

ENTRY-GUARD™

OPERATION MANUAL



**SAFETY INTERLOCK ACCESS
CONTROL SYSTEM**

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1. INTRODUCTION

ENTRY-GUARD™ is a Safety Interlock System (SIS) that provides a fail-safe Access Control System (ACS) with a primary function to ensure that unauthorized personnel are prohibited from areas where laser radiation may be present. When the power to the controller is interrupted, critical outputs, such as door magnetic locks and laser interlocks, revert to a safe state: magnetic locks off, laser interlocks open.

The Safety Interlock System (SIS) has become more critical recently in light of accidents in the laser industry. These incidents have led organizations to develop better operating procedures and standards that suggest a separate system be implemented for safety functions, away from the basic process control procedure. This separation has become an industry standard.

2. OVERALL CONCEPT

ENTRY-GUARD™ has the capability to integrate with components of any Access Control System (ACS), which may include any or all of the following components:

Laser Warning Signs	Safety Interlocks	Emergency Stop Switches	Laser Shutters
Active Status Lights	Proximity Sensors	Remote Start Switches	Enclosures
Audible Signals	Safety Mats	Exit Request Switches	Curtain Systems
Keypads	Crash Bar Sensors	Bypass Key Switches	Light Curtains
Card Readers	Laser Scanners	Magnetic Locks	Entryway Doors
Biometric Scanners	PLC Circuits	Electronic Latches	

Kentek's versatile system enables placement of safeguards around all possible hazards within the work area. We provide 12 outputs that can be used for a variety of applications.

Four laser interlocks (TB13, TB14, TB15 and TB16) are single pole double throw (SPDT) normally open/normally closed, dry contacts. 12VDC can be added by applying jumpers JP10-JP13.

Three auxiliary interlocks (TB17, TB18, TB19) are single pole single throw (SPST) normally open, dry contacts. 12VDC can be added by applying jumpers JP14-JP16.

All seven interlocks can be used to control anything that needs to be turned on or off, depending on the status of the system. For applications that require a higher voltage or current rating, external relays can be used to switch power for these devices.

Two magnetic lock terminals (TB3, TB4) are single pole double throw normally open/normally closed contacts and can provide 12VDC (with jumpers installed JP2/JP3). Removing these jumpers individually turns each set of contacts to dry contacts. These contacts are bypassed while the 'EXIT NOW' circuit is active, allowing entry into the room.

One 'Exit now' terminal (TB2) is single pole double throw normally open/normally closed contacts and can provide 12VDC (with jumper installed JP1). These contacts switch during any 'EXIT NOW' request and remain active until the 'EXIT NOW' timer is finished.

One user +12VDC terminal (TBDC) has two connections for 12VDC and ground.

3. SYSTEM SPECIFICATIONS

Control Panel Dimensions: 6.00 D x 8.37 W x 10.50 L (inches)

Control Panel Weight: 3.25 lbs. (approx.)

Input Power: Transformer, Input: 100-240 VAC; Output: 15VDC, 2.4 Amp

OUTPUT FEATURES:

Laser Interlocks: (4) SPDT normally open/normally closed dry contacts
For applications requiring a 12VDC source voltage, apply jumpers JP10-JP13 to applicable terminal block.

- Maximum switched power: 60 watts or 125VA
- Maximum switched current: 2 amps
- Maximum switched voltage: 220VDC or 250VAC

Auxiliary Interlocks: (3) SPST normally open dry contacts
For applications requiring a 12VDC source voltage, apply jumpers JP14-JP16 to applicable terminal block.

- Maximum switched power: 60 watts or 125VA
- Maximum switched current: 2 amps
- Maximum switched voltage: 220VDC or 250VAC

Exit Now: (1) SPDT normally open/normally closed dry contacts
For applications requiring a 12VDC source voltage, apply jumper to JP1.

- Maximum switched power: 60 watts or 125VA
- Maximum switched current: 2 amps
- Maximum switched voltage: 220VDC or 250VAC
- Inductive or resistive loads, surge protected to 31VDC

Sign Status Signals: Safe / Danger / Controlled Entry
Active status = +12VDC

- Maximum allowable current draw: <1 amp/ Status
- Inductive or resistive loads, surge protected to 31VDC

Magnetic Locks: (2) SPDT normally open/normally closed dry contacts
For applications requiring a 12VDC source voltage, apply jumpers JP2-JP3 to applicable terminal block.

- Maximum switched current: 2 amps
- Maximum switched voltage: 24VDC
- Inductive or resistive loads, surge protected to 31VDC

User DC Output: (2) 12VDC

- Maximum available current: 1.5 amps

NOTES:

Maximum combined current draw for all external components powered by this device should not exceed 1.5 amps. For applications exceeding 1.5 amps of total current draw use of an external power source may be required, consult with Kentek for these types of applications.

INPUT FEATURES:

- Safety Loop:
- TB5 Door 1
 - TB7 Door 2
 - TB8 Auxiliary
 - TB9 Emergency access
 - TB10 Emergency stop
 - All external connections require normally closed dry contacts
 - Voltage across inputs: 12VDC
 - Current: 61mA nominal
 - External inputs can be wired in series for multiple component configurations
- Remote Start:
- All external connections require normally open dry contacts
 - Voltage across inputs: 12VDC
 - Current: 61mA nominal
 - External inputs can be wired in parallel for multiple component configurations
- Exit Request:
- All external connections require normally open dry contacts
 - Voltage across inputs: 12VDC
 - Current: 24mA nominal
 - External inputs can be wired in parallel for multiple component configurations

OTHER COMPONENTS:

- Chime:
- Sound pressure: >80dB @ 12VDC (at 1 foot)

4. SYSTEM INSTALLATION

- 4-1. Remove components from packaging and verify that all components have been received and are not damaged.
- 4-2. Mount components in a visible location, where labels can be read and controls can be operated easily.
- 4-3. Create a template by either tracing each component outline on paper, or hold the product firmly against the wall and mark the hole locations prior to mounting equipment.
- 4-4. We recommend mounting the lowest point of the control panel between 48-56 inches above finished floor.
- 4-5. External wiring should be located within conduit or within the wall.
- 4-6. A basic wiring layout diagram is included with this manual (Section 10-1). Custom wiring drawings can be provided on request. All components should be wired by a certified electrician.
- 4-7. Please call 1-800-432-2323 if you have any questions about the installation of this product.

The following installation checklist is only a guide and is intended to be used by qualified service technicians. The sequence of the checks is arbitrary. Actual sequence will be determined by the technician performing the checks.

GENERAL SYSTEM INFORMATION

The system is considered **ENGAGED** when all of the following conditions are met:

- 4-8. 'START' LED is illuminated.
- 4-9. 'MAGLOCK ON' LED is illuminated.
- 4-10. All doors to the protected room are locked (if equipped with magnetic or electronic locks).
- 4-11. All interlocked (protected) equipment is enabled.
- 4-12. The 'LASER ON' sign is illuminated.

- 4-13. The 'LASER OFF' sign is not illuminated.
- 4-14. The 'ENTER CAUTION' or 'EXIT NOW' sign(s) (if so equipped) should be off except during 'EXIT NOW' mode.
- 4-15. The 'EXIT NOW' audible alarm should not sound, except during 'EXIT NOW' mode.

The system is considered DISENGAGED or in SAFE MODE when all of the following conditions are met:

- 4-16. The 'START' LED is not illuminated.
- 4-17. The 'MAGLOCK ON' LED is not illuminated.
- 4-18. All doors to the protected room are unlocked (if equipped with magnetic or electronic locks).
- 4-19. All interlocked (protected) equipment is disabled.
- 4-20. The 'LASER ON' sign is not illuminated.
- 4-21. The 'LASER OFF' sign is illuminated.
- 4-22. The 'ENTER CAUTION' or 'EXIT NOW' sign(s) (if so equipped) are not illuminated.
- 4-23. The building security system resumes control of the door locks (special requirement).

To ENGAGE the system:

- 4-24. Ensure the 'KEY SWITCH' is on.
- 4-25. Ensure the 'POWER ON' LED is on.
- 4-26. Ensure the 'ENTRYWAY CLOSED' LED is on.
- 4-27. Ensure the 'SYSTEM READY' LED is on.
- 4-28. Press the 'START' button and the system should engage.

The system should DISENGAGE when any of the following actions are performed:

- 4-29. Any 'EMERGENCY STOP' or 'EMERGENCY ACCESS' button is pressed.
- 4-30. Any door to the protected room is opened without first pressing an Exit/Enter request, keypad or biometric scanner.
- 4-31. The building fire alarm actuates (special requirement).
- 4-32. Power outage with no battery backup.
- 4-33. Safety loop input wire(s) shorted to ground will trip the self-recovery fuse (D7) and illuminate (LED 8).

The system is considered to be in EXIT NOW mode when system is ENGAGED and EXIT NOW circuit is activated.

The following occurs during EXIT NOW mode:

- 4-34. The front panel 'EXIT' LED illuminates.
- 4-34. The 'MAGLOCK ON' LED is NOT illuminated.
- 4-35. The magnetic door locks release (go to the unlocked position if equipped).
- 4-36. The 'ENTER CAUTION' and 'EXIT NOW' signs illuminate (if equipped).
- 4-37. The 'LASER ON' sign remains illuminated.
- 4-39. The 'LASER OFF' sign is NOT illuminated.
- 4-40. The audible chime sounds for 5 to 120 seconds (end user set).
- 4-41. While the chime is sounding, the protected doors can be opened without the system disengaging.
- 4-42. If the 'EXIT NOW AUTO RESET' jumper is in place, closing all open doors after any door was opened terminates the EXIT NOW sequence as follows:
 - a. The chime signal is silenced.
 - b. The 'ENTER CAUTION' and 'EXIT NOW' signs turn off (if equipped).
 - c. The 'MAGLOCK ON' LED illuminates.
 - d. The magnetic door locks engage (go to the locked position if equipped)
 - e. The system remains ENGAGED.
- 4-43. If the 'EXIT NOW AUTO RESET' jumper is not in place, closing the doors does not terminate EXIT NOW mode before the timer times out; it will operate throughout the entire cycle.
- 4-44. If any door remains open when the EXIT NOW mode times out, the system reverts to DISENGAGED mode.

Control Panel Static Checks

- 4-45. The key switch and push-buttons are not damaged and operate smoothly.
- 4-46. The external power supply (wall transformer) is connected to the PCB.
- 4-47. The screws to any terminal blocks that have wires connected to them are tight and the wires won't pull out with moderate pulling force.
- 4-48. Ensure the bypass jumpers are removed for each of the "Safety Loop Inputs" that have wires connected to them (in use).
- 4-49. Ensure the bypass jumpers are in place for each of the "Safety Loop Inputs" that do not have wires connected to them (not used).
- 4-50. Ensure the +12V jumpers are removed from any magnetic lock that is connected to an external power source.
- 4-51. Ensure the 'EXIT NOW AUTO RESET' jumper is installed unless the customer has specified that closing the doors should not terminate the EXIT NOW chime. Select the status of the jumper: installed/not installed.

Safety Loop Checks

- 4-52. The 'ENTRYWAY CLOSED' LED illuminates when all the doors are closed and extinguishes when any door is opened.
- 4-53. The front panel 'SYSTEM READY' LED illuminates when all the doors are closed and all the 'E-STOP' and 'E-ACCESS' push buttons are not pressed.
- 4-54. The front panel 'SYSTEM READY' LED extinguishes when any of the doors are open or 'E-STOP' or 'E-ACCESS' buttons are pressed.
- 4-55. With the 'SYSTEM READY' LED not illuminated, pressing the front panel 'START' button does not ENGAGE the system.
- 4-56. With the 'SYSTEM READY' LED illuminated, pressing the front panel 'START' button ENGAGES the system.
- 4-57. With the system ENGAGED, press the front panel 'EMERGENCY STOP' button and make sure the system DISENGAGES.
- 4-58. Safety loop input wire(s) shorted to ground will trip the self-recovery fuse (D7) and illuminate (LED 8).
- 4-59. With the system ENGAGED, press any external 'E-STOP' or 'E-ACCESS' buttons to ensure the system disengages.

