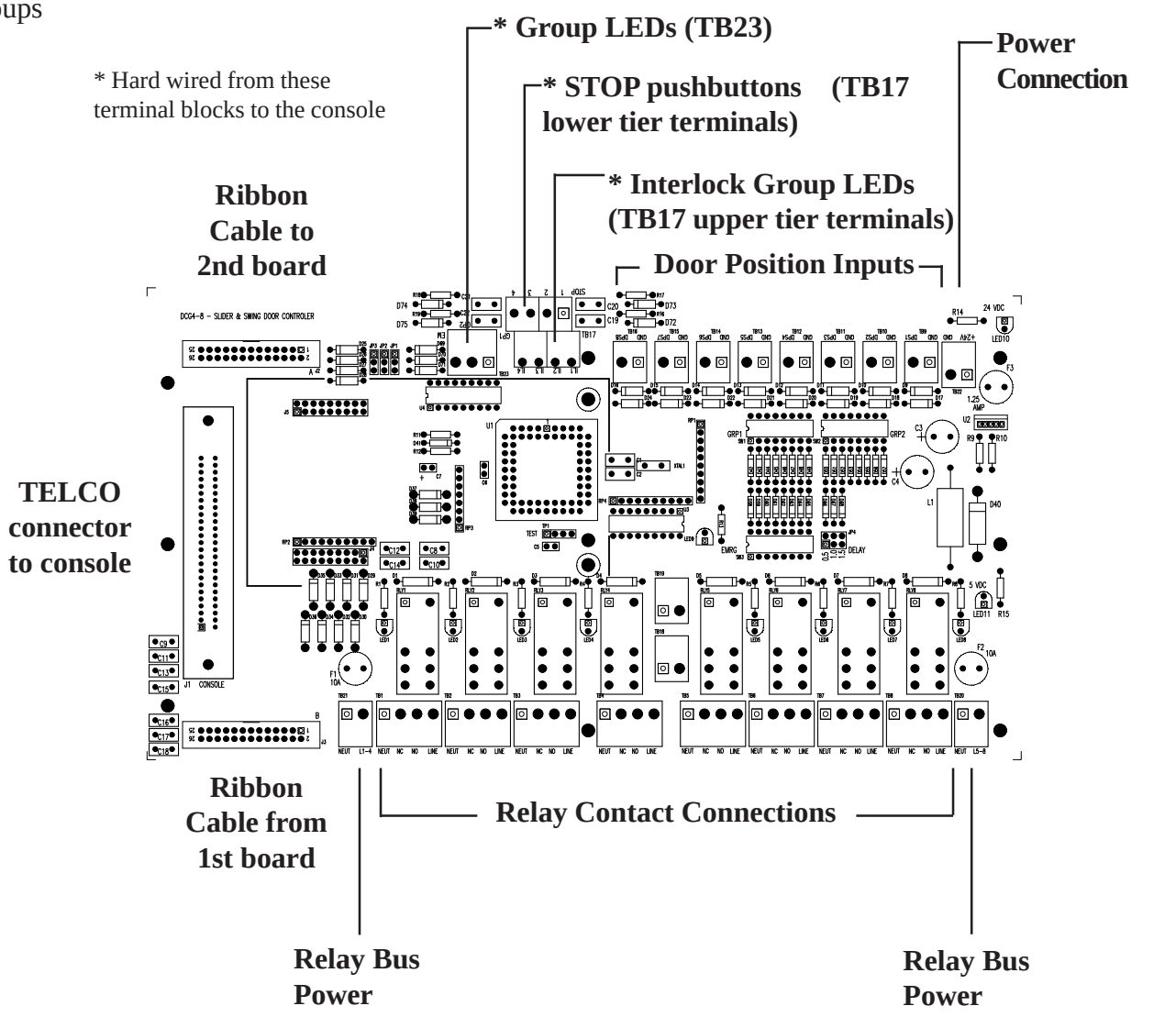
DCG4-8 and IC-8 Boards

Group Release Door Controller and Interlock Controller

Features:

