Innovative Control Systems®

Tunnel Master® *wbc*

Installation Guide - Version 8.0

Defining the World of Car Wash Technology

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CHAPTER 1:
Introduction

Installation Overview

This document was written for installation technicians and electricians. A thorough understanding of electrical wiring, installation, codes and safety protocols is required. Additionally, some familiarity with car wash tunnel equipment and installation is recommended. No prior experience with the Tunnel Master® *wbc* (Web Based Controller) is required. The Tunnel Master® *wbc* is also known as the WBC.

This installation guide is provided to assist you in installing the Tunnel Master® *wbc*. This guide should be supplied to the electrician prior to the installation of conduit and wiring to ensure the WBC system is installed properly.

Faulty installations are the major cause of system malfunctions.
The Tunnel Master® *wbc* system must be installed exactly as described in this manual to ensure its reliability and proper operation.

WARNING: Failure to properly install the WBC system will void the warranty and could result in serious injury or death.

NOTE: Innovative Control Systems provides a toll-free number for customers and installers who have questions pertaining to the installation:

1-800-246-3469

Many of the WBC system features were integrated at the request of current car wash operators. We welcome your feedback and want to assure you that ICS will always remain the industry leader in car wash controller and management systems.

By reading the information and performing the procedures in this manual, you should be able to:

- Install the WBC system-level wiring
- Install the WBC communications wiring
- Troubleshoot problems if they occur

Related Documents

The following documents are available for further reference:

- *Tunnel Master® wbc User Manual* for web-based configuration

Version Considerations

Version 8.0 of this document included content based on the following ICS software versions:

- Controller software version 1.2 B51
- Server-side controller software version 4.1.8.3 for *Tunnel Master®*
- *Tunnel Master®* software version 5.30 B2
- ICS API 4.2.12.8 for *Tunnel Master®*
- *WashConnect®* software version 1.4.12.6

Hardware Specs

- IP-based tunnel controller capable of handling:
  - 192 outputs
  - 48 inputs
- Graphics display showing status of all inputs and other tunnel status indicators
- Easily configured through Web interface
- Firmware update over network
- Main CPU board

- Up to four directly connected relay boards
- Input board
- All boards powered by 24 V DC from power supply:
  - Isolated 12 V DC for display back light
  - 12 V AC RS-485 isolation and 16 main inputs
- All isolated inputs powered from separate external AC supply

The Tunnel Master® *wbc* is a tunnel controller, configuration tool, and error reporting system. It includes these main hardware components:

- The unit itself is a 130 lbs., 32" W × 40" H × 12" D, hinged-panel design for mounting on a dry, non-corrosive, interior surface.
- One of the following dedicated universal power supplies (UPS): 1500VA/865 Watts output capacity.

Hardware includes a one-year, conditional warranty against defects in material, workmanship and operating failure from normal use.

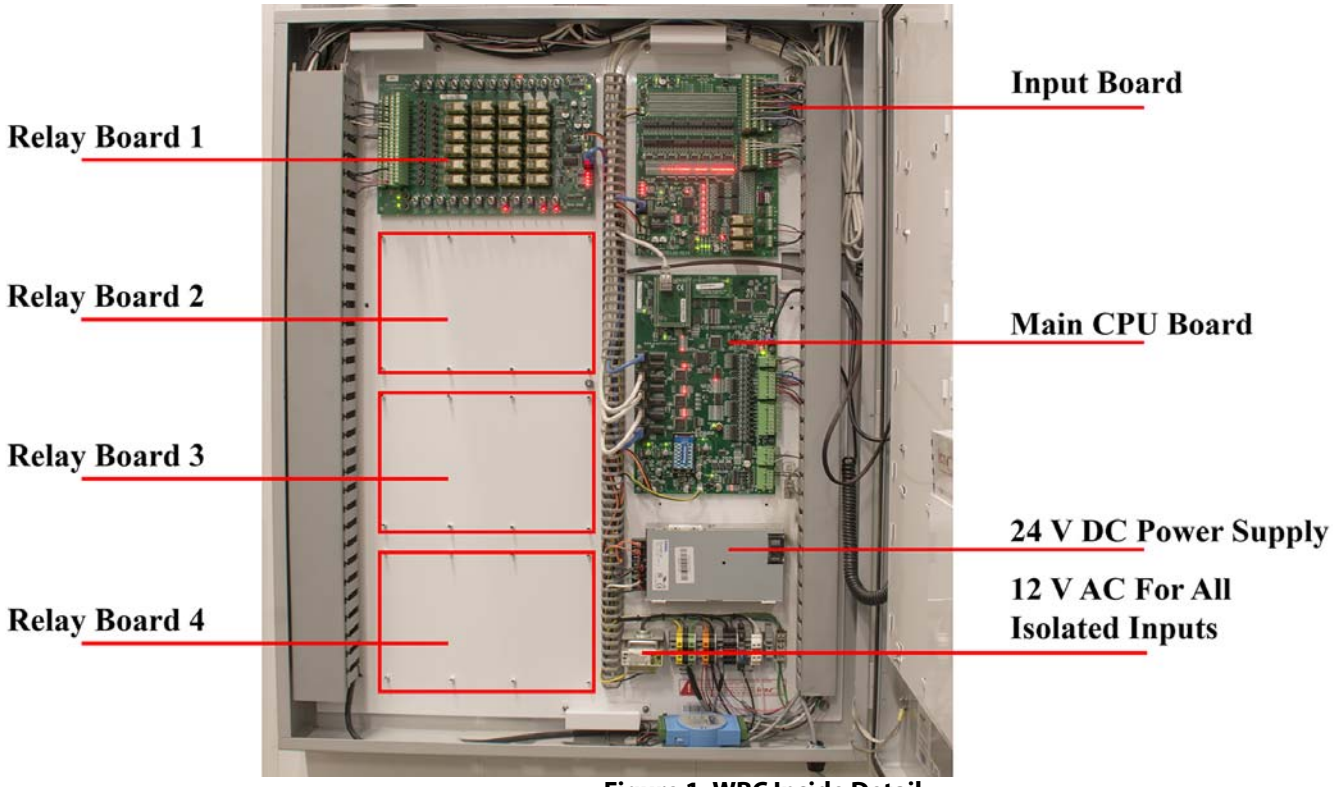


Figure 1. WBC Inside Detail

Figure 2. WBC Front Panel Detail

Planning for Installation

- Before you begin, please read this entire manual.
- Permanent connections to be installed and used in accordance with local building/fire codes, all Federal, State, and Local codes.
- All wiring must meet the National Electrical Code ANSI/NFPA 70.
- Canadian users must also comply with the Canadian Electrical Code CEC, CAN/CSA C22.1 Pt. 1.
- Wiring can be contained in rigid PVC conduit or metal conduit.

- High-voltage (AC) and low-voltage (DC) must not be combined in a common conduit, junction box, or wire trough.
- Power for the Tunnel Master® *wbc* and any peripherals must come from the dedicated UPS, as supplied by ICS.
- The Tunnel Master® *wbc* and peripheral equipment must be properly grounded.

📖 *See "Site Grounding Considerations" on page 21.*

- Test connections in the manual override position prior to system start-up.
- Check through all boxes and cartons before disposing of them for manuals, cables, connectors, etc.

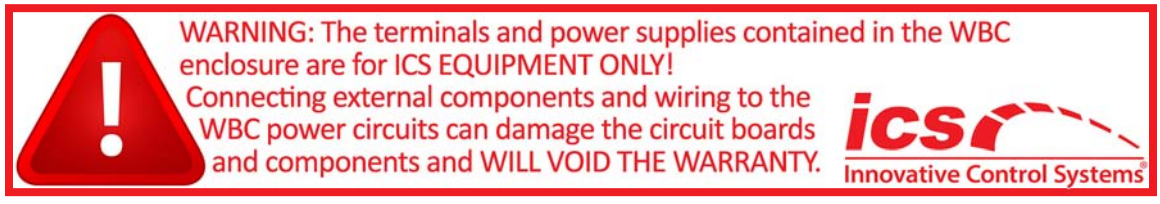
Training and Support

Contact Innovative Control Systems for additional training and support.

800-246-3469

Warning Markings

The symbol below (on equipment and hardware) indicates you should consult accompanying documentation before proceeding.



CHAPTER 2:
Site Planning

Careful planning for the layout of the site will help eliminate possible problems with the start-up of your system and will ensure continued, reliable system operation. In the site planning stage, keep the following objectives in mind:

- Determine the site Layout.
- Prepare to have all the necessary tools and parts.
- Ensure permanent connections to be installed and used in accordance with local building/fire codes, all Federal, State, and Local codes.
- Ensure all wiring and cabling requirements must meet the National Electrical Code ANSI/NFPA 70.
- Canadian users must also comply with the Canadian Electrical Code CEC, CAN/CSA C22.1 Pt. 1.

Determine the Location

There are a few primary concerns to consider when determining the site layout for the Tunnel Master® *wbc*.

- The Tunnel Master® *wbc* must be securely mounted to the wall in the equipment room of the car wash.
- The Tunnel Master® *wbc* is designed to be located in a dry, non-corrosive, interior surface.
- The unit has been designed to operate in an environment of 32° F to 122° F (0°C to 50°C).

- The unit is 130 lbs., 32" W × 40" H × 12" D with a hinged-panel door. Hinges are on the right. The door swings open from left to right. The unit must be located with enough clearance for the door to open easily, without interfering with entrances and exits from the equipment room.
- A minimum of 48 inches of clearance is recommended. This clearance should be available both in front of the door and on the wall to the right of the unit. This minimum will give enough clearance for the door to swing out and be fully opened.
- The WBC box must be located so that conduit connections can be easily made, and the relays can be readily accessed.
- Recommended minimum mounting height of 32" off ground to bottom of box. Installer shall first follow any local codes, which supersede this recommendation.

Equipment Dimensions

When mounting the unit, minimum clearances must meet local codes.

Table 1: Dimensions, Measurements and Ratings

Dimension	Amount	Notes
Width.	32"	—
Height.	40"	—
Depth.	12"	Includes the plastic face.
Weight.	130 lbs.	Inclusive of the box, board and door.
Operating Temp. Range.	32°F to 122° F 0°C to 50°C	Interior, non-corrosive surface.
Frequency.	60 Hz.	—
Supply Voltage.	110 VAC	—
Max. Amps.	6.0 Amps.	—
Power Supply.	15 Amps.	Power must come from a dedicated, 15-Amp. breaker.
IPX0 Rating.	Ordinary rating.	The *Tunnel Master® wbc* is not rated for protection against dust and liquid ingress.

Mounting the Tunnel Master® *wbc*

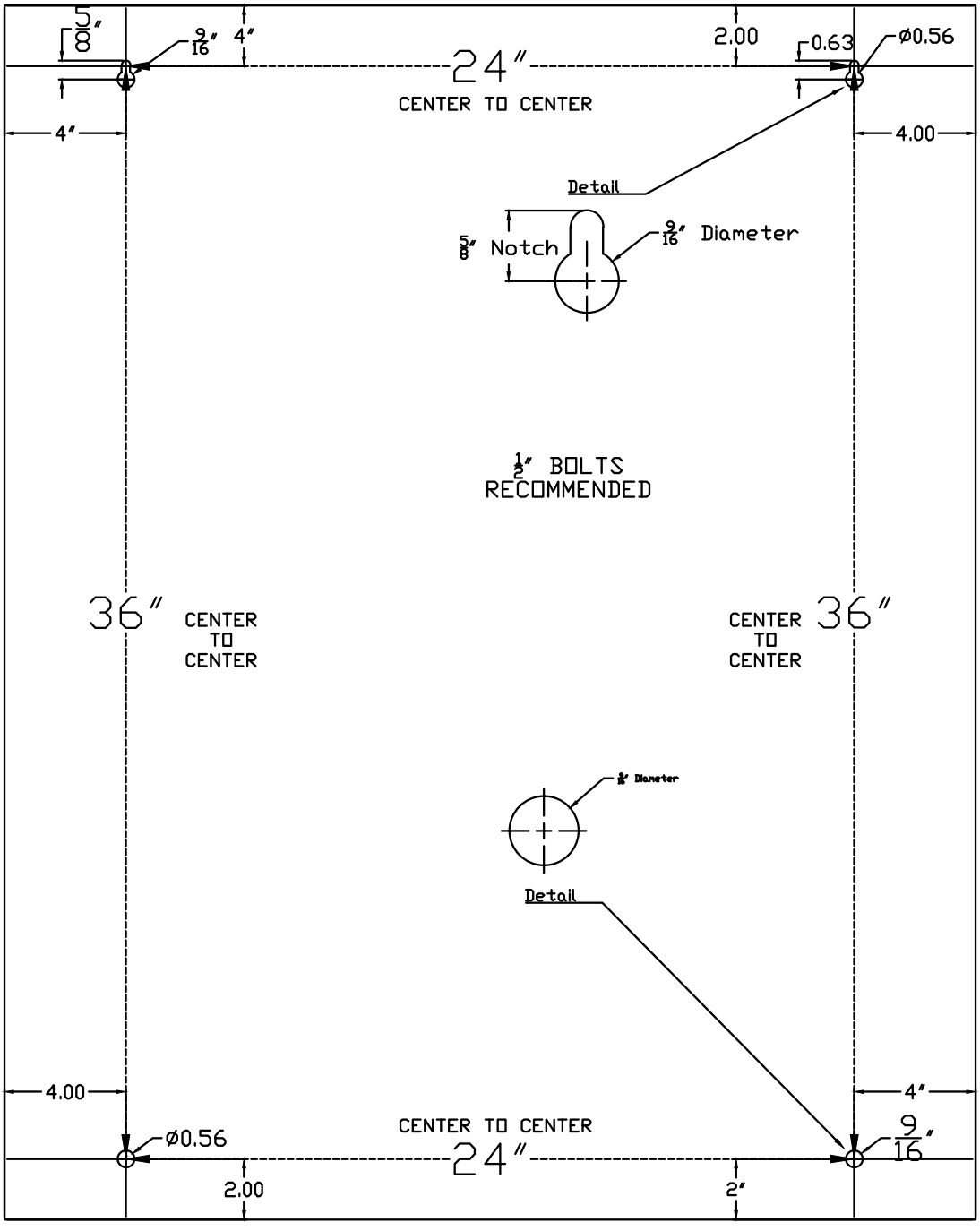


Figure 3. WBC Mounting Box Footprint

Power Requirements

- Electrician must provide a dedicated 15 A, 120 V AC circuit to power the Tunnel Master® *wbc* box. This dedicated circuit must supply the UPS. The UPS will supply power to the WBC.
- A separation of 120 V AC and 24 V AC shall be maintained for all field-wiring circuits. All 24 V AC circuits must be supplied by a class-2 transformer, which is to be provided by the electrician. Electrician must determine proper size of transformer, depending on total required power consumption.
- The Tunnel Master® *wbc* unit must be properly grounded.

📖 *See "Site Grounding Considerations" on page 21.*

Conduit Run Guidelines

When running wires to and from the Tunnel Master® *wbc* unit, follow these guidelines:

- Punch conduit holes through bottom of WBC box whenever possible.
- Use wiring channels inside WBC box (left and right sides) to contain wires.
- Run a 14–3 cable, from a UPS output, to the 120 V AC terminal block. The terminal block is labeled with L and N for Line and Neutral. There is a mechanical ground lug located in the lower-right corner near the AC terminal block within the box. It is labeled with the universal ground symbol.
- All conduits runs should meet local and national codes. Conduits shall be properly connected and securely fastened to the boxes with listed conduit hubs, and should be tightened to the torque specs of the manufacturer. Over-torquing may cause enclosure breakage.
- Tighten all wires on the circuit board terminal blocks to 15 inch-pounds. Over-torquing may cause breakage.
- All conduit must be rigid PVC or metal.

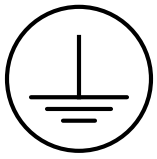
High-voltage (AC) and low-voltage (DC) must not be combined in a common conduit, junction box, or wire trough.

Site Grounding Considerations

The Tunnel Master® *wbc* and peripheral equipment must be properly grounded.

Recommended and Accepted Grounding Methods

Proper system grounding is an extremely important part of the system installation. Grounds for all system devices should be wired to the breaker panel ground bus bar which, in turn, should be grounded to a ground rod. A conduit ground does not provide a sufficient ground. It is recommended that the neutral and ground bus bars be bonded together when it is not prohibited by local codes.



The universal ground symbol identifies the grounding lug connector located inside the lower-right hand corner of the Tunnel Master® *wbc* box.

Ground wire must be connected to the ground lug. Failure to properly ground the unit could result in unit failure and/or bodily injury.

NOTE: Improper grounding will void equipment warranty.

Wire Gauge and Conduit Size

When planning the orientation of the wiring runs, follow the applicable ICS wiring diagrams and consider the layout of the components at the site.

To determine conduit size needed, see the table below for more information.

Table 2: Max. Number of Wires (THHN) in a Given Conduit Size

—	½	¾	1	1 ¼	1 ½	2	2 ½	3
AWG 14	13	24	39	69	94	154	—	—
AWG 12	10	18	29	51	70	114	164	—
AWG 10	6	11	18	32	44	73	104	160
AWG 8	3	5	9	16	22	36	51	79
AWG 6	1	2	6	11	15	26	37	57
AWG 4	1	1	4	7	9	16	22	35
AWG 3	1	1	3	6	8	13	19	29
AWG 2	1	1	3	5	7	11	16	25
AWG 1	1	1	1	3	5	8	12	18

CHAPTER 3:
Electrical Installation

The Tunnel Master® *wbc* is the control center for "firing" the various outputs or services in the wash tunnel, (e.g., soap foamer, reclaim motor, etc.). The Tunnel Master® *wbc* provides for automatic, computer controlled or manual firing of the outputs. The system can control up to 192 outputs and 64 inputs (48 of which are user-programmable).

Locating and Identifying Boards and Terminal Blocks

This section provides details on board/component locations and terminal block identification.

Interior

The Tunnel Master® *wbc* includes the following:

- Main CPU board
- Input board
- Up to four directly connected relay boards
- 24 V DC power supply
- 12 V AC transformer used for supplying the following:
  - Isolated 5 V DC RS485
  - 5 V DC for 16 main CPU board inputs
  - 48 auxiliary inputs on the input board
  - All start/stop inputs

WBC Board Orientation and Layout

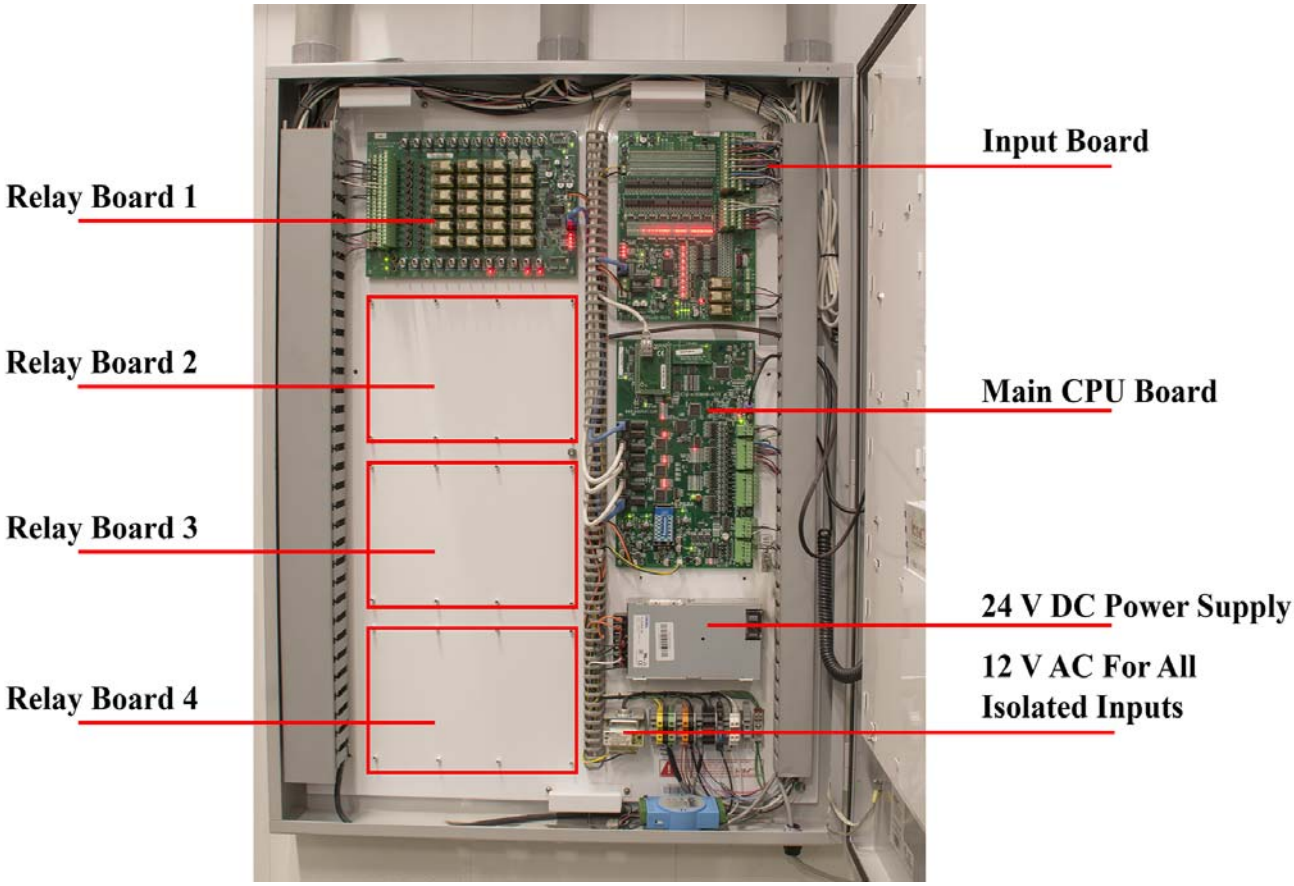
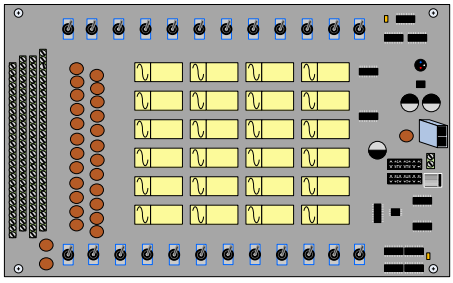
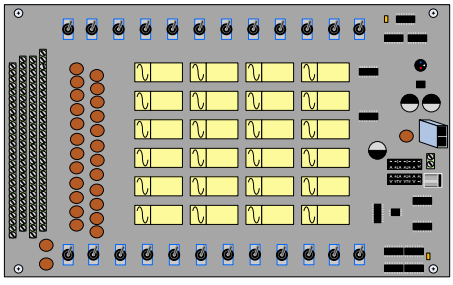