Remote Inputs

- 4-59. When the 'REMOTE START' button (if so equipped) is pressed the 'START PB' LED on PCB-EG001 adjacent to TB12 illuminates and extinguishes when the button is released.
- 4-60. When the remote 'ENTER/EXIT REQUEST' push button (if so equipped) is pressed the 'EXIT REQ' LED on the PCB-EG001 adjacent to TB11 illuminates and extinguishes when the button is released.
- 4-61. When any keypad (if so equipped) is actuated the 'EXIT REQ' LED on PCB-EG001 adjacent to TB11 illuminates for approximately one second.

Exit Request Function

- 4-62. With the system engaged pressing any 'ENTER/EXIT REQUEST' push button or activating a correct keypad code results in the system entering into EXIT NOW mode. The audible exit chime shall sound for a preset time of 5 to 120 seconds.
- 4-63. With the system in EXIT NOW mode and the 'EXIT NOW AUTO RESET' jumper in place, opening and closing a door contact terminates EXIT NOW mode.
- 4-64. With the system in EXIT NOW mode and the 'EXIT NOW AUTO RESET' jumper not in place, opening and closing a door will not terminate EXIT NOW mode.

5. SYSTEM OPERATION

- 5-1. Wire 120VAC to internal power supply blue wire (neutral) black wire (live). Power supply should be wired to TB6 on PCB-EG001. Verify that the red 'PWR' LED located on PCB-EG001 is illuminated. This should remain on while power is supplied to PCB-EG001.
- 5-2. Turn the key to the 'ON' position, verify that the 'POWER ON', 'SYSTEM READY', and 'ENTRYWAY CLOSED' LEDs on the control panel are illuminated. If they are not, check the jumpers located on the safety loop inputs on PCB-EG001 (TB5, 7, 8, 9, 10). Also, check to make sure all interlocked doors are closed, all emergency stop and access buttons are not depressed, and any auxiliary inputs are in the N/C state. The 'SAFE' LED by TB1 on PCB-EG001 should also be on as well as the 'KEY ON' LED on PCB-EG-MPI.
- 5-3. With the start key in the 'ON' position; the 'POWER ON', 'SYSTEM READY', and 'ENTRYWAY CLOSED' LEDs on the control panel should all be illuminated. Inside the control panel the 'SAFE' LED adjacent to TB1 on PCB-EG001 and the 'KEY ON' LED on PCB-EG-MPI should be illuminated.
- 5-4. Press the 'START' button; both the 'START' LED and the 'MAGLOCK ON' LED should illuminate on the control panel. Inside the control panel the 'ENGAGED' LED and 'DNGR' (danger) status LED adjacent to TB1 should be illuminated. The 'SAFE' LED adjacent to TB1 should not be illuminated.
- 5-5. Press the 'EXIT' button; the 'EXIT' LED should stay on and an audible signal should sound for the duration of the adjustable time period. On PCB-EG001, the 'DNGR' and 'EXIT' LEDs adjacent to TB1 and the 'CHIME' LED on PCB-EG-MPI should remain on for the entire exit delay period. You can now silence the audible sound by removing JP1 on PCB-EG-MPI.
- 5-6. To set the exit duration for enter/exit periods use the 'EXIT DURATION' potentiometer (R14) located on PCB-EG001. Turn counter clockwise for the minimum setting of 5 seconds and clockwise for the maximum setting of 120 seconds. Press the 'EXIT' button to verify time settings. To reset the time when the door is closed, leave (JP9) jumper installed on PCB-EG001. If full duration is required, remove (JP9) from the PCB-EG001. Check any external switches request to exit/enter switches (optional) along with any keypads (optional) to verify the circuit is receiving input signals.
- 5-7. Press the 'EMERGENCY STOP' button. Verify that the 'MAGLOCK ON', 'SYSTEM READY' and 'START' LEDs on the control panel turn off. Turn switch clockwise to reset. Press the 'START' button to reset the system and continue to test any external E-stop (optional) or E-stop access switches (optional). External emergency switches can be wired in series or connected to either TB9 or TB10 located on PCB-EG001.
- 5-8. The 'ENTRYWAY CLOSED' LED on the control panel is used to give the status of all door safety interlock connections. Normally closed safety interlocks should be used on all entry ways to allow the ENTRY-GUARD™ to monitor door status. These interlocks can be wired in series or connected directly to TB5 or TB7 located on PCB-EG001. Verify that when the all doors are closed, the 'ENTRYWAY CLOSED' LED is illuminated, and when the door is open, the 'ENTRYWAY CLOSED' LED is not illuminated. This safety loop will be bypassed once the 'EXIT' button is pressed to allow room entry or exit for selected time duration.

NOTES:

- 5-9. 'POWER ON' LED shows the key switch is on and power is applied.
- 5-10. 'MAGLOCK ON' LED shows the status of the magnetic lock outputs.
- 5-11. 'SYSTEM READY' LED shows when the entryway doors are all closed and all E-stops and E-access switches are not pressed.
- 5-12. 'ENTRYWAY CLOSED' LED shows when the entryway doors are all closed.
- 5-13. 'START' LED shows when the safety circuit is ENGAGED.
- 5-14. 'EXIT' LED shows when the system is in EXIT NOW mode.
- 5-15. Pressing the 'STOP' button or turning the key switch off will turn off the ENTRY-GUARD™ system.
- 5-16. 'EMERGENCY STOP' button will create a fail-safe status that will shut down laser emission completely or contain the laser beam within a laser shutter device. Once the button is pressed, it must be turned clockwise to reset. When the system has been reset, the 'START' button must be pressed to allow laser operation.

6. PREVENTIVE MAINTENANCE INSPECTION

Early detection of failed components ensures the safest work environment. Listed below is a weekly safety routine recommended to verify all relays, interlocks and switches are performing as intended.

- K1 Relay controls main system relay
- K2 Relay controls all interlock outputs
- K3 Relay controls exit now relay
- K4 Relay controls magnetic locks
- K5 Relay controls laser interlocks TB13 and TB14
- K6 Relay controls laser interlocks TB15 and TB16
- K7 Relay controls auxiliary interlocks TB17 and TB18
- K8 Relay controls auxiliary interlock TB19

- 6-1. Testing laser interlocks (TB13, 14, 15, 16): Using a multimeter set to measure continuity turn the Key Switch 'OFF' on the control panel and measure between common and N/C, then common to N/O. Common to normally closed should be closed. Common to normally open should be open. If these are not as indicated above, replace K2 or K5 or K6 on PCB-EG001.
- 6-2. Testing auxiliary interlocks (TB17, 18, 19): Using a multimeter set to measure continuity turn the Key Switch 'OFF' on the control panel and measure between common and N/O. Common to normally open should be open. If these are not as indicated above, replace K2 or K7 or K8 on PCB-EG001.
- 6-3. Test all emergency stops and emergency access switches individually. Press the 'START' button to engage the system and make sure it drops to the fail-safe state after each E-stop request. System will have to be engaged before each test. Verify that pressing each button creates a fail-safe status.

If a switch fails to create a fail-safe status check these three possibilities:

- 1. Make sure the switch is wired correctly on PCB-EG001.
 - 2. Check the switch contact for welded contacts by measuring across the contacts with the switch pressed in, which should indicate open contacts. Replace if they remain normally closed in both sensor positions.
 - 3. Replace K1 on PCB-EG001.
- 6-4. Test all external safety interlocks individually. Engage system and open each door, curtain, or contact closure. Verify that opening each contact creates a fail-safe status. If the system doesn't drop to a fail-safe state, measure across the door contact with the door open. If it remains closed, replace the interlock. If it is open replace K1 on PCB-EG001.
 - 6-5. Test any magnetic locks wired through TB3 or TB4. If a magnetic lock fails to open or release while the 'EXIT NOW' bypass circuit is active, make sure it is wired correctly on PCB-EG001. If it is wired correctly and a problem still exists, replace K4 relay.

7. ACCESSORY PARTS LIST**

- | | | |
|------|----------|-------------------------------|
| 7-1. | ETG-KP | Keypad |
| 7-2. | ETG-ML | Magnetic lock |
| 7-3. | ETG-ML2 | Magnetic lock for double door |
| 7-4. | ETG-ES | Emergency stop |
| 7-5. | ETG-ES-F | Emergency stop flush mount |

7-6.	ETG-ES-FC	Emergency stop flush mount w/cover
7-7.	ETG-EABG3	Emergency access resettable switch
7-8.	ETG-EA	Emergency access
7-9.	ETG-EA-F	Emergency access flush mount
7-10.	ETG-EA-FC	Emergency access flush mount w/cover
7-11.	ETG-SS	Remote start switch
7-12.	ETG-SS-F	Remote start switch flush mount
7-13.	ETG-SS-FC	Remote start switch flush mount w/cover
7-14.	ETG-RE	Request to exit/enter
7-15.	ETG-RE-F	Request to exit/enter flush mount
7-16.	ETG-RE-FC	Request to exit/enter flush mount w/cover
7-17.	ETG-INLK-L	Interlock switch
7-18.	ETG-INLK-R	Interlock switch
7-19.	ETG-INLK-F	Interlock switch flush mount
7-20.	ETG-ILR2	Dual status indicator lights
7-21.	ETG-DLS-2	Dual status sign 12VDC LED bulbs
7-22.	ETG-DLS-WP	Dual status sign 12VDC LED bulbs waterproof
7-23.	ETG-TLS	Triple status sign 12VDC LED bulbs
7-24.	ETG-TLS-WP	Triple status sign 12VDC LED bulbs waterproof
7-25.	ETG-BPS	Interlock bypass switch
7-26.	ETG-X1S	Single interlock receptacle
7-27.	ETG-X1	Dual interlock receptacle
7-28.	ETG-X2	Single interlock connector plug
7-29.	ETG-X3	Triple interlock receptacle
7-30.	ETG-X4	Quad interlock receptacle