- Integration includes: Relays, Door Position Switch inputs and Group Release control
- 8 Relays: 16A 240VAC or 24VDC contacts - May be used individually and/or in groups for 4 SLIDER doors or 8 SWING doors
- Sequenced Relay Control: 0.5-, 1.0- or 1.5-seconds to spread door power supply surges
- Split power bus for relay output: 2 10 Amp fuses, 2 groups of 4 or a single group of 8 relays
- 8 DPS Inputs: 8 door position switch inputs connect to console LEDs and interlock board (part number IC-8)
- Easy Connection: a 50-circuit TELCO connector and cable handles all connections to the console for 2 DCG4-8 boards. TELCO connector is plugged into the 1st board of the pair.
- Cascade Connection: 2nd board connected by ribbon connector allows sequencing of up to 16 relays in an extended group
- Independent Connection: 2nd board connected by ribbon may also provide many other useful combinations of the 6 groups (4 standard and 2 emergency groups) and 16 relays of the pair of boards
- Interlocked Groups: a plug-in, piggyback board (part number IC-8) implements up to 4 interlock groups



Jumper Settings

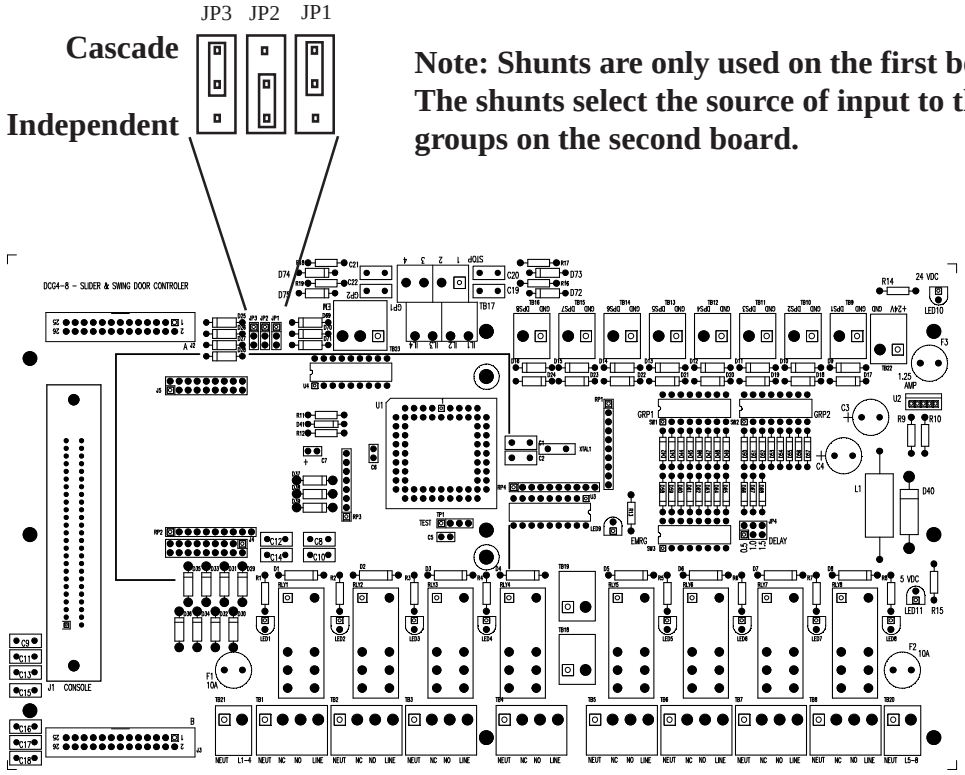
Three headers for shunts are illustrated below:

JP1 for Group 1 or 3
JP2 for Group 2 or 4
JP3 for Emergency Group 1 or 2

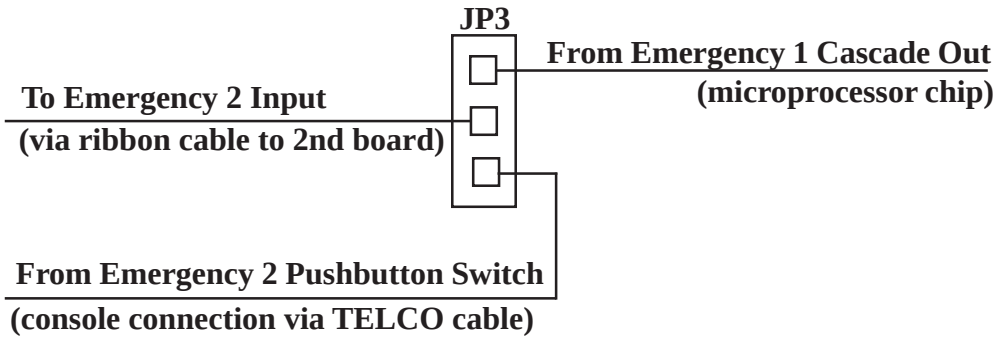
Group 1, Group 2 and Emergency Group 1 are on the first board of a pair of boards and the same groups are called Group 3, Group 4 and Emergency Group 2 when used independently on the second board.

