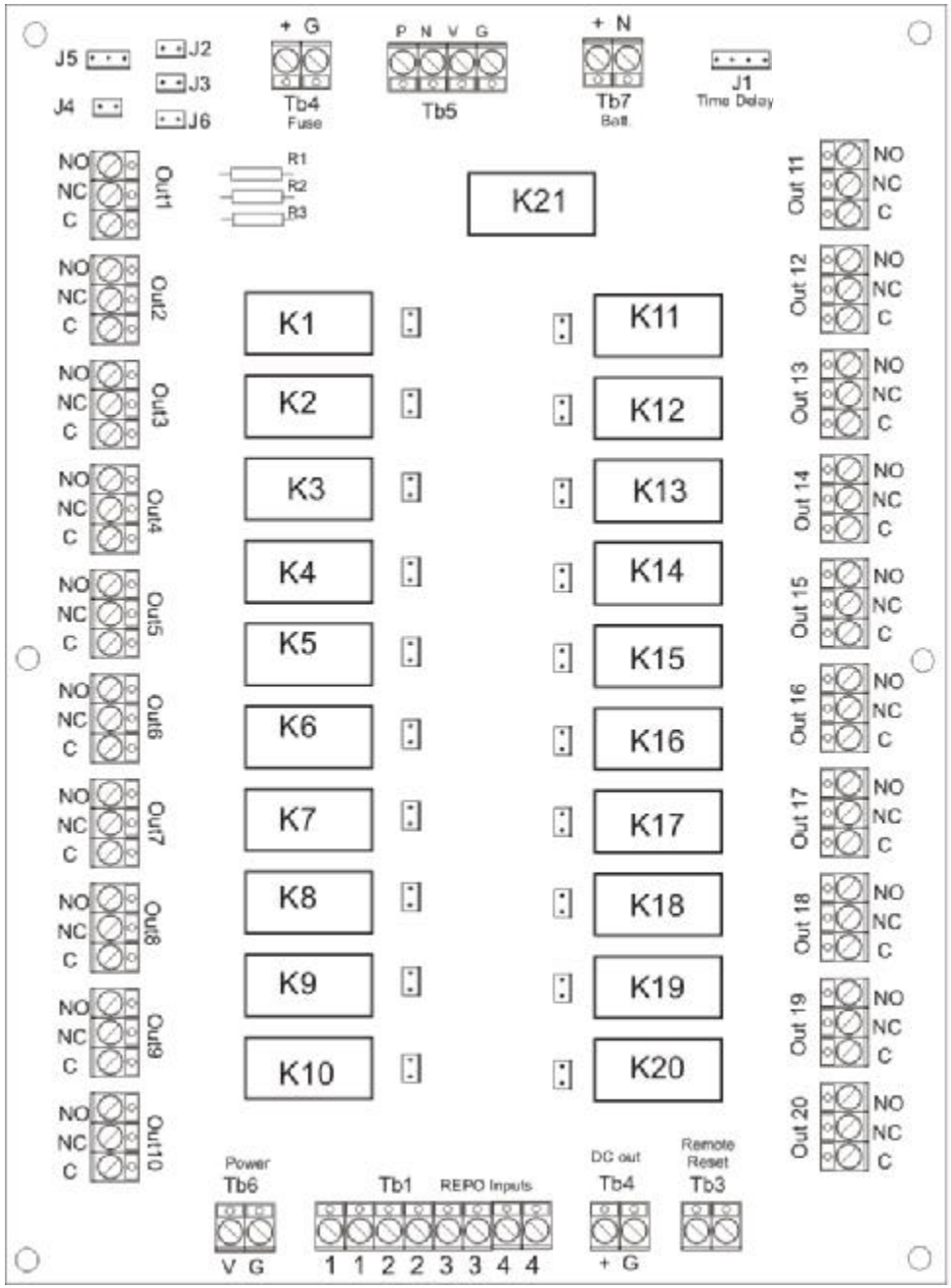
Inside the TM-XL

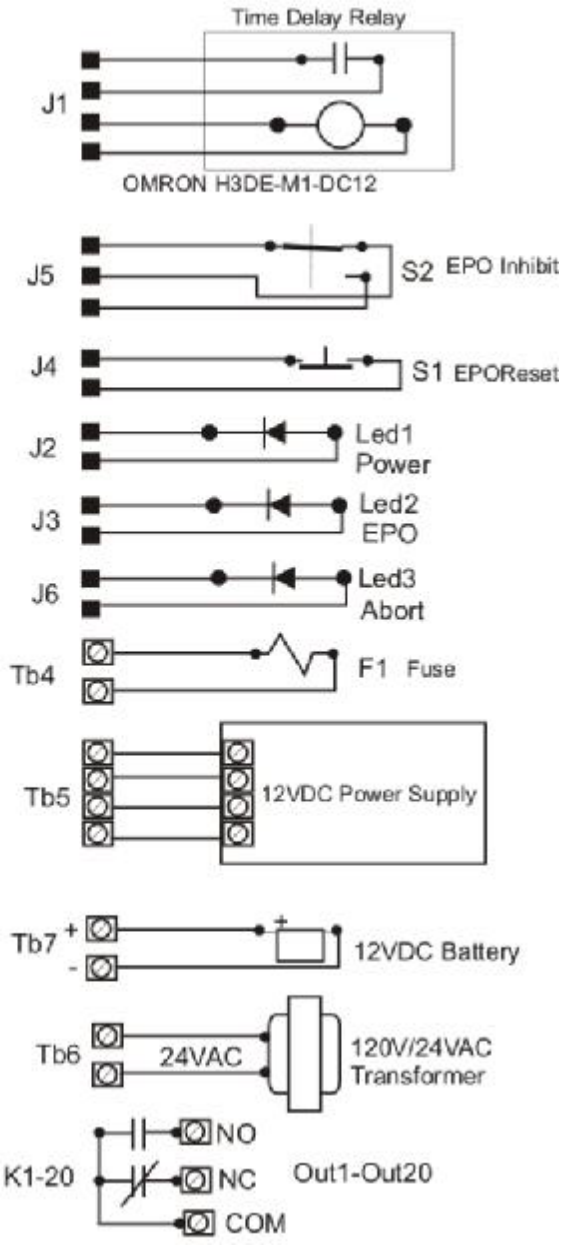
Main Control Board - All field connections come to this board and it's terminal blocks.

Power Supply– This is a 12VDC 3 Amp power supply for the TM-EPOCCL.

Battery Location– This are reserved for the optional backup battery for the TM-XL

Time Delay– The EPO Time Delay relay is mounted in this location.

