Information in this manual is subject to change without notice. The example companies, organizations, products, domain names, email addresses logos, people, places and events depicted herein are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place or event is intended or should be inferred unless otherwise noted. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose without the express written permission of Innovative Control Systems, Inc.

Innovative Control Systems and its product trademarks in this manual are trademarks of Innovative Control Systems, Inc. All other marks are property of their respective owners.

© 2020 Innovative Control Systems, Inc.

Innovative Control Systems, Inc.
81 Highland Avenue, Suite 300
Bethlehem, PA 18017
(610) 881-8000
Contents

Chapter 1: Introduction ........................................................................................................... 11
Version Considerations ........................................................................................................... 12
Hardware Features .................................................................................................................. 12
Warning Marking ..................................................................................................................... 12

Chapter 2: Hardware Installation ............................................................................................ 13
Planning for Installation .......................................................................................................... 13
Controller Box Dimensions .................................................................................................... 14
Entrance Keypad Dimensions ................................................................................................. 14
Relay Box Mounting ................................................................................................................ 15
Relay Box Wiring ..................................................................................................................... 15
Low Voltage Layout Wiring Diagram ...................................................................................... 17
Resetting Default Configuration Settings ............................................................................. 17
Output Overview ..................................................................................................................... 19
  24 Outputs ............................................................................................................................. 19
Relay Box Interior .................................................................................................................. 20
Pulse/Proximity Switch Wiring ................................................................................................. 22
Pulse/Proximity Switch Wiring ............................................................................................... 23
Gate Switch (Electric Eye) Wiring ......................................................................................... 24
  Gate Eye Switch Wiring ........................................................................................................... 24
Tire Switch Wiring .................................................................................................................. 25
Entrance Management System Wiring .................................................................................. 26
  Entrance Management System Wiring Layout ..................................................................... 26
Roller Locator Wiring ............................................................................................................. 27
  Conveyor Roller Locator Cross Section Diagram ............................................................... 27
  Roller Locator Wiring ............................................................................................................ 28
Panic Stop Circuit Wiring ......................................................................................................... 29
Anti-Collision Wiring ............................................................................................................. 30
Anti-Collision Wiring ............................................................................................................. 31
Input Wiring Designations ..................................................................................................... 32
Push Button Wiring ................................................................................................................ 33
  Push Button Wiring 1 Row 8 Columns .................................................................................. 33
  Push Button Wiring First 8 Buttons ...................................................................................... 34
  Push Button Wiring for Second 8 Buttons .......................................................................... 35
Relay Box Jumper Settings ..................................................................................................... 36
DIP Switch Settings ............................................................................................................... 38
Tunnel Master® Jr. AC Power Terminations ......................................................................... 40
Chapter 3: Entrance Keypad Installation ............................................................. 41
Entrance Keypad Mounting and Installation ............................................... 41
   Entrance Keypad Mounting ................................................................. 41
   Entrance Keypad Wiring ................................................................. 41
Second Entrance Keypad Mounting and Installation ...................................... 42
   Second Entrance Keypad Mounting ...................................................... 43
   Second Entrance Keypad Wiring ......................................................... 43
Entrance Keypad Jumper Settings ............................................................. 44
   Jumper - J3 ...................................................................................... 45
   Entrance Keypad DIP Switch Settings .................................................. 45
Chapter 4: Optional Printer Installation .......................................................... 47
Mounting and Installation of Report/Receipt Printer ...................................... 47
   Report Printer Mounting .................................................................... 47
Report Printer Wiring .............................................................................. 48
Chapter 5: Operating Procedures ................................................................. 49
Operating Procedures ............................................................................ 49
Main Wash Menu ................................................................................... 49
Wet Down Wash .................................................................................... 49
Chapter 6: Wash Configuration .................................................................... 51
Relay Box Display Keypad ....................................................................... 52
Relay Box Display and Keypad Descriptions ............................................. 53
Set Password ......................................................................................... 54
   Access a Password Protected Menu .................................................. 55
Set Date Time ......................................................................................... 56
Configure Wash Menu ........................................................................... 57
Wash Setting Descriptions ................................................................... 58
Configure Wash Settings ....................................................................... 62
About Countdown Times ....................................................................... 63
Outputs ................................................................................................. 63
Output Settings ..................................................................................... 65
Assign Outputs to Services ................................................................... 70
Chapter 7: Entrance Keypad ....................................................................... 71
Entrance Keypad .................................................................................... 71
Entrance Keypad Functions ..................................................................... 72
Entrance Keypad to Process Vehicles (Non-Stacking) ................................ 74
Entrance Keypad to Process Vehicles (Stack) ........................................... 75
   Change Service and/or Add Retract .................................................. 76
<table>
<thead>
<tr>
<th>Feature</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add a Car to Stack</td>
<td>76</td>
</tr>
<tr>
<td>Remove a Car from Stack</td>
<td>76</td>
</tr>
<tr>
<td>View Service Counts for the Current Shift</td>
<td>77</td>
</tr>
<tr>
<td>Bump Shift</td>
<td>77</td>
</tr>
<tr>
<td>Bump a Shift or Manually Close Current Shift</td>
<td>78</td>
</tr>
<tr>
<td><strong>Chapter 8: Trouble Shooting</strong></td>
<td>79</td>
</tr>
<tr>
<td>System Diagnosis</td>
<td>79</td>
</tr>
<tr>
<td>Entrance Keypad</td>
<td>79</td>
</tr>
<tr>
<td>Wash Controller Response</td>
<td>79</td>
</tr>
<tr>
<td>Wash Controller Input Check</td>
<td>79</td>
</tr>
<tr>
<td>Entrance Keypad Diagnostics</td>
<td>80</td>
</tr>
<tr>
<td><strong>Change History</strong></td>
<td>93</td>
</tr>
</tbody>
</table>
# List of Tables

Table 1. Tunnel Master® Jr. Controller Dimensions, Measurements and Ratings .................. 14
Table 2. Tunnel Master® Jr. Keypad Dimensions, Measurements, and Ratings .................... 14
Table 3. Relay Box Circuit Descriptions ................................................................. 37
Table 4. DIP Switch Normal Settings/Functions ......................................................... 39
Table 5. 120 VAC Terminations ................................................................................. 43
Table 6. Comm Cable Terminations .............................................................................. 44
Table 7. Default Jumper Settings .................................................................................. 45
Table 8. DIP Switch Settings ...................................................................................... 46
Table 9. Main Wash Menu. ......................................................................................... 49
Table 10. Wet Down Wash Instructions ........................................................................ 50
Table 11. Relay Box Display and Keypad Descriptions ................................................. 53
Table 12. Change the System Password Instructions .................................................... 54
Table 13. Add Password Instructions .......................................................................... 55
Table 14. Set Date and Time Instructions ..................................................................... 56
Table 15. Configure Wash Menu .................................................................................. 57
Table 16. Wash Settings Menu .................................................................................... 58
Table 17. Configure Wash Settings .............................................................................. 62
Table 18. Outputs Descriptions ................................................................................... 63
Table 19. Output Settings ......................................................................................... 65
Table 20. Services Menu Item Descriptions ................................................................. 68
Table 21. Change or Set Services Instructions ............................................................. 68
Table 22. Assign Outputs to Services Instructions ....................................................... 70
Table 23. Entrance Keypad Buttons ............................................................................ 73
Table 24. Process Vehicles (Non-Stacking) ................................................................. 74
Table 25. Process Vehicles Stack Instructions ............................................................. 75
Table 26. View Service Counts Instructions .................................................................. 77
Table 27. Manually Close or Bump the Current Shift Instructions ............................... 78
Table 28. Relay Box Troubleshooting ......................................................................... 80
Table 29. Entrance Keypad Troubleshooting ............................................................... 81
Table 30. Miscellaneous Troubleshooting ................................................................... 81
List of Figures