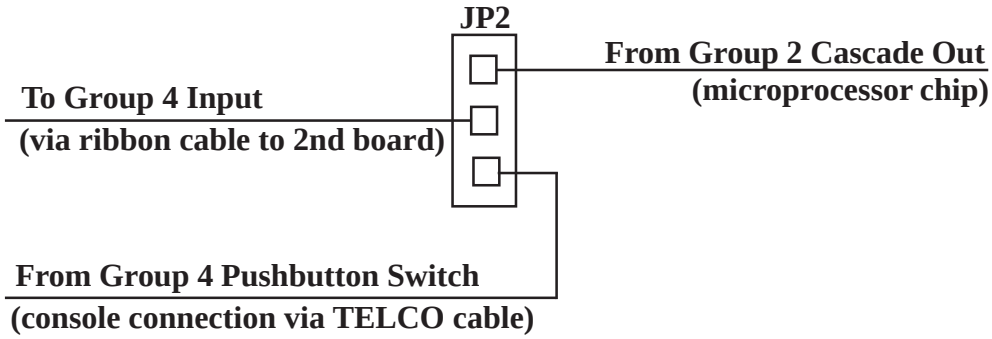
When the shunts are in the upper position (see JP1 and JP3 below) the group on the second board becomes a continuation of the group on the first board (it is **cascaded**). For example: if the input line for Group 1 is activated, the relays in Group 1 on the first board are sequenced ON then the relays in Group1 (Group 3) of the second board are sequenced ON. After being turned ON for 10 seconds each, the relays of Group1 on the first board are sequenced OFF followed by the relays in Group 1 (Group3) of the second board. This setting allows relays on the second board to be added to a group on the first board to extend the size of the associated group.

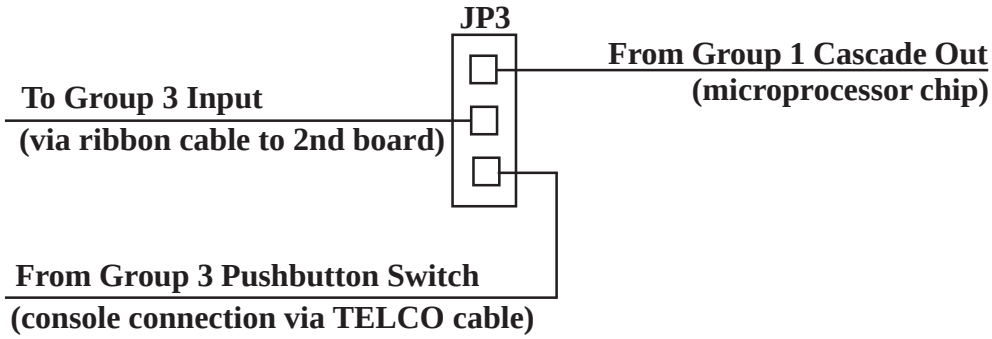
When the shunts are in the lower position (see JP2 below) the associated group input line (G3, G4 or EG2) from the TELCO connector is sent to the ribbon connector which connects to a group input on the second board. If all three jumpers were placed into the lower positions the result would be three **independent** groups on each board, controlled from six group pushbutton switches on the console. This setting allows more groups to be controlled via each TELCO cable connected to the console.



The drawings below show the signal flow for the three jumper headers.