Figure 4. Tunnel Master® *wbc* Board Orientation and Layout (Image)

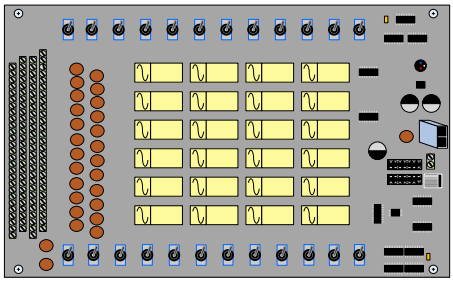
RELAY BOARD #1 RELAYS 1 - 24



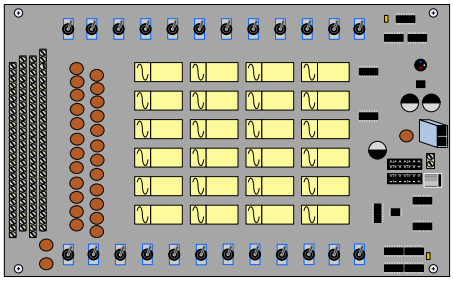
RELAY BOARD #2 RELAYS 25 - 48



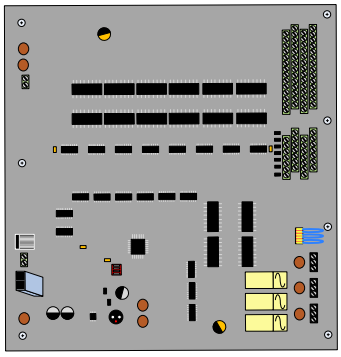
RELAY BOARD #3 RELAYS 49 - 72



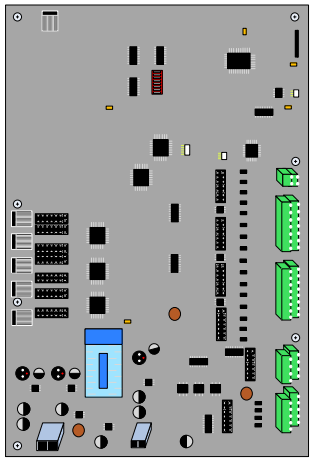
RELAY BOARD #4 RELAYS 73 - 96



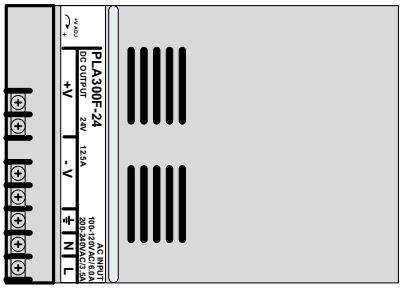
INPUT BOARD

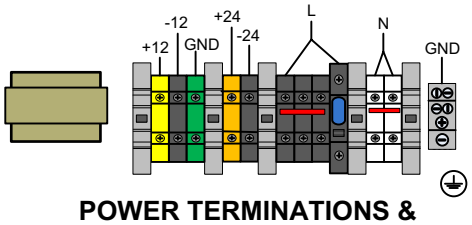


MAIN CPU BOARD



PRIMARY POWER SUPPLY





POWER TERMINATIONS & TRANSFORMER

Figure 5. Tunnel Master® *wbc* Board Orientation and Layout (Detail)

Main CPU Board Overview

The main CPU board includes a microprocessor module, and 16 main inputs. It drives up to four in-box relay boards and one in-box input board.

LED indicators display the status of inputs. A data flash module is included for storage of configuration settings. One eight-port DIP switch is included.

One RS232 port is available for debug. The main CPU board drives the included PS2 keyboard and 640 × 480 color display monitor.

One RS485 port with two connectors is included. It is available for connecting a wash selection keypad.

LEDs are available for all the I/Os including the RS232/485 connections.

The main status LEDs include the following:

- LED1–Logic
- LED2–Auto pulse
- LED3–6 Reserved
- LED7–Chain travel
- LED8–Conveyor Status

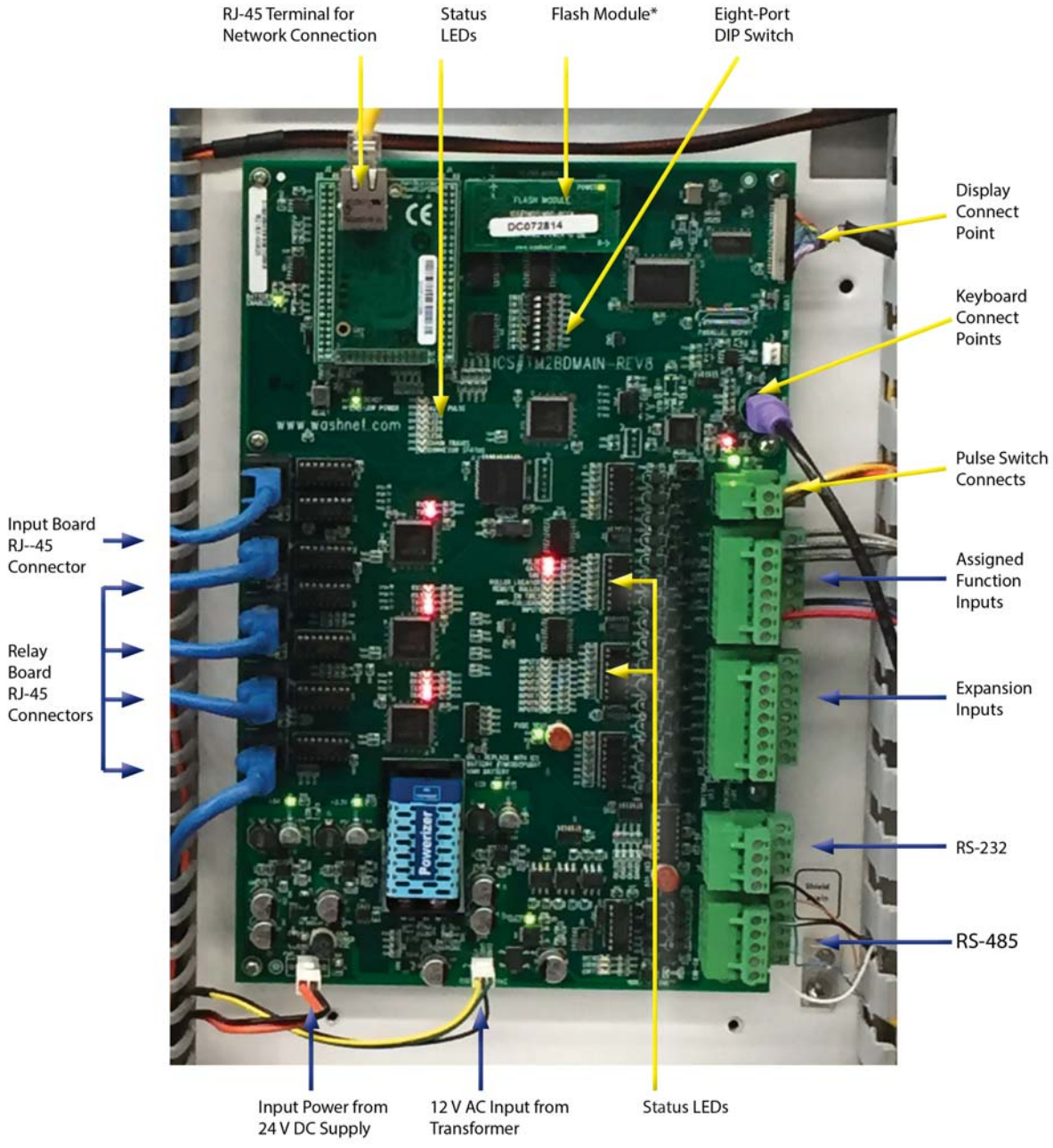


Figure 6. Main CPU Board

MAIN CPU BOARD DETAIL

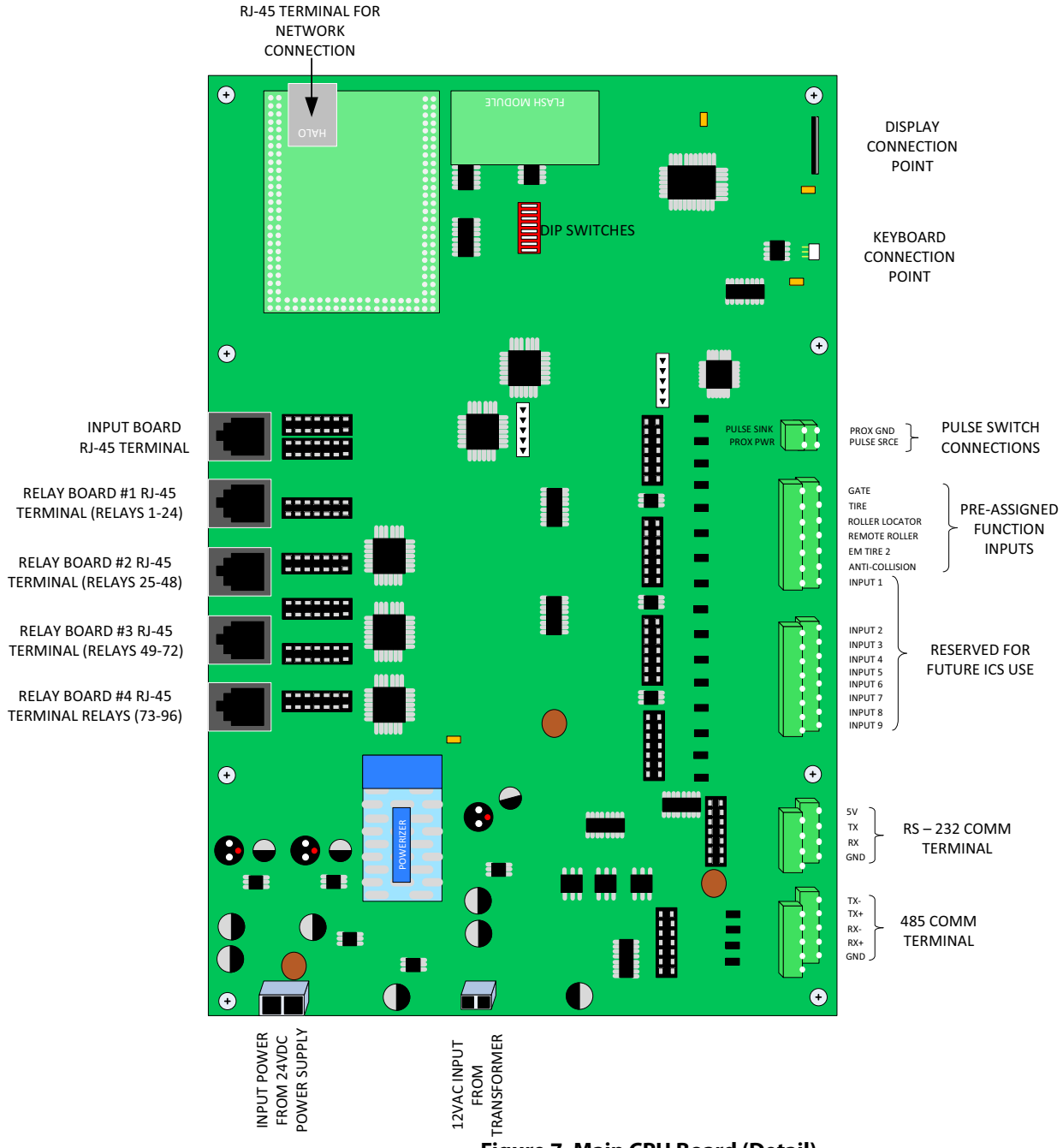


Figure 7. Main CPU Board (Detail)

Table 3: Main CPU Terminal Block Inputs

Terminal Block	Input Name	Description
Pulse Input	PULSE SINK	When using a normally open, two-wire pulse switch, use terminals marked PULSE SINK and PROX GND. See “Pulse Switch Wiring” on page 41.
	PROX GND	
	PROX POWER SINK GND	When using a normally open three-wire pulse switch, use terminals marked PROX POWER, PULSE SINK, and PROX GND. System provides 18 V DC power. See “Pulse Switch Wiring” on page 41.
	POWER PULSE SRCE GND	When using a normally closed three-wire pulse switch, use terminals marked PROX POWER, PULSE SRCE, and PROX GND. See “Pulse Switch Wiring” on page 41.
Main Inputs	GATE SIGNAL	General note: ICS highly recommends using shielded cable for all input wiring. Terminate the shield drain as close to the 24 V AC power supply as possible. See “Main Inputs Wiring” on page 42.
	TIRE SWITCH	
	ROLLER LOCATOR	
	REMOTE ROLLER	
	ENTRANCE MGMT	
	ANTI-COLLISION	
	DELAYED PANIC	If this input is active, the conveyor will pause for the programmed amount of time before entering a full Panic Stop Mode.
Expansion Inputs	INPUT2–9	Reserved for future ICS use.

Input Board

The input board provides monitoring and error reporting of all 48 inputs wired to the inputs terminal block. Auxiliary inputs help report the state of the tunnel. If an error condition or event occurs, you can use the inputs as monitors to receive alerts or set the tunnel into a panic stop mode. The input board works independently of main CPU board.

- The input board includes eight stop inputs. One stop input is controlled by the computer. Seven stop inputs are directly controlled by push-button stops. All stop input circuits must be closed for the conveyor to work.
- The input board includes eight start inputs. One start input is controlled by computer. Seven start inputs are directly controlled by push-button starts.

The input board includes 48 undesignated, optically isolated inputs. The board also features on-board relays to control the horn and the conveyor. A DIP switch bank controls the delay time between the horn and the conveyor start.

Normal Operation

Component JP29 enables normal operation on the input board. This is the default configuration.

Bypass Mode

Component JP30 enables bypass operation on the input board. You must remove the connector from JP29 and plug it into JP30 to enable bypass

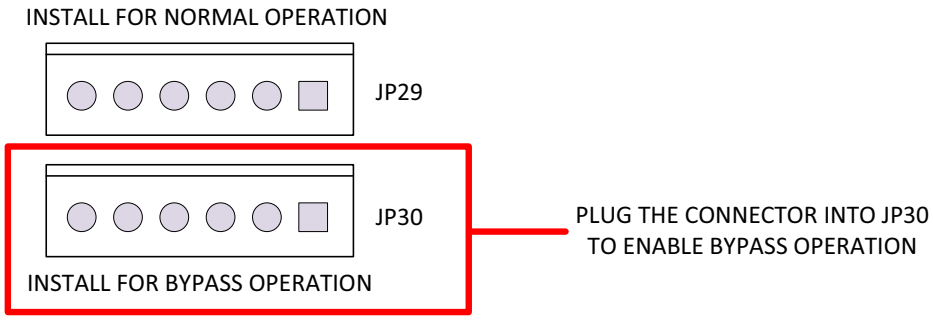


Figure 8. Normal and Bypass Operation Settings

Transformer Selector

This jumper is used to select the input voltage for the 48 inputs. Customers can choose a separate external voltage for the inputs.

- **When configured to use internal (I)**: The voltage supplied on the INTERNAL 12 V AC POWER INPUT TERMINAL connector will be used for dry contact operation -- Not Recommended.
- **When configured to use external (E)**: The voltage must be supplied to the common, and then switched out -- Recommended.

Input Board

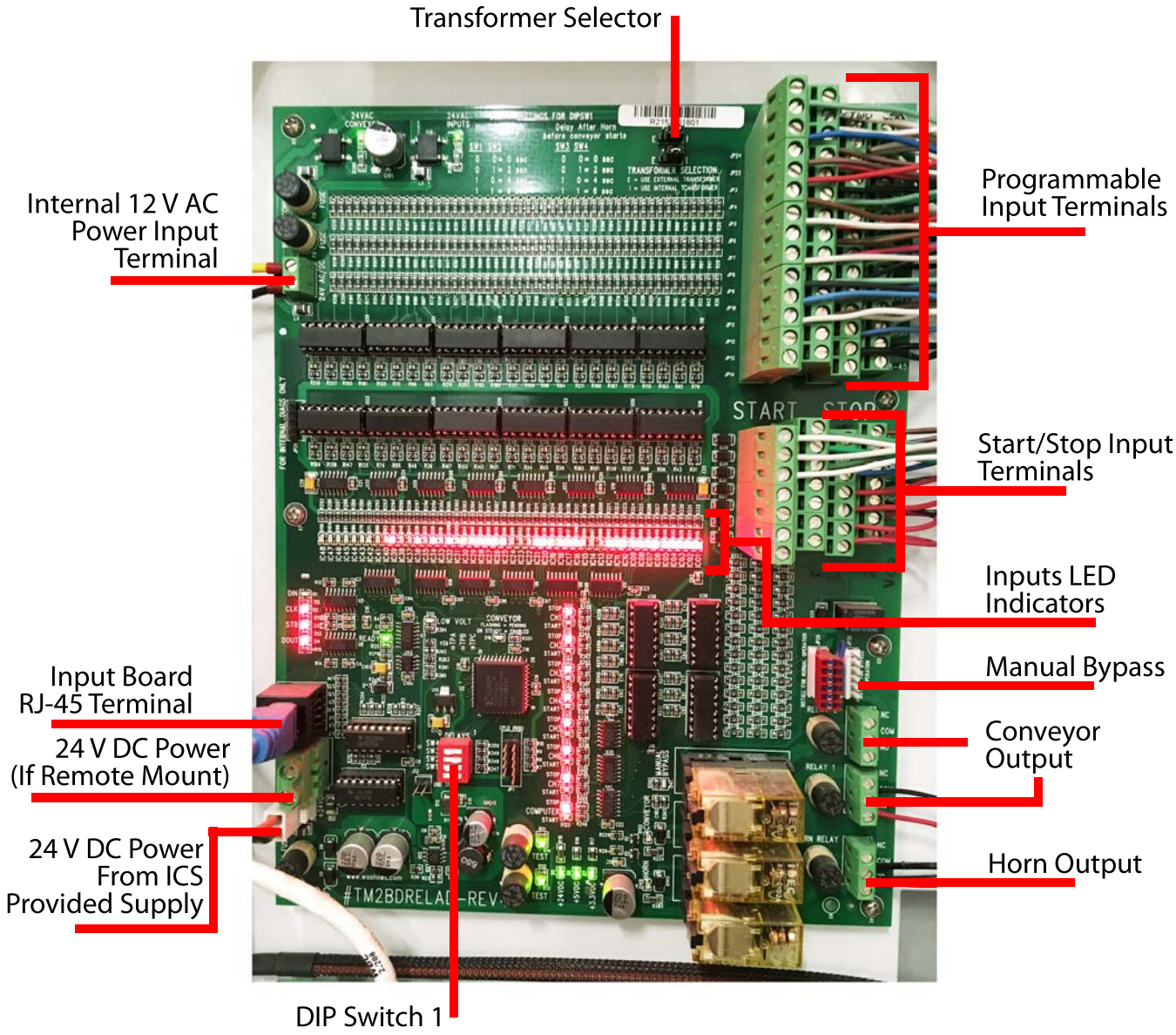


Figure 9. Input Board (Image)