Figure 1. DIP Switch 6 On position .................................................18
Figure 2. Reset button .................................................................18
Figure 3. Front Panel of the Tunnel Master Jr. ....................................19
Figure 4. Relay Box Interior Components ........................................21
Figure 5. Pulse/Proximity Switch Wiring ..........................................23
Figure 6. Gate Eye (Switch) Wiring ................................................24
Figure 7. Tire Switch Wiring ........................................................25
Figure 8. Entrance Management Overview and Wiring Diagram ..........26
Figure 9. Roller Locator Cross Section Diagram ............................27
Figure 10. Roller Locator Wiring ..................................................28
Figure 11. Panic Stop Circuit Wiring ..............................................29
Figure 12. Anti-Collision Wiring ....................................................31
Figure 13. Input Wiring ...............................................................32
Figure 14. Push Button Wiring 1 Row 8 Columns ............................33
Figure 15. Push Button Wiring First 8 Buttons .................................34
Figure 16. Push Button Wiring for Second 8 Buttons .......................35
Figure 17. Relay Jumper Box Settings ..........................................36
Figure 18. DIP Switch addressed for 9 ..........................................38
Figure 19. AC Power Terminations ..............................................40
Figure 20. Keypad Connectors (Keypad Board) ............................41
Figure 21. Communication Cable Termination Diagram ....................42
Figure 22. Keypad Circuit Board Jumper Settings ..........................44
Figure 23. Jumper - J3 ...............................................................45
Figure 24. DIP Switch ...............................................................46
Figure 25. Report/Receipt Printer ...............................................47
Figure 26. Main Screen Display and Keypad .................................52
Figure 27. Entrance Keypad ......................................................72
Figure 28. Appendix A - 1 Relay Box/1 Entrance Keypad/1 Receipt Printer .............85
Figure 29. Appendix B - 2 Relay Boxes/1 Entrance Keypad/1 Receipt Report Printer .87
Figure 30. Appendix C - 2 Relay Boxes/2 Entrance Keypads/Report Receipt Printer .89
CHAPTER 1: Introduction

This document was written for the installation of the Tunnel Master® Jr. (also known as the **TMJ**) to assist technicians, electricians, and operators. 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® Jr. This guide should be supplied to the electrician prior to the installation of conduit and wiring to ensure the TMJ is installed properly. Faulty installations are the major cause of system malfunctions.

**WARNING:** Failure to properly install the TMJ system will void the warranty.

Innovative Control Systems provides technical support for customers and installers:

1-800-246-3469

Many of the TMJ 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 committed to being the industry leader in car wash controller and management systems.

The Tunnel Master® Jr. system must be installed exactly as described in this manual to ensure its reliability and proper operation. By following the procedures in this manual, you should be able to perform the following:

- Install the Tunnel Master® Jr. system-level wiring
- Install the Tunnel Master® Jr. communications wiring
- Configure your wash settings and features
- Process vehicles through your wash
- View car counts
- View historical information
- Track sales
- Print reports
- Troubleshoot problems if they occur
- Provide a comprehensive, easy-to-use system reference guide.
- Enable operators and their employees to obtain the maximum value from the system.
- Furnish operators with a tool for training their employees on the Car Wash Controller.
Version Considerations

This document is 4.8 released October 22, 2019, and includes content based on the following ICS® software versions:

- Tunnel Master® Jr. software version 7.48

Hardware Features

The Tunnel Master® Jr. hardware is designed to withstand the harsh environments and hard use of a busy car wash. As an ICS customer, you benefit from a thoroughly researched and developed car wash controller. This manual will enable the operator to have an active part in the control and operation of your car wash facility with the many Tunnel Master® Jr. features:

- 24 programmable, fused outputs, upgradeable to 48, each with two independent circuits for 24 VAC and 120 VAC.
- Programmable flashing relay.
- Exclusive, patented anti-theft feature to prevent unauthorized processing of car washes.
- Input for Pulse, Gate, Tire, Roller Locator, Entrance Management and Panic circuits.
- Auto pulse feature allows pulse simulation in the event of pulse switch failure.
- Auto Gate feature allows gate switch simulation in the event of gate switch failure.
- Exterior indicators for easy troubleshooting.
- 16 programmable service buttons on the entry keypad, upgradeable to 32.
- Automated wet down feature for easy startup.
- Optional report and/or receipt printers.

Warning Marking

**WARNING:** This warning on equipment or hardware indicates the need to consult accompanying documentation before proceeding.
CHAPTER 2: Hardware Installation

This chapter provides a brief description of the hardware components and their function and the tunnel settings wiring diagrams for a new Tunnel Master® Jr. installation. The following instructions will provide detailed information on proper relay box mounting and installation of the Entrance Keypad.

Planning for Installation

- Before you begin, please read this entire manual.
- Permanent connections must be installed by a licensed electrician and must comply in accordance with all local and national codes.
- 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® Jr. and any peripherals must come from the dedicated UPS as supplied by ICS.
- The Tunnel Master® Jr. and peripheral equipment must be properly grounded.
- Test connections in the manual override position prior to system start-up.
- Before disposing boxes and cartons, look through to make certain all manuals, cables, connectors, and more have been removed.

**WARNING:** Failure to properly install the Tunnel Master® Jr. system will void the warranty and could result in serious injury or death.

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

800-246-3469
Controller Box Dimensions

Table 1: Tunnel Master® Jr. Controller Dimensions, Measurements and Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Amount</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>27 3/8”</td>
<td>—</td>
</tr>
<tr>
<td>Height</td>
<td>15 3/8”</td>
<td>—</td>
</tr>
<tr>
<td>Depth</td>
<td>6 3/8”</td>
<td>Includes the plastic face.</td>
</tr>
<tr>
<td>Weight</td>
<td>48 lbs.</td>
<td>Inclusive of the box, board and door.</td>
</tr>
<tr>
<td>Operating Temp. Range</td>
<td>32 °F to 122 °F 0 °C to 50 °C</td>
<td>—</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz.</td>
<td>—</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>120 VAC</td>
<td>—</td>
</tr>
<tr>
<td>Max. Amps</td>
<td>6.0 Amps.</td>
<td>—</td>
</tr>
<tr>
<td>Power Supply</td>
<td>6.0 Amps.</td>
<td>Power must come from a dedicated, 6-Amp. breaker.</td>
</tr>
<tr>
<td>IP Rating.</td>
<td>IP40</td>
<td>The Tunnel Master® Jr. is rated for protection against solid objects up to 1mm diameter and not protected against liquid.</td>
</tr>
</tbody>
</table>

Entrance Keypad Dimensions

Table 2: Tunnel Master® Jr. Keypad Dimensions, Measurements, and Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Amount</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>9 3/8”</td>
<td>—</td>
</tr>
<tr>
<td>Height</td>
<td>7”</td>
<td>—</td>
</tr>
<tr>
<td>Depth</td>
<td>2 5/8”</td>
<td>Includes the plastic face.</td>
</tr>
<tr>
<td>Weight</td>
<td>3 lbs.</td>
<td>Inclusive of the box, board and door.</td>
</tr>
<tr>
<td>Operating Temp. Range</td>
<td>32 °F to 122 °F 0 °C to 50 °C</td>
<td>—</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz.</td>
<td>—</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>12 VAC</td>
<td>—</td>
</tr>
<tr>
<td>Max. Amps</td>
<td>.02 Amps</td>
<td>—</td>
</tr>
<tr>
<td>Power Supply</td>
<td>.02 Amps</td>
<td>Power must come from a dedicated ICS transformer.</td>
</tr>
<tr>
<td>IP Rating.</td>
<td>IP65</td>
<td>The Tunnel Master® Jr. is rated for total protection against dust and strong jets of water from all directions, limited ingress permitted.</td>
</tr>
</tbody>
</table>
Relay Box Mounting

- The relay box must be securely mounted to the wall in the equipment room of the car wash. The relay box is designed to be located in a dry, non-corrosive environment.
- The relay box must be located so that conduit connections can be easily made, and the relays can be readily accessed.

Relay Box Wiring

- Install one approved 3/4” conduit from the relay box to the entrance keypad box located near the front of the wash tunnel. All conduit runs should meet all 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.
- Electrician must provide a dedicated 120 VAC circuit to power the relay box.
- Run a 14-3 cable to the 120 VAC terminal block. It is labeled with L and N for Load and Neutral, respectively. There is a mechanical ground lug located on the back of the box adjacent to the terminal block. It is labeled with the universal ground symbol. Terminations for the shielded cable should be torqued to 35 pound-inches.
- Electrician must supply a separate 24 VAC and 120 VAC circuit to the common (C) side of the upper and lower termination points of each relay respectively, then loop the commons together to each relay. This power is to fire the solenoids and equipment.
- A separation of 120 VAC and 24 VAC shall be maintained for all field-wiring circuits. All 24 VAC circuits must be supplied by a class 2 transformer.
- Tighten all wires on the circuit board in the relay box to 20 pound-inches (2.3 n-m.) Over torquing may cause enclosure breakage.
- Relays in the relay box are double pole with independent commons so that each relay can have two circuits running through it. Commons are independent to provide a power source to switch two devices through either the normally open or normally closed circuits.
- Relays circuits should be supplied with no greater than 120 VAC 15 Amp. 