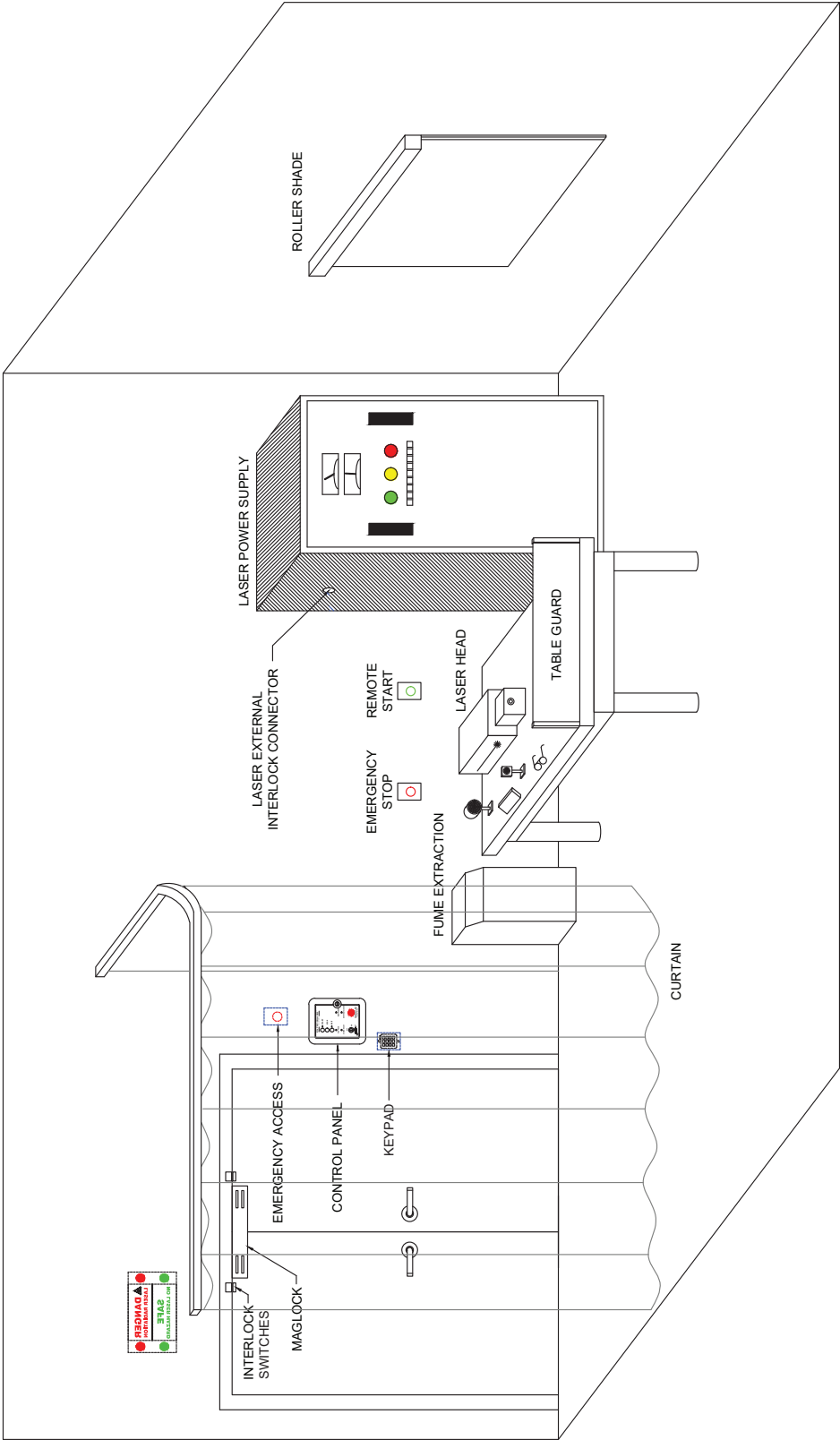
**Call for updated lists

8. SPARE PARTS LIST**

8-1.	F-2-250	Fuse (F1)
8-2.	RY-EG-1	Relay (K1-K8)
8-3.	IC-LM555	Integrated circuit (IC1)
8-4.	IC-MC14011	Integrated circuit (IC2)
8-5.	ETA-JM	Jumper cover (JP1-JP9)
8-6.	ETA-PS	Wall transformer 12VDC, 2 amp
8-7.	ETA-ES	Emergency stop on control panel
8-8.	ETA-KS	Power key switch on control panel
8-9.	ETA-AS	Internal audible signal