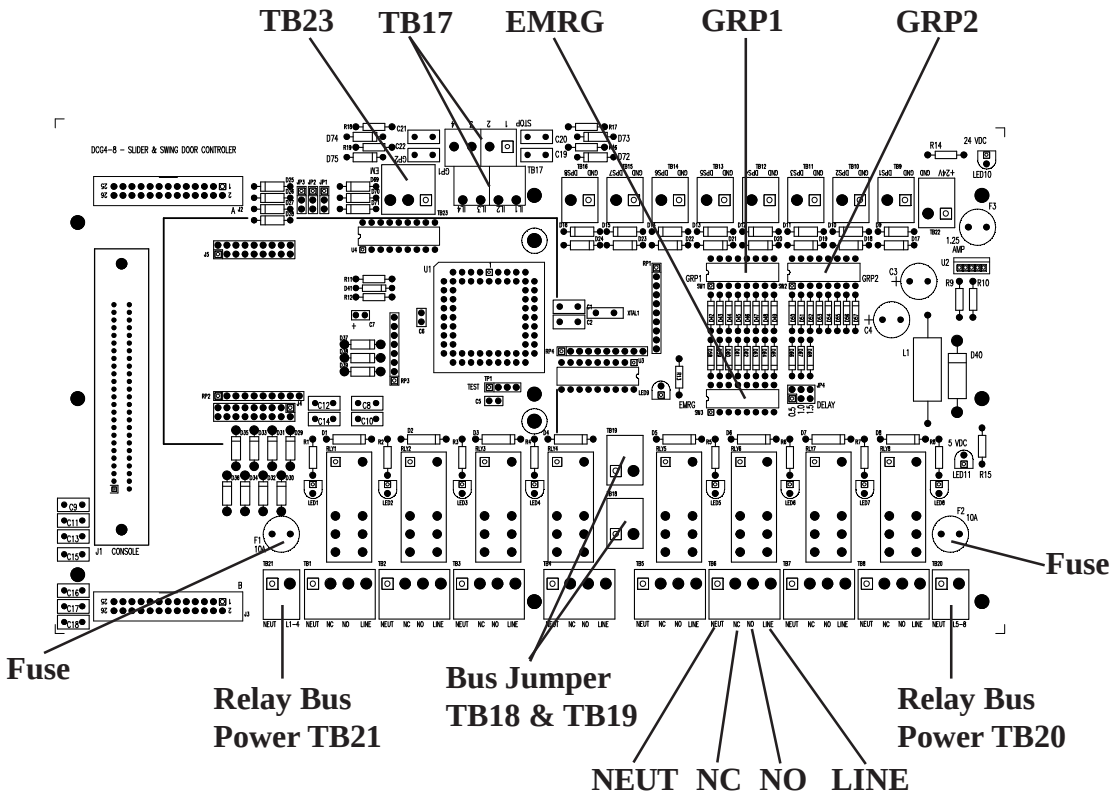






Release Group Switch Settings

The board has three DIP switch banks that are used to select the door relays that will be included in each release group. The switches are labeled SW1, SW2 and SW3. Additionally they are labeled GRP1, GRP2 and EMRG respectively. Each switch has 8 positions to allow selection of any or all of the relays. When a switch is in the ON position the associated relay is selected for that group. **The switches must be set while the power is turned OFF**. When the power is turned back ON the microprocessor will scan each DIP switch bank during its start-up routine and thereby discover which relays have been selected for each group.



Split Power Bus for Relay Output

Jumper wires on the two terminal blocks (TB18 and TB19) labeled “Bus Jumper” above may be removed to split the power bus for the relay outputs. If the bus is split, power is applied separately to the terminal block (TB21 and TB20) on each end of the bus and each isolated bus has its own 10A fuse. **Remove BOTH jumpers to split the bus.**

The left hand screw position (NEUT) of both the Relay Bus Power and Relay terminal blocks is the neutral or negative side of the power. The right hand screw position (LINE) of the Relay Bus Power and Relay terminal blocks is the line or positive side of the power.

From left to right the Relay terminal blocks are labeled NEUT, NC, NO, LINE. **Note that the COMMON terminal of the relay is tied directly to the line or positive side of the power.**

The COMMON terminal of the relay is connected to the NC terminal when the relay is deactivated and to the NO terminal when the relay is activated. Under normal circumstances the door locking devices would be connected between the NO and NEUT terminals of the relay terminal blocks.

Door Position Switch Inputs

The door position switches are connected across the GND and DPS positions of TB9 through TB16 for doors 1 through 8 respectively. The switches should be the usual dry contact type used for door position monitoring. When the switch is closed a "pulled low" condition is applied to the LED and resistor mounted in the console display (as well as to the interlock board, part number IC-8, if used). The other side of the LED/resistor combination mounted in the console should be connected to a power source that shares a common reference with the GND terminals of TB9 through TB16 via the signal return wires of the TELCO cable.