**NOTE:** This 120 VAC MUST BE A SEPARATE circuit from the dedicated 120 VAC circuit terminated in the lower right corner of the Relay Box.

- A 6.3 Amp 250V fuse protects each relay. Four spare fuses along with LED fuse test indicators are located at the center of the relay board. (Fuses should not be replaced with any other device.)
- Another approved ¾” conduit needs to be run to your motor control center to the relay box and will contain the low voltage wires for clock (Pulse), gate (Entrance switch) and Tire switch functions.
- When using a normally open 2-wire pulse switch, use terminals marked CLK SINK and PROX GND.
When using a normally open 3-wire pulse switch, use terminals marked PROX PWR, CLK SINK, and PROX GND.

Gate and Tire inputs require a constant 24 VAC neutral supplied from a class 2 transformer. The load signal would be terminated to the normally open pole of the electric eye (Gate) switch.

For Entrance Keypad Installation, See “Entrance Keypad” on page 71.
Resetting Default Configuration Settings

The Tunnel Master® Jr. is delivered with preloaded settings. You can erase these settings before configuring your own settings. The following procedure shows how to erase the current settings.

**NOTE:** ICS recommends a complete, first-time erase using DIP switch 6. See Figure 1.

To erase all configuration settings, follow these steps:

1. Open the Tunnel Master Jr. door.
2. Remove the motherboard cover which is located on the inside of the Tunnel Master Jr. door, if necessary.
3 Locate DIP switch 6, and then move to the On position. See Figure 1, “DIP Switch 6 On position.”

![DIP Switch 6 On position](image)

Figure 1. DIP Switch 6 On position

4 Press the Reset button located above the battery. See Figure 2, “Reset button.”

![Reset button](image)

Figure 2. Reset button

5 On the Tunnel Master Jr. (TMJ) display, press the Menu button.

6 On the display keypad, press #1. The TMJ display quickly shows the “Initialize Files” message.

7 On the display keypad, press #2. The TMJ display quickly shows the “Clear Memory” message.

8 On the display keypad, press #4 which is the factory reset.

9 After the factory reset, move DIP switch 6 back to the Off position.

10 Press the Reset button. The TMJ display shows the “System Shut Down” message.

11 After completing these instructions, contact ICS Technical Support at 800-246-3469 to clear the “System Shut Down” message.

See “DIP Switch Settings” on page 38.
Output Overview

24 Outputs

The Tunnel Master® Jr. Relay Box is the control center for firing the various outputs or services in the wash tunnel: soap foamer, reclaim motor, and more. The Tunnel Master® Jr. Controller relay box provides for automatic, computer controlled, or manual firing of the outputs. The relay box can control up to 24 outputs.

Figure 3. Front Panel of the Tunnel Master Jr.

Each toggle switch controls the operation of one output or service.

The switch has three positions:

- **UP** = Manual Override. Manually turn on output. (This feature can be turned off if desired.)
- **MIDDLE** = Output Off. The output is off and will not fire.
- **DOWN** = Computer controlled on position (normal).
Relay Box Interior

Each relay has circuits to control both 24 VAC and/or 120 VAC simultaneously so that a service sign as well as the service solenoid can be operated from the same relay.

- Plug in relays for ease of serviceability.
- Each relay has 2 fuses.
- Built in spare fuses and fuse tester near the center of the box.
■ Each relay can be programmed to flash, eliminating the need for field installed flashing relays for signs.

Termination points for Pulse, Gate, Tire, and Panic Circuits.

Plug in relays for ease of serviceability. Each relay has two fuses (24 VAC and 120 VAC).

Built in spare fuses and fuse tester.

12 VAC transformer powers the Keypad Power Board only.

**WARNING:**
Do NOT power any other devices from this transformer!

Power In

Comm Cable Terminal Blocks for 16 button Entrance Keypad and other TMJ relay box.

**Figure 4. Relay Box Interior Components**
Pulse/Proximity Switch Wiring

**IMPORTANT:** The pulse switch is a critical input for the Controller. It signals the system that the conveyor is moving and is the measuring device from which the system knows when to turn equipment devices on and off.

See wash equipment vendor for location of the switch.

The Controller is designed to accept all commonly used pulse/proximity switches. There are two types that are most commonly used, either a two wire or three wire Sinking (NPN) switch. The drawing below indicates the wiring for these two types of switches.

The other type of switch is defined as a Sourcing (PNP). If it is determined that this type of proximity switch is being used, there are two jumpers located just below the **CLK SINK** and **CLK SRCE** terminal blocks (JP1) and (JP2). These jumpers must be moved to the **SOURCE** jumper position. Some pulse switches vary in the wire color. You should check the pulse/proximity switch manual for proper color codes. The following diagram shows how to wire the pulse/proximity switch into the Relay Box.
Pulse/Proximity Switch Wiring

RELAY ENCLOSURE

2-Wire pulse switch with N.O. contact

3-Wire (NPN) Proximity switch - Sinking

Terminals not used in this diagram

Terminal strip on top of relay board

Refer to Jumper settings

Figure 5. Pulse/Proximity Switch Wiring
**Gate Switch (Electric Eye) Wiring**

**IMPORTANT:** The Gate switch is the second critical input device to the Relay Box. It is usually an electric eye system or some type of vehicle position detector located just before the first piece of wash equipment. This switch signals the Controller that a vehicle is starting through the tunnel. All equipment turn on points are measured from this switch to the particular piece of equipment.

See the wash equipment provider for the location of this relay. The following diagram to the Smart Relay Box starts at the control relay for the sensing device being used. The diagram shows how to wire the Gate (electric eye) switch into the Relay Box.

**Gate Eye Switch Wiring**

![Diagram of Gate Eye Switch Wiring]

---

**Figure 6. Gate Eye (Switch) Wiring**
**Tire Switch Wiring**

**IMPORTANT:** This circuit is used if the customer has purchased a tire position switch from the equipment vendor. The switch enables the Controller software to turn equipment on and off as each of the vehicle’s tires pass that piece of equipment. In order for this to work properly, the tire switch should be located in line with the gate switch.

The following diagram shows how to wire the Tire Switch (tire position detection) into the Relay Box.

![Figure 7. Tire Switch Wiring](image)

**Figure 7. Tire Switch Wiring**
Entrance Management System Wiring

**IMPORTANT:** This circuit is used if the customer has purchased a treadle switch from the equipment vendor. The Entrance Management System in the Tunnel Master® Jr. allows a roller to be fired automatically upon seeing a second 24V input on Input 10. At the same time, an output can be set to fire and the roller can be delayed.

When a car enters the tunnel, the Tunnel Master® Jr. will wait to see two signals within 15 seconds of each other from the tire treadle that is wired into Input 10. The first signal represents the front tire, and the second signal represents the rear. Once it sees the second signal, the Tunnel Master® Jr. will fire an optional sign relay followed by a roller relay. The amount of time between the sign firing and the roller is called the **Entrance Management Delay** in the Wash Settings. The following diagram shows how to wire the treadle switch for the EMS into the Relay Box.

**Entrance Management System Wiring Layout**

![Diagram](image)

**Figure 8. Entrance Management Overview and Wiring Diagram**
Roller Locator Wiring

**IMPORTANT:** You can add a roller locator to the Tunnel Master® Jr. to keep your rollers from jamming your conveyor. In order to do this, a roller locator switch must be installed on your conveyor to signal the presence of a roller.

When a roller locator is used, the Tunnel Master® Jr. will wait to fire a roller until the trailing edge of the signal is detected from a roller locator. There are various devices available to detect the roller and because the Tunnel Master® Jr. reads the trailing edge of the signal either a normally open or normally closed switch can be used.

To set this up two things need to be done:

- A roller locator switch needs to be wired into Input 9, and installed on the conveyor. This switch should be positioned so that as soon as a roller passes the switch it will be in a position where it is safe for the roller forks to come up.
- Turn the roller locator function on in Wash Settings.