**Call for updated lists

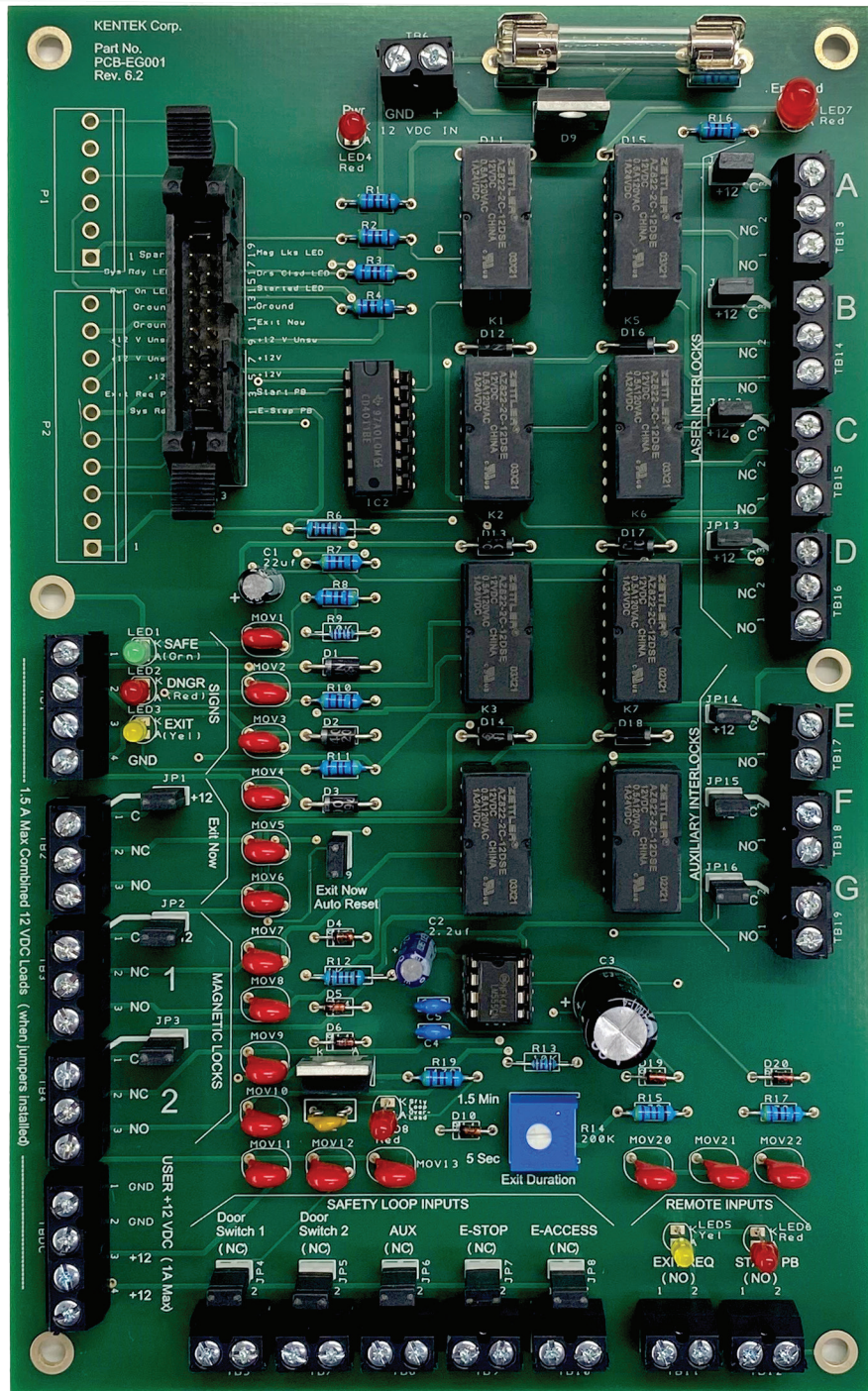
APPLICATION LAYOUT OPTIONS



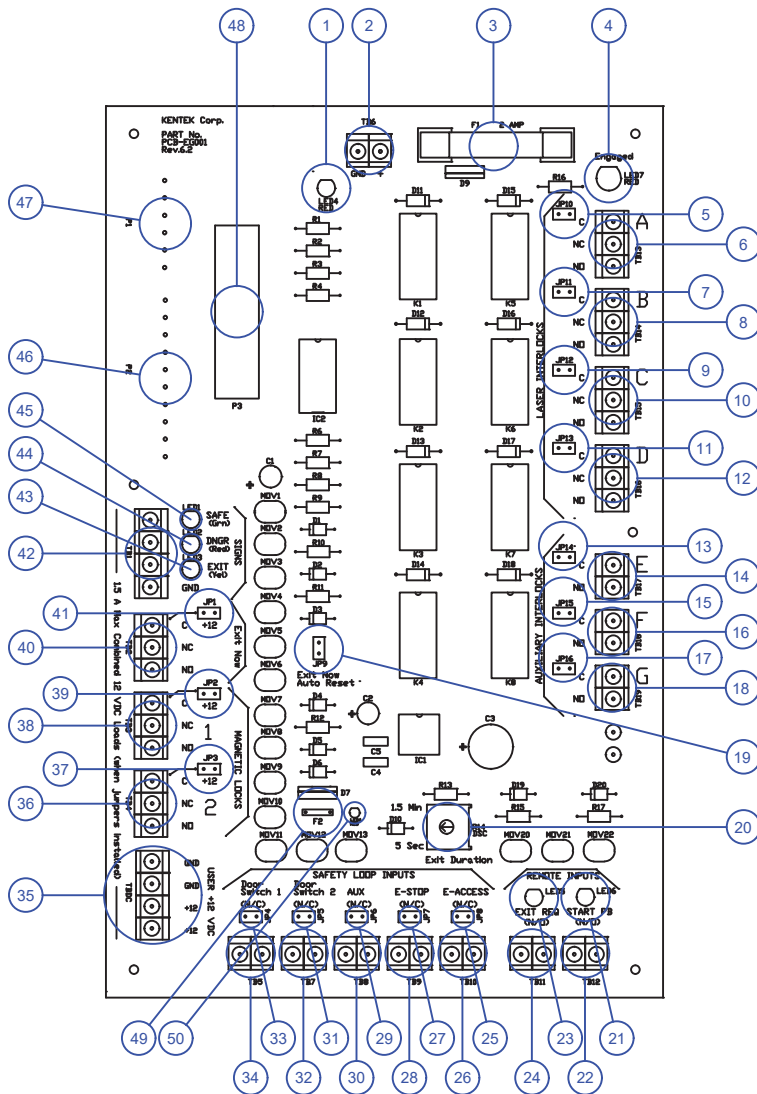
CONTROL PANEL FACEPLATE



PRINTED CIRCUIT BOARD PCB-EG001



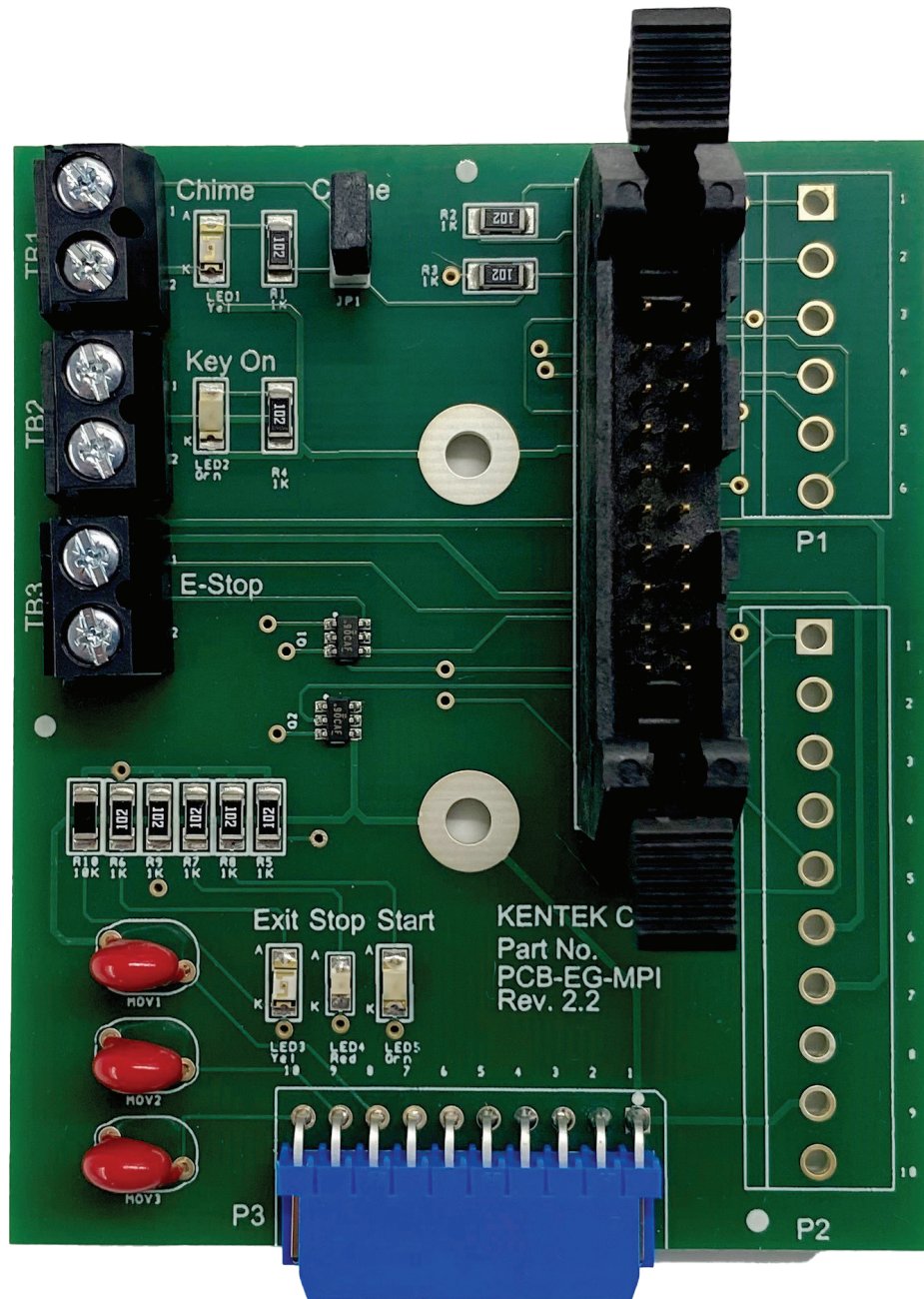
PRINTED CIRCUIT BOARD PCB-EG001 LAYOUT



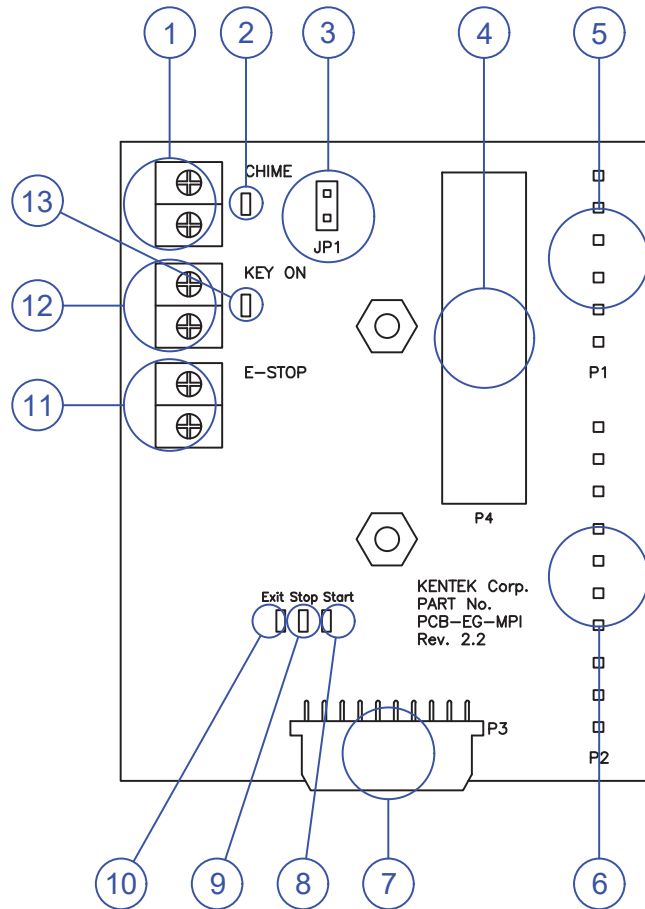
KEY

1. POWER LED INDICATOR
2. INPUT 12VDC POWER TERMINAL BLOCK
3. FUSE, FAST ACTING 2 AMP, 1/4" AGC SERIES
4. ENGAGED LED INDICATOR
5. JUMPER JP10, REMOVE FOR DRY CONTACT TB13
6. LASER INTERLOCK TERMINAL BLOCK TB13
7. JUMPER JP11, REMOVE FOR DRY CONTACT TB14
8. LASER INTERLOCK TERMINAL BLOCK TB14
9. JUMPER JP12, REMOVE FOR DRY CONTACT TB15
10. LASER INTERLOCK TERMINAL BLOCK TB15
11. JUMPER JP13, REMOVE FOR DRY CONTACT TB16
12. LASER INTERLOCK TERMINAL BLOCK TB16
13. JUMPER JP14, REMOVE FOR DRY CONTACT TB17
14. AUXILIARY INTERLOCK TERMINAL BLOCK TB17
15. JUMPER JP15, REMOVE FOR DRY CONTACT TB18
16. AUXILIARY INTERLOCK TERMINAL BLOCK TB18
17. JUMPER JP16, REMOVE FOR DRY CONTACT TB19
18. AUXILIARY INTERLOCK TERMINAL BLOCK TB19
19. JUMPER JP9, EXIT NOW AUTO RESET
20. EXIT NOW TIME ADJUSTMENT POTENTIOMETER
21. REMOTE START LED INDICATOR
22. REMOTE START TERMINAL BLOCK
23. EXIT REQUEST LED INDICATOR
24. EXIT REQUEST TERMINAL BLOCK
25. JUMPER JP8, REMOVE IF TB10 IS USED
26. EMERGENCY ACCESS TERMINAL BLOCK TB10
27. JUMPER JP7, REMOVE IF TB9 IS USED
28. EMERGENCY STOP TERMINAL BLOCK TB9
29. JUMPER JP6, REMOVE IF TB8 IS USED
30. AUXILIARY TERMINAL BLOCK TB8
31. JUMPER JP5, REMOVE IF TB7 IS USED
32. DOOR SWITCH 2 TERMINAL BLOCK TB7
33. JUMPER JP4, REMOVE IF TB5 IS USED
34. DOOR SWITCH 1 TERMINAL BLOCK TB5
35. 12VDC USER OUTPUT TBDC
36. ELECTROMAGNETIC LOCK TERMINAL BLOCK TB4
37. JUMPER JP3, REMOVE FOR DRY CONTACT TB4
38. ELECTROMAGNETIC LOCK TERMINAL BLOCK TB3
39. JUMPER JP2, REMOVE FOR DRY CONTACT TB3
40. EXIT NOW TERMINAL BLOCK TB2
41. JUMPER JP1, REMOVE FOR DRY CONTACT TB2
42. SIGN TERMINAL BLOCK TB1
43. SIGN EXIT LED INDICATOR
44. SIGN DANGER LED INDICATOR
45. SIGN SAFE LED INDICATOR
46. P2 BACKWARD COMPATIBILITY PAD
47. P1 BACKWARD COMPATIBILITY PAD
48. P3 RIBBON CABLE CONNECTOR
49. SELF-RECOVERY FUSE
50. SAFETY LOOP INPUT SHORTED TO GROUND LED INDICATOR