LED & STOP Pushbutton Connections

TB17 and TB23 must be wired to the console via a cable that is separate from the TELCO connector.

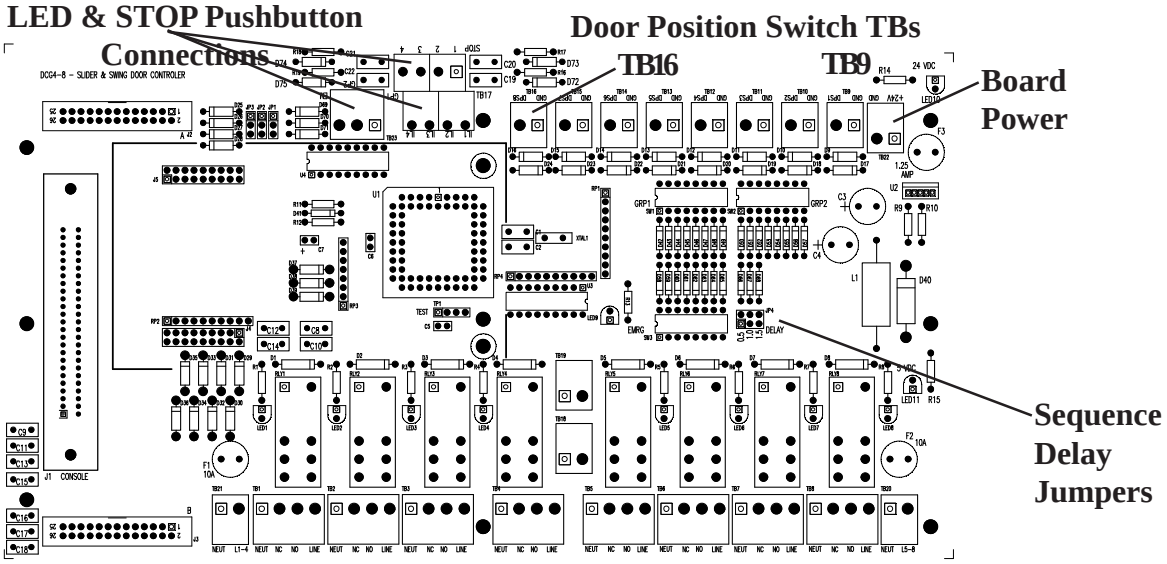
TB23 provides outputs to wire to console LEDs to indicate when the groups (GP1, GP2 & EM) are active.

The upper tier 4 terminal points on TB17 provide outputs to wire to consol LEDs to indicate when the Interlock groups (IL1, IL2, IL3 & IL4) are active. The common (ground) terminal of the power supply used at the console must be connected to the signal return line in the TELCO cable to provide a common reference between the console and the DCG4-8 board/s.

The lower tier 4 terminal points on TB17 provide input connections for 4 pushbuttons located on the console that will activate the STOP inputs of the DCG4-8 board when it is used to control SLIDER doors. The pushbuttons should pull the points low (to the ground reference in the TELCO connector) to initiate the STOP process when needed to ameliorate a safety issue while the SLIDER door is moving in either direction.

Board Power

The terminal block (TB22) labeled "Board Power" in the illustration provides power for the electronic circuits on the DCG4-8 board. The power supply is required to provide a maximum of 300 milliamperes per board when all 8 of the relays are energized. A separate power supply should be used for only this purpose.



Sequence Delay Jumpers

The dual-row, three-position, header labeled "Sequence Delay Jumpers" provides a delay time of 0.5-, 1.0- or 1.5-seconds from the time one relay is energized until the next in the group is energized. The delay time allows the power surge to the door lock to taper down before applying power to the next door lock in sequence. The selected delay time is also applied from the time one relay is de-energized until the next in the group is de-energized during the turnoff sequence.