The following diagram shows how to wire the roller locator into the Relay Box.

**Conveyor Roller Locator Cross Section Diagram**

![Figure 9. Roller Locator Cross Section Diagram](image-url)
Roller Locator Wiring

Figure 10. Roller Locator Wiring
Panic Stop Circuit Wiring

**IMPORTANT:** This drawing shows the basic wiring of the panic circuit. The Panic circuit allows for certain software programming that could not be programmed without this circuit in place.

The diagram shows how to wire the Panic Stop circuit into the Controller.

**PROGRAMMING**
- Relay #1: Conveyor Enable S, S, C, AC, N, N, N, N
- Relay #2: Auto Step S, S, S, A, AC, N, N, N
- Relay #3: Conveyor Auto Start S, S, O, C, N, N, N, N
- Relay #4: Homing S, S, H, AC, N, N, N, N

Panic Wash is set to "Y"

In Relay #4 the start time is the length of time that the horn sounds and the extend time is the delay that the conveyor will start after the horn ends.

**Figure 11. Panic Stop Circuit Wiring**
Anti-Collision Wiring

**IMPORTANT:** The anti-collision on the Tunnel Master® Jr. is a function to help prevent cars from running into each other at the exit end of the tunnel. In order for this to work you need an anti-collision device mounted in the tunnel at the spot where you could have a potential collision.

The process consists of two variables in order for the Tunnel Master® Jr. to go into an anti-collision panic. The first variable is for the Tunnel Master® Jr. to validate a car through some sort of sensing device. The second variable is the anti-collision start time in the wash settings on the Tunnel Master® Jr. When a car is in the sensing device and a second car reaches the Anti-collision Start Time, the system will go into a panic until the sensing device is cleared. The system must also have a panic circuit wired in for this function to be able to restart the conveyor.

(See “Panic Stop Circuit Wiring” on page 29.)

The magnetic loop and the photo eye are two examples of anti-collision devices that operate the open contacts that interact with the Tunnel Master® Jr. wash controller.

(See “Anti-Collision Wiring” on page 31.)

The following diagram shows how to wire an anti-collision system into the Tunnel Master® Jr.
Anti-Collision Wiring

Figure 12. Anti-Collision Wiring
**Input Wiring Designations**

*All input devices must complete a 24VAC circuit to the input. A contact closure alone will **NOT** toggle the input. *Please refer to the example circuit below.*

(Example: Gate, Anti Collision, Roller detect, etc.)

**Figure 13. Input Wiring**
NOTE: This feature is for non-ICS tunnel controllers.

If the Tunnel Master® Jr. is going to utilize a Push Button Station as a means of remotely selecting the features of each car wash, refer to one of the following schematic diagrams of how it must be wired to operate correctly with the inputs of the Tunnel Master® Jr.

**Push Button Wiring 1 Row 8 Columns**

Can be used for up to 7 Services and an 'ALL Clear on Input 8'.

![Diagram of Push Button Wiring 1 Row 8 Columns]

**Figure 14. Push Button Wiring 1 Row 8 Columns**

**IMPORTANT:** Please be certain to install it exactly as it is shown in the diagram. Wiring it in any other way would conflict with the designated inputs causing the washes to run incorrectly or not at all.
Push Button Wiring First 8 Buttons

First 8 buttons (4 Rows and 4 Columns)

![Diagram of Push Button Wiring First 8 Buttons]

Figure 15. Push Button Wiring First 8 Buttons
Push Button Wiring for Second 8 Buttons

Second 8 Buttons (4 Rows and 4 Columns)

Figure 16. Push Button Wiring for Second 8 Buttons
Relay Box Jumper Settings

The following figure and table will explain the location and purpose of the various jumpers, switches, and controls on the Relay Box circuit board. This board is located on the inside of the Relay Box door.

Figure 17. Relay Jumper Box Settings
<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>N/A</td>
<td>Does not exist.</td>
</tr>
<tr>
<td>J2</td>
<td>ON</td>
<td>BIAS High (+) set ON for the Main Relay box only.</td>
</tr>
<tr>
<td>J3</td>
<td>485</td>
<td>3 position jumper should be on 2-pins to select 485 Communication (Up).</td>
</tr>
<tr>
<td>J4</td>
<td>485</td>
<td>3 position jumper should be on 2-pins to select 485 Communication (Up).</td>
</tr>
<tr>
<td>J5</td>
<td>ON</td>
<td>Transmit terminating resistor. Only ON if first or last device in network. If you have a 24-output system, this should be ON. If you have a 48-output system, the main relay box should be OFF and the second relay box should be ON.</td>
</tr>
<tr>
<td>J6</td>
<td>485</td>
<td>3 position jumper should be on 2-pins to select 485 Communication (Left).</td>
</tr>
<tr>
<td>J7</td>
<td>OFF</td>
<td>Receive terminating resister.</td>
</tr>
<tr>
<td>J8</td>
<td>ON</td>
<td>Network Interface Chassis Ground Jumper.</td>
</tr>
<tr>
<td>J9</td>
<td>ON</td>
<td>Network Interface Signal Ground Jumper.</td>
</tr>
<tr>
<td>J10</td>
<td>ON</td>
<td>BIAS Low (-) set ON for the Main Relay box only.</td>
</tr>
<tr>
<td>J11</td>
<td>ON</td>
<td>ON=Enables, OFF=Disables manual override switches on relay box.</td>
</tr>
</tbody>
</table>
DIP Switch Settings

The following picture and table will show the Relay Box DIP switch and the various settings that may be used. The DIP switch is located on the inside of the Relay Box Door.

The ON position is marked with an arrow and is always up. A 24 Output Relay Box will ship as ADDR1. If you were to add a second Relay Box to the system, it should be addressed as ADDR9.

See Figure 17, “Relay Jumper Box Settings.” for various jumpers, switches, and controls.

Figure 18. DIP Switch addressed for 9
The following table displays the DIP Switch settings for normal operations.

**NOTE:** If the DIP switch is up then it is On, and if its down then it is Off.

<table>
<thead>
<tr>
<th>Switch</th>
<th>Default Setting</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>Address Setting: 1, 2, 3, 4 OFF = Address 1</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>Address Setting: 1 ON = Address 9</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
<td>Address Setting: 2, 3, 4 OFF = Address 10</td>
</tr>
<tr>
<td>4</td>
<td>OFF</td>
<td>Address Setting: 1 ON; 2 OFF; 3, 4 ON = Address 11</td>
</tr>
<tr>
<td>5</td>
<td>OFF</td>
<td>Baud Rate: OFF = 9600; ON = 38,400</td>
</tr>
<tr>
<td>6</td>
<td>OFF</td>
<td>Up position allows access to Initialization Menu options</td>
</tr>
<tr>
<td>7</td>
<td>OFF</td>
<td>Pulse 7, 8 OFF Normal</td>
</tr>
<tr>
<td>8</td>
<td>OFF</td>
<td>Pulse Enhancement 7 OFF; 8 ON 2 Times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 ON; 8 OFF 4 Times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7, 8 ON 8 Times</td>
</tr>
</tbody>
</table>
Tunnel Master® Jr. AC Power Terminations

Figure 19. AC Power Terminations
CHAPTER 3: Entrance Keypad Installation

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

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.
- The Entrance 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 Entrance Keypad should be mounted away from corrosive chemicals.

Entrance Keypad Wiring

- Locate conduit that was run from the Tunnel Master® Jr. relay box.
- 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 12 VAC 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 e to the Entrance Keypad.

Figure 20. Keypad Connectors (Keypad Board)

- There is a terminal block (POWER), located on the keypad circuit board labeled with ACH, ACN and GND, for Load, Neutral and Ground, respectively. Terminations for the 3 – 18AWG wires should be torqued to 20 pound-inches (2.3 n-m.) Over torquing may cause enclosure breakage.
The equipped with a 12 VAC transformer, which is to be used to power the Entrance Keypad. If a second transformer is present, the 12 VAC terminations must be made as follows from the separate transformer. If there is only one transformer, terminate power from it.

Electrician must run a single-twisted pair, 24AWG shielded COMM cable (can be purchased from ICS) through 3/4" conduit from the 485 terminal to the Entrance Keypad.