WBC INPUT BOARD DETAIL

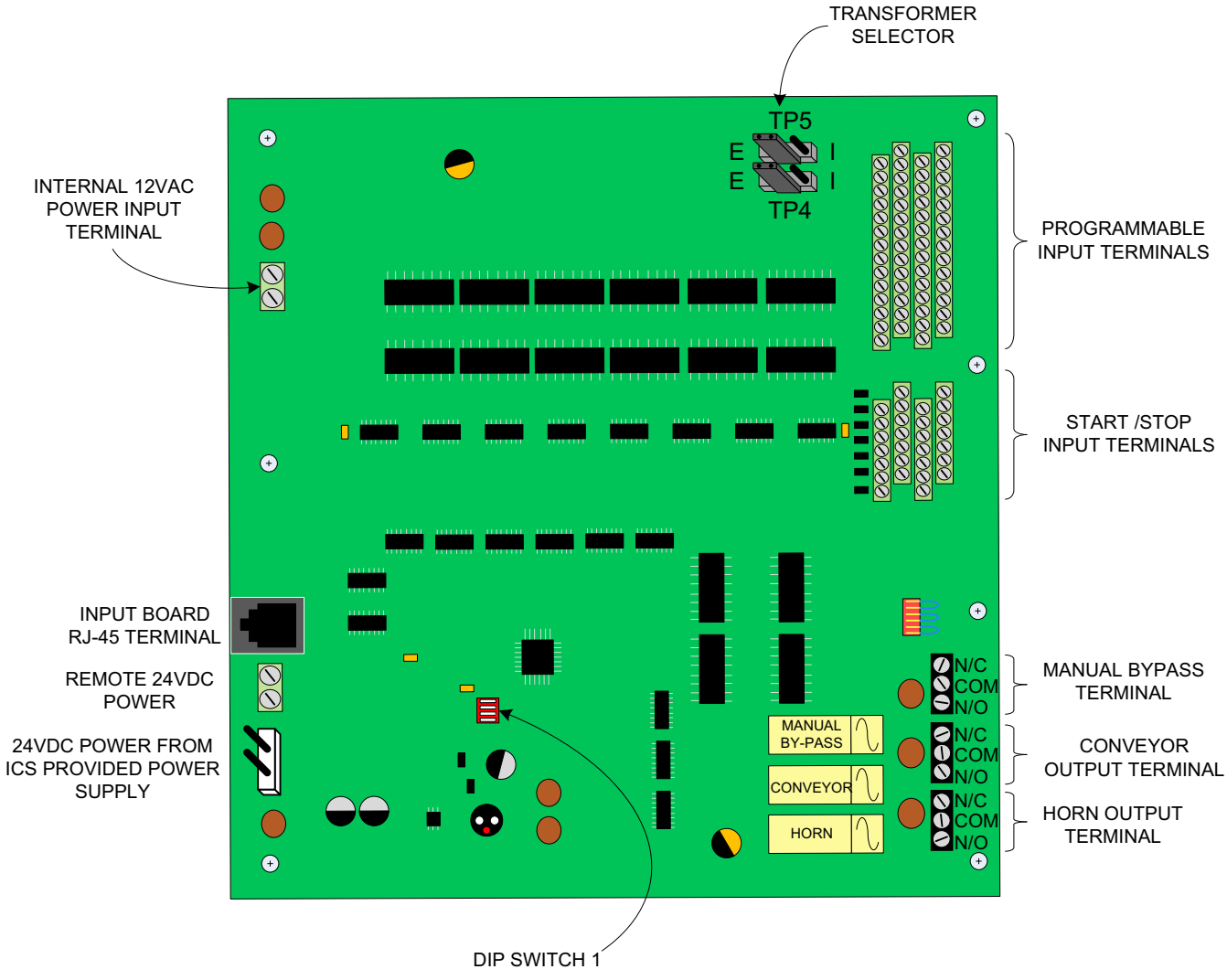


Figure 10. Input Board (Detail)

Relay Boards

The Tunnel Master® *wbc* ships with one relay board (standard). Up to three additional boards can be mounted inside the box (additional fees apply). Separate data and power cables are used for each board. Each board supports 24 relays for a total of 96 [24 × 4 = 96] directly controlled relays. A manual override switch is included for each relay. Each board includes a 24 V DC power terminal for remote relay board installations of up to 200 feet.

A single relay can be configured in ten ways as outputs.

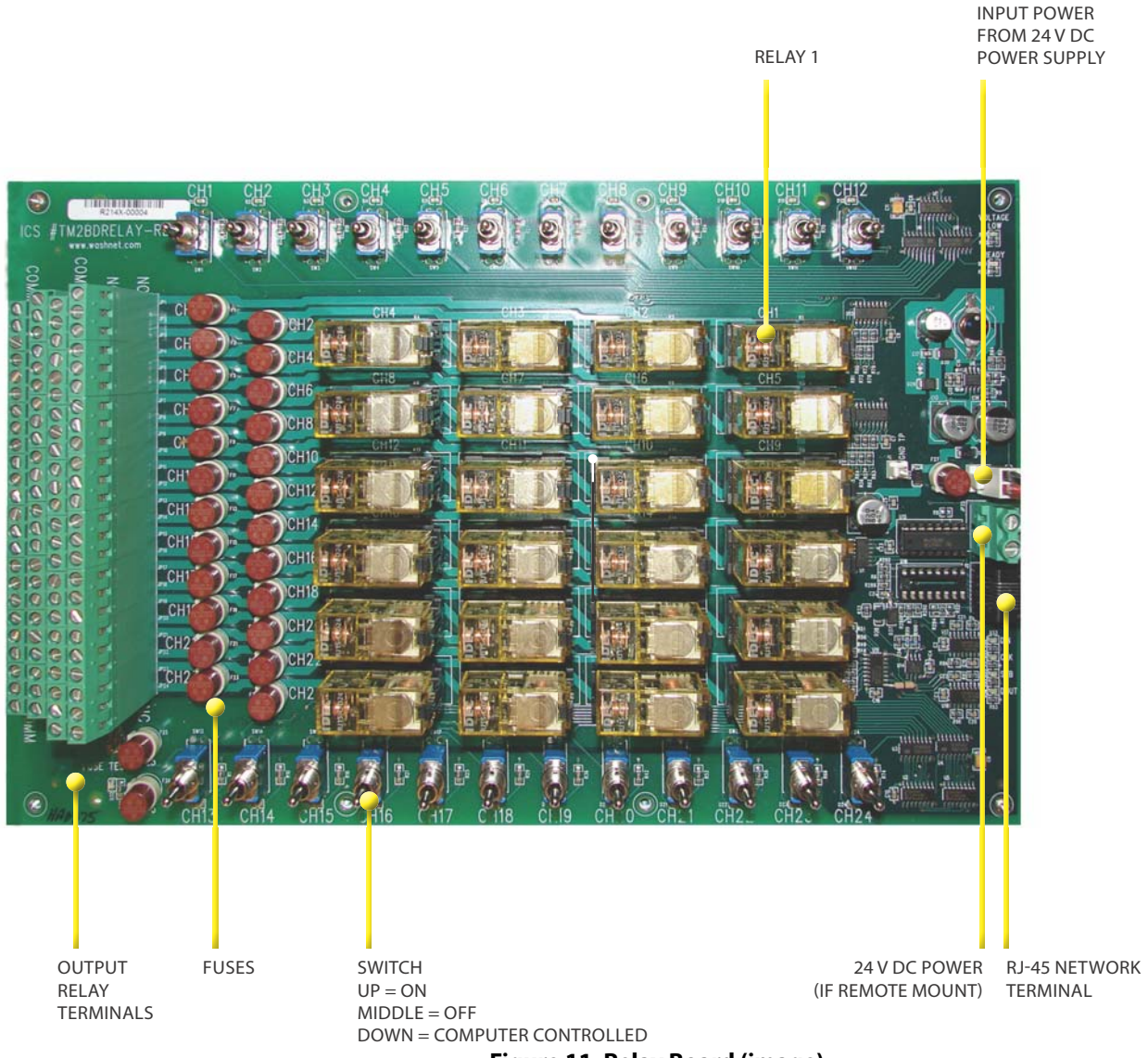


Figure 11. Relay Board (image)

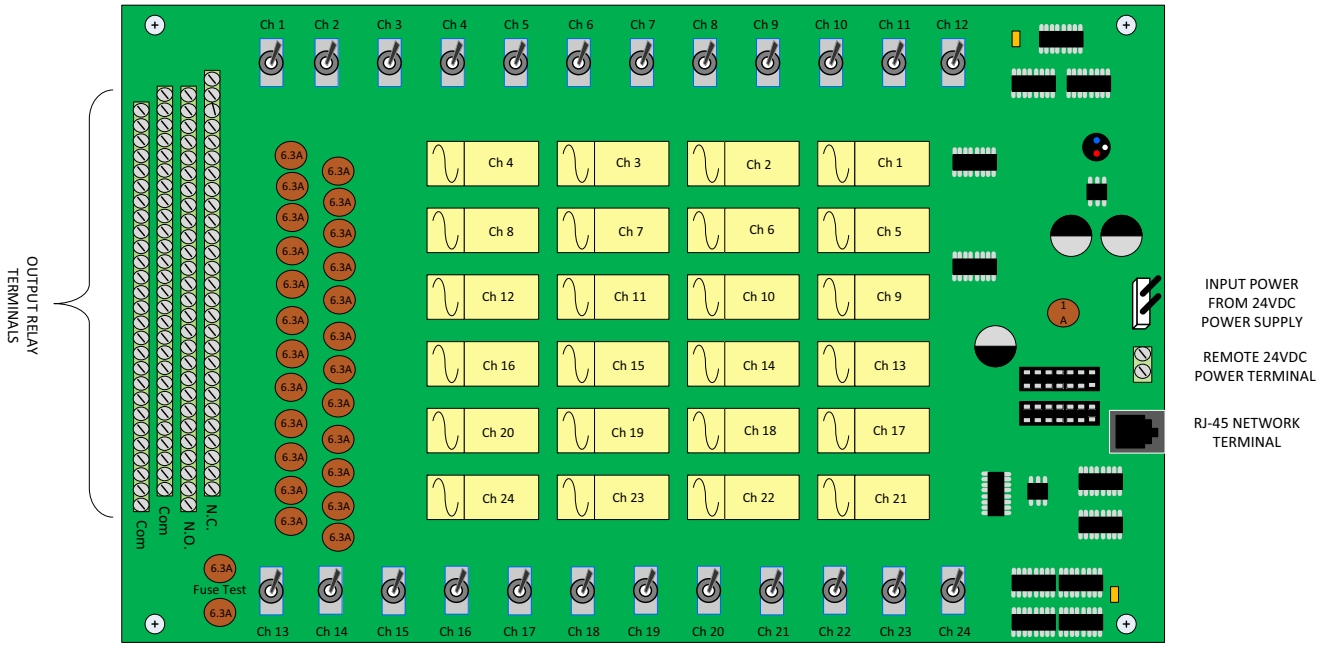


Figure 12. Relay Board (Detail)

Relay Board Wiring Guidelines

- Relays on the relay boards are single-pole.
- A 6.3 amp, 250 V fuse protects each relay. Spare fuses along with LED fuse test indicators are located at the bottom-left of the relay board.

NOTE: Fuses should not be replaced with any device other than those supplied and specified by Innovative Control Systems.

- Spare relay board fuses are contained in the Tunnel Master® *wbc* packaging.
- Relay circuits should be supplied with no greater than 120 V AC, 15 amp. This 120 V AC **must be a separate circuit** from the dedicated 120 V AC circuit used to supply power to the WBC box.
- Electrician can supply a separate 24 V AC and/or 120 V AC circuit to the common (C) terminal block. Then, the commons can be tied together via the supplied six-pole jumpers or daisy-chained individually with the appropriate gauge wire. This power is to "fire" the solenoids and equipment.

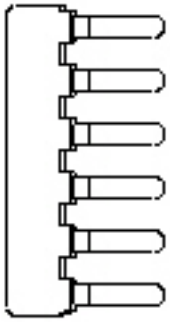


Figure 13. Jumpers for Relay Board Terminal Blocks

Jumpers

ICS supplied six-pole jumpers for relay board terminal block wiring.

Phoenix Contact®, order number 1733 208, Part EBP 6-5

Start/Stop Inputs Wiring

Wiring is to be done on the input board.

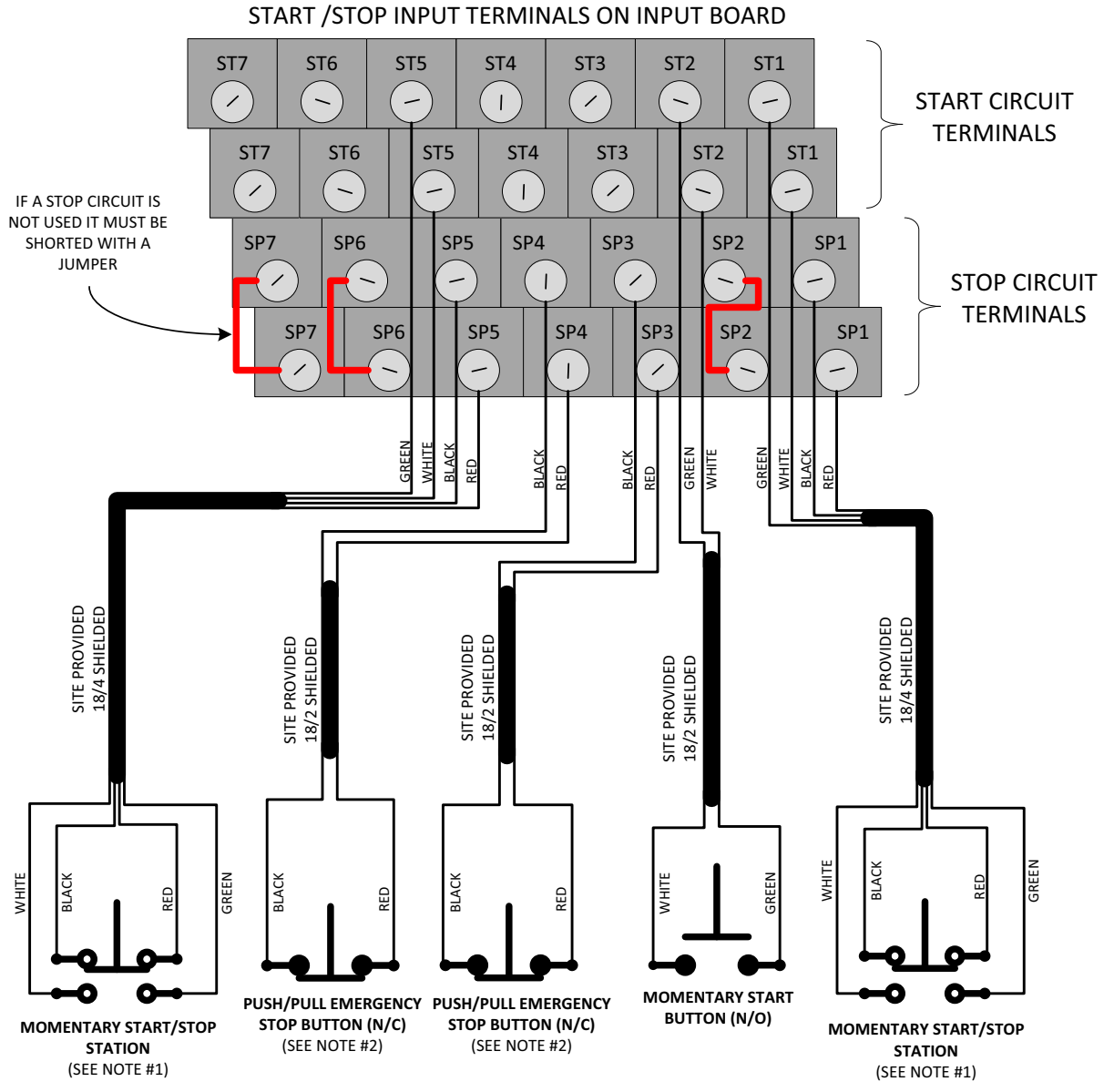


Figure 14. Wiring for Start/Stop Stations and Emergency Stop Stations

NOTES:

1 Each momentary start/stop station must be home-run with 18/4 shielded cable back to the input-conveyor interlock board inside the controller cabi-

2 Each push/pull e-stop mushroom button must be home-run with 18/2 shielded cable back to the input-conveyor interlock board inside the controller cabinet. The e-stop button may be with or without a lockout.

Horn, Conveyor and Manual Bypass Wiring

Wiring is to be done on the input board.

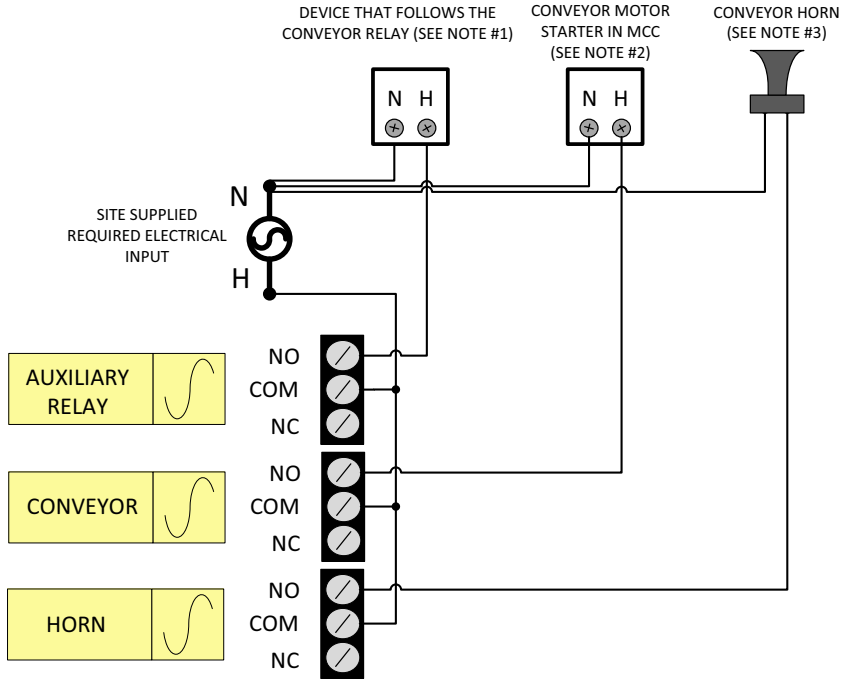


Figure 15. Wiring of On-Board Relays for Conveyor Start Circuit

NOTES:

1 The manual bypass relay will activate and deactivate as the conveyor relay does. Any piece of tunnel equipment that is meant to be on and off with the conveyor, should be terminated to this relay.

2 The conveyor relay will activate upon the start circuit being momentarily closed or a wash having been loaded into the controller, dependent upon how the controller is programmed. This relay will remain fired until after the last car in the tunnel has passed the last piece of equipment in the tunnel, plus that piece of equipment's extend time, plus the value programmed for the auto stop delay.

3 The horn relay will activate if the conveyor is stationary and a wash has been loaded into the controller. The horn will activate for the time programmed through the settings of dip switch one and two on the input board. The extend time represents the pause in seconds between the horn relay deactivating and the conveyor relay activating. It is programmed through the settings of dip switch three and four.