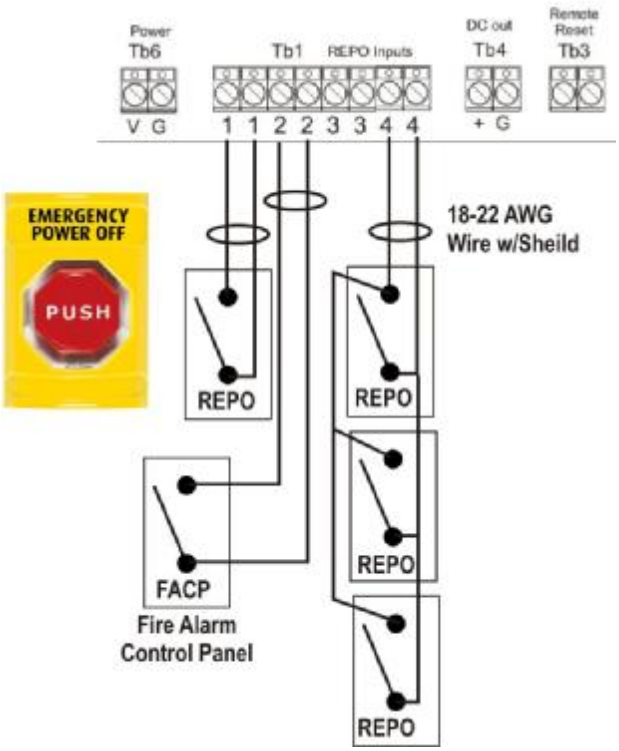

J5
J4
J2
J3
J6
+ G
Tb4
Fuse
P N V G
Tb5
+ N
Tb7
Batt
J1
Time Delay
R1
R2
R3
K21
K1
K2
K3
K4
K5
K6
K7
K8
K9
K10
K11
K12
K13
K14
K15
K16
K17
K18
K19
K20
NO
NC
C
Out1
Out2
Out3
Out4
Out5
Out6
Out7
Out8
Out9
Out10
Out 11
Out 12
Out 13
Out 14
Out 15
Out 16
Out 17
Out 18
Out 19
Out 20
Power
Tb6
V G
Tb1
REPO Inputs
1 1 2 2 3 3 4 4
DC out
Tb4
+ G
Remote
Reset
Tb3

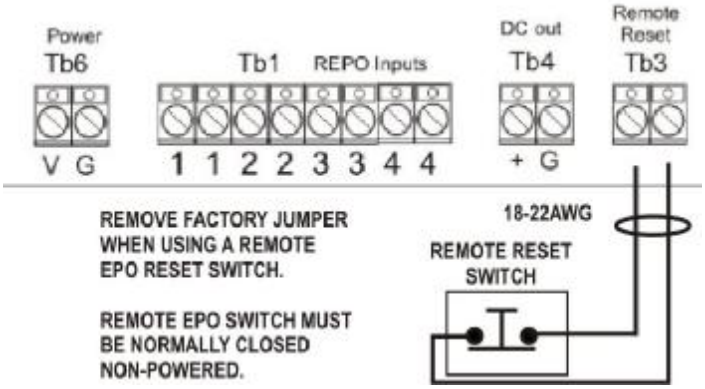

Time Delay Relay
J1
OMRON H3DE-M1-DC12
J5
S2 EPO Inhibit
J4
S1 EPOReset
J2
Led1
Power
J3
Led2
EPO
J6
Led3
Abort
Tb4
F1 Fuse
Tb5
12VDC Power Supply
Tb7
+
-
12VDC Battery
Tb6
24VAC
120V/24VAC
Transformer
K1-20
NO
NC
COM
Out1-Out20

EPO INPUTS

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





REMOTE EPO RESET

TB-3 Provides a simple connection point for a remote EPO reset switch. The remote switch must be normally closed and non-powered.

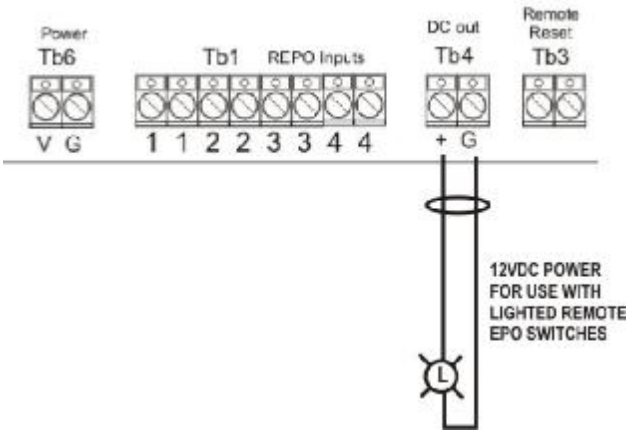
REMOVE the factory jumper before connecting the remote EPO switch.

Test the TM-XL by:

- Placing the panel in the INHIBIT mode.
- Press a Remote EPO Input switch until the TM-XL latches in the EPO state.
- Press the Remote EPO Reset switch.
- The TM-XL should reset to normally.
- Replace the keyed Inhibit switch to Normal.