PRINTED CIRCUIT BOARD PCB-EG-MPI



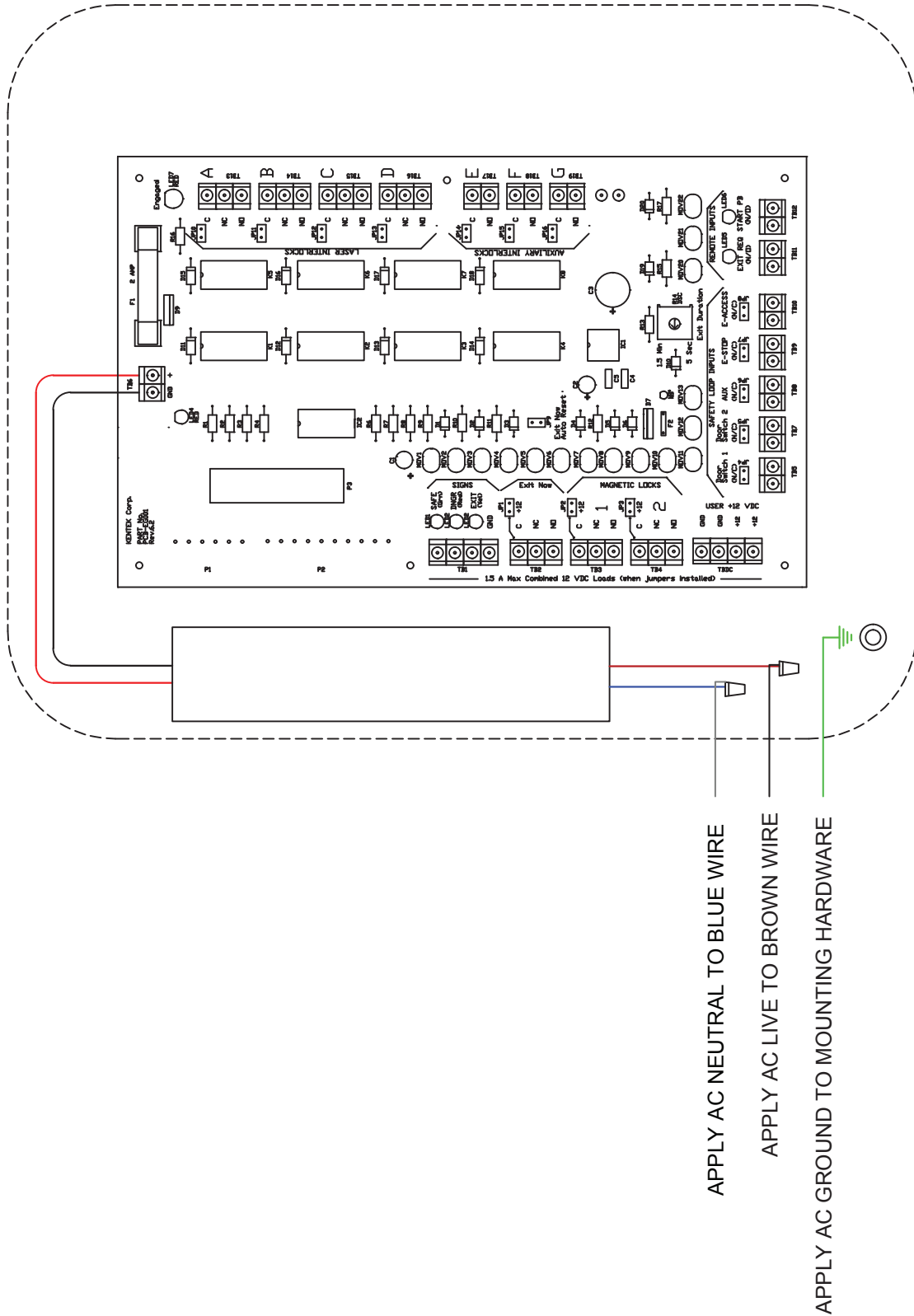
PRINTED CIRCUIT BOARD PCB-EG-MPI LAYOUT



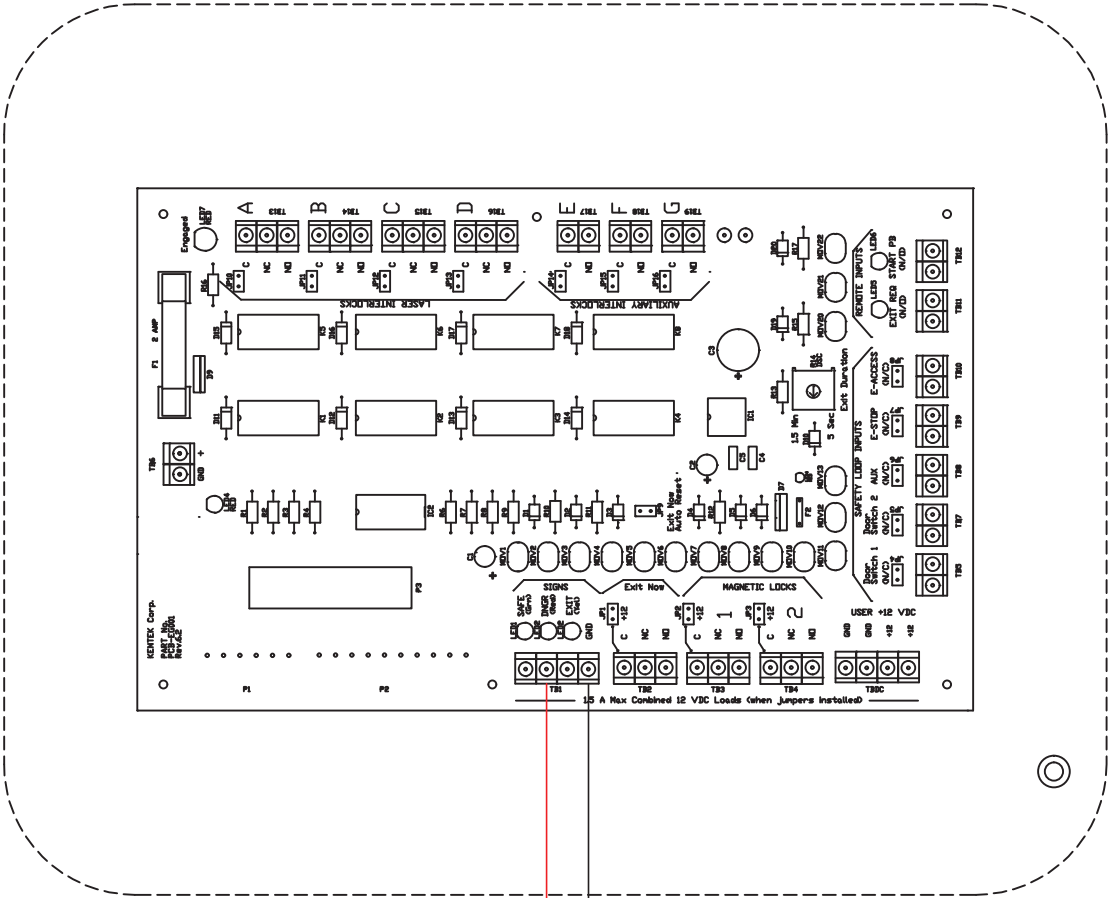
KEY

1. CHIME TERMINAL BLOCK
2. CHIME LED INDICATOR
3. CHIME AUDIBLE SIGNAL JUMPER
4. P4 RIBBON CABLE CONNECTOR
5. P1 BACKWARD COMPATIBILITY PAD
6. P2 BACKWARD COMPATIBILITY PAD
7. P3 CONNECTOR MEMBRANE CONTROL
8. START LED INDICATOR
9. STOP LED INDICATOR
10. EXIT LED INDICATOR
11. EMERGENCY STOP TERMINAL BLOCK
12. KEY SWITCH TERMINAL BLOCK
13. KEY SWITCH ON LED INDICATOR

AC POWER WIRING



SINGLE STATUS SIGN WIRING



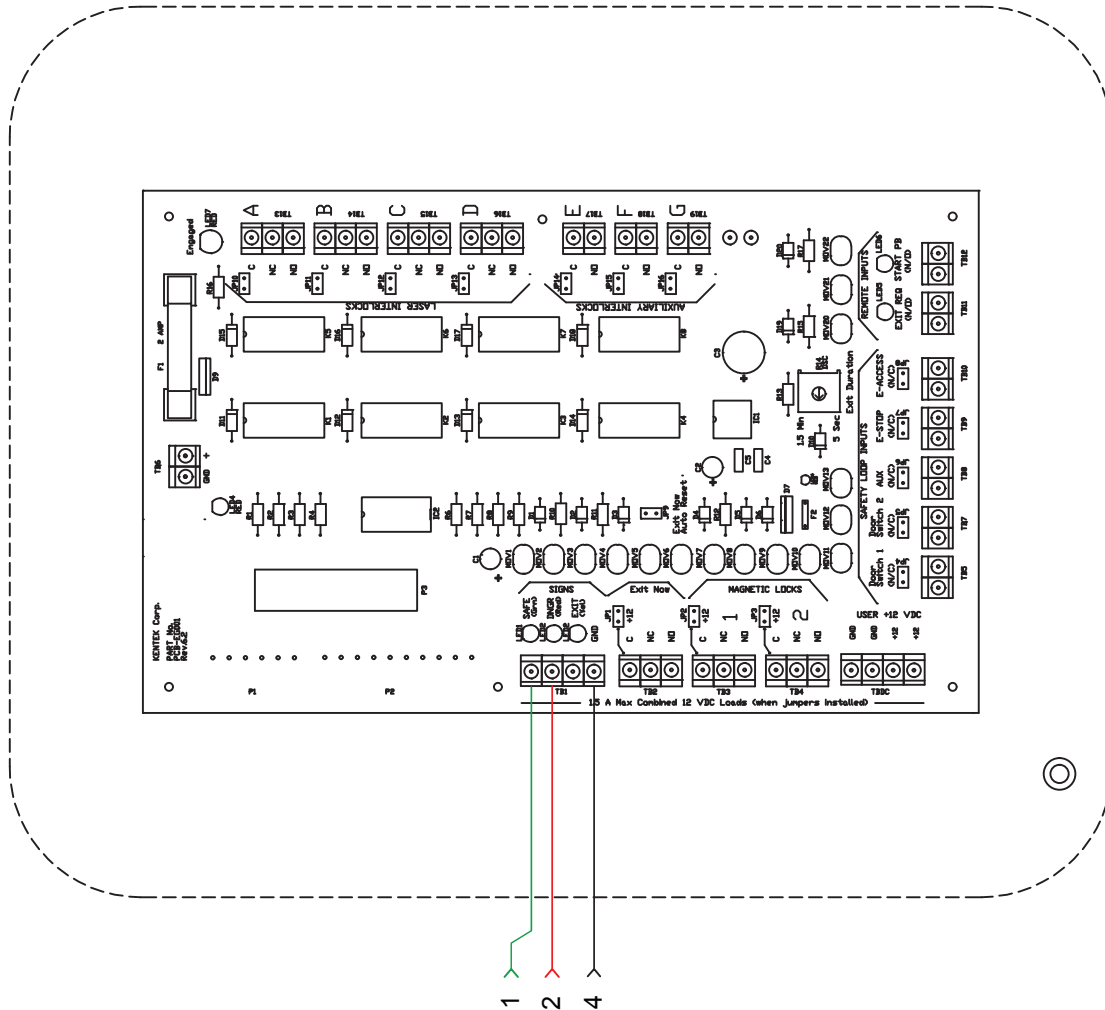
2
4

SINGLE STATUS 12VDC SIGN WIRING
TB1 PIN 2 +12VDC DANGER STATUS
TB1 PIN 4 12VDC RETURN

MULTIPLE CONNECTIONS SHOULD BE
WIRED IN PARALLEL

MAXIMUM CURRENT DRAW AVAILABLE
<1 AMP PER STATUS

DUAL STATUS SIGN WIRING



DUAL STATUS 12VDC SIGN WIRING

TB1 PIN 1 +12VDC SAFE STATUS

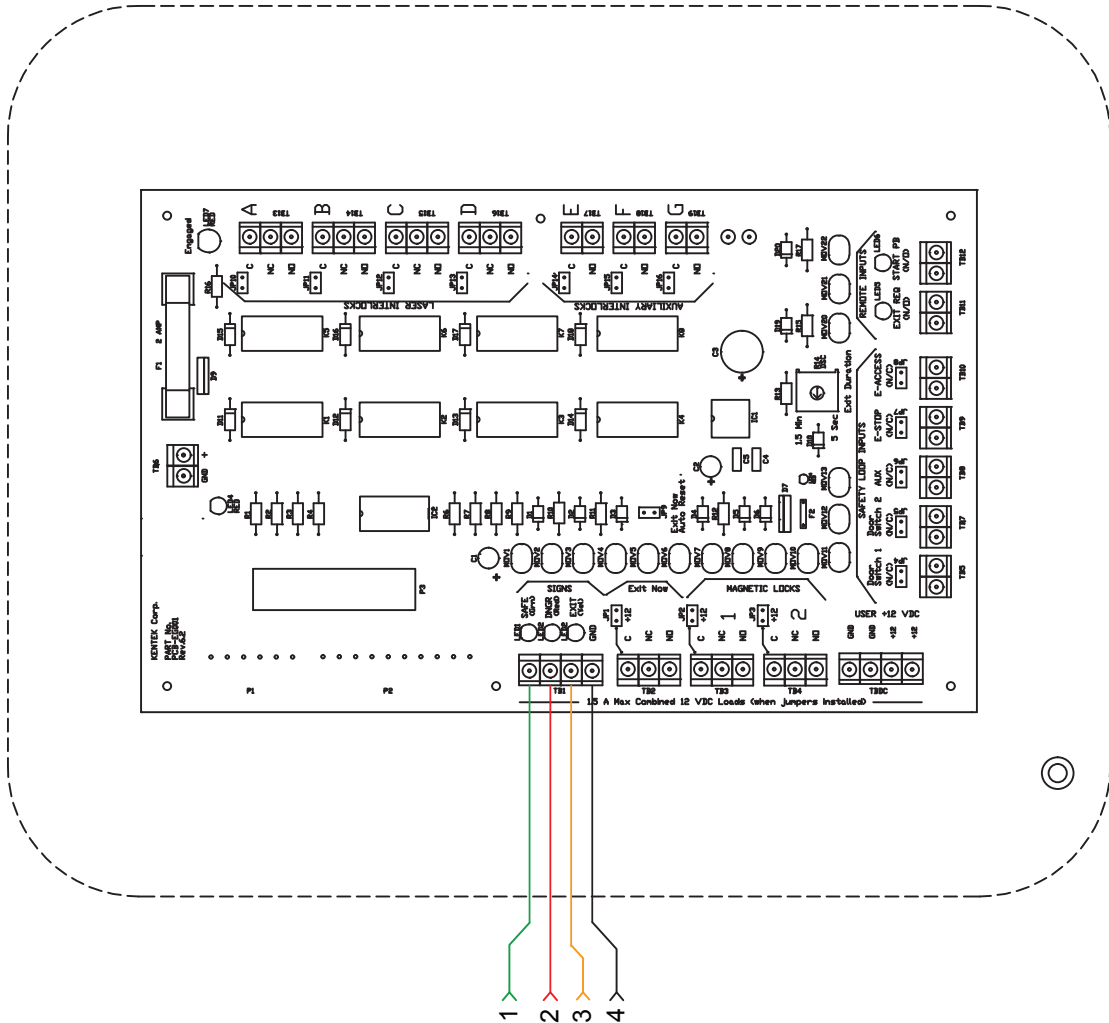
TB1 PIN 2 +12VDC DANGER STATUS

TB1 PIN 4 12VDC RETURN ALL STATUSES

MULTIPLE CONNECTIONS SHOULD BE WIRED IN PARALLEL

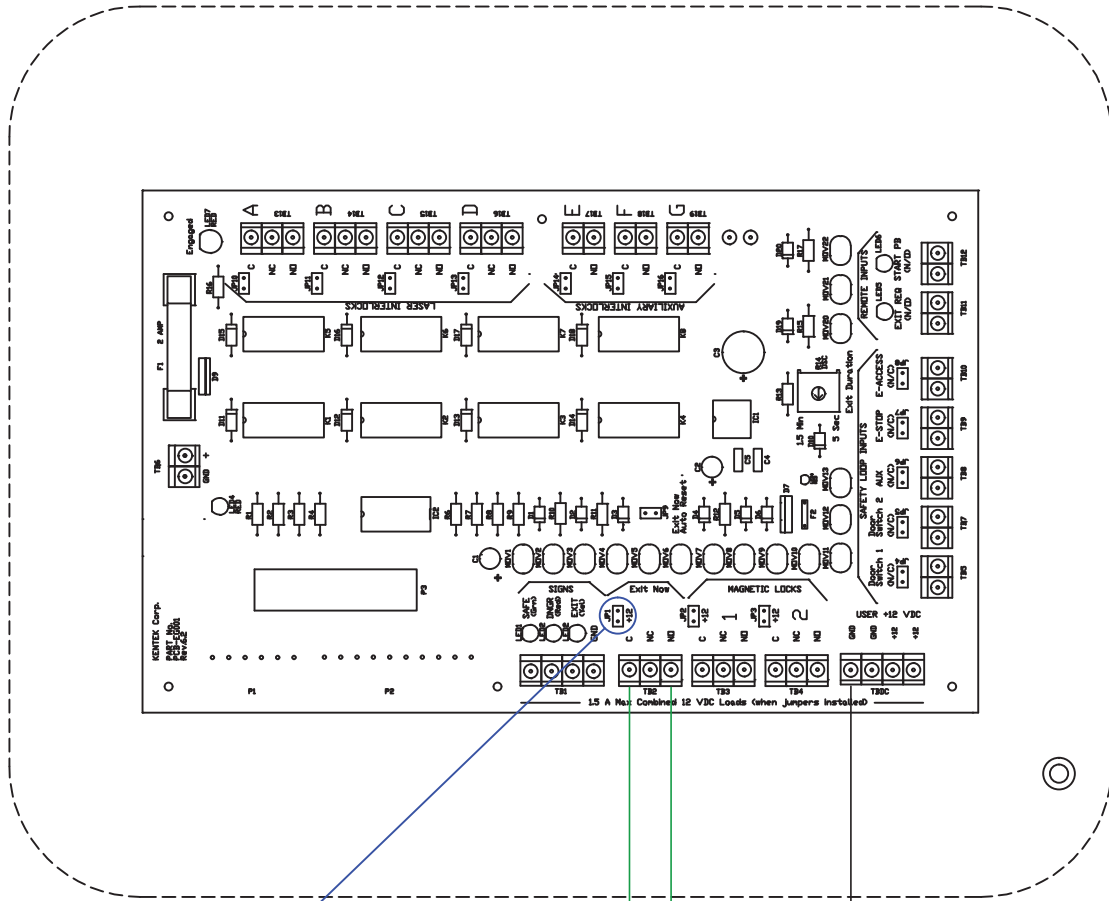
MAXIMUM CURRENT DRAW AVAILABLE
<1 AMP PER STATUS