Conveyor Relay Wiring

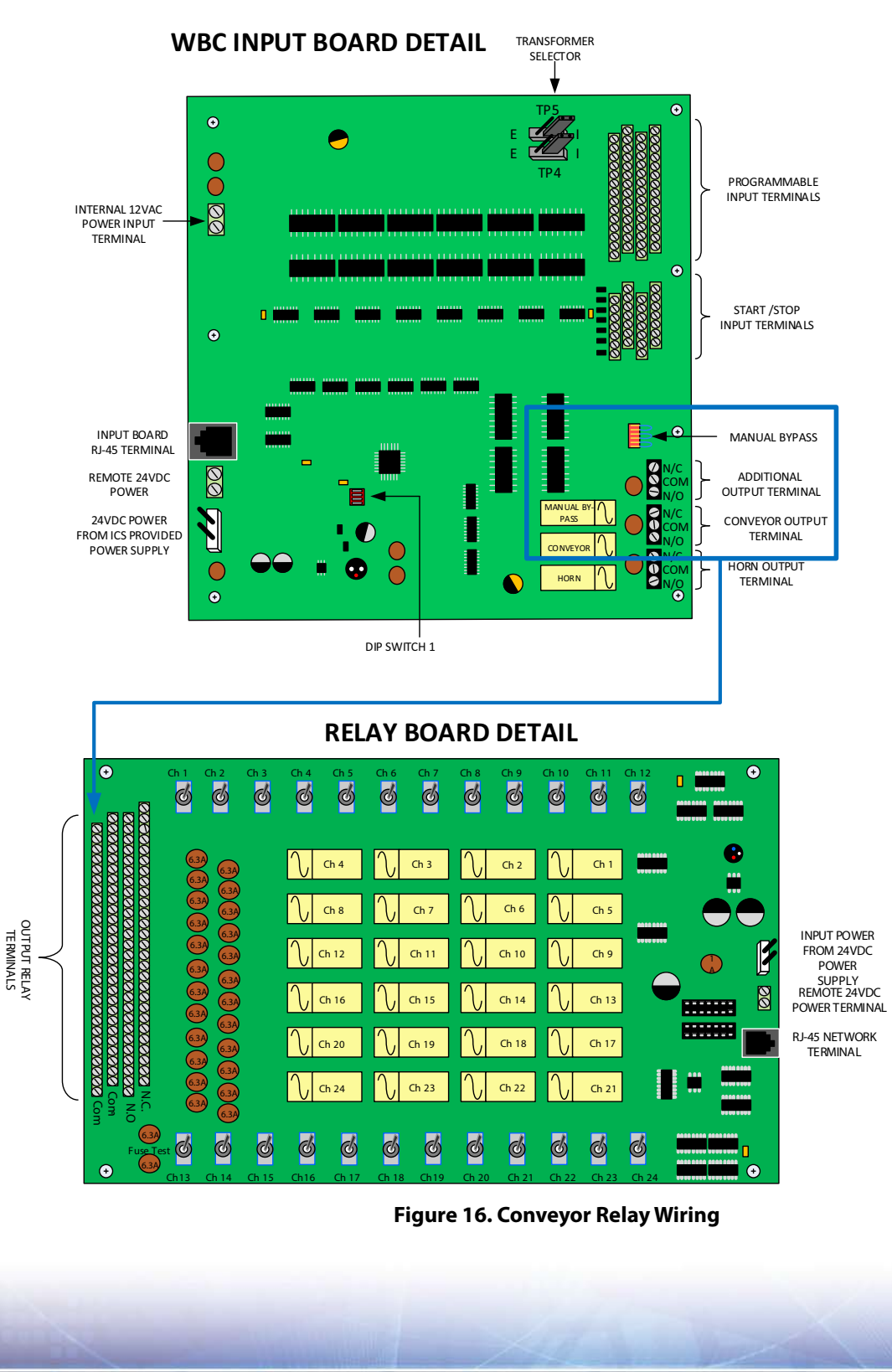


Figure 16. Conveyor Relay Wiring

Wiring for the conveyor control circuit is energized via a separately configured conveyor relay. Conveyor Wiring summary is as follows:

- Conveyor relay on input board is wired to designated conveyor relay on dedicated relay board, and from there, wired to conveyor equipment.
- Input supply voltage (e.g., 120 VAC or 24 VAC) for all equipment is switched through Relay 1 or Relay 2 on the input board.
- Normally Open (NO) terminal block for Relay 1 or Relay 2 on the input board is wired to the Common (C) terminal position of the Relay board for the designated **Conveyor Relay**.
- Normally Open (NO) terminal block on the designated **Conveyor Relay** is wired to the conveyor equipment.

Details include the following:

- During a panic stop, the circuit is guaranteed to break power to the relays and thus **not** depend on computer to stop.
- During a staggered restart, the computer initiates a wash start, which energizes the relays. Only at the end of the wash start is the conveyor relay turned on.
- Wetdown process turns on the conveyor relay.

Conveyor Relay DIP Switch Settings

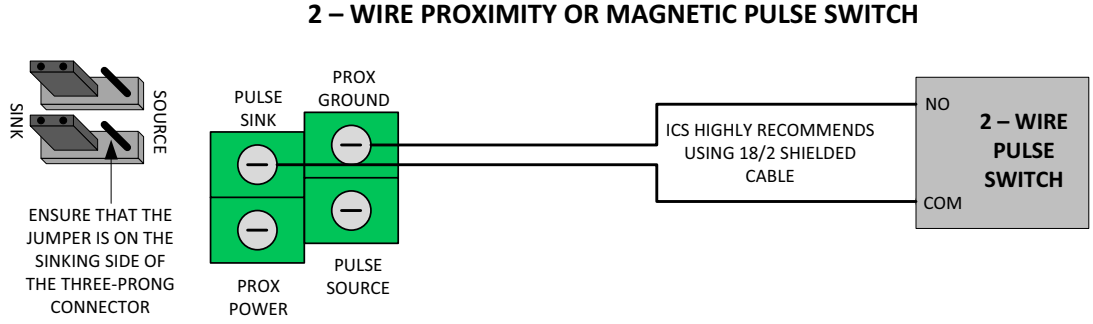
The conveyor horn and delay control is handled via the DIP switch settings on the input board.

The DIP switches on the input board follow the silk-screen reference on the board (0 and 1) to determine the desired switch positions.

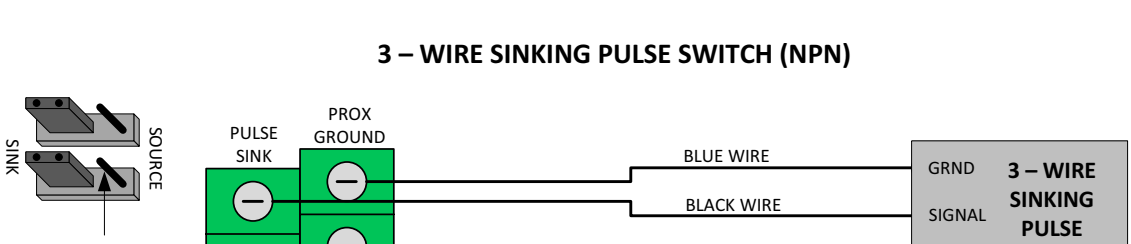
Pulse Switch Wiring

Wiring is to be done on the main CPU board.

2 – WIRE PROXIMITY OR MAGNETIC PULSE SWITCH



3 – WIRE SINKING PULSE SWITCH (NPN)



3 – WIRE SOURCING PULSE SWITCH (PNP)

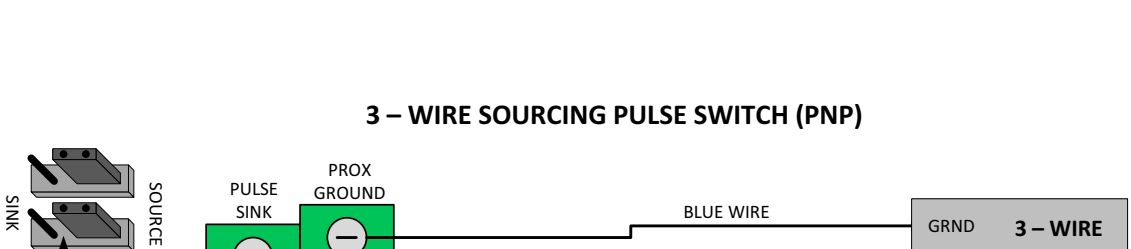


Figure 17. Pulse Switch Wiring

Main Inputs Wiring

Wiring is to be done on the main CPU board.

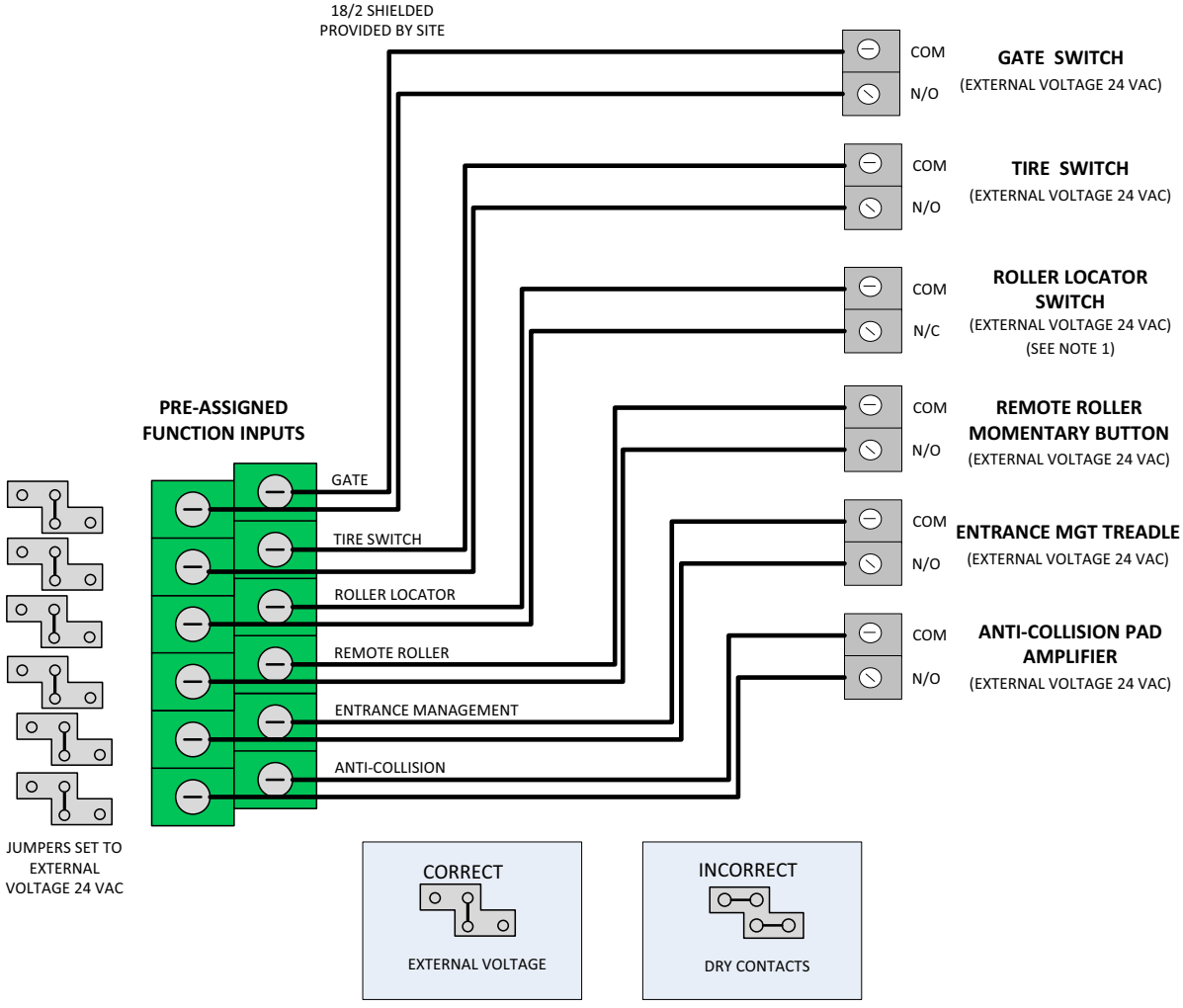


Figure 18. Main Inputs Wiring

GENERAL NOTE: ICS highly recommends using shielded cable for all input wiring.

Terminate the shield drain on the ground lug provided in the controller.

Jumpers for each input must be set to external voltage 24 VAC.

NOTE 1: Optimally, the roller locator switch should be wired normally closed to the ICS controller. Wiring the roller locator switch normally-open is acceptable but will mean waiting longer for the roller to fire.

Delayed Panic Input

The Delayed Panic Input, if active, will pause the conveyor for the programmed amount of time before entering a full Panic Stop mode.

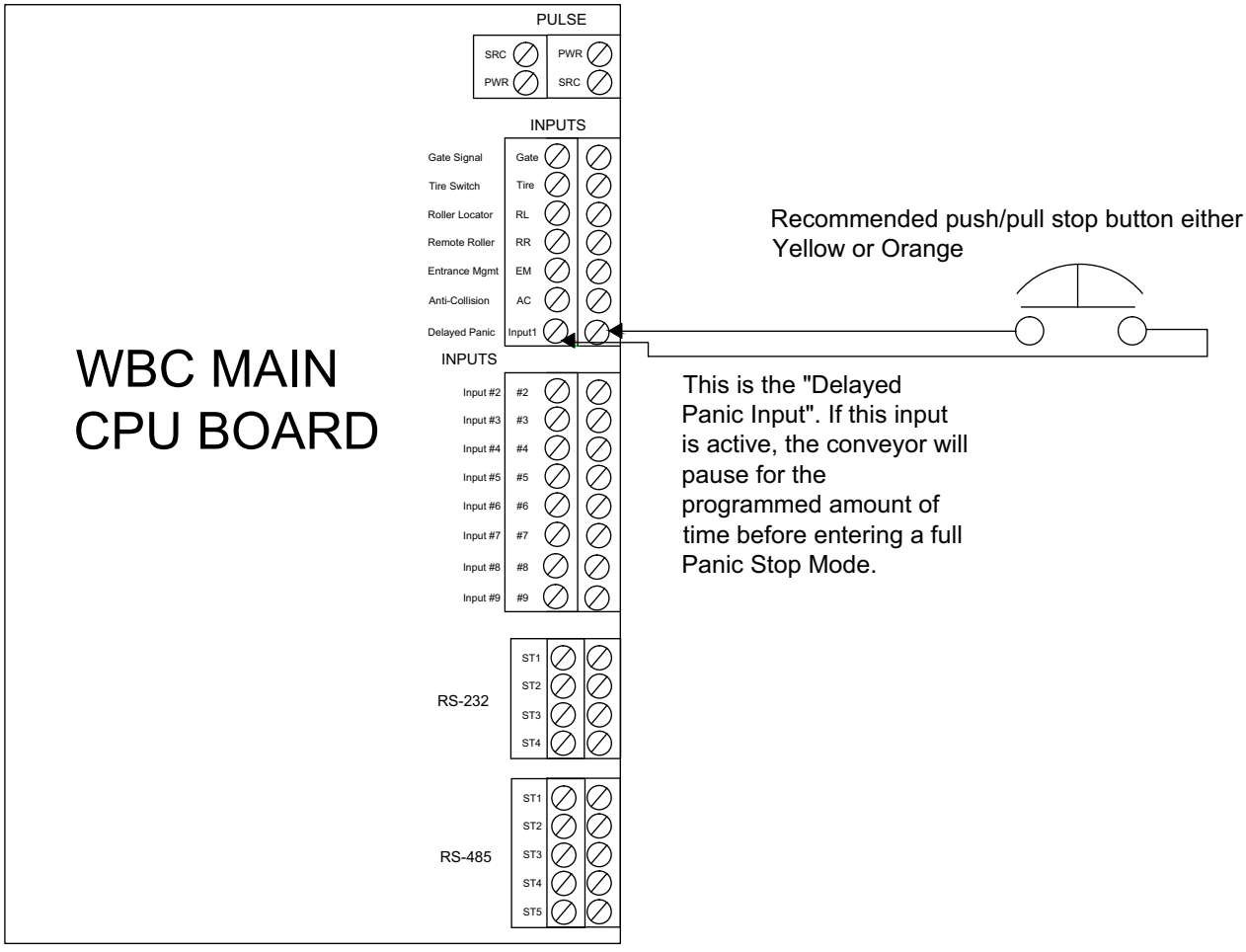


Figure 19. Delayed Panic Input

Common Relay Output Wiring

Common relay output wiring is to be done on the relay board.

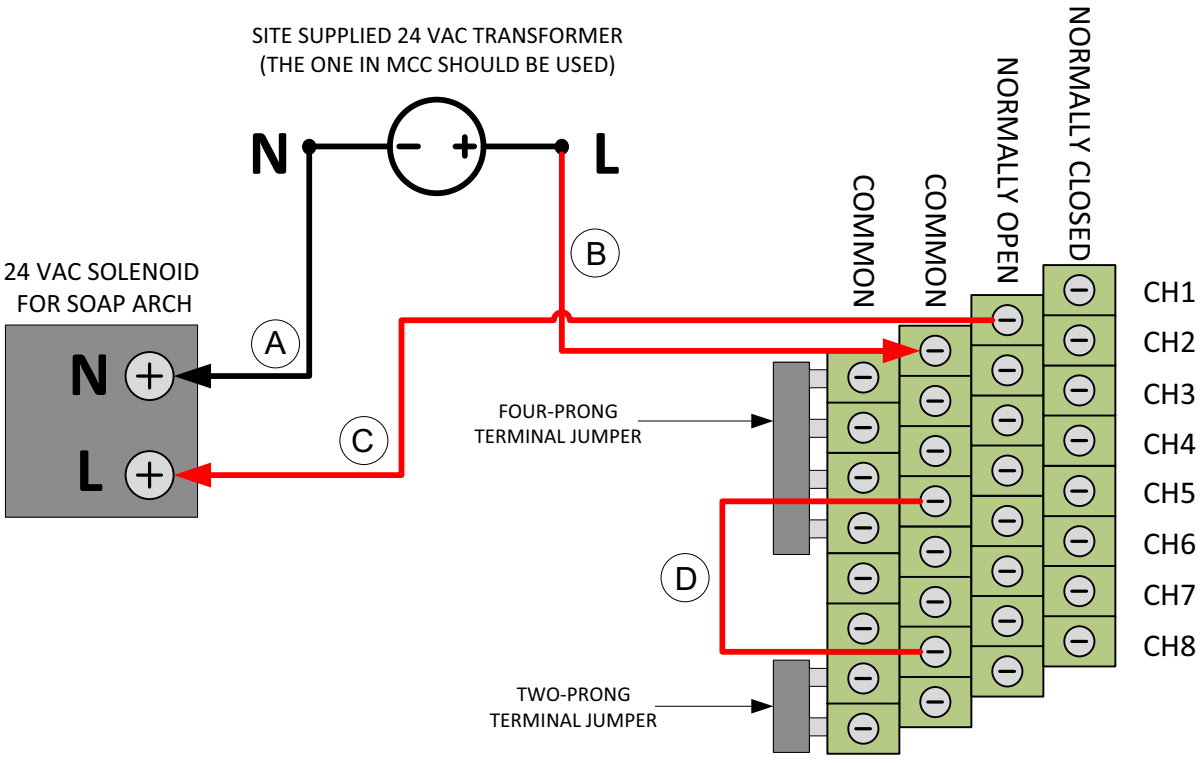


Figure 20. WBC Relay Board Terminations Common Relay Output Wiring

Each relay is referred to as a channel (channels 1 through 24 on each relay board). Each relay is a single pole - double throw (SPDT). On the terminal strip, each channel has two common terminals that are shorted to each other (the upper tier common and the lower tier common), a normally open terminal and normally closed terminal. No voltage is supplied by the relay. A set of dry-contacts is provided at each channel. External power is required to be run through the dry-contacts of each relay, ending at the motor starter, solenoid or device that the relay will be controlling.

If the device to be controlled operates on a 24 VAC, run a wire from the neutral side of the transformer to the neutral side of the device as shown above (wire A). Run another wire (wire B) from the load side of the transformer to the upper tier common of the relay that is to control the device (channel/relay #1 shown). Run a third wire (wire C) from the normally open terminal on channel 1 to the load side of the device controlled by the relay.

If sequential relays will be controlling devices that require the same voltage, jump the required voltage through the commons using the prefabricated shorting bars provided by ICS. Each terminal jumper is long enough to connect the commons for six consecutive channels. If a lesser number of channel commons are to be connected, simply cut-off those not needed with pliers (**NOTE:** the two pin shorting bar connecting the commons for channels 7 & 8). If the number of sequential relays using the same voltage is greater than six, then use two or more shorting bars and over-lap them. Use a wire jumper (wire D) to connect the voltage from one block of shorted channels to another block of shorted channels as shown above.

In Figure 20, "WBC Relay Board Terminations Common Relay Output Wiring," channels 1, 2, 3, 4, 7, & 8 all have 24 VAC connected to their commons and will provide 24 VAC to the piece of equipment that is wired into the normally/open terminal of each relay. Channels 5 & 6 have been left open for another voltage to be connected to them.

NOTES: The prefabricated terminal jumpers should be terminated into the lower common tier and all wire feeds to the commons and wire jumpers should be made on the upper common tier. This will prevent the terminal jumpers from covering up any screw terminals.

Common Relay Output Wiring (cont.)