12 DC OUTPUT

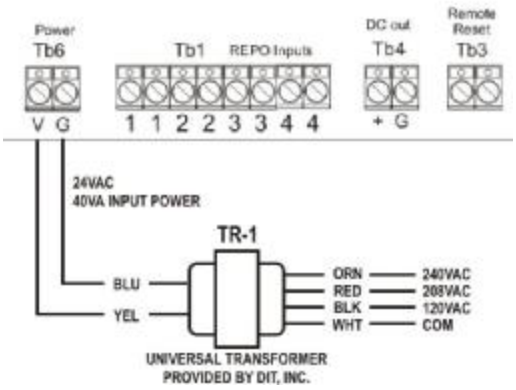
The TM-XL provides a 12VDC power output to use for remote lamps or LEDs on EPO switches. Use TB-4 to connect remote lamps. Do not exceed 400Ma.



POWERING THE TM-XL

A universal power transformer is provided with the TM-XL. It should be mounted externally or if space allows inside the TM-XL. The TR-1 provides 24VAC out to the TM-XL and allows four different input voltages.

Select the proper input voltage and cap off the unused input wires.

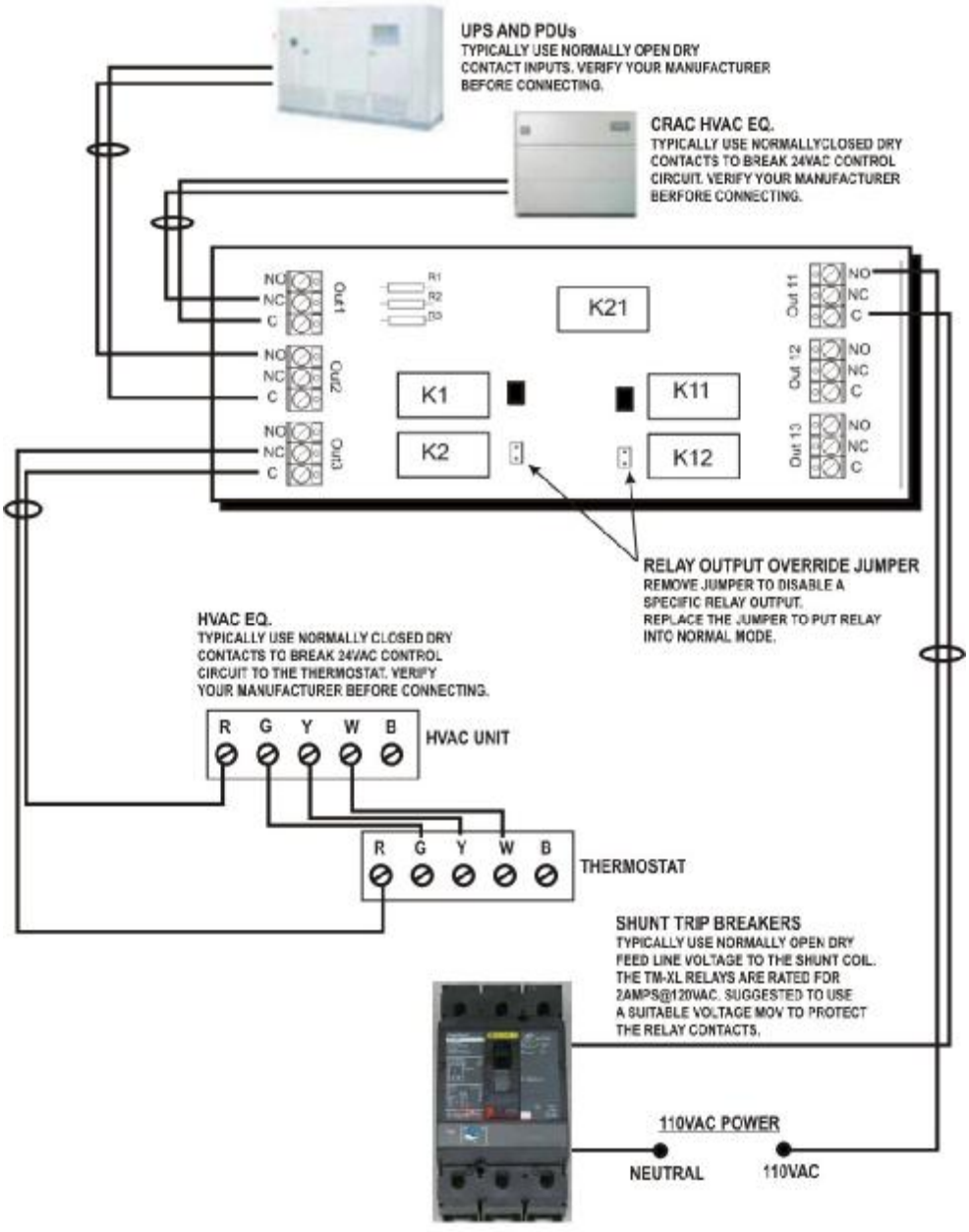


EPO OUTPUTS

The TM-XL provides 20 output relays for controlling facility support systems such as HVAC, CRAC, PDUs, UPSs, MPBs and Generatrors.

All relay outputs are Form C, normally open or normally closed and non-powered. The relay outputs are rated 2Amps@120VAC.

When using 120VAC switching it is suggested to use a properly rated MOV across the output contacts to prevent power surges at the relay points. MOVs are available from DIT, Inc.



Remote Alarm Outputs to Other Monitoring Systems