TELCO Connector Pin Usage

1	**Relay 1**	**26**	**Relay 2**
2	**Relay 3**	**27**	**Relay 4**
3	**Relay 5**	**28**	**Relay 6**
4	**Relay 7**	**29**	**Relay 8**
5	**Relay 9**	**30**	**Relay 10**
6	**Relay 11**	**31**	**Relay 12**
7	**Relay 13**	**32**	**Relay 14**
8	**Relay 15**	**33**	**Relay 16**
9	**DPS 1**	**34**	**DPS 2**
10	**DPS 3**	**35**	**DPS 4**
11	**DPS 5**	**36**	**DPS 6**
12	**DPS 7**	**37**	**DPS 8**
13	**DPS 9**	**38**	**DPS 10**
14	**DPS 11**	**39**	**DPS 12**
15	**DPS 13**	**40**	**DPS 14**
16	**DPS 15**	**41**	**DPS 16**
17	**Group 1**	**42**	**Group 2**
18	**Emergency 1**	**43**	**Group 3**
19	**Group 4**	**44**	**Emergency 2**
20	**DPS Tone Bus**	**45**	**Lamp Test**
21	**Override IL1**	**46**	**Override IL2**
22	**Override IL3**	**47**	**Override IL4**
23	**Override IL5**	**48**	**Override IL6**
24	**Override IL7**	**49**	**Override IL8**
25	**Ground**	**50**	**Ground**

Expected Line Levels

- The relay lines should be pulled to ground by switches at the console.

- The DPS lines should be activated by normally open door position switches (they will be in the open position when the magnet or other actuator is in place) and should be connected at the console to LEDs and appropriate resistors and then to a positive power source that is referenced to the ground pins (Pin 25 and Pin 50). The console LEDs turn on when the door position causes the DPS switch to close the connection between the two terminals points on TB9 through TB16, thus providing a pull-low to the console LEDs.

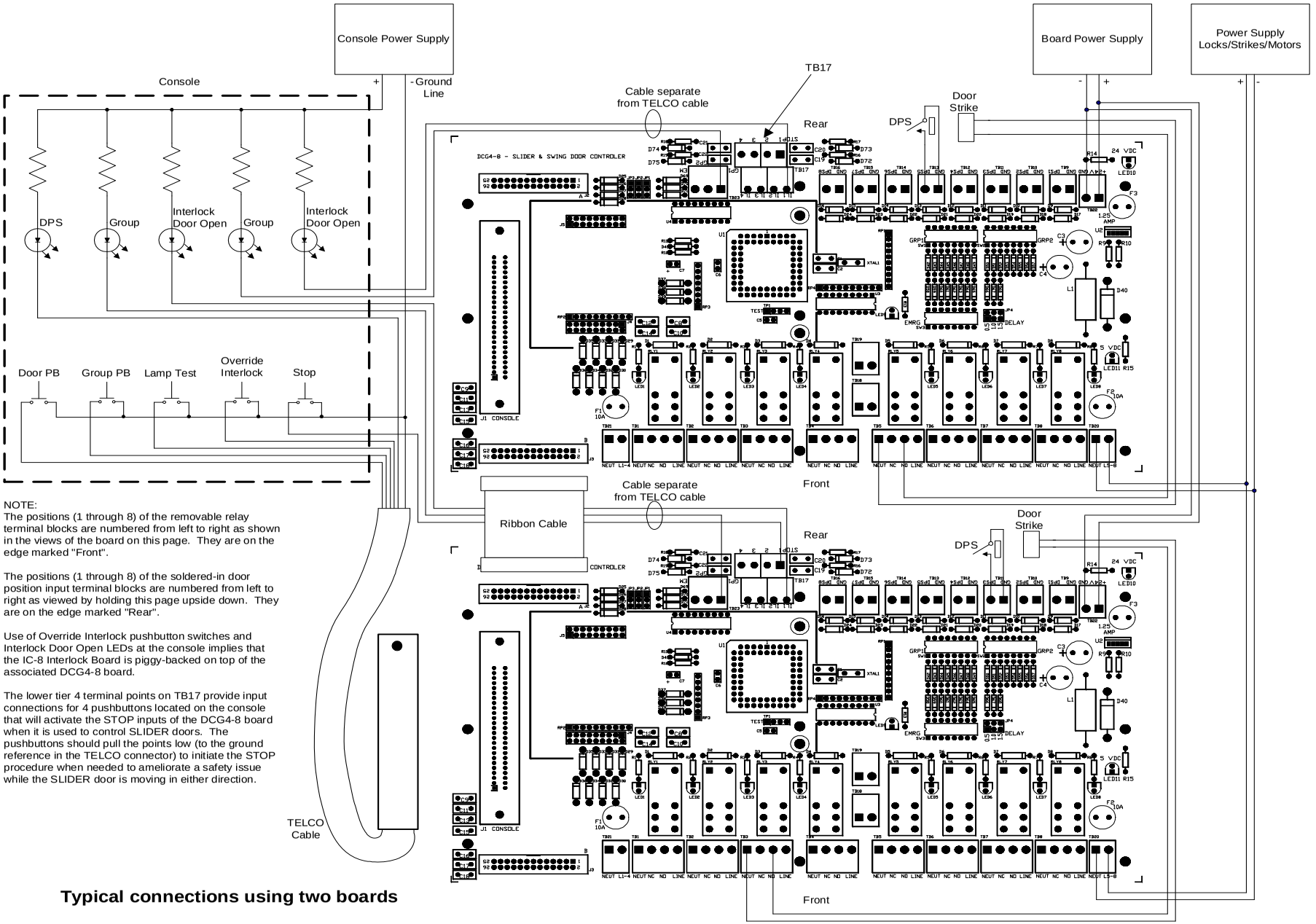
- The group lines (Pins 17 - 19 and Pins 42-44) should be pulled to ground by a pushbutton switch at the console