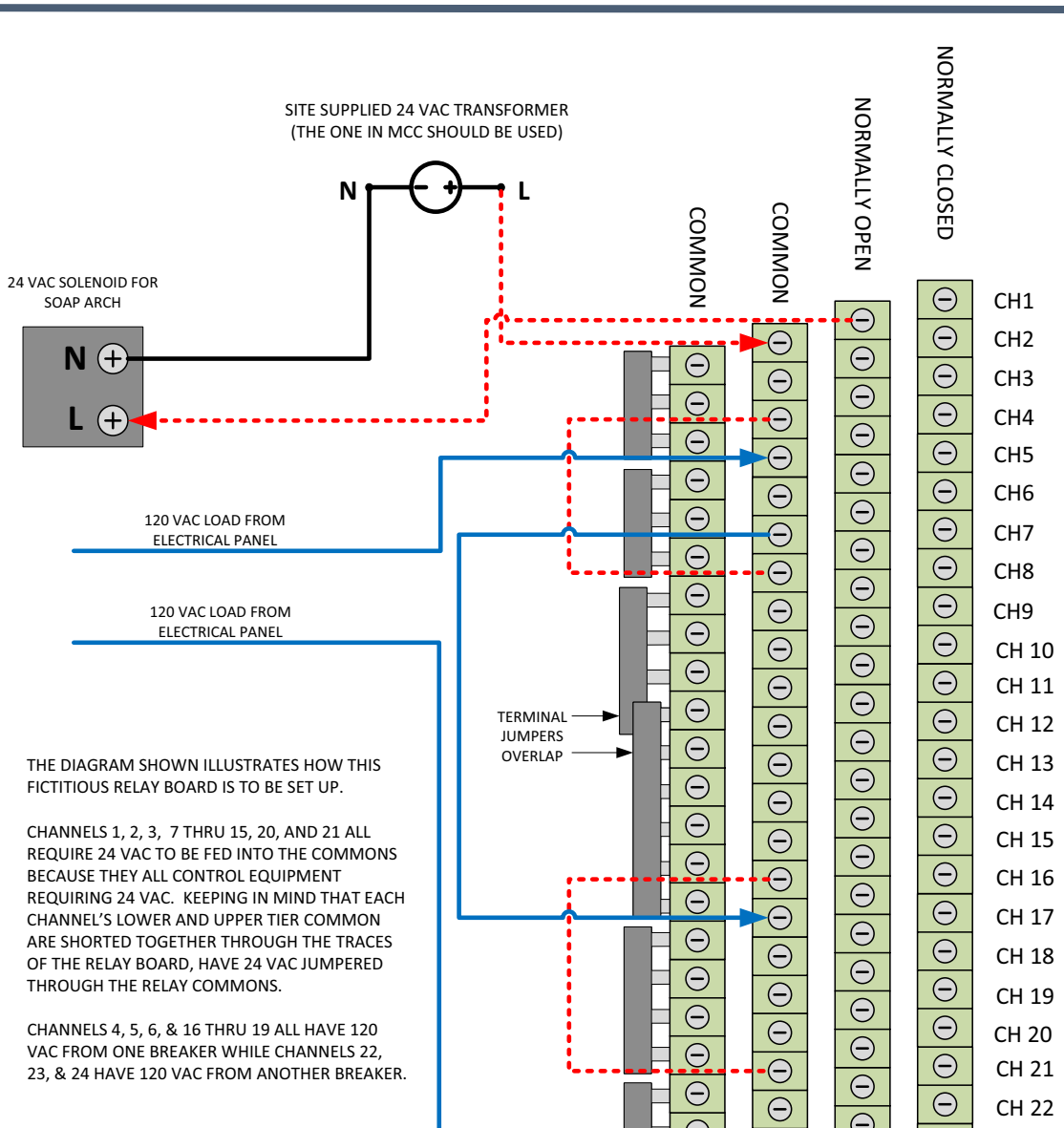


Figure 21. Common Relay Output Wiring

Jumper Settings

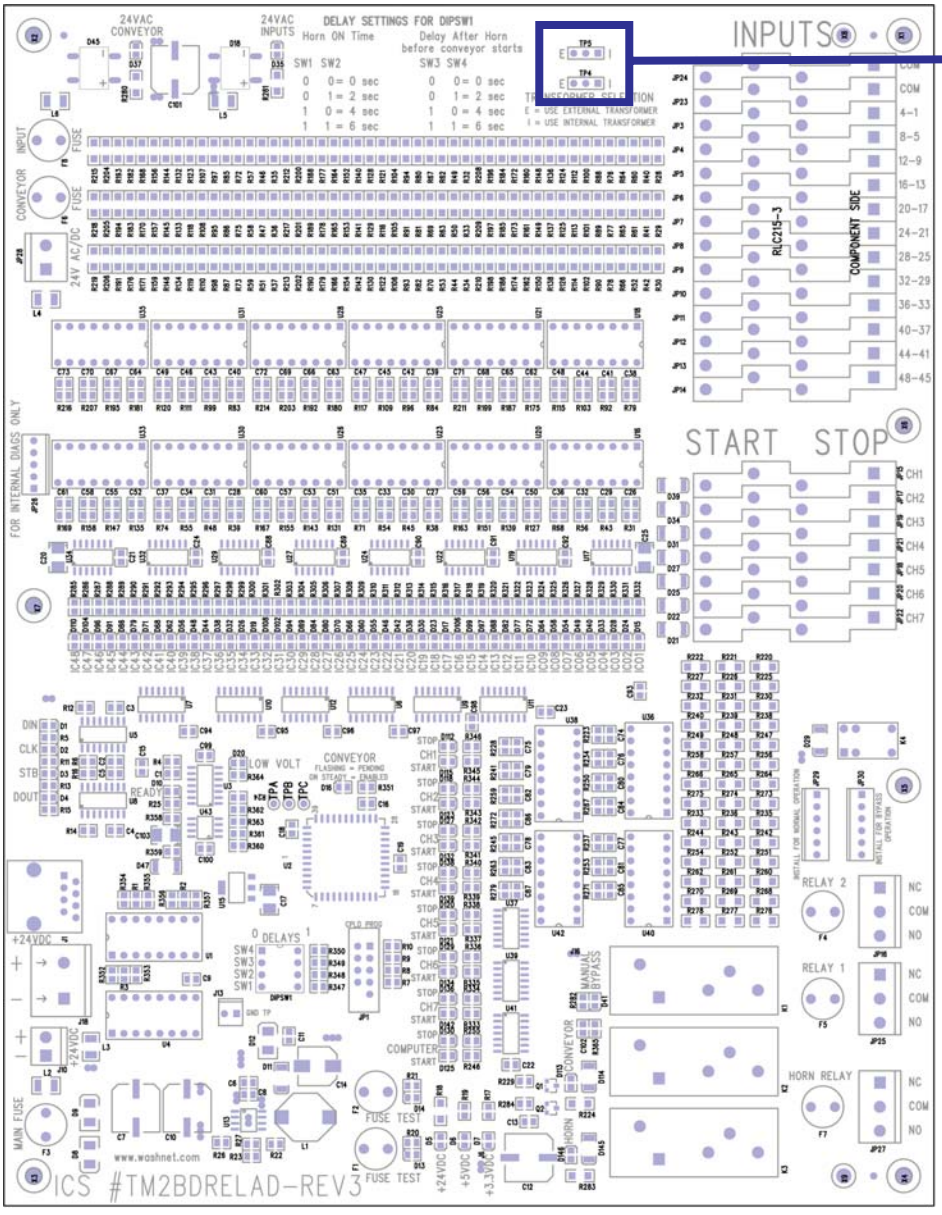


Figure 22. Jumper Test Point Locations

This section explains the location and purpose of the jumpers on the Tunnel Master® *wbc* circuit boards.

The following table describes jumper functions and settings.

Table 4: Jumper Settings

Jumper	Jumped	Not Jumped
TP4	Transformer Selection. Both jumpers must be in either the E or I position, depending on the application. This is for the voltage required for the user-configurable inputs. Position I will use the voltage from JP25 to supply power to the individual inputs. (Dry Contact). (Default). Position E will need to have voltage supplied between the COM and the individual inputs. (External Voltage).	
TP5		
TP6	Delayed reset when S2 is pressed (default).	Immediate reset when S2 is pressed.
TP7	RS-485 select (default).	RS-422 select.
TP8	RS-485 select (default).	RS-422 select.
TP9	Keyboard processor diagnostics (internal use).	Standard operation (default).
TP10	GND test point.	
TP11	GND test point.	
TP12	Isolated GND test point.	
TP13	Powers 5 V DC in battery back-up mode.	Powers 3.3 V DC only in battery back-up mode (default).
TP21	Both TP 21 and TP 22 must be in either SINK or SOURCE position, depending on the application: SOURCE jumps pins 1 and 2. SINK jumps pins 3 and 2.	
TP22		
TP23	Connects 120R termination resistor across TX+ and TX– on JP10.	No termination resistor across TX+ and TX– on JP10.
TP24	Connects 120R termination resistor across RX+ and RX– on JP10.	No termination resistor across TX+ and TX– on JP10.
TP25	Connects 1.5 K pull-up to RX+ on JP20.	No pull-up on RX+ on JP20.
TP26	Connects 1.5 K pull-down to RX– on JP20.	No pull-down on RX– on JP20.
TP27	RS-422, RS-485 selection: RS-485 jumps pins 1 and 2 (default). RS-422 jumps pins 3 and 2.	
TP28	—	—
TP29	INPUT2 input selection.	
TP30	INPUT3 input selection.	

Table 4: Jumper Settings (Continued)

Jumper	Jumped	Not Jumped
TP31	INPUT4 input selection.	
TP32	INPUT5 input selection.	
TP33	INPUT6 input selection.	
TP34	INPUT7 input selection.	
TP35	INPUT8 input selection.	
TP36	INPUT9 input selection.	
TP37	—	
TP38	GATE input selection.	
TP39	TIRE input selection.	
TP40	ROLLER LOCATOR input selection.	
TP41	REMOTE ROLLER input selection.	
TP42	EM TIRE2 input selection.	
TP43	ANTI COLLISION input selection.	
TP44	INPUT1 input selection.	
TP45	—	—
TP46	—	—
TP47	Pulls PD15 low on the *Coldfire*® module.	Pulls PD15 high on the *Coldfire* module (default).
TP48	—	—
TP49	Selects the voltage source for the LCD I/O: +LCD jumps pins 1 and 2. +3 V jumps pins 3 and 2 (default).	
DRY CONTACT: Jumps 1 to 2 and 3 to 4. Example: To wire ANTI COLLISION as dry contact, connect 1 to 2 & 3 to 4 on TP 43.		
EXTERNAL VOLTAGE: Jumps 2 to 3. Example: To wire ANTI COLLISION as external voltage, connect 2 to 3 on TP 43.		

DIP Switch Settings

The following diagram shows DIP switch locations.

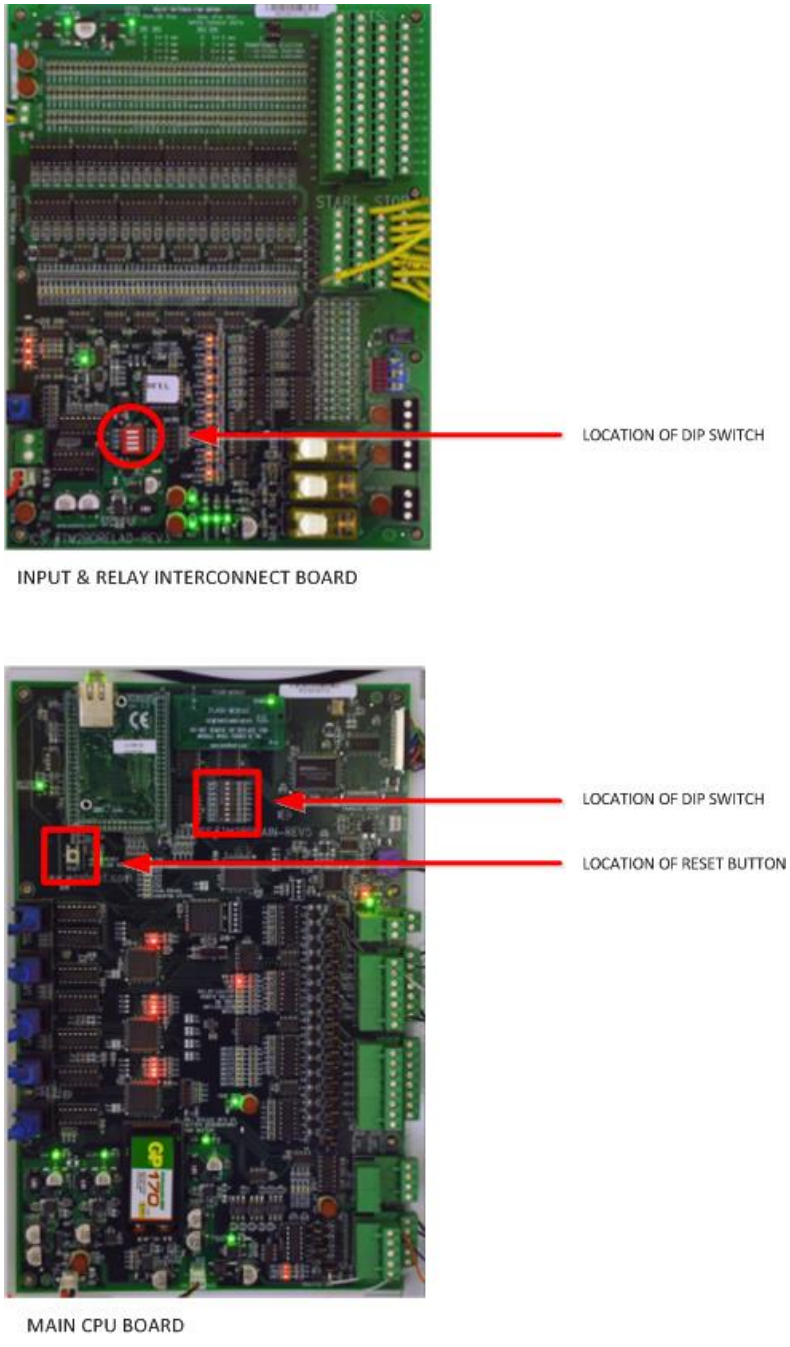


Figure 23. DIP Switch Locations

Table 5: Main CPU Board DIP Switch Settings[1]

DIP Switch	Function
SW1	Clears configuration data.
SW2	Clears daily shift data.
SW3	Clears monthly and yearly shift data.
SW4	Clears data flash completely.
SW5	SW5–SW8 not used.
SW6	
SW7	
SW8	

1. DIP switch default settings are OFF. After setting DIP switch to ON, press reset button on Main CPU board to activate.

The following table describes DIP switch settings and functions for DIP switch on Input and Conveyor Interlock Board.

Table 6: Input and Conveyor Interlock Board DIP Switch Settings

DIP Switch	Function	Settings[1]		
SW1 & SW2	Horn-on time.	**SW1**	**SW2**	**Sec. (On)**
		0	0	0
		0	1	1
		1	0	4
		1	1	6
SW3 & SW4	Delay after horn, before conveyor starts	**SW3**	**SW4**	**Sec. (Delay)**
		0	0	0
		0	1	1
		1	0	4
		1	1	6

1. Switch settings:
   0 = off (opened)
   1 = on (closed)

Tunnel Master® *wbc* AC Power Terminations

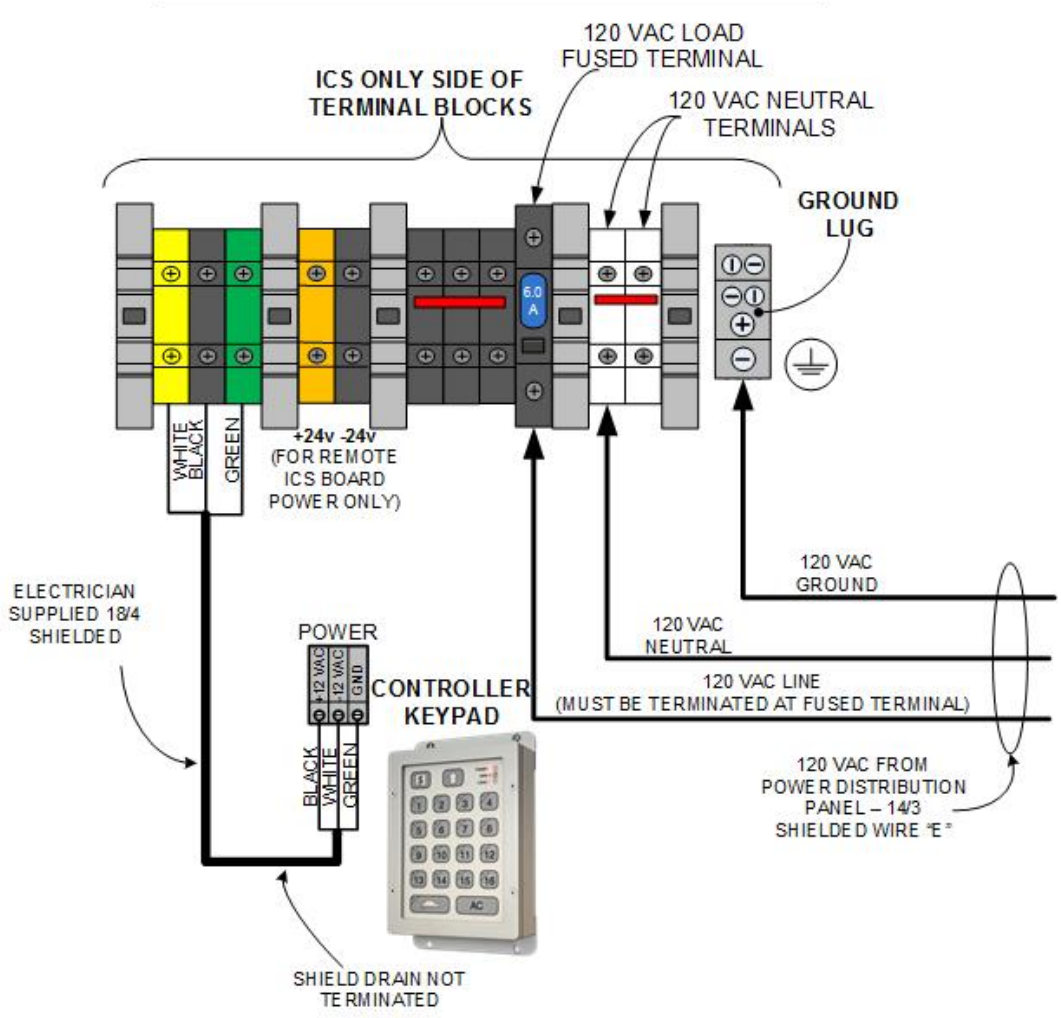


Figure 24. AC Power Terminations

WARNING: The terminals and power supplies contained in the WBC enclosure are for ICS EQUIPMENT ONLY!
Connecting external components and wiring to the WBC power circuits can damage the circuit boards and components and WILL VOID THE WARRANTY.

ics Innovative Control Systems®

Auto Sentry® Flex System Wiring for Two Lanes

The Tunnel Master® *wbc* can be used to control a two-gate, double *Auto Sentry® flex* system. This system allows for gated entry to a tunnel.

NOTE: This system uses two stand-alone *Auto Sentry® flex* units running SQL database software.

Traditionally, one stand-alone *Auto Sentry® flex* would be installed on a single lane leading into the tunnel. However, it is possible to install two *Auto Sentry® flex* units on two lanes with a gate on each lane. The gates are controlled by the Tunnel Master® *wbc*. The WBC queues customers onto a stack, opening and closing the gates as necessary to sequence customers into the tunnel.

The following illustrations show typical networking diagrams for a two-gate, double *Auto Sentry® flex* system communicating with a Tunnel Master® *wbc* to sequence cars into the tunnel.

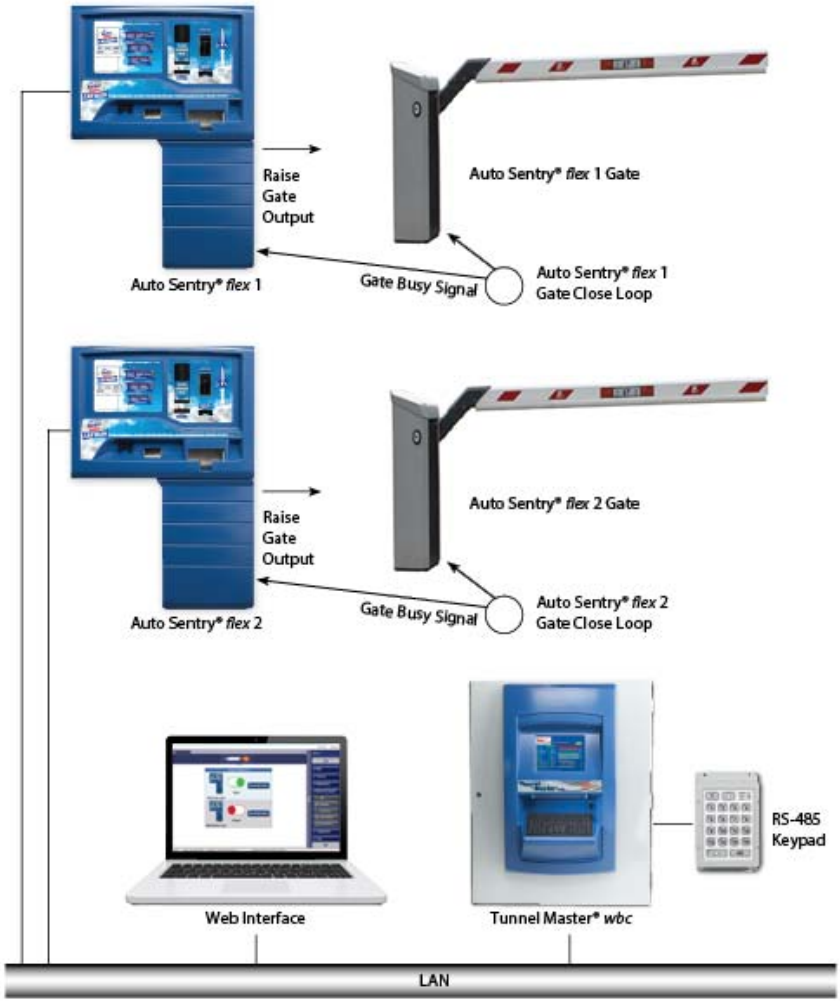


Figure 25. WBC, Double *Auto Sentry® flex* Networking Diagram

The figure above shows two *Auto Sentry® flex* units communicating with a Tunnel Master® *wbc* via a LAN connection. The WBC can control the sequence of cars from both lanes to the tunnel entrance.