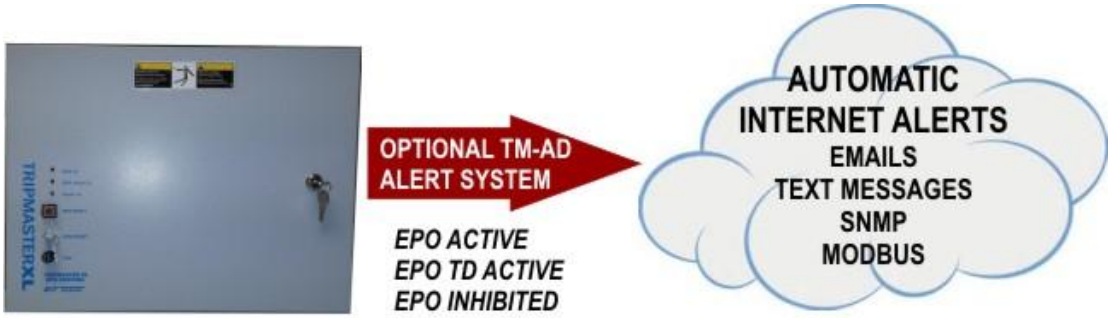
The TM-XL can provide relay alarm outputs to alert other monitoring or security systems of troubles and alarms. The alarm outputs are EPO Active, EPO Time Delay Active or EPO Inhibited.

EPO Active – This output can be any of the 20 standard relay outputs. The relay outputs are non-powered Form C, normally open or normally closed.

EPO TD Active – The alarm output requires a TM-SF06 relay to be ordered and is an optional relay installed during manufacture. This alarm contact will close when the Time Delay is in a count down mode. The alarm output indicates an EPO event is imminent. When the Time Delay is finished the TM-XL will lock out all systems connected to its outputs.

EPO Inhibited – this alarm output requires a TM-SF01 relay to be ordered and is an optional relay installed during manufacture. This output closes whenever the keyed EPO Inhibit is activated. The alarm indicates the TM-XL panel is not normal and cannot shutdown connected systems.