1. Attach the shield drain at each end of the COMM cable to the ground lug of each enclosure. Shield ground noodles to the earth ground at one end only. Ground lug is 120 VAC.

Figure 21. Communication Cable Termination Diagram

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.) Over torquing may cause enclosure breakage.

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 12 VAC 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 Load, Neutral and Ground, respectfully. Terminations for the 3 – 16AWG wires should be torqued to 20 inch pounds (in-lb) (2.3 n-m.) Over torquing may cause enclosure breakage.

<table>
<thead>
<tr>
<th>First Entrance Keypad</th>
<th>Second Entrance Keypad</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACH</td>
<td>ACH</td>
</tr>
<tr>
<td>ACN</td>
<td>ACN</td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
</tbody>
</table>

- Electrician must run a single-twisted pair, 12AWG shielded Comm cable (can be purchased from ICS) through the above 3/4” conduit from the first Entrance Keypad to the second Entrance Keypad.

- 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.
Comm cable terminations must be made as in the following table.

Table 6: Comm Cable Terminations

<table>
<thead>
<tr>
<th>First Entrance Keypad (Either Connector)</th>
<th>Second Entrance Keypad (Either Connector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT+</td>
<td>DT+</td>
</tr>
<tr>
<td>DT-</td>
<td>DT-</td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
</tbody>
</table>

Entrance Keypad Jumper Settings

Figure 22 shows the Entrance Keypad circuit board and location of the various jumpers on the Entrance Keypad circuit board.

In Figure 22, “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 7: Default Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>ON</td>
<td>Reserved Jumper; ALWAYS ON</td>
</tr>
<tr>
<td>J2</td>
<td>ON</td>
<td>Reserved Jumper; ALWAYS ON</td>
</tr>
<tr>
<td>J3</td>
<td>1 and 2</td>
<td>EPROM Chip Enable; Jumper covering pins 1 &amp; 2 letters for corresponding letters EPC. See Figure 23.</td>
</tr>
<tr>
<td>J4</td>
<td>ON</td>
<td>Ground Jumper</td>
</tr>
<tr>
<td>J5</td>
<td>OFF</td>
<td>Biasing Resistor High (+)</td>
</tr>
<tr>
<td>J6</td>
<td>OFF</td>
<td>Biasing Resistor Low (-)</td>
</tr>
<tr>
<td>J7</td>
<td>ON</td>
<td>Terminating Resistor. Set to ON if it is the first or last device in the network.</td>
</tr>
</tbody>
</table>

Jumper - J3

The following figure will show the EPROM Chip in the down position covering pins 1 & 2 corresponding to the letters EPC.

![Figure 23. Jumper - J3](image)

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: The OFF position is away from the word Config on the circuit board.

**Figure 24. DIP Switch**

**Table 8: DIP Switch Settings**

<table>
<thead>
<tr>
<th>Switch</th>
<th>Setting</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>Address setting</td>
</tr>
<tr>
<td></td>
<td>1, 2 OFF</td>
<td>= Address 5</td>
</tr>
<tr>
<td></td>
<td>1 OFF, 2 ON</td>
<td>= Address 6</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>Address setting</td>
</tr>
<tr>
<td></td>
<td>1 ON, 2 OFF</td>
<td>= Address 7</td>
</tr>
<tr>
<td></td>
<td>1, 2 ON</td>
<td>= Address 8</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
<td>Baud Rate</td>
</tr>
<tr>
<td></td>
<td>OFF = 9600</td>
<td>ON = 38,400</td>
</tr>
<tr>
<td>4</td>
<td>OFF</td>
<td>Test Mode</td>
</tr>
</tbody>
</table>
CHAPTER 4: Optional Printer Installation

The thermal printer is utilized by the Tunnel Master® Jr. system for both the report and a receipt printer. These printers can be purchased as an option to the base system or purchased and added to the system after initial installation.

Please refer to the Operator’s Manual supplied with the printer for proper care and maintenance of your printer.

**NOTE:** If you are using the Dot Matrix printer, please be sure to check the DIP switch settings of the printer. DSW1 DIP switch 3 should be the only DIP switch set to ON all of the others should be off. The DIP switches are located on the bottom of the printer. You will have to remove the small door covering the DIP switches.

![Figure 25. Report/Receipt Printer](image)

Mounting and Installation of Report/Receipt Printer

**Report Printer Mounting**

- The report printer should be set on a shelf, which is securely mounted next to the Relay Box.
- The report printer is not moisture resistant or waterproof. It must be located in a dry and non-corrosive environment.
- The report printer must be located so that connections can be easily made, and the printed reports can be readily accessed.
Report Printer Wiring

- Electrician must provide a dedicated 120 VAC circuit and outlet to power the report printer. This should be on the same dedicated circuit as the Relay Box.

- Drill and provide access into the Relay Box using a Listed ½” water tight compression connector for a ¼” cable. The connector should be tightened to the torque specs of the manufacturer. Over torquing may cause enclosure breakage.

- Insert the cable with the 25-pin RS-232 connector attached (supplied by ICS) into the Relay Box. Allow excess cable outside the Relay Box for easy access to the backside of the report printer so that the RS-232 25-pin connector can be easily attached and removed.

- Attach the cable to one of the two RS-232 ports in the Relay Box labeled Gnd, Rxd, Txd and 5v as follows:
  
<table>
<thead>
<tr>
<th>Color</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Gnd</td>
</tr>
<tr>
<td>White/Black</td>
<td>Rxd</td>
</tr>
<tr>
<td>Black/White</td>
<td>Txd</td>
</tr>
</tbody>
</table>

- Tighten all wires on the circuit board in the relay box to 20 pound-inches (2.3 n-m.) Over torquing may cause enclosure breakage.

- Connect the 120 VAC power supply (provided by ICS) to the dedicated 120 VAC outlet and the report printer.

- Connect the 25-pin RS-232 connector to the back of the receipt printer.
CHAPTER 5: Operating Procedures

Operating Procedures

The Operating Procedures chapter will provide the user with an explanation of how to operate their Tunnel Controller, process customer vehicles and review operations through the reports available. As in the previous chapters, the instructions will follow a logical trail through a day’s operations beginning with the opening process. Proper operation will ensure operators that they will obtain accurate reports and prevent potential employee errors or possible theft.

Main Wash Menu

After setting up the various wash settings and services, the user is now ready to wash cars. The main wash menu is where many of the day to day activities will be performed. It is important to train personnel in the proper selection of these menu options to ensure accurate shift reporting and to review operations.

The following is a list of menu options in the Main Wash menu and a brief explanation of their function.

Table 9: Main Wash Menu

<table>
<thead>
<tr>
<th>Item</th>
<th>Menu Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bump Shift</td>
<td>When selected this menu option will print a report, if a report printer is attached, and ask if the operator wishes to close (Bump) the current shift.</td>
</tr>
<tr>
<td>2</td>
<td>Wet Down Wash</td>
<td>This option allows the user to activate any equipment outputs, which have been designated to activate whenever the operator chooses this wet down option.</td>
</tr>
<tr>
<td>3</td>
<td>Configure Wash</td>
<td>Allows user to configure wash settings and services, explained in-depth. See &quot;Wet Down Wash&quot; on page 49.</td>
</tr>
<tr>
<td>4</td>
<td>View Counts</td>
<td>This menu gives the ability to view counts, number of times the various services have been processed during the current shift.</td>
</tr>
<tr>
<td>5</td>
<td>Print Reports</td>
<td>From this menu option a user can print various financial reports, if there is an optional report printer attached to the controller.</td>
</tr>
</tbody>
</table>

Wet Down Wash

The Wet Down process is the first step that the opening person should do to prepare the wash for the first customer. When selected, the process is setup to activate all relays (outputs) which have been designated to turn on during the Wet Down cycle. The cycle time is setup in the Wash Settings menu. By wetting down the cloth equipment and perhaps charging the foaming manifolds in the wash, the wash will be prepared to process the first vehicle, and provide a more consistent wash to the customer.
Follow these steps to start a wet down at the Tunnel Master® Jr. display:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the Tunnel Master® Jr. display panel, press the <strong>Menu</strong> button to access the main menu. <strong>NOTE:</strong> If a password has been set, it will be necessary to enter the password before the main menu can be accessed.</td>
<td>[1] Bump Shift [4] View Counts [2] Wet Down Wash [5] Print Reports [3] Configure Wash</td>
</tr>
<tr>
<td>2</td>
<td>From the display panel numeric keypad, press the numeric 2 key to select <strong>Wet Down Wash</strong>. <strong>NOTE:</strong> The relays will be activated and you will be returned to the main display screen. A second to second countdown will start next to the word WETDOWN. This system will continue counting down until it reaches 0 and then shut all of the activated relays off.</td>
<td>ICS Tunnel Controller  10:25:35 PM VER 1 REV 5.1104/15/2002 WETDOWN 085 SEASCARS 0000</td>
</tr>
</tbody>
</table>
CHAPTER 6: Wash Configuration

This chapter will provide information on how to setup and configure facility specific information and how to use some of the features of your new Tunnel Master® Jr. Car Wash Controller. The Tunnel Master® Jr. Controller contains unique features usually found only in high-end full-service wash controller systems. Features like ICS copyrighted anti-theft software; integration with a Panic Stop circuit; and for quick morning wash checkouts, use Wet down.