After passing each *Auto Sentry® flex*, there is a gate. After passing the gate, there is a Gate Close Loop, which is typically a sub-base, inductive loop used for indicating the presence or passage of vehicles.

When a customer purchases a service at the *Auto Sentry® flex*, it communicates with the Tunnel Master® *wbc* to determine if the gate can be opened. The gate is opened via the Raise Gate output signal from the *Auto Sentry® flex*. The vehicle passes through the gate, and then over the loop. When the vehicle clears the loop, the Gate Busy signal drops and the gate is closed. The*Auto Sentry® flex* will once again communicate with the WBC to determine if the gate can be opened for the next customer.

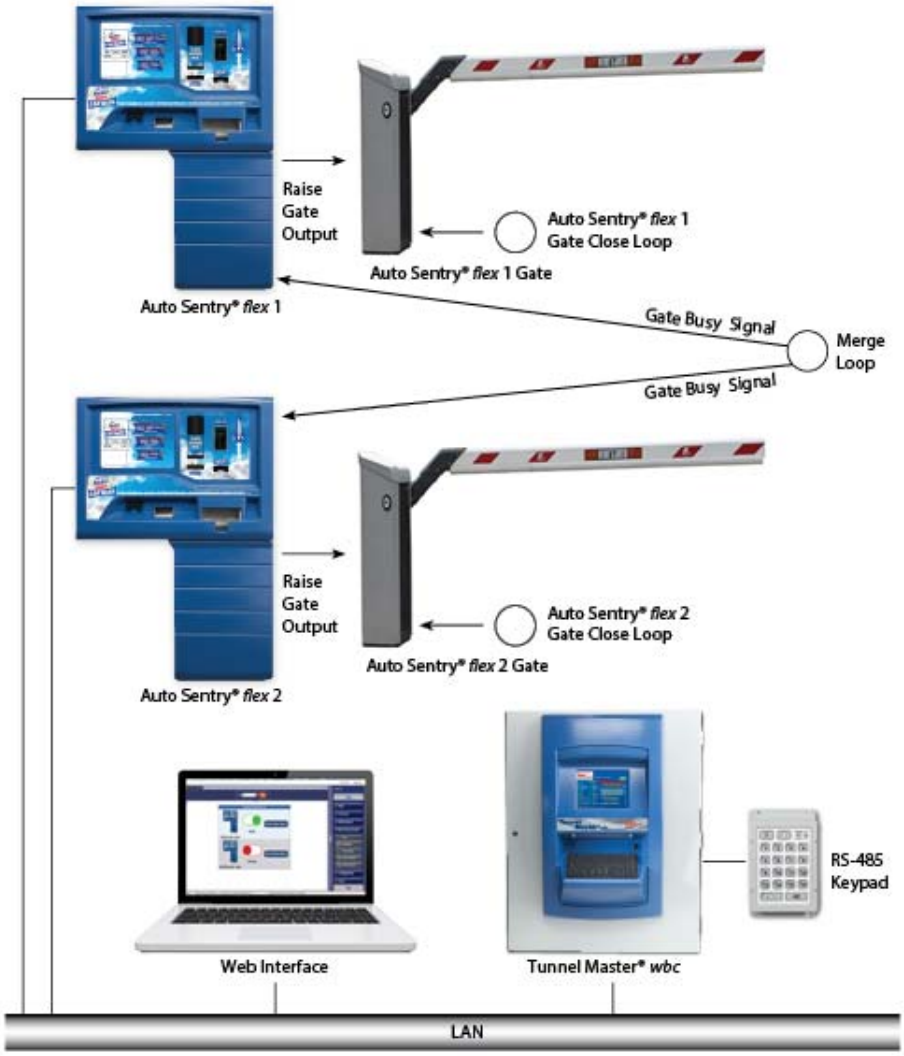


Figure 26. WBC, Double *Auto Sentry® flex* Networking Diagram with Merge Loop

The Figure 26, "WBC, Double Auto Sentry® flex Networking Diagram with Merge Loop," shows two *Auto Sentry® flex* units communicating with a Tunnel Master® *wbc* via a local LAN connection. But in this diagram a Merge Loop is included. The

WBC can still control the sequence of cars from both lanes to the tunnel entrance. However, the merge loop allows for a vehicle merge-point detection area.

After each *Auto Sentry® flex* is a gate. After the gate is a Gate Close Loop, which is typically a sub-base, inductive loop used for indicating the presence or passage of vehicles. After the gate close loop is the merge loop.

When a customer purchases a service at the *Auto Sentry® flex*, it communicates with the Tunnel Master® *wbc* to determine if the gate can be opened. The gate is opened via the Raise Gate output signal from the *Auto Sentry® flex*. The vehicle passes through the gate, and then over the Gate Close loop. When the vehicle clears the loop, the gate is closed.

But now the Gate Busy signal will drop only after the vehicle clears the merge loop. At this time, the *Auto Sentry® flex* can communicate with the WBC to determine if the gate can be opened for the next customer.

Third Party Kiosk to Tunnel Master® *wbc* Terminations

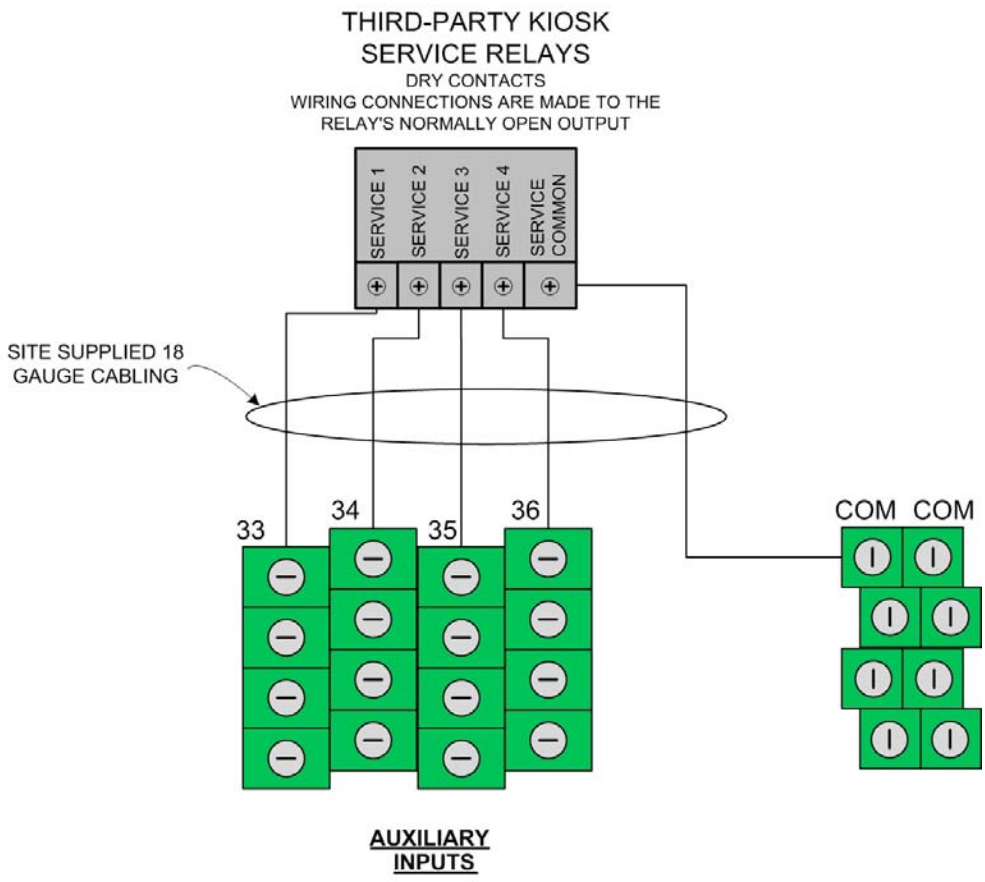
A third party entrance kiosk can be wired to the Tunnel Master® *wbc*.

- Wire services from the kiosk to auxiliary inputs 33–48 on the input board.
- Use 18 gauge cable.
- Third party devices using relays will make all output connections to their normally open relay contacts.
- All relay output connections will be using dry contacts. Therefore, the transformer selector on the input board should be configured for internal.

For more information on the transformer selector, see "Transformer Selector" on page 30.

- Service 1 on the kiosk is wired to auxiliary input 33 on the input board. Service 2 is wired to auxiliary input 34, and so on.
- Service common on the kiosk is wired to any one of the common inputs located on the first eight positions of the terminal block.

- An ICS-supplied keypad is optional but recommended. A keypad provides an alternate way to wash cars should the kiosk fail. There is a terminal block (POWER), located on the keypad circuit board labeled with ACH, ACN, and GND, for Hot, Neutral and Ground respectively. Terminations for the 3-AWG wires should be torqued to 20 pound-inches (2.3 n-m.) Over torquing may cause enclosure breakage. Electrician must run a single-twisted pair, 24AWG shielded com cable (can be purchased from ICS) through 3/4" conduit from the relay box to the Entrance Keypad.
- The **General Settings** dialog box in the Tunnel Master® *wbc* web interface contains two fields you can adjust for a third-party kiosk: **Stacking** and **Wash Input Device**.
  - Set **Stacking** to **Yes**.
  - If a keypad is available, then set **Wash Input Device** to **Push Button and Keypad**.
  - If a keypad is not available, then set **Wash Input Device** to **Push Button**.



SPECIAL PROGRAMMING FOR WBC

GENERAL SETTINGS

STACKING = ON

INPUT DEVICE = PUSH BUTTON (IF NO KEYPAD)

INPUT DEVICE = PUSH BUTTON AND KEYPAD (IF KEYPAD)

Figure 27. Third Party Kiosk to Tunnel Master® *wbc* Terminations

Exterior

Figure 28. Exterior Picture

Display

The display is a 640 × 480 color monitor. It shows the status of all the inputs, along with other tunnel status indicators.

Ultrasonic Sensor Wiring

The ultrasonic sensor can detect a pickup truck bed. The sensor is a Pepperl+Fuchs UC4000-30GM-IUR2-V15 Ultrasonic Sensor. In the past, ICS has used APG® IRU-2xx4/3xx4 series ultrasonic sensor.

Figure 29. Ultasonic Sensor Mounted

Ultrasonic Sensor Specifications

Sensor specifications are given in the following table.

Table 7: Ultrasonic Sensor Specifications

Specification	Description
Range	1–9 feet
Housing	ABS or PVC
Outputs	RS-485 and NPN
Supply Voltage	24 VDC
Power Consumption	≤ 900 mW
Transducer Type	Ceramic
Ratings	NEMA 4x
IP Code	IP65
Sensor Adjust	RS-485 interface

Table 7: Ultrasonic Sensor Specifications (Continued)

Specification	Description
Operating temp.	–13° F to 158° F (-25° C to 70° C)
Resolution	Evaluation range [mm]/4000, but ≥ 0.35 mm
Repeat Accuracy	≤ 0.1% of full-scale value
Temp. Comp.	≤ 2 % from full-scale value (with temperature compensation)
Common Mode Operation	≤ 13 Hz
Beam Pattern	24 degrees off axis (when operating with high sensitivity)
Cable	This is hard wired to sensor. It is cut to 18" to fit into NEMA enclosure on terminal blocks.

Ultrasonic Sensor Mounting Recommendations

When mounting the ultrasonic sensor, alignment is critical. Ensure the face of the transducer is clear of obstructions and parallel to the target. A misalignment of a few degrees can affect the accuracy and reliability of the sensor.

- Maximum mounting height is 9 feet.
- Mount the sensor on a stable solid arch that will not move. Attach the ultrasonic sensor directly.
- Position the sensor at the mid-point between the walls of the tunnel on center line of equipment.
- Position the sensor so it is mounted directly over the photo eye system directly in line with the eye beam.
- There needs to be solid ground directly below where the sensor is mounted. Do not install over a car wash pit grating with openings in it. A 2' to 3' solid piece of metal plate or plastic matting should be located directly under the sensor so we have a consistent flooring that the sensor can use as a baseline.
- In the case of an inductive loop, position the sensor in line with the area of the loop that first starts sensing the car.
- Use ½ conduit for the communications wiring.
- If any of the above mounting recommendations cannot be met, a custom mounting solution can be fabricated for your location. Contact your ICS sales representative for more information. Additional charges may apply.

- Ultrasonic sensor mounting dimensions are shown in the following figure.

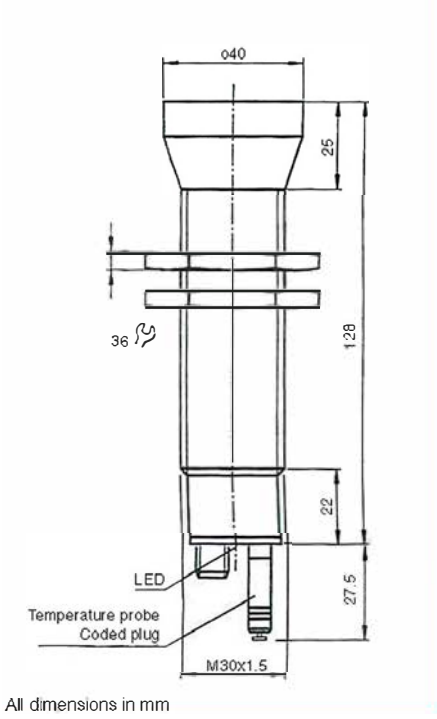


Figure 30. Ultrasonic Sensor Dimensions

Ultrasonic Sensor Power Supply Wiring

Wire the UC4000-30GM-IUR2-V15 to the power supply as described below.

Power Wiring supplied withing Tunnel Master® *wbc*

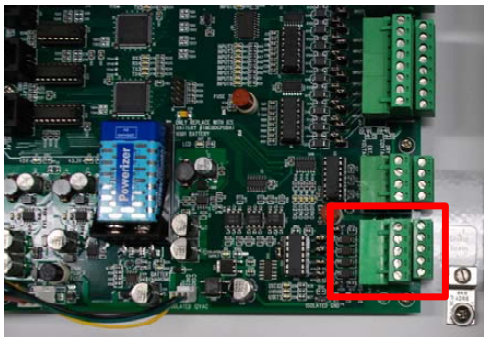
Terminal blocks are located in the bottom right of the Tunnel Master® *wbc*.

- Orange 24 VDC (+)
- Black 0 VDC (–)

NOTE: High-voltage (AC) and low-voltage (DC) must not be combined in a common conduit, junction box, or wire trough.

Ultrasonic Sensor Wiring Components

WBC
TWO RS-485 Comm Tiers
Located on the Controller's Main CPU Board



WBC
Power Terminal Block

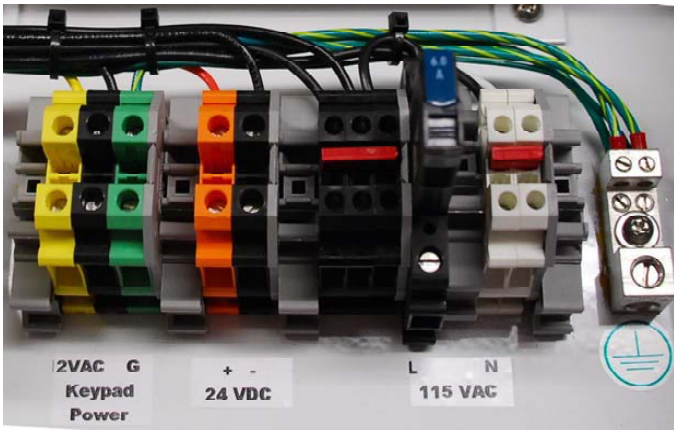


Figure 31. Warning label located below Tunnel Master® *wbc* Power Terminations

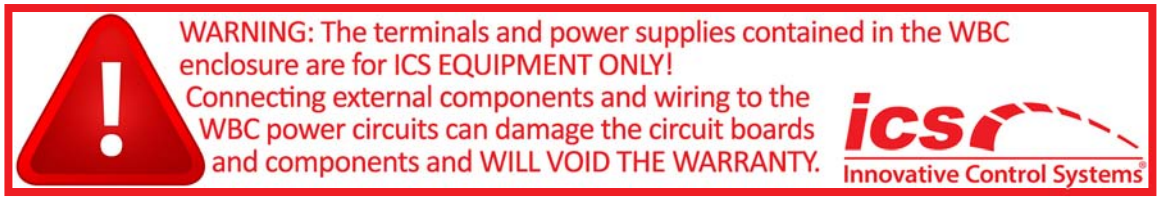


Figure 32. WARNING Label

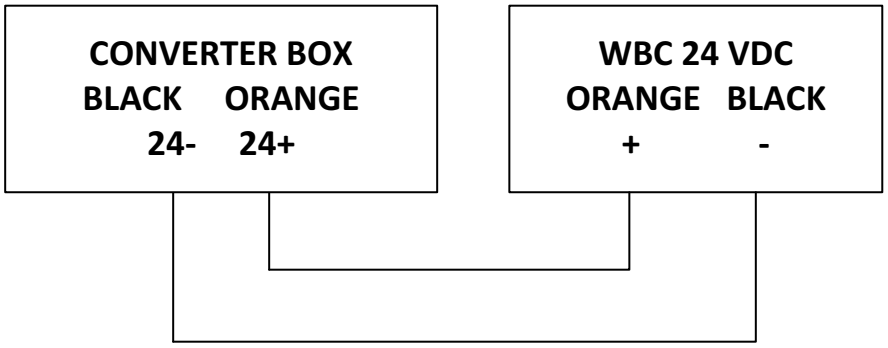


Figure 33. Ultrasonic Sensor Power Terminations

Ultrasonic Sensor Communication Wiring

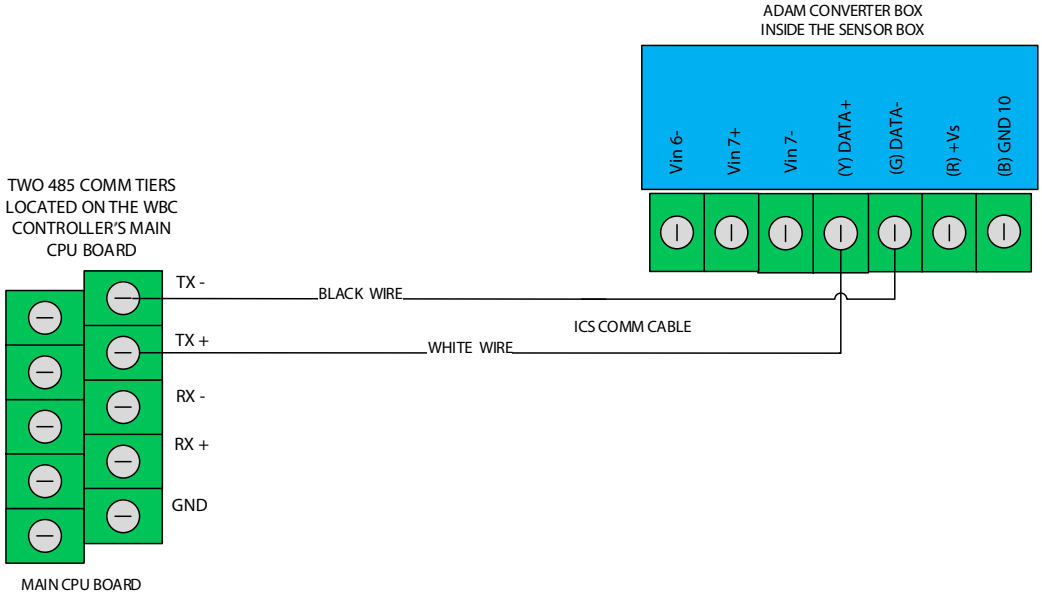


Figure 34. Ultrasonic Sensor Comm Connections

The ultrasonic sensor operation for detecting a pickup truck bed is shown in the following figure.

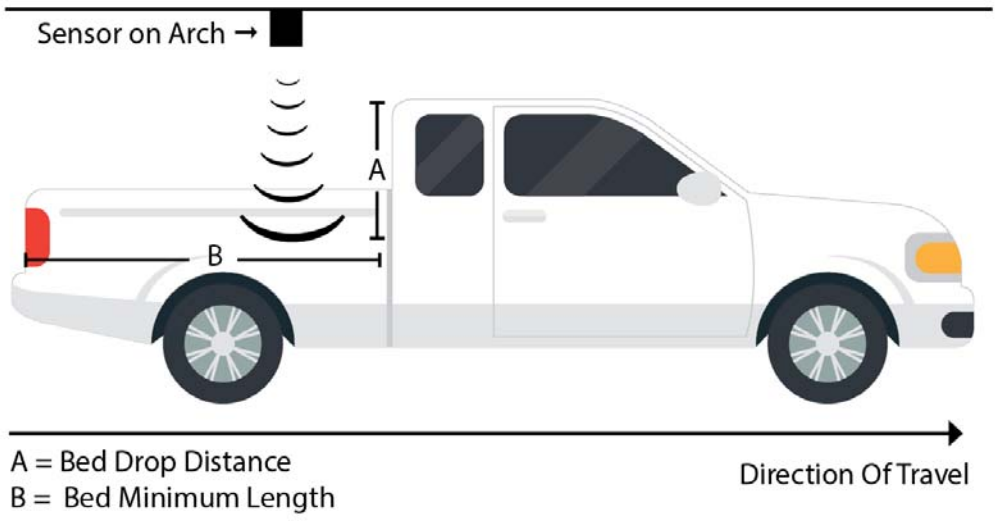


Figure 35. Pickup Bed Sensor Mounting

Settings for letters A and B shown in the figure above are described in the following table.