TRIPLE STATUS SIGN WIRING



TB1 PIN 1 +12VDC SAFE STATUS
 TB1 PIN 2 +12VDC DANGER STATUS
 TB1 PIN 3 +12VDC CONTROLLED ACCESS STATUS
 TB1 PIN 4 12VDC RETURN ALL STATUSES
 MULTIPLE CONNECTIONS SHOULD BE
 WIRED IN PARALLEL
 MAXIMUM CURRENT DRAW AVAILABLE
 <1 AMP PER STATUS

EXIT NOW EXTERNAL INDICATOR WIRING



REMOVE JUMPER FOR DRY CONTACT ON TB2
INSTALL JUMPER TO SOURCE +12VDC ON TB2

DRY CONTACT OPERATION:

SUPPLY EXTERNAL POWER (+) SOURCE TO TB2 PIN 1

WIRE TB2 PIN 3 TO EXTERNAL CHIME OR LIGHT (+)

WIRE EXTERNAL DEVICE BACK TO EXTERNAL POWER (-)

REFER TO SYSTEM SPECIFICATIONS FOR RELAY RATINGS

12VDC SOURCE OPERATION:

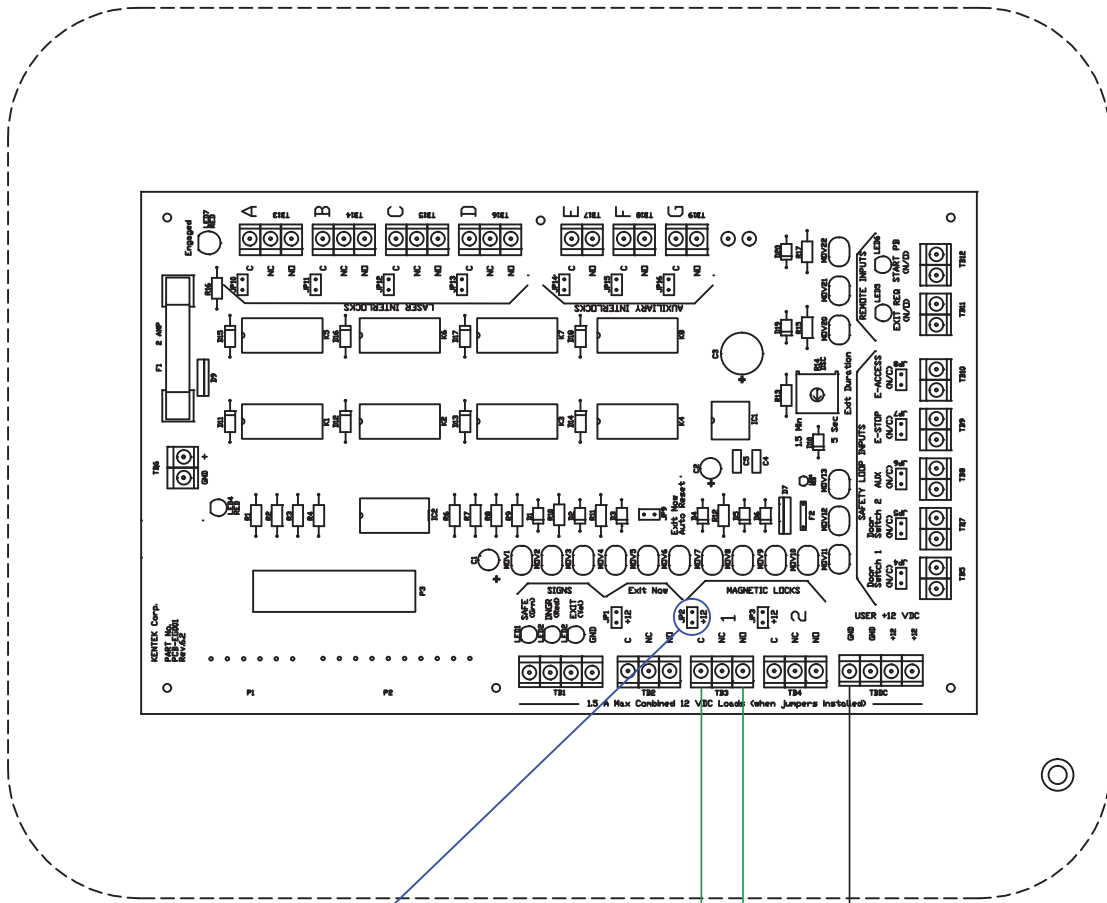
TB2 PIN 3 +12VDC CONTROLLED ACCESS STATUS

TB2 PIN 1 12VDC RETURN

MULTIPLE CONNECTIONS SHOULD BE WIRED IN PARALLEL

MAXIMUM CURRENT DRAW AVAILABLE <1 AMP

ELECTROMAGNETIC LOCK WIRING



REMOVE JUMPER FOR DRY CONTACT ON TB3
INSTALL JUMPER TO SOURCE +12VDC ON TB3

ELECTROMAGNETIC LOCK CONTROL (TB3 & TB4, TB3 SHOWN)

DRY CONTACT OPERATION:

SUPPLY EXTERNAL POWER (+) SOURCE TO TB3 PIN 1

WIRE TB3 PIN 3 TO MAGLOCK (+)

WIRE MAGLOCK RETURN BACK TO EXTERNAL POWER (-)
REFER TO SYSTEM SPECIFICATIONS FOR RELAY RATINGS

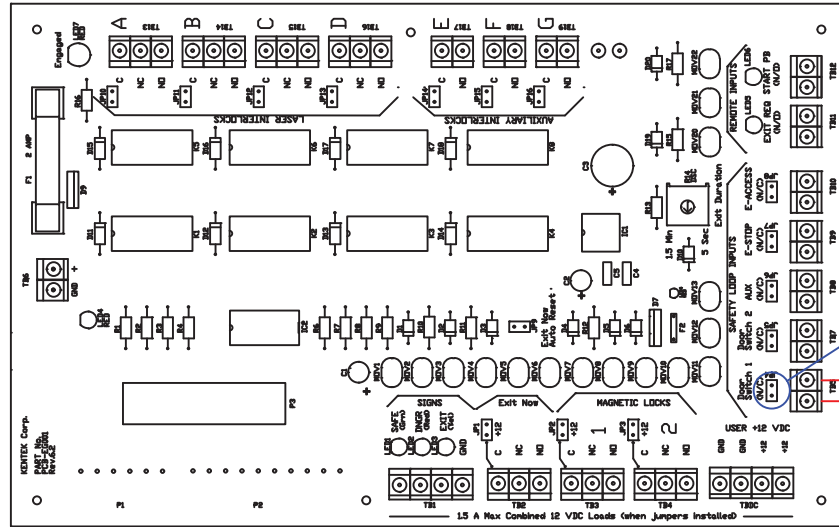
12VDC SOURCE OPERATION:

TB3 PIN 3 +12VDC TO MAGLOCK (+)

TBDC PIN 1 12VDC RETURN TO MAGLOCK (-)

MULTIPLE CONNECTIONS SHOULD BE WIRED IN PARALLEL
MAXIMUM CURRENT DRAW AVAILABLE <1 AMP

SAFETY INTERLOCK WIRING

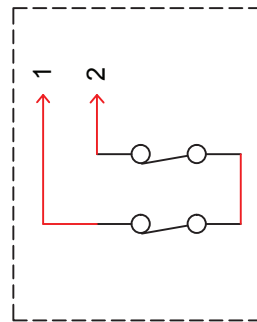


REMOVE JUMPER
JB4 AFTER
CONNECTION

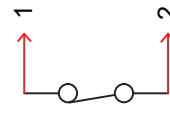
1 2

2

ENTRYWAY SAFETY INTERLOCK WIRING
(TB5 & TB7, TB5 SHOWN) REQUIRES NORMALLY
CLOSED DRY CONTACT WHEN DOOR IS CLOSED,
MULTIPLE CONNECTIONS SHOULD BE WIRED
IN SERIES

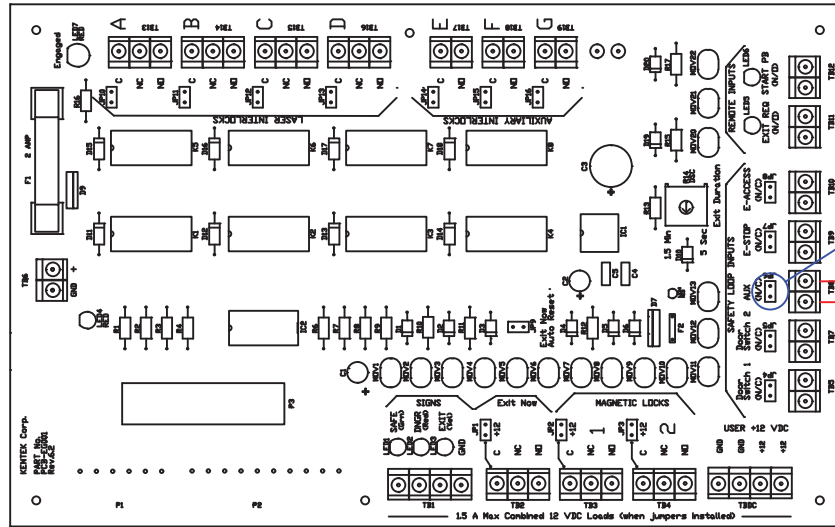


MULTIPLE INTERLOCK EXAMPLE



SINGLE INTERLOCK EXAMPLE

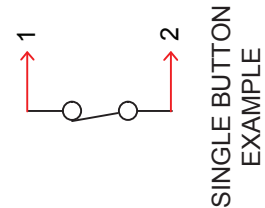
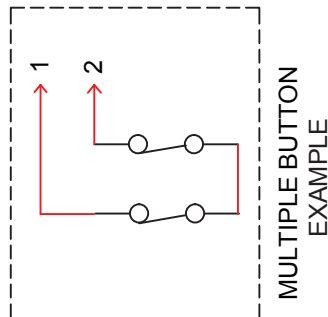
AUXILIARY WIRING



REMOVE JUMPER
JB6 AFTER
CONNECTION

1
2

AUXILIARY SAFETY LOOP WIRING
MAINTAINED MUSHROOM BUTTON OR FIRE
ALARM RELAY REQUIRES NORMALLY CLOSED
DRY CONTACT THAT MOMENTARY OR FULLY
OPENS DURING AN EMERGENCY EVENT WIRE
LEADS ACROSS TERMINAL BLOCK 8 MULTIPLE
CONNECTIONS SHOULD BE WIRED IN SERIES