Remote Alarm Notification Via Internet

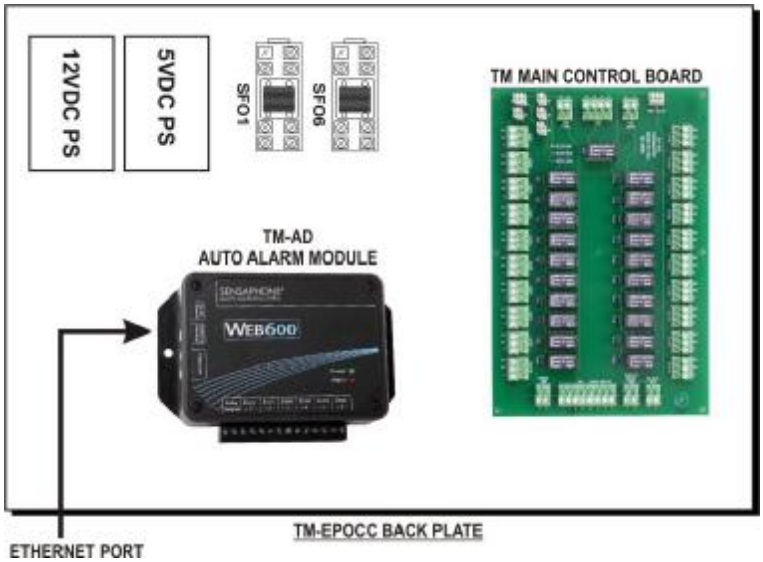


The Tripmaster Auto-Dialer (TM-AD) option allows the TM-XL to remotely announce alarms using the Internet to email, cell phones, SMTP or MODBUS. This option requires an Ethernet connection to the Internet provided by others. The alarm inputs to the TM-AD are factory pre-wired. Three additional alarm inputs are provided for additional monitoring. TM-AD is field programmed via web page and the TM-AD stores historical data logging of alarm events. For more information see the TM-AD operation instructions.

Alarm Notifications
EPO Activate, EPO Time Delay Active and EPO Inhibited plus 3 additional alarm outputs.

Notification Types
Email, Text Message, SNMP Traps, MODBUS/TCP Slave and HTTP Web page.

Relay Output
One relay output is available for remote control via web page access.



TripMaster XL Maintenance Procedures

Maintenance Procedures for TM-XL
These maintenance steps will insure the TripMaster XL is in proper working order. Please follow these instructions to prevent accidental shunt tripping of the facility equipment. This test should be preformed annually or sooner as customer requires.

EPO Operation Test

1. With the TripMaster XL powered and in the normal condition.
2. Move the EPO Inhibit Switch to the “Inhibit” position.
3. The EPO Inhibit led should be lit.
4. If the EPO Inhibit led is not lit, STOP. Contact the factory or a factory rep for repair.
5. With the EPO Inhibit led lit, press a remote EPO switch and hold for the preset time delay.
6. The TM-XL will set the EPO Lock relay R21 to the latched state.
7. Release the remote EPO switch.
8. None of the 20 EPO output relays will close because the EPO Inhibit is active.
9. The EPO On led will light.
10. Press the EPO Reset button. The EPO ON led should reset.
11. Repeat steps 5—9 with all remote EPO inputs switches and contacts.
12. These steps insure all remote EPO inputs are still wired and working properly.
13. Check the EPO On led is off.
14. Return the EPO Inhibit key switch to normal position.

The EPO Inhibit led should not be off.

Battery Test

1. With the TripMaster XL powered and in the normal condition.
2. Move the EPO Inhibit Switch to the “Inhibit” position.
3. The EPO Inhibit led should be lit.
4. If the EPO Inhibit led is not lit, STOP. Contact the factory or a factory rep for repair.
5. Remove the RED and BLACK wires from the plug connectors on the top of the battery.
6. Using a DVM read the battery voltage. The voltage should be 12.0 –13.5VDC.
7. If the battery reads 11.5 or less, replace the battery.
8. Check the EPO On led is off.
9. Return the EPO Inhibit key switch to normal position.

The EPO Inhibit led should not be off.