Table 8: Key to Sensor Settings

Letter	Field Name	Recommended Setting*	Description
A	Bed Drop Distance	16 Inches	Sensed first. From top of truck to inside floor of bed.
B	Bed Minimum Length	18 Inches	Sensed second, after drop distance is sensed. If both thresholds (A and B) are met, then system recognizes a pickup truck bed.

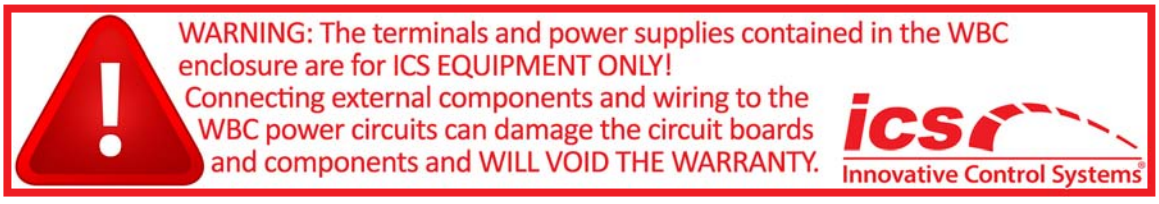
* Recommended settings based on initial ICS test results. Your settings may vary.

CHAPTER 4:
Communications Wiring

This section describes wiring for RS-422 and RS-485 communications.

Installation Requirements

- All peripheral equipment connected to the RS-232 ports must be Listed, have an Electronics Industrial Association (EIA) standard RS-232 communications protocol and not be installed over a hazardous location.
- RS-232 communication must not exceed 100 feet. RS-232 communication wires must be in a separate PVC conduit from any AC wires.
- Communications equipment signal wires must also be run in separate rigid PVC or metal conduit, separate from any power conduits.



RS-232 COMM Terminal Wiring Diagram

Wiring to be done on the main CPU board.

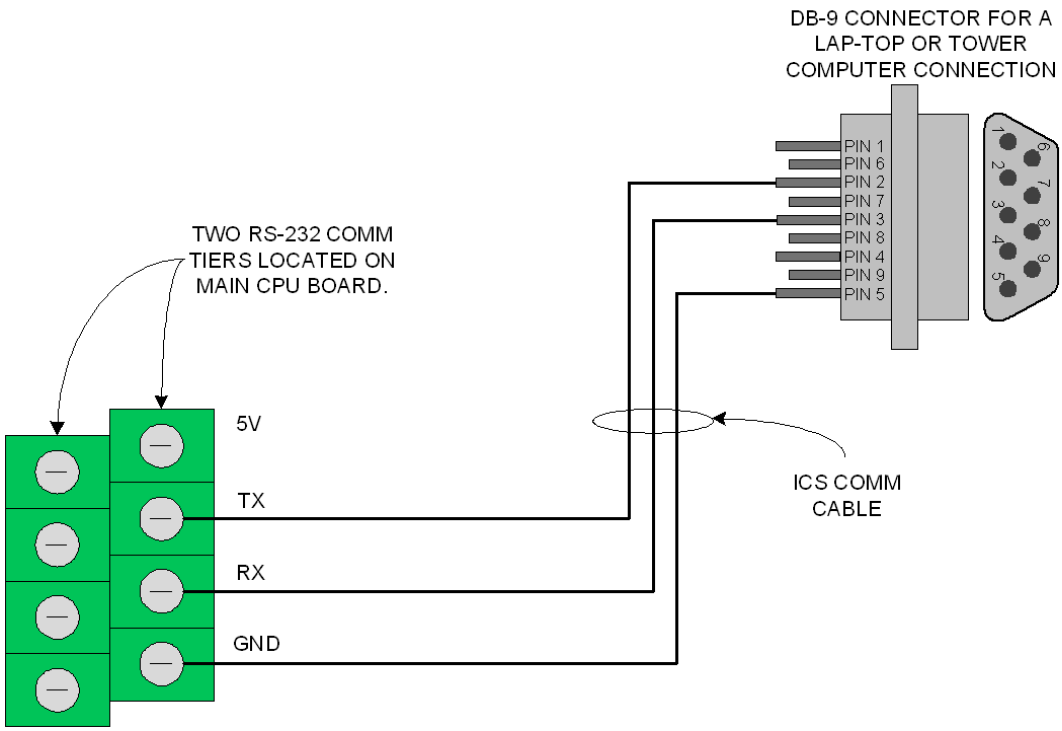
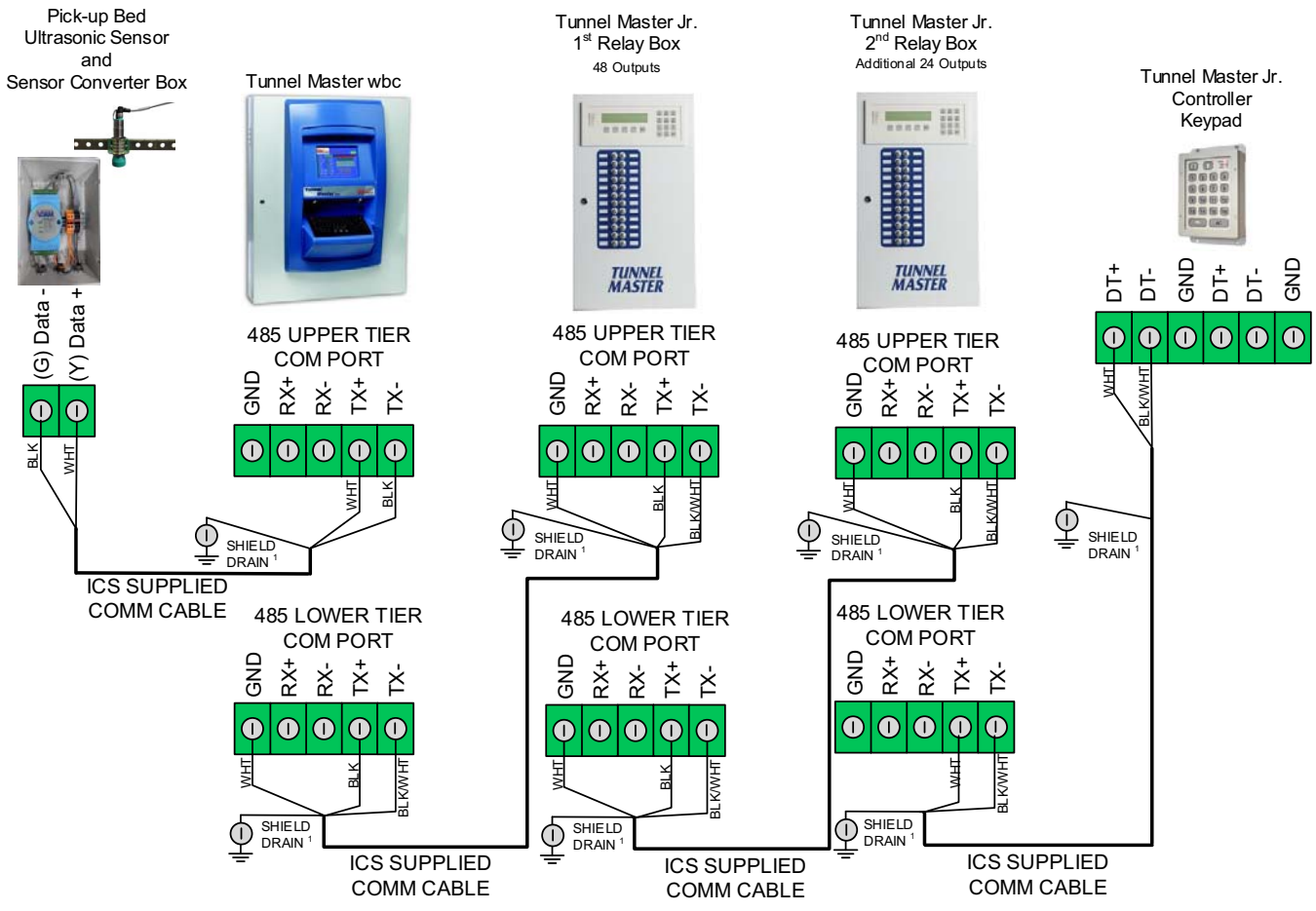


Figure 36. RS-232 COMM Terminal Wiring Diagram (Main CPU Board)

RS-485 Wiring Layout

You can wire up to a maximum of four smart relay boards. Connectors are interchangeable on all boards even though there are two separate ports, either one can be used.

Communication Cable Terminations Diagram for a Tunnel Master wbc Interface System with a Double Junior Configuration, 72 Outputs



NOTE: 1 Attach the shield drain at each end of the COMM cable to the ground lug of each enclosure. Shield ground needs to be tied to the earth ground at one end only.

Figure 37. RS-485 Layout

RS-485 COMM Terminal Wiring Diagrams

Wiring to be done on the main CPU board.

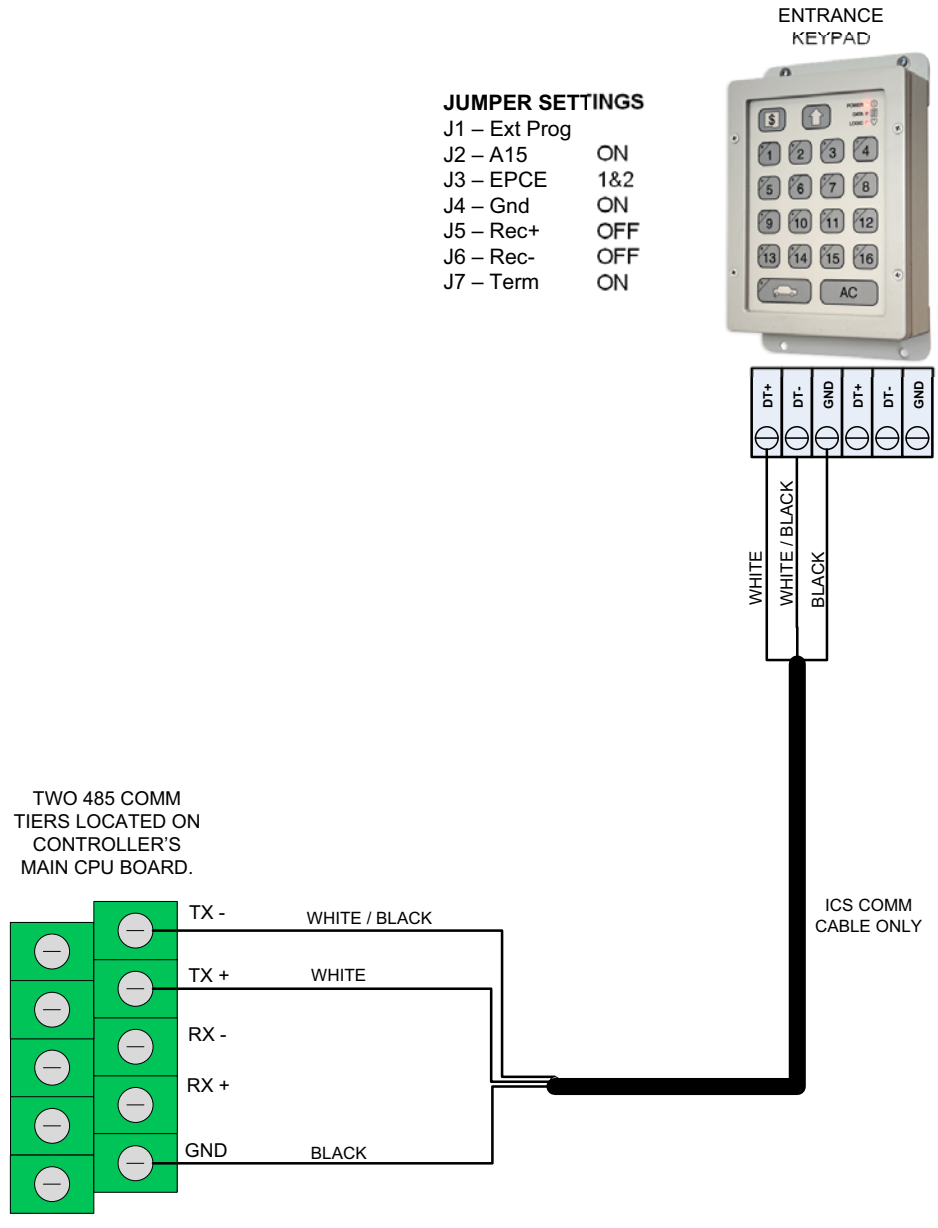


Figure 38. RS-485 COMM Terminal Wiring Diagram (Main CPU Board)

Ultrasonic Sensor Wiring

Ultrasonic Sensor Communications Wiring

Sensor communication connections are RS-485. ICS recommends wiring the ultrasonic sensor on a dedicated line. Avoid wiring additional devices, for example, keypad, or smart relay box, on the same line as the ultrasonic sensor.

Two RS-485 communications ports are available on the Tunnel Master® *wbc*. Use one for the ultrasonic sensor, and the other for additional devices.

Communications wiring runs from the Tunnel Master® *wbc* directly to the terminations blocks on the Adam Converter box in the truck bed sensor control box.

Connections to the Tunnel Master® *wbc* are shown in the table below.

Table 9: Ultrasonic Sensor Communications Wiring Connections

Tunnel Master® *wbc*	Adam Converter Box
TX–	**(G) DATA-**
TX+	**(Y) DATA+**
Ground	Signal Ground Drain Wire. NOT USED.
—	White NPN (200 ma max). NOT USED.
—	Green Clock Sync. NOT USED.

Ultrasonic Sensor Wiring

Ultrasonic Sensor Jumper Settings

ICS recommends leaving RS-485 jumpers unterminated on the Tunnel Master® *wbc* main CPU board. If the ultrasonic sensor is tested and returns communication errors, then you can terminate one or both RS-485 jumpers. The jumpers are labeled TP23 and 24.

For more information, see "Jumper Settings" on page 47.

CHAPTER 5:
WBC Entrance Keypad Installation

The following instructions will provide detailed information on the proper mounting and installation of the entrance keypad.

Entrance Keypad Mounting and Installation

Entrance Keypad Mounting

- The Entrance Keypad should be mounted securely to the wall of the car wash, in the entrance to the tunnel, at approximately chest height.

NOTE: The keypad is a Type 3 enclosure, which means it is a watertight enclosure, but should not be mounted where it is constantly inundated with water.

- The keypad should be mounted away from corrosive chemicals.

Entrance Keypad Mounting

- Locate the conduit that was previously run from the Tunnel Master® *wbc*.
- The conduit should be secured with a Listed watertight conduit hub, and should be tightened to the torque specs of the manufacturer.

NOTE: Over torquing may cause enclosure breakage.

- The conduit will contain the 12VAC and Communications cable and should enter the opening in the bottom of the keypad enclosure.
- Electrician must run 3 - 18 AWG wires, or cable (supplied by customer) through the 3/4" conduit from the Tunnel Master® *wbc* to the entrance keypad.

The following picture shows the connection points for the various components.

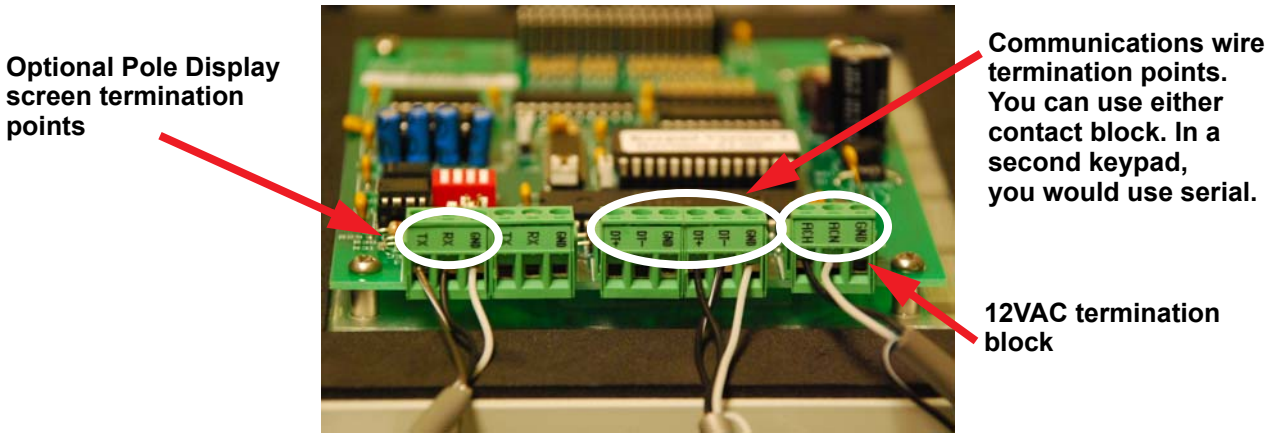


Figure 39. Keypad Connectors (Keypad Board)

Entrance Keypad Wiring

- There is a terminal block (POWER) located on the keypad circuit board labeled with **ACH (Hot)**, **ACN (Neutral),** and **GND** (Ground). Terminations for the 3 – 18AWG wires should be torqued to 20 pound-inches (2.3 n-m.)

NOTE: Over torquing may cause enclosure breakage.

- The Tunnel Master® *wbc* has terminal blocks specified for keypad power.

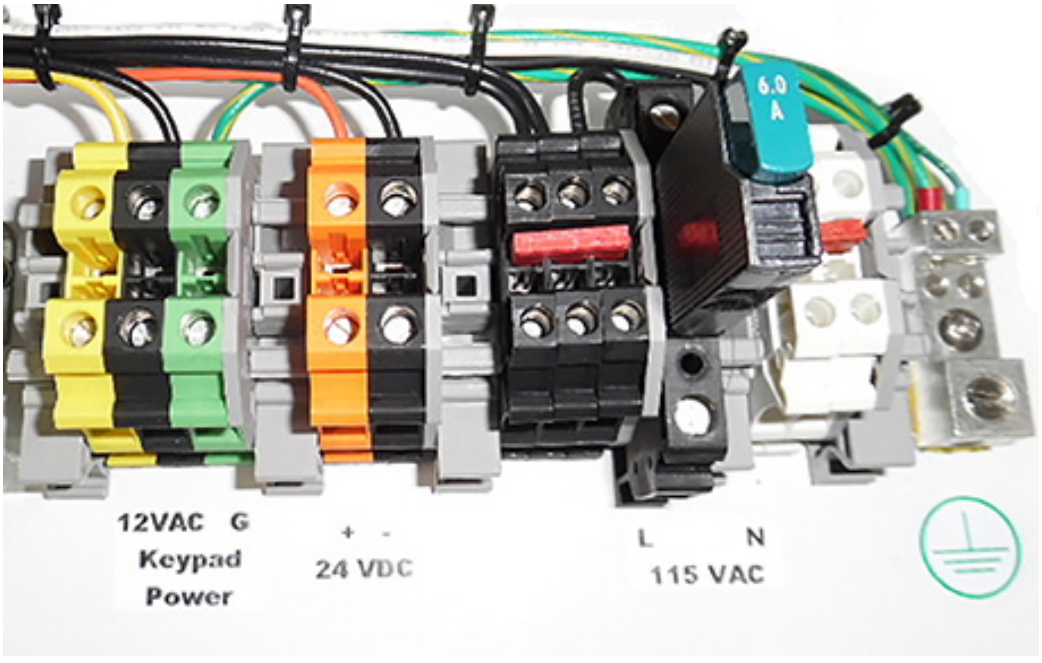


Figure 40. Tunnel Master® *wbc* Power Terminal Block

The following Figure displays the AC Power Terminations.