The following topics will be covered in this chapter:

“Relay Box Display Keypad” on page 52.
“Configure Wash Settings” on page 62.
“Set Password” on page 54.
“Configure Wash Menu” on page 57.
“Configure Wash Settings” on page 62.
“Outputs” on page 63.
“Follow these procedures to set or change the settings for the Outputs in the Tunnel Master® Jr. Controller program.” on page 65.
“Assign Outputs to Services” on page 70.
Relay Box Display Keypad

The Relay Box keypad is the primary place from which to program and configure the wash tunnel. If your facility has two relay boxes, one of them will serve as the primary input relay box. From this screen you can:

- Setup and configure the wash tunnel outputs and services.
- View car count and some sales information.
- Print vehicle count and sales information, if optional printer is installed.
- Some equipment diagnostics occur at the Relay Box.

![Main Screen Display and Keypad](image)

**Figure 26. Main Screen Display and Keypad**

**NOTE:** In order to utilize the full functionality of the Tunnel Master® Jr. controller, it is very important that the electrician follow the wiring instructions provided with the Relay Box.
### Table 11: Relay Box Display and Keypad Descriptions

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicator Lights:</strong></td>
<td></td>
</tr>
<tr>
<td>+5V DC</td>
<td>This light should be lit at all times indicating that the Tunnel Master Jr. has good power.</td>
</tr>
<tr>
<td>LOGIC</td>
<td>This light should be blinking in a steady rapid beat indicating that the system is sending and receiving logic information within the system. This light indicates the heartbeat of the switch board.</td>
</tr>
<tr>
<td>CLOCK</td>
<td>When blinking, indicates operation of pulse switch on conveyor.</td>
</tr>
<tr>
<td>GATE</td>
<td>When on, indicates gate switch (electric eye) is sensing.</td>
</tr>
<tr>
<td>TIRE</td>
<td>When on, indicates tire switch is sensing.</td>
</tr>
<tr>
<td>PANIC</td>
<td>When on, indicates panic circuit is activated.</td>
</tr>
<tr>
<td>F1 – F4</td>
<td>Function buttons are used during the setup and programming of the wash facility. During setup options will be displayed at the bottom of the display indicating which button to press for the option desired. Options:</td>
</tr>
<tr>
<td></td>
<td>F1 = PREV allows user to return to previous screen.</td>
</tr>
<tr>
<td></td>
<td>F2 = NEXT allows user to advance to the next screen.</td>
</tr>
<tr>
<td></td>
<td>F3 = CLEAR allows user to clear existing entries.</td>
</tr>
<tr>
<td></td>
<td>F4 = SAVE allows user to save new settings entered.</td>
</tr>
<tr>
<td>Menu</td>
<td>The Menu button is used when accessing various menu options in your car wash controller. It is also used as an escape key to exit out of the current screen display or to return to the previous menu.</td>
</tr>
<tr>
<td>Numeric 1-9</td>
<td>Alphanumeric buttons are also used during programming as well as entering passwords etc. When entering a desired letter, press the corresponding numeric key to select the desired number. Example: When entering the letter C, press the number 1 key three times.</td>
</tr>
<tr>
<td>Numeric 0</td>
<td>The 0 button has multiple functionality depending on what is being programmed. In most menu options, the 0 button, when pressed, will allow for a space, a decimal point or zero. When setting service or output features, where there is more than one option, the 0 button can be pressed to scroll through the various options allowed for that setting.</td>
</tr>
<tr>
<td>AC</td>
<td>The AC button clears all entries on the current screen.</td>
</tr>
<tr>
<td>ENT</td>
<td>When pressed during programming allows user to advance to the next option.</td>
</tr>
</tbody>
</table>
Set Password

Setting a password is optional. After you set a Password, the user is required to enter that password in order to access menu options.

This feature allows you to restrict access to the menus in the Tunnel Master® Jr. system.

Follow the steps in Table 12, “Change the System Password Instructions,” to set or change the system password.


Table 12: Change the System Password Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Display</th>
</tr>
</thead>
</table>
[3] Configure Wash |
| 2    | Press the numeric key 3 from the Main Menu to select **Configure Wash**. | [1] Services[4] Wash Settings  
| 3    | Press the numeric key 6 to select **Set Password**. | New Password: _ |
| 4    | Enter in your password. Example: For the letter L, press the 4 key three times | New Password: _ |
| 5    | Press the **ENT** key to save your changes, and return to the Configure Wash Menu. **NOTE:** Remember this password. | New Password: ICS _ |
Access a Password Protected Menu

Once a password has been set into the system, any access to the menu options will require that the user enter the password that has been setup.

NOTE: If the password is forgotten, contact ICS Support 800-246-3469.

Follow these instructions to set up a password to access the menu options:

Table 13: Add Password Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the main screen, press the Menu key.</td>
<td>ICS Tunnel Controller 5.1104/15/2019&lt;br&gt;Password _ _ _ _ _ _&lt;br&gt;ADDR =1CARS 0000</td>
</tr>
<tr>
<td>2</td>
<td>Using the numeric keypad, type in the first letter of the password.</td>
<td>ICS Tunnel Controller 5.1104/15/2019&lt;br&gt;Password * _ _ _ _ _ _&lt;br&gt;ADDR=1CARS 0000</td>
</tr>
<tr>
<td>3</td>
<td>Wait until the cursor moves to the next position. Warning: If you press ENT after entering a letter, what you have entered to that point will be accepted as the password and you will be returned to the main screen display.</td>
<td>ICS Tunnel Controller 5.1104/15/2019&lt;br&gt;Password * _ _ _ _ _ _&lt;br&gt;ADDR=1CARS 0000</td>
</tr>
<tr>
<td>4</td>
<td>Repeat steps 3 &amp; 4 until the entire password is entered.</td>
<td>ICS Tunnel Controller 5.11 04/15/2019&lt;br&gt;Password **** _ _&lt;br&gt;ADDR=1CARS 0000</td>
</tr>
</tbody>
</table>
Set Date Time

The first item to program is the correct date and time for the system. This is menu option #3 in the Configure Wash menu. The time will be important in that other programming options such as when to automatically bump a shift will need the correct time set to accomplish the process at the correct time of day.

Follow these procedures to set or change the correct date and time in the system.

Table 14: Set Date and Time Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Press the numeric key 5 to select Set Date Time.</td>
<td>Set Date Time&lt;br&gt;Date: _ / _ / _ _ _ _ _&lt;br&gt;Time: 10:25:35 AM&lt;br&gt;Press [Menu] to return</td>
</tr>
<tr>
<td>4</td>
<td>Using the numeric keys, type in the corresponding number representing the month. For example, 04 = April. Press the ENT key after the correct selection is made.</td>
<td>Set Date Time&lt;br&gt;Date: 04 / _ / _ _ _ _ _&lt;br&gt;Time: 10:25:35 AM&lt;br&gt;Press [Menu] to return</td>
</tr>
<tr>
<td>5</td>
<td>Repeat steps 3 and 4 to correctly enter the day, year, hour, minutes, seconds and whether it is AM or PM.</td>
<td>Set Date Time&lt;br&gt;Date: 04/15/2002 Time: 10:25:35 AM&lt;br&gt;Press [Menu] to return</td>
</tr>
</tbody>
</table>
Configure Wash Menu

Before any washes can be processed, the user must configure the wash. There are many items to be configured including the actual tunnel setup all the way to setting up services. Each item must be configured accurately if the wash is to operate properly.