- The DPS Tone Bus line is pulled to ground through diodes on the DCG4-8 board when any one of the DPS lines is pulled to ground

- The Lamp Test line should be pulled to ground by a pushbutton switch at the console

- The Override Interlock lines should be pulled to ground by switches at the console

- The pair of Ground pins (Pin 25 and Pin 50) provide a signal return or reference between the power supplies and the control and monitoring circuitry on the DCG4-8 board



NOTE:
The positions (1 through 8) of the removable relay terminal blocks are numbered from left to right as shown in the views of the board on this page. They are on the edge marked "Front".

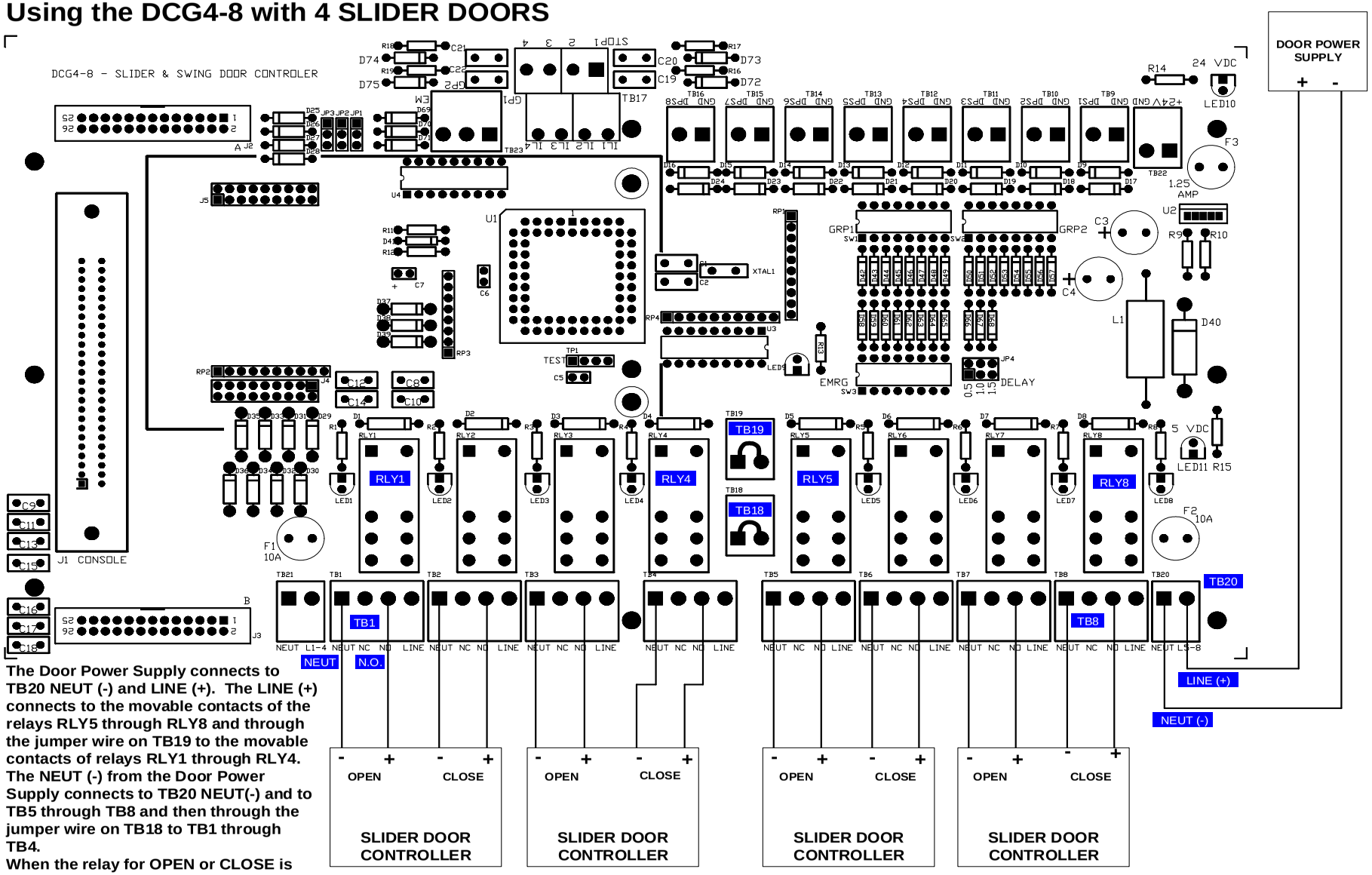
The positions (1 through 8) of the soldered-in door position input terminal blocks are numbered from left to right as viewed by holding this page upside down. They are on the edge marked "Rear".