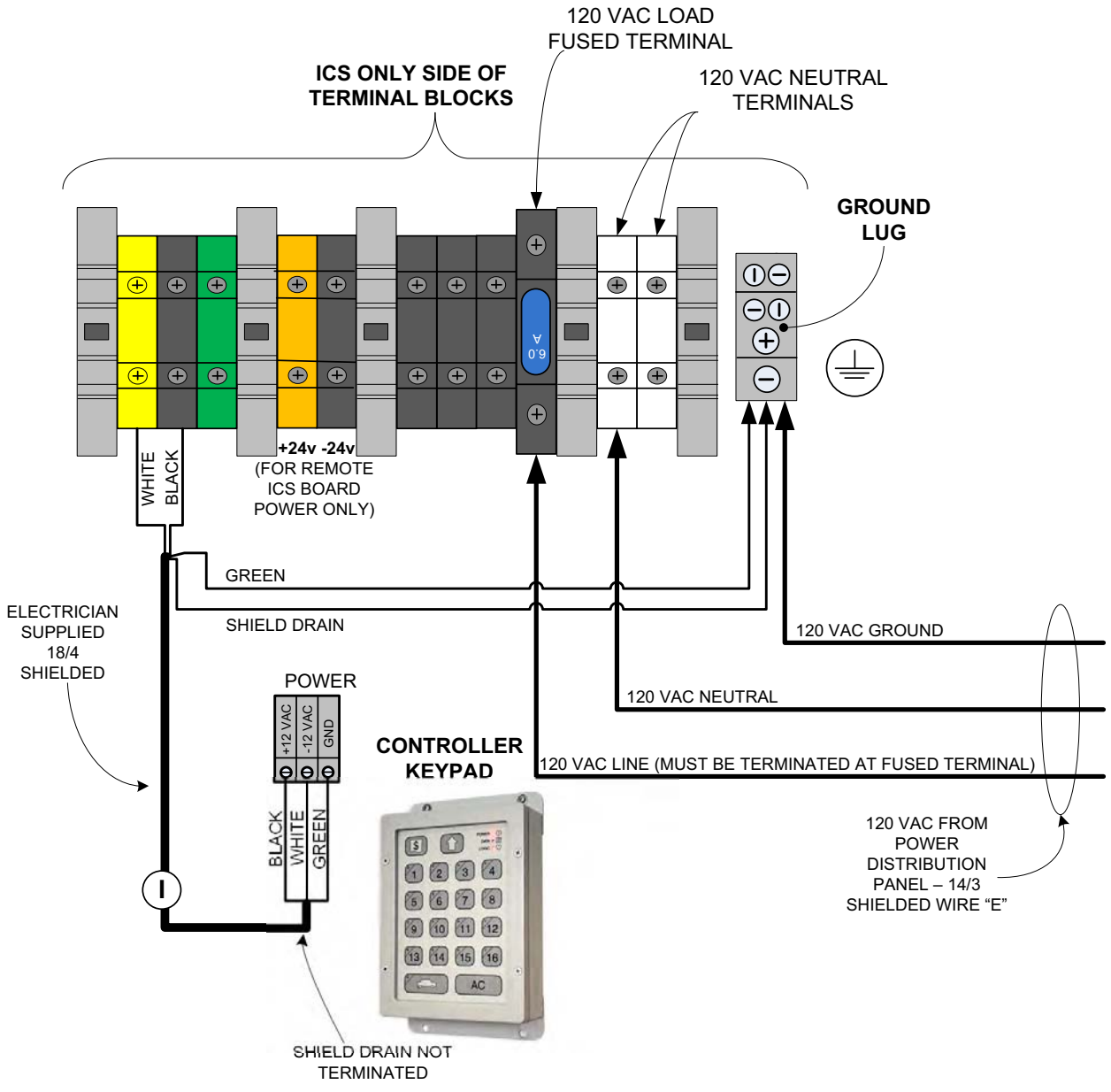


Figure 41. AC Power Terminations

- Electrician must run a single-twisted pair, 24AWG **shielded** com cable (can be purchased from ICS) through 3/4" conduit from the Tunnel Master® *wbc* 485 terminal to the entrance keypad.

- There is a terminal block (NETWORK 485), located on the keypad circuit board labeled with **DT+**, **DT-**, and **GND**, for Data+, Data- and Ground, respectfully. Terminations for the single-twisted pair Comm wires should be torqued to 20 pound-inches (2.3 n-m.)

NOTE: Over torquing may cause enclosure breakage.

- Comm cable terminations must be made as shown in Figure 42

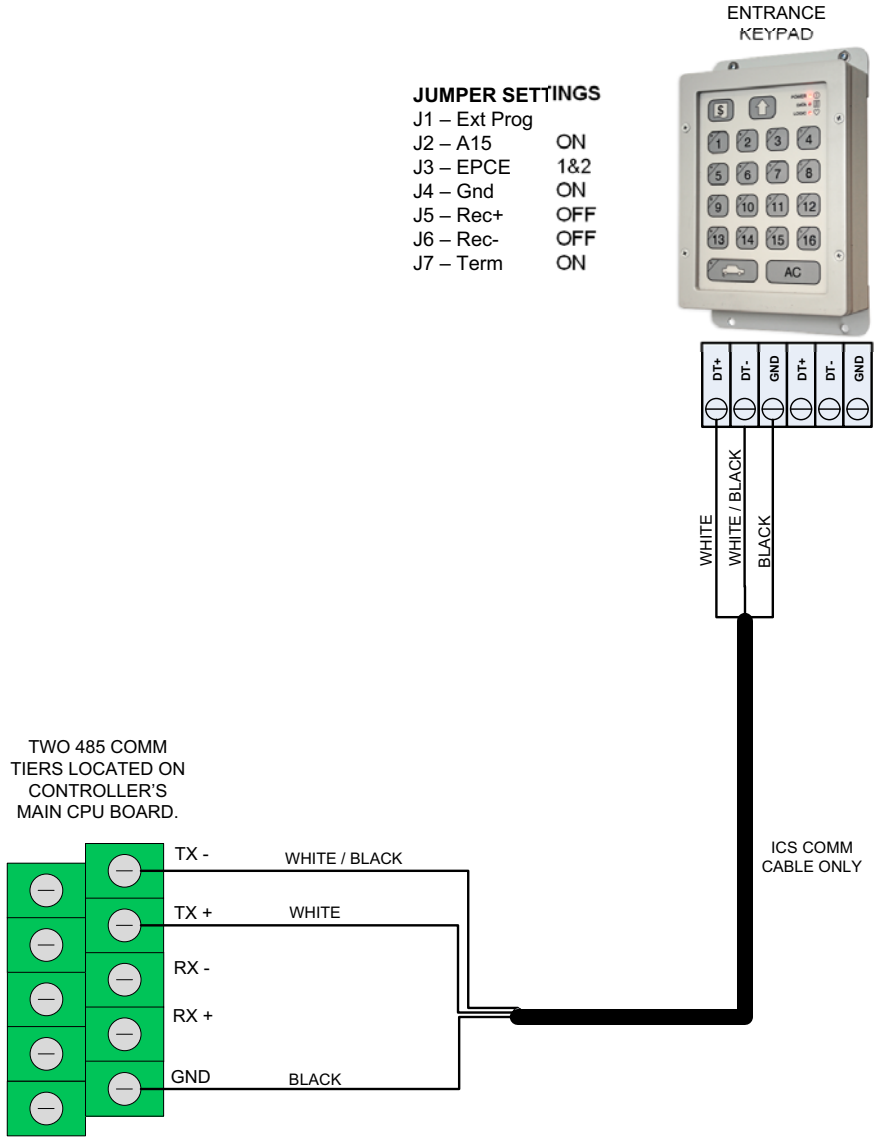


Figure 42. RS-485 Comm Terminal Wiring Diagrams (Main CPU board)

Second Entrance Keypad Mounting and Installation

The following instructions will provide detailed information on proper mounting and installation of the optional second entrance keypad.

Second Entrance Keypad Mounting

- The second entrance keypad should be mounted securely to the wall of the car wash, directly next to the first entrance keypad in the entrance to the tunnel.
- The keypad is a Type 3 enclosure, which means it is a watertight enclosure, but should not be mounted where it is constantly inundated with water.
- The keypad should be mounted away from corrosive chemicals.

Second Entrance Keypad Wiring

- One approved 3/4" conduit must be run between the first and second keypads. Conduit should originate from the bottom of the first keypad enclosure to the bottom of the second keypad enclosure. All conduits shall be properly connected and securely fastened to the boxes with Listed conduit hubs, and should be tightened to the torque specs of the manufacturer.
- The conduit shall be secured with a Listed watertight conduit hub, and should be tightened to the torque specs of the manufacturer. Over torquing may cause enclosure breakage.
- The conduit will contain the 12VAC and Communications cable and should enter the opening in the bottom of the keypad enclosure.
- Electrician must run 3 - 18 AWG wires, or cable (supplied by customer) through the 3/4" conduit above from the first entrance keypad to the second Entrance Keypad.
- There are terminal blocks (POWER), located on each of the keypad circuit boards labeled with ACH, ACN and GND, for Hot, Neutral and Ground, respectfully. Terminations for the 3 – 16AWG wires should be torqued to 20 inch pounds (in-lb) (2.3 n-m.)

NOTE: Over torquing may cause enclosure breakage.

Table 10: 12VAC Terminations

First Entrance Keypad	Second Entrance Keypad
ACH	ACH
ACN	ACN
GND	GND

- Electrician must run a single-twisted pair, 24AWG **shielded** COM cable (can be purchased from ICS) through the above 3/4" conduit from the first entrance keypad to the second entrance keypad.

Second Entrance Keypad Wiring

- There is a terminal block (NETWORK 485), located on each of the keypad circuit boards labeled with **DT+**, **DT-**, and **GND**, for Data+, Data- and Ground, respectfully. Terminations for the single-twisted pair COMM wires should be torqued to 20 pound inches (2.3 n-m.) Over torquing may cause enclosure breakage.
- Com cable terminations must be made as in the following table:

First Entrance Keypad (Either Connector)	Second Entrance Keypad (Either Connector)
DT+	DT+
DT-	DT-
GND	GND

Table 11: Comm Cable Terminations

Entrance Keypad Jumper Settings

The following figure shows the entrance keypad circuit board and location of the various jumpers on the entrance keypad circuit board.

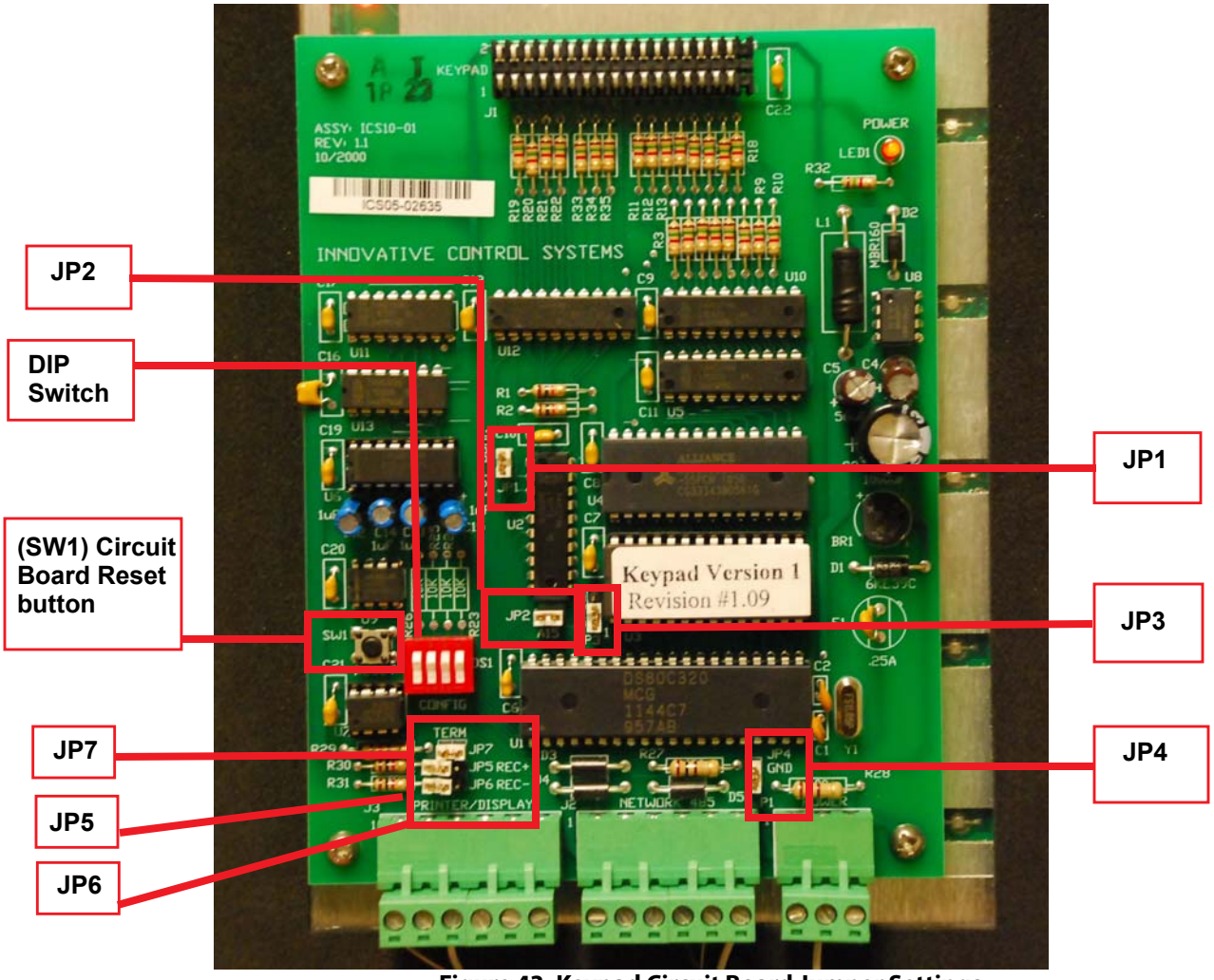


Figure 43. Keypad Circuit Board Jumper Settings

In Figure 43, “Keypad Circuit Board Jumper Settings,” the jumper functions are displayed with their normal settings. By default, the keypad is address 5. There is no reason to change this unless advised by ICS. If you have two keypads, you should address the second as address 6.

Table 12: Jumper Settings

Jumper		
J1	ON	Reserved Jumper; ALWAYS ON
J2	ON	Reserved Jumper; ALWAYS ON
J3	1 and 2	E-Prom Chip Enable; Jumper Down next to “CE”
J4	ON	Ground Jumper
J5	OFF	Biasing Resister High (+)
J6	OFF	Biasing Resister Low (-)
J7	ON	Terminating Resister. Set to ON if it is the first or last device in the network.

Entrance Keypad DIP Switch Settings

The following picture and table will show the Entrance Keypad Dip switch and the various settings that may be used.

NOTE: For location of the DIP Switch refer to the previous Entrance Keypad picture on page 23. The OFF position is toward the word Config on the circuit board.

The following picture shows the Keypad lid DIP Switch.

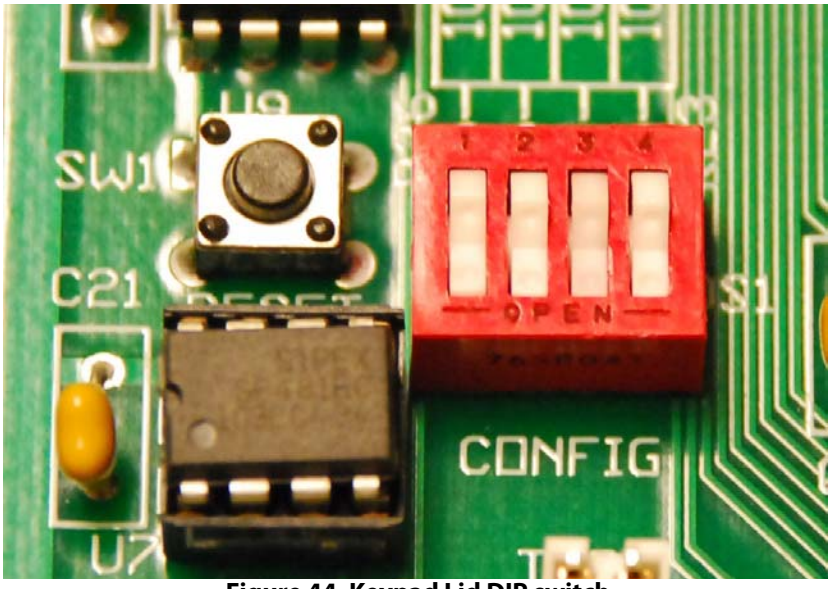


Figure 44. Keypad Lid DIP switch

Table 13: DIP Switch Settings

Switch	Setting	Function		
1	OFF	Address setting	1, 2 OFF	= Address 5
			1 OFF, 2 ON	= Address 6
2	OFF	Address setting	1 ON, 2 OFF	= Address 7
			1, 2 ON	= Address 8
3	OFF	Baud Rate	OFF = 9600	ON = 38,400
4	OFF	Test Mode		

CHAPTER 6:
Troubleshooting and Maintenance

Preventative Maintenance and Inspection

- Visually inspect unit daily for loose connections or damage.
- Wipe exterior of unit with damp cloth to clean. Do not use chemicals or cleaning agents.

Central Log Server

For troubleshooting, you can view Tunnel Master® *wbc* operations data via the CLS (Central Log Server) application:

- **CentralLogServer.exe**

The application file is located on the site server. It can be started with a desktop shortcut. The executable is in \\ICS\CLS\. A network connection to the Tunnel Master® *wbc* is required. Plug the network cable into the RJ-45 terminal on the WBC main CPU board.

Serial Debug Port

If the network connection fails, you can use the RS-232 terminals to transmit debug and diagnostic data from the Tunnel Master® *wbc* to a laptop computer. The RS-232 terminals are located on the main CPU board. You can wire a female DB9 COMM cable to the terminal.

- Prepare a COMM cable with a female DB9 connector on one end. Strip the other end to expose the wires. Tone out the wires to the pins:

- 2 is receive data. Connect wire to TX on WBC.
- 3 is transmit data. Connect wire to RX on WBC.
- 5 is ground. Connect wire to GND on WBC.

- Connect the female end of the COMM cable to a serial port on a laptop computer. If the laptop does not include a serial port, then use a serial (male) to USB converter.

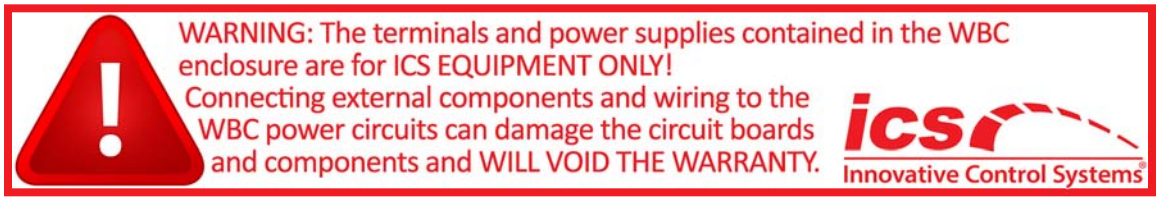
About MTTTY

The laptop must also include software to communicate with the Tunnel Master® *wbc* over a COM port. ICS recommends the multi-threaded TTY (MTTTY) application, which is installed along with the WBC software on the site's network server. It can be found in the WBC directory. Once you locate the **MTTTY.exe** file, you can simply copy it to the laptop:

1 Start **MTTTY.exe**, and then verify the following settings:
   - Select the **Port**.
   - Set **Baud** to **115200**.
   - Set **Parity** to **None**.
   - Set **Data Bits** to **8**.
   - Set **Stop Bits** to **1**.

2 Click **Connect**.
Data from the Tunnel Master® *wbc* appears in the MTTTY window.

Battery



Replacing the Battery

Only replace battery on main CPU board with ICS battery number TMCBDC-PUBAT NiMH battery.

Index

Version History

Table 1: Version Change History

Document Version	Dates	Contributor Initials	Description
1.0	03/18/2008	JL-S	First release.
1.1	04/07/2008	BB, JL-S, KK, RH, SD, TR	Full review.
1.2	04/09/2008	S.D.	Updated two drawings on pages 26 and 36 that reversed PULSE SRCE and PROX PWR.
2.0	05/28/2009 —10/12/2009	S.D., R.H., J.M., J.L-S.	-Pickup bed sensor specs and diagrams. -Smart relay board wiring diagram. -Entrance management sensor diagram -Tire sensor diagram. -Added double Wash Valet system section in System Wiring chapter. -Added Updated Conveyor Wiring section in System Wiring chapter. -Added Network Debug Log and Serial Debug Port sections to Troubleshooting chapter.
3.0	09/17/2010—10/21/2010	S.D., J.L-S.	-More detailed ultrasonic sensor installation instructions. -Changed references from Double Wash Valet® to Double Auto Sentry® flex in text and drawings. -Third Party Kiosk Wiring Terminations.
4.0	10/10/2012-8/20/2013	J.M., S.D., B.M., J.L., K.K., A.D., W.S.	-More detailed ultrasonic sensor installation instructions (pages 57-59). -Wetdown turns on conveyor relay. -Recommend use external voltage and supply 24 VAC for the inputs.
5.0	9/10/2014	B.M., W.S.	
6.0	10/22/2015	A.C., B.M., C.B., W.S	Ultra-sonic Sensor update pg. 62-63. Updated drawing on page 69. Input board (prior ICIB) page 27.
7.0	4/1/2016	B.M., W.S., S.B., S.S.	New look. Added Delayed Panic drawing.
8.0	3/13/2017	W.S., T.R	Included 7.0 Addendum, New Ultrasonic Sensor

Innovative Control Systems®

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It is our passion to leverage our experience as car wash operators, our position as a Market Leader, and our ability to incorporate advanced technology into Visionary products, which enables our Customers to differentiate their operations, achieve a distinct competitive advantage, and maximize their earnings.

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