The following is a list of menu options in the Configure Wash menu and a brief explanation of their function.

Table 15: Configure Wash Menu

<table>
<thead>
<tr>
<th>Item</th>
<th>Menu Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Services</td>
<td>In the Services menu option the user will define the various services and wash options they will have at their car wash.</td>
</tr>
<tr>
<td>2</td>
<td>Outputs</td>
<td>This option is where the user will setup what each output is operating and the various settings for that output.</td>
</tr>
<tr>
<td>3</td>
<td>Outputs List</td>
<td>This option allows the user to assign what selective outputs will be activated for which services that are available to sell.</td>
</tr>
<tr>
<td>4</td>
<td>Wash Settings</td>
<td>Wash Settings allows the user to set the various equipment settings that directly relate to their particular equipment. This is where the user will set many of the unique feature of the Tunnel Master® Jr. tunnel controller.</td>
</tr>
<tr>
<td>5</td>
<td>Set Date Time</td>
<td>This option allows the user to set the date and time the system will recognize.</td>
</tr>
<tr>
<td>6</td>
<td>Set Password</td>
<td>This option allows you to setup a password to restrict access to the menus on the relay box.</td>
</tr>
</tbody>
</table>

NOTE: This manual will take you through the process of setting up a car wash. It will do this in the logical order for the setup, which may not necessarily be the order in which the menu options appear on the screen.
Wash Setting Descriptions

The Wash Settings menu option is where important information about the user’s specific car wash equipment is programmed. Important features such as the anti-theft program and Wet Down options are set in this menu.

The following is a list of menu items within the Wash Settings menu option and a brief explanation of their function.

Table 16: Wash Settings Menu

<table>
<thead>
<tr>
<th>Wash Setting Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EqptMeasurement In Inches</td>
<td>If Y for yes, the equipment distance measured in inches. If N for no, the equipment distance is measured in pulses.</td>
</tr>
<tr>
<td>Pulse Length</td>
<td>Pulse length must be set and will affect the input for Min and Max Car Length as well as Anti Bounce settings. Enter “1” if the user wishes the system to track start stop times in pulses. Enter the number of inches of chain travel for one pulse if the user wishes to set start stop times in inches.</td>
</tr>
<tr>
<td>Pulse On Input 8</td>
<td>Is the Pulse Wiring installed on Input8? Enter Y for Yes and N for No. Default is set to Y (Yes) on the Mandatory Only Secondary Tunnel Master® Jr.</td>
</tr>
<tr>
<td>Min Car Length</td>
<td>The length in inches or the number of pulses of the minimum size vehicle that may enter the car wash. This can be as little as 24” but must be greater than the minimum pulse length and greater than the anti- bounce value. This is part of the anti-theft features. Note: If using inches, when an entry is made the system will round off to the closest setting possible based on the entry made.</td>
</tr>
<tr>
<td>Max Car Length</td>
<td>The length in inches or the number of pulses of the longest vehicle that will enter the car wash before a violation is recorded. This is part of the anti-theft feature. <strong>NOTE:</strong> If using inches, when an entry is made the system will round off to the closest setting possible based on the entry made.</td>
</tr>
<tr>
<td>Anti-bounce</td>
<td>The length in inches or the number of pulses that the system still counts a vehicle if the sensor drops out as car passes the gate switch for less than anti-bounce value and comes back on. Value MUST be less than value set for Min Car Length. <strong>NOTE:</strong> If using inches, when an entry is made the system will round off to the closest setting possible based on the entry made.</td>
</tr>
<tr>
<td>Auto Pulse Period</td>
<td>This is the rate in which you want the conveyor to run when in Auto Pulse. You should set this value to 0 when the conveyor is running. Doing this will automatically calibrate this setting based on your conveyor speed. If you change conveyor speeds, you should reset this.</td>
</tr>
<tr>
<td>Auto Pulse</td>
<td>Enter Y for yes, N for no, if the user wishes the system to simulate a pulse in the event of pulse switch failure. <strong>Note:</strong> This feature will activate as soon as Y is entered and the user hits save.</td>
</tr>
<tr>
<td>Invert Gate</td>
<td>Enter Y for yes, N for no, allows operator to decide if logo switch is wired low or high. (Will vehicle break continuous circuit or complete a circuit?)</td>
</tr>
</tbody>
</table>
### Table 16: Wash Settings Menu

<table>
<thead>
<tr>
<th>Wash Setting Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Gate Delay</td>
<td>Enter the length in inches or pulses of estimated chain travel, after a roller button is activated, before a vehicle would normally activate the gate switch. This value must be greater than 0.</td>
</tr>
<tr>
<td>Auto Gate</td>
<td>Enter Y for yes, N for no. This feature is used as a back up for the Gate input. If the Gate input goes down, you can turn this feature on. This will simulate the measuring of the car. It will set every car length to the value set for Max Car Length.</td>
</tr>
<tr>
<td>Roller Control</td>
<td>Enter Y for yes, N for no, if one of the outputs will fire the roller solenoid.</td>
</tr>
<tr>
<td>Entrance Management</td>
<td>Enter Y for yes, N for no, if you have a treadle switch wired into Input 10.</td>
</tr>
<tr>
<td>Entrance Mgmt Delay</td>
<td>Optional setting to be used with the Entrance Management System. This value is the number of seconds you want the roller output to delay before firing.</td>
</tr>
<tr>
<td>Roller Locator</td>
<td>Enter Y for yes, N for no. When this option is set to yes, the system will wait to fire the Roller Output until the trailing edge of a signal is detected from Input 9.</td>
</tr>
<tr>
<td>Roller Interlock</td>
<td>When set to Y, the system will not allow a roller to be fired without a service being selected for that vehicle. Roller Interlock disables the roller-up and gate switch until a valid service is programmed for the vehicle. Since it will not recognize a car, no outputs would be turned on in the tunnel. When set to N, the system will allow a roller to be fired for a vehicle that is not assigned to a valid service. This will allow that vehicle to be sent into the tunnel and it will receive the Unloaded wash service.</td>
</tr>
<tr>
<td>Auto Roller</td>
<td>Enter Y for yes, N for no. When this option is set to yes, as soon as you select a base service on a non-stacking system, a roller will fire.</td>
</tr>
<tr>
<td>Panic Stop</td>
<td>Enter Y for yes if you have the panic stop wired into the system, N for no if a Panic Stop is not installed.</td>
</tr>
<tr>
<td>Anti-Collision</td>
<td>This is going to be the distance from first gate input to where you want the anti-collision feature to trigger. See “Panic Stop Circuit Wiring” on page 29. Anti-collision diagram and for a detailed explanation. (Must have Panic Enable Circuit wired in.)</td>
</tr>
<tr>
<td>Auto Stop Period</td>
<td>Enter the number of seconds after the last car you want the system to automatically shut the conveyor off. You must have an Auto Stop output wired and setup in order for this feature to work.</td>
</tr>
<tr>
<td>Wet Down Period</td>
<td>Enter the number of seconds you would like to have the wash equipment turned on for the wet down process. A wet down will fire all of the outputs that have Y for the wet down option.</td>
</tr>
<tr>
<td>Flash On</td>
<td>In 100 milli-seconds increments how long the relay will flash on. This is what the system looks at when you set the output flash to Y.</td>
</tr>
<tr>
<td>Flash Off</td>
<td>In 100 milli-seconds increments how long the relay will flash off. This is what the system looks at when you set the output flash to Y.</td>
</tr>
<tr>
<td>Shift</td>
<td>This displays the shift number that the system is currently on. You cannot change this setting.</td>
</tr>
<tr>
<td>Auto Shift</td>
<td>Enter Y for yes, N for no. If you set this option to Y, the system will automatically close the shift at midnight. This option should be set to Y if you are using the Tunnel Master® Jr. Interface.</td>
</tr>
<tr>
<td>Tax Rate 1.0%</td>
<td>The percentage rate for the first tax rate charge.</td>
</tr>
</tbody>
</table>
### Table 16: Wash Settings Menu