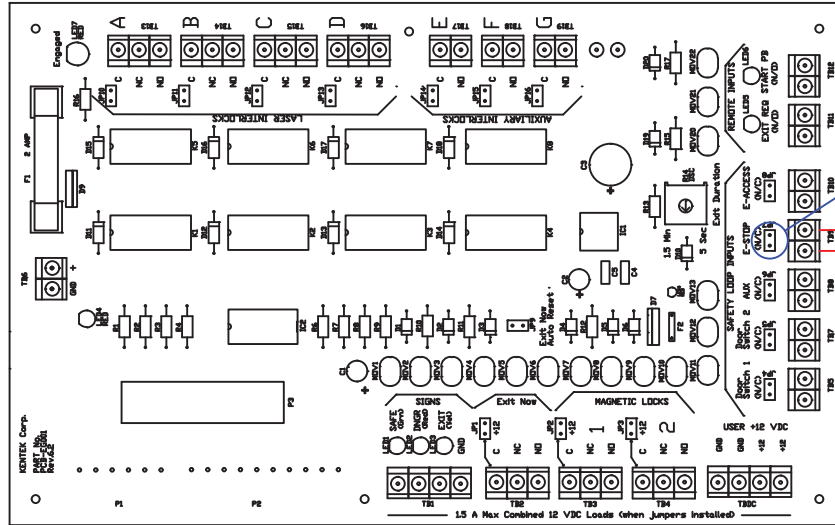
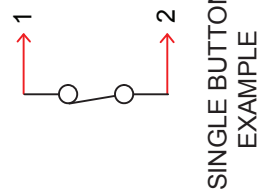
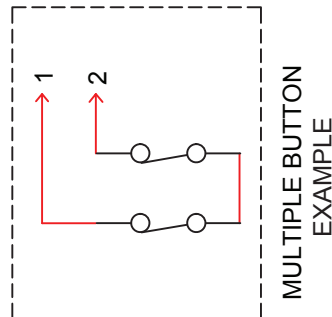


EMERGENCY STOP WIRING

EMERGENCY STOP WIRING
MAINTAINED MUSHROOM BUTTON
REQUIRES NORMALLY CLOSED DRY CONTACT
THAT MOMENTARY OR FULLY OPENS DURING
AN EMERGENCY EVENT

WIRE LEADS ACROSS TERMINAL BLOCK 9

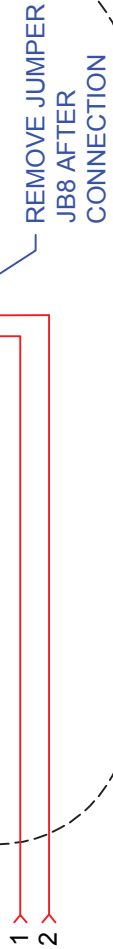
MULTIPLE CONNECTIONS SHOULD BE
WIRED IN SERIES



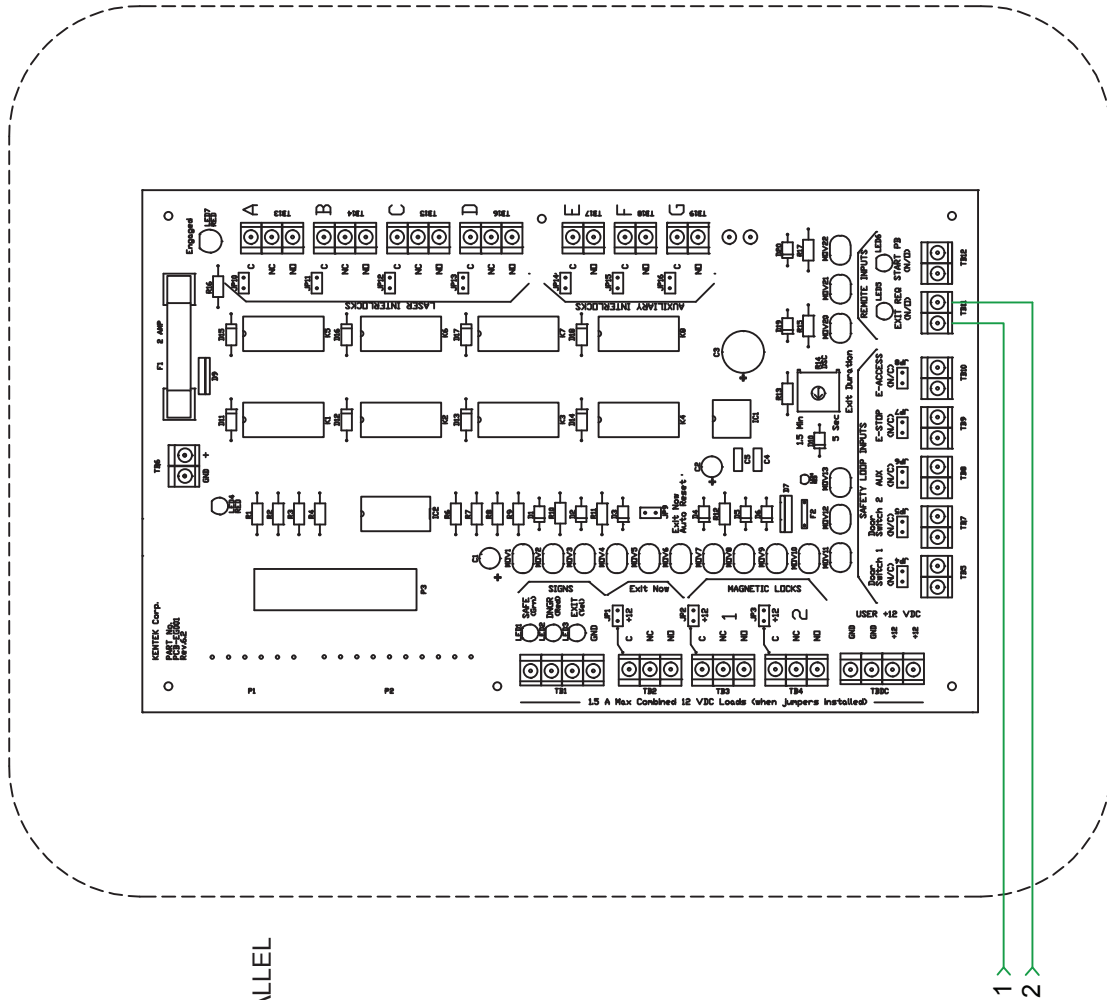
1
2

REMOVE JUMPER
JB7 AFTER
CONNECTION

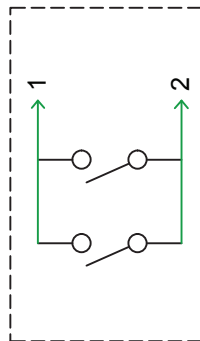
MULTIPLE BUTTONS SHOULD BE WIRED IN SERIES



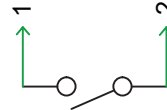
ACCESS CONTROL WIRING



EXTERNAL ACCESS CONTROL WIRING
MOMENTARY PUSH BUTTON
NORMALLY OPEN DRY CONTACT
WIRE LEADS ACROSS TERMINAL BLOCK 11
MULTIPLE BUTTONS SHOULD BE WIRED IN PARALLEL

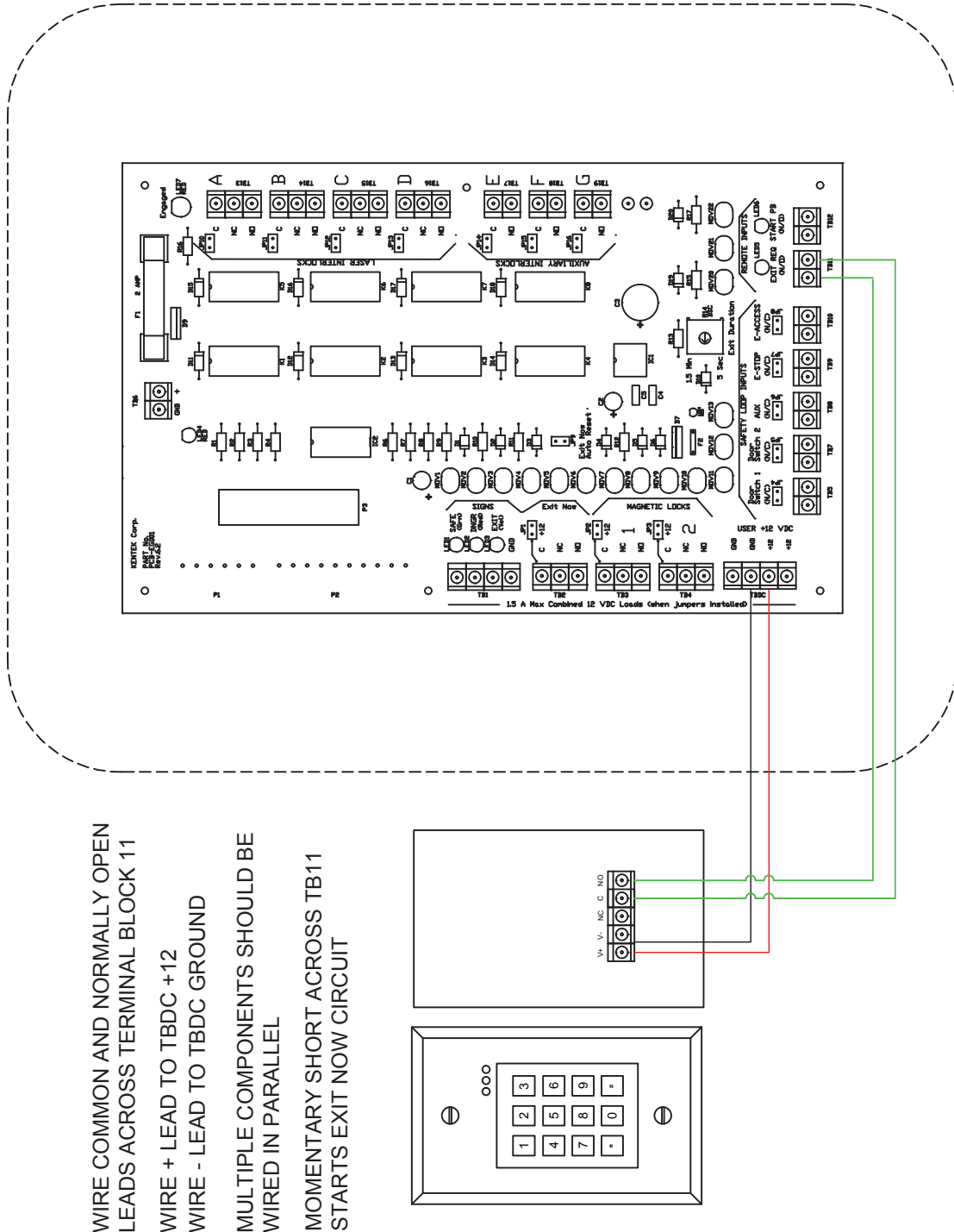


MULTIPLE BUTTON
EXAMPLE



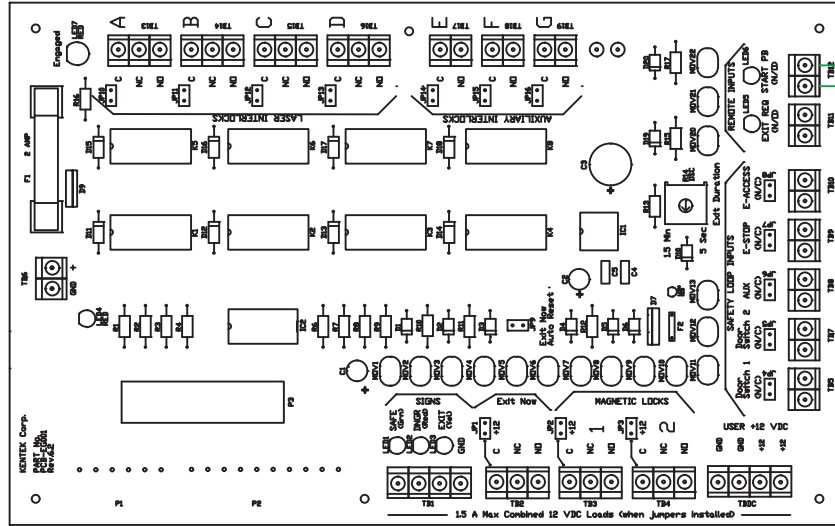
SINGLE BUTTON
EXAMPLE

KEYPAD ACCESS CONTROL WIRING



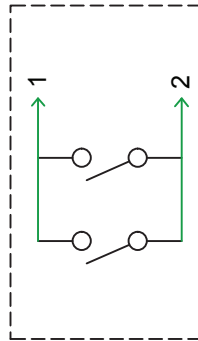
WIRE COMMON AND NORMALLY OPEN
LEADS ACROSS TERMINAL BLOCK 11
WIRE + LEAD TO TBDC +12
WIRE - LEAD TO TBDC GROUND
MULTIPLE COMPONENTS SHOULD BE
WIRED IN PARALLEL
MOMENTARY SHORT ACROSS TB11
STARTS EXIT NOW CIRCUIT