Use of Override Interlock pushbutton switches and Interlock Door Open LEDs at the console implies that the IC-8 Interlock Board is piggy-backed on top of the associated DCG4-8 board.

The lower tier 4 terminal points on TB17 provide input connections for 4 pushbuttons located on the console that will activate the STOP inputs of the DCG4-8 board when it is used to control SLIDER doors. The pushbuttons should pull the points low (to the ground reference in the TELCO connector) to initiate the STOP procedure when needed to ameliorate a safety issue while the SLIDER door is moving in either direction.

Typical connections using two boards

Using the DCG4-8 with 4 SLIDER DOORS



The Door Power Supply connects to TB20 NEUT (-) and LINE (+). The LINE (+) connects to the movable contacts of the relays RLY5 through RLY8 and through the jumper wire on TB19 to the movable contacts of relays RLY1 through RLY4. The NEUT (-) from the Door Power Supply connects to TB20 NEUT(-) and to TB5 through TB8 and then through the jumper wire on TB18 to TB1 through TB4.

When the relay for OPEN or CLOSE is activated the LINE (+) is connected through the normally open (N.O.) contact of the respective relay to the Slider Door Controller input to move the door in the opening or closing direction.

The SLIDER version of the firmware is required for this configuration.

IC-8 Interlock Board

The IC-8 board plugs into the DCG4-8 board. The function of the IC-8 board is to provide up to 4 interlocked groups of doors. If the associated DPS (door position switch) of one of the doors in an interlocked group indicates that the door is open, attempts to open another door in the same group will not be possible until the console override pushbutton switch for that group is turned on. Any of the eight doors connected to the DCG4-8 may be included in any one of the four interlocked groups.

Use care when plugging and unplugging the IC-8 board. J4 on the DCG4-8 board will usually have 9 shunts installed. They must be removed before attempting to install the IC-8 board onto the DCG4-8 board. The pins of P2 on the underside of the IC-8 board plug into J5, the socket on the DCG4-8 board. Conversely, the socket at P1 on the underside of the IC-8 board plugs down onto the pins of the header J4 on the DCG-8 board after the shunts are removed.

If doors cannot be opened via a DCG4-8 board that once had an IC-8 board installed on it, ensure that the 9 shunts are installed on J4 again.

SW1, SW2, SW3 and SW4 are associated with Groups 1, 2, 3, and 4 respectively. These DIP switches select the doors to be included in each interlocked group. The numbered positions on the switches correspond directly with the numbered door positions on the DCG4-8. If the switch is moved to the "ON" position, the door is included in the group.