REMOTE START WIRING

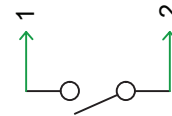


1
2

EXTERNAL OR REMOTE START WIRING
MOMENTARY PUSH BUTTON
NORMALLY OPEN DRY CONTACT
WIRE LEADS ACROSS TERMINAL BLOCK 12
MULTIPLE BUTTONS SHOULD BE WIRED IN PARALLEL

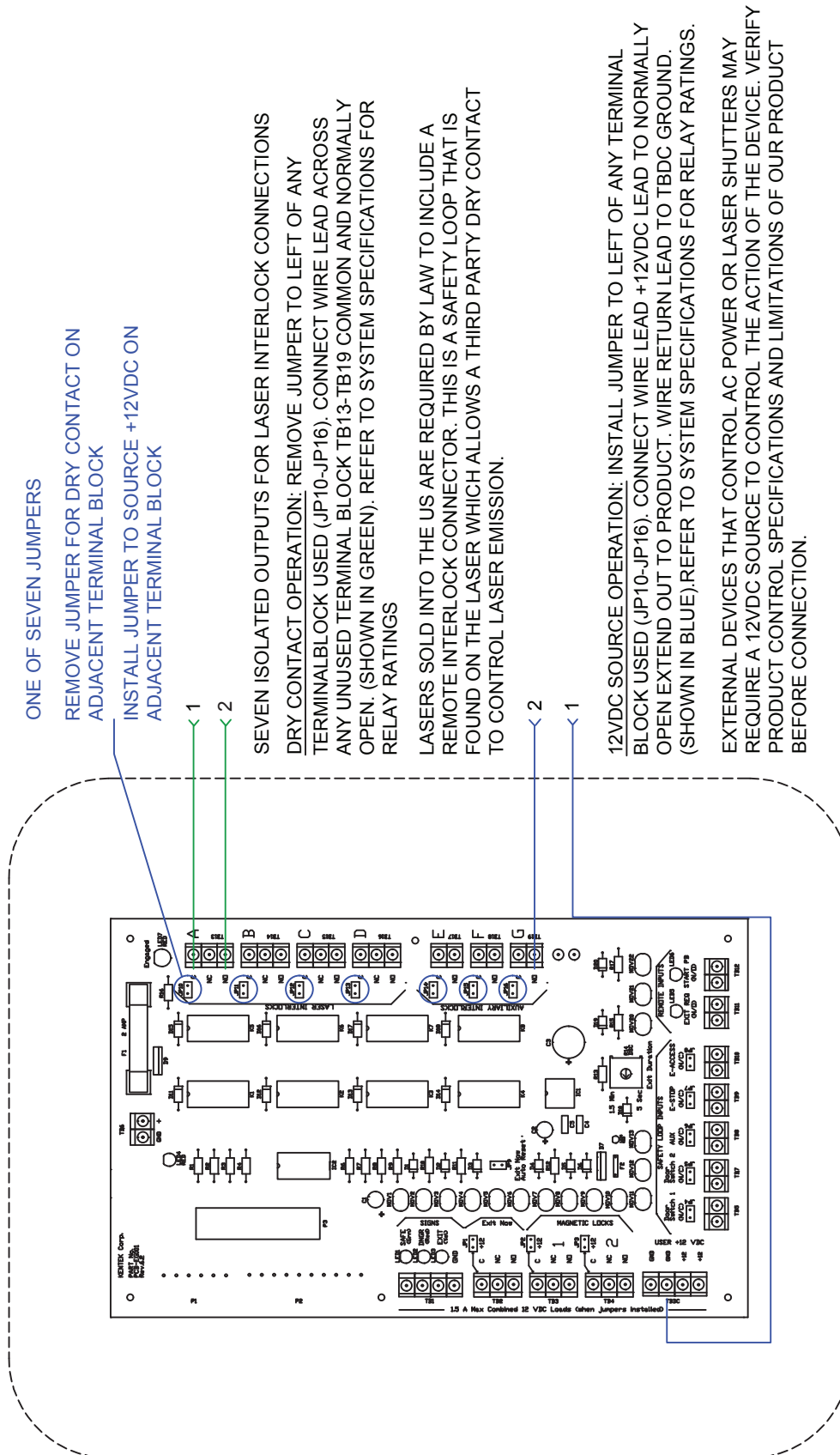


MULTIPLE BUTTON
EXAMPLE



SINGLE BUTTON
EXAMPLE

LASER INTERLOCK WIRING





ROOM#: _____ *The following checklist is only a guide and is intended to be used by qualified service technicians. The sequence of the checks is arbitrary. Actual sequence will be determined by the technician performing the checks.*

DATE: _____

TECHNICIAN: _____

General System Information

The system is considered "ENGAGED" when all of the following conditions are met:

1. "Start" button is illuminated.
2. "Maglocks On" indicator is illuminated.
3. All doors to the protected room are locked (if equipped with magnetic or electronic locks).
4. All interlocked (protected) equipment is/are enabled.
5. The "Beam On" sign is illuminated.
6. The "Beam Off" sign is NOT illuminated.
7. The "Ok to Enter" or "Exit Now" sign(s) (if so equipped) should be off except during "Exit Now" mode.
8. The exit now audible alarm should not sound.

The system is considered "DISENGAGED" or in "SAFE MODE" when all of the following conditions are met:

1. The start button is NOT illuminated.
2. The "Maglocks On" indicator is NOT illuminated.
3. All doors to the protected room are unlocked (if equipped with magnetic or electronic locks).
4. All interlocked (protected) equipment is/are disabled.
5. The "Beam On" sign is NOT illuminated.
6. The "Beam Off" sign is illuminated.
7. The "Exit Now" or "Enter Now" signs (if so equipped) are NOT illuminated.
8. The building security system resumes control of the door locks (special requirement).

To ENGAGE the system:

1. Ensure the "Key Switch" is on.
2. Ensure the "Power on" indicator is on.
3. Ensure the "Doors Closed" indicator is on.
4. Ensure the "System Ready" indicator is on.
5. Press the Start button and the system should engage.

The system should DISENGAGE when any of the following actions are performed:

1. Any "E-Stop" or "E-Access" button is pressed.
2. Any door to the protected room is opened WITHOUT first pressing an Exit Request or Enter Request button.
3. The building fire alarm actuates (special requirement).

The system is considered to be in EXIT NOW mode when the system is ENGAGED and the EXIT NOW circuit is activated. The following occurs during EXIT NOW mode:

1. The front panel "Exit Request" pushbutton illuminates.
2. The "Maglocks On" indicator extinguishes.
3. The Magnetic Door locks release (go to the unlocked position).

4. The "Exit Now" and "Enter Now" signs illuminate (if so equipped).
5. The "Beam On" sign remains illuminated.
6. The "Beam Off" sign remains extinguished.
7. The audible Exit Chime sounds for 5 to 90 seconds.
8. While the Chime is sounding, the protected doors can be opened without the system DISENGAGING.
9. If the "Exit Now Auto Reset" jumper is in place, closing all the doors after any door was opened terminates the "Exit Now" sequence as follows:
 - a. The Exit Chime terminates.
 - b. The "Exit Now" and "Enter Now" signs extinguish.
 - c. The "Maglocks On" indicator illuminates.
 - d. The Magnetic Door locks engage (go to the locked position).
 - e. The system remains ENGAGED.
10. If the "Exit Now Auto Reset" jumper is NOT in place, closing the doors does not terminate EXIT NOW mode before the timer times-out.
11. If any door remains open when the Exit Chime times out, the system reverts to DISENGAGED mode.

Control Panel Static Checks

- ☐ The key switch and pushbuttons are not damaged and operate smoothly.
- ☐ The External Power Supply is connected to the PCB and main power.
- ☐ The screws to any Terminal Blocks that have wires connected to them are tight and the wires won't pull out with moderate pulling force.
- ☐ Ensure the bypass jumpers are REMOVED for each of the "Safety Loop Inputs" that have wires connected to them (in use).
- ☐ Ensure the bypass jumpers are in place for each of the "Safety Loop Inputs" that do NOT have wires connected to them (not used).
- ☐ Ensure the +12V jumpers are REMOVED for any maglock that is connected to an external power source.
- ☐ Ensure the "Exit Now Auto Reset" Jumper is installed unless the customer has specified that closing the doors should NOT terminate the Exit Now chime. Select the status of the jumper: Installed / NOT Installed.

Safety Loop Checks

- ☐ The "Doors Closed" indicator is illuminated when all the doors are closed and extinguishes when any door is opened.
- ☐ The front panel "System Ready" indicator illuminates when all the doors are closed and all the "E-Stop" and "E-Access" pushbuttons are not pressed.
- ☐ The front panel "System Ready" indicator extinguishes when any of the "E-Stop" or "E-Access" buttons are pressed or any door is opened.
- ☐ With the "System Ready" indicator NOT illuminated, pressing the front panel "Start" button does NOT ENGAGE the system.
- ☐ With the "System Ready" indicator illuminated, pressing the front panel "Start" button ENGAGES the system.
- ☐ With the system "ENGAGED" pressing any E-Stop or E-Access Pushbuttons DISENGAGES the system.

Remote Inputs

- ☐ When the remote "Start" pushbutton (if so equipped) is pressed the "Start PB" indicator on the PCB illuminates and extinguishes when the button is released.
- ☐ When the remote "Exit/Enter Request" pushbutton (if so equipped) is pressed the "Exit Req" indicator on the PCB illuminates and extinguishes when the button is released.
- ☐ When the "Enter Request" keypad (if so equipped) is actuated the "Exit Req" indicator on the PCB illuminates for approximately one second.

Exit Request Function

- ☐ With the system ENGAGED pressing any "Exit Req" pushbutton or entering the correct access code into the remote Keypad results in the system entering into EXIT NOW mode.
 - The audible exit chime sounds for the preset time of 5 to 90 seconds and is set to the customer's specifications. Actual time is approximately: _____
- ☐ With the system in EXIT NOW mode and the "Exit Now Auto Reset" jumper is in place, opening and closing a door terminates EXIT NOW mode.
- ☐ With the system in EXIT NOW mode and the "Exit Now Auto Reset" jumper is NOT in place, opening and closing a door does NOT terminate EXIT NOW mode.

Electrical Checks

- ☐ Power supply voltage is 11 to 15VDC when measured at the "User +12VDC" Terminals of the PCB.
The measured voltage is: _____ V.

Special Requirements/ Visual Indicators

- ☐ Define which system has control of the door locks during the following status.

	Entry-Guard	Other System	Neither
1. ENTRY-GUARD™ key off	☐	☐	☐
2. ENTRY-GUARD™ key on	☐	☐	☐
3. ENTRY-GUARD™ ENGAGED	☐	☐	☐
4. ENTRY-GUARD™ EXIT NOW	☐	☐	☐
5. ENTRY-GUARD™ DISENGAGED	☐	☐	☐
6. Building fire alarm signal	☐	☐	☐

- ☐ With the system in SAFE MODE verify illuminated indicators are either in safe mode or off.
- ☐ With the system ENGAGED verify illuminated indicators have switched from safe mode to danger mode.
Verify all safe indicators have been extinguished.

The following Problems/Discrepancies were found during the inspection:



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