<table>
<thead>
<tr>
<th>Wash Setting Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Rate 2.0%</td>
<td>The percentage rate for the second tax rate charge.</td>
</tr>
<tr>
<td>Stacking</td>
<td>Enter <strong>Y</strong> for yes or <strong>N</strong> for no. If you set this option to <strong>Y</strong>, the system will start stacking. This option should be set to <strong>N</strong> if using the Tunnel Master® Jr. Interface.</td>
</tr>
<tr>
<td>Input Device</td>
<td>This is set <strong>K</strong> for keypad, <strong>P</strong> for push button, <strong>C</strong> for Computer / Controller, <strong>B</strong> both keypad and Wash Valet, or <strong>W</strong> for Wash Valet talking directly to a TMJ. This is used to interface with Tunnel Master® Sr.</td>
</tr>
<tr>
<td>Push Button Rows</td>
<td>If a push button entry station is being used, enter the number of rows, going across, of buttons on the station. This will tell the system what inputs to accept. If you do not have a push button station, this option is disregarded.</td>
</tr>
<tr>
<td>Push Button Cols</td>
<td>If a push button entry station is being used, enter the number of columns, going down, of buttons on the station. If you do not have a push button station, this option is disregarded.</td>
</tr>
<tr>
<td>Console Debug</td>
<td>This is a debug utility that ICS may use to track system activity. This should be set to <strong>N</strong> if you are using the Tunnel Master® Jr. Interface.</td>
</tr>
<tr>
<td>Header 1</td>
<td>Enter information desired to display on the first line on the top of reports and receipts. This is usually company information.</td>
</tr>
<tr>
<td>Header 2</td>
<td>Enter information desired to display on the second line on the top of reports and receipts. This is usually company information.</td>
</tr>
<tr>
<td>Header 3</td>
<td>Enter information desired to display on the third line on the top of reports and receipts. This is usually company information.</td>
</tr>
<tr>
<td>Header 4</td>
<td>Enter information desired to display on the fourth line on the top of reports and receipts. This is usually company information.</td>
</tr>
<tr>
<td>Footer 1</td>
<td>Enter information desired to display on the first line on the bottom of receipts. This is usually a message to the customer.</td>
</tr>
<tr>
<td>Footer 2</td>
<td>Enter information desired to display on the second line on the bottom of receipts. This is usually a message to the customer.</td>
</tr>
<tr>
<td>Footer 3</td>
<td>Enter information desired to display on the third line on the bottom of receipts. This is usually a message to the customer.</td>
</tr>
<tr>
<td>Footer 4</td>
<td>Enter information desired to display on the fourth line on the bottom of receipts. This is usually a message to the customer.</td>
</tr>
<tr>
<td>Display Cars</td>
<td>Enter <strong>Y</strong> for yes, <strong>N</strong> for no. When this option is set to yes, the daily car count will display on the main display on the relay box.</td>
</tr>
<tr>
<td>Car Count</td>
<td>Displays the number of cars for the current shift. This is reset when you bump a shift.</td>
</tr>
<tr>
<td>Invalid Count</td>
<td>This is the number of times in the current shift that the gate input started to sense a car, but it did not measure up to the Min Car Length. This is reset when you bump a shift.</td>
</tr>
<tr>
<td>Violation Count</td>
<td>This is the number of times in the current shift that the gate sensed a car longer than the Max Car Length.</td>
</tr>
</tbody>
</table>
### Table 16: Wash Settings Menu

<table>
<thead>
<tr>
<th>Wash Setting Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleared Count</td>
<td>This is the number of times in the current shift that a service wash cleared. This count is reset when a shift is bumped.</td>
</tr>
<tr>
<td>Duplicate Count</td>
<td>This is the number of times in the current shift that a duplicate receipt was printed. This count is reset when a shift is bumped.</td>
</tr>
<tr>
<td>Relay 2 Address</td>
<td>This is the address of the Relay box. The DIP switches determine this. If this is a 24 output system, set this to &quot;0&quot;. If it is a 48 output system, set this to &quot;9&quot;.</td>
</tr>
<tr>
<td>Key Pad 1 Address</td>
<td>This is the address of the first Keypad. If you are using a push button station, set this to &quot;0&quot;. By default the keypad is set to &quot;5&quot;. If you are using multiple keypads consult the DIP switch settings on the keypad for the proper address.</td>
</tr>
<tr>
<td>Key Pad 2 Address</td>
<td>This is the address of the second Keypad. The address of the keypad is based on the DIP switch settings on the keypad.</td>
</tr>
<tr>
<td>Report Address</td>
<td>This is the address in which the report printer is hooked up to. If the report printer is hooked up to the main relay box, then set this to &quot;0&quot;. If the report printer is hooked up to the keypad, set this option to &quot;5&quot;. This is the printer where all of the reports will print out.</td>
</tr>
<tr>
<td>Receipt Address</td>
<td>This is the address in which the receipt printer is hooked up to. If the receipt printer is hooked up to the main relay box, then set this to &quot;0&quot;. If the receipt printer is hooked up to the keypad, set this option to &quot;5&quot;. All of the reports will print out from this printer.</td>
</tr>
<tr>
<td>Net Error Count</td>
<td>This displays the number of network errors that have occurred since the system was setup. This is used for troubleshooting purposes only and is not changeable.</td>
</tr>
<tr>
<td>Reset Count</td>
<td>The number of times the Tunnel Master® Jr. has been reset. For information purposes only.</td>
</tr>
<tr>
<td>Expire Days</td>
<td>For ICS use only.</td>
</tr>
</tbody>
</table>
Configure Wash Settings

Before any washes can be processed, the user must configure the wash. Each item must be configured accurately if the wash is to operate properly.

### Table 17: Configure Wash Settings

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
</table>
| 1    | From the main screen display, press the **MENU** button. | [1] Bump Shift[4] View Counts  
[3] Configure Wash |
| 2    | From the numeric keypad, press the **3** key to select the **Configure Wash** menu option. | [1] Services[4] Wash Settings  
| 3    | From the numeric keypad, press the numeric **4** key to select the **Wash Settings** menu option. | EqptMeasurementInInches? _ _ _ _ _ _  
F1=PREV F2=NEXT F3=RESET F4=SAVE |
| 4    | Using the numeric keypad, type 0 to select **Y** for Yes and **N** for No. **NOTE:** Review function buttons on Figure 26, “Main Screen Display and Keypad,” on page 52. | EqptMeasurementInInches?Y _ _ _ _ _ _  
F1=PREV F2=NEXT F3=RESET F4=SAVE |
| 5    | From the numeric keypad, press the **F4** button to accept and save the entry. | EqptMeasurementInInches?Y _ _ _ _ _ _  
F1=PREV F2=NEXT F3=RESET F4=SAVE |
| 6    | Press the **F2** button to advance to the next setting to enter. | PulseLength _ _ _ _ _ _ _ _  
F1=PREV F2=NEXT F3=RESET F4=SAVE |
| 7    | Repeat steps 4 – 6 until all settings have been programmed. | MaxCarLength _ _ _ _ _ _ _ _  
F1=PREV F2=NEXT F3=RESET F4=SAVE |
| 8    | From the main screen display, press the **MENU** button to return to the previous menu screen. | [1] Services[4] Wash Settings  
About Countdown Times

Set the **Wet Down Period** in the panel to the exact wet down time (e.g., 100). This is the amount of time you want the actual wet down relays to fire and apply water to the equipment.

For example, the **Wet Down Period** is set to 100, the equipment may only get 90 seconds of water (100 seconds minus the 10 seconds required to sound the horn). The wet down will end when the Tunnel Master® Jr. counts down to zero.

### Outputs

The Outputs menu option is where the user will initially setup and later, as needed, edit the wash relays that will be activate for the various wash equipment. The basic Tunnel Master® Jr. relay box allows for up to 24 outputs. There is an option to add an additional relay box that will provide for an additional 24 outputs for a total maximum of 48. The available Outputs menu items and a brief description of their function are listed in the following table.

**Table 18: Outputs Descriptions**

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Enter the relay number corresponding to the relay switch on the outside of the relay box. They are numbered 1-12 down the left side and 13-24 down the right side.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the specific equipment controlled by this relay. For example, soap foamer.</td>
</tr>
<tr>
<td>Start</td>
<td>Enter the number of pulses or inches, depending on the setup choice in Wash Settings, for how far past the gate switch (electric eye) the piece of equipment should turn on.</td>
</tr>
</tbody>
</table>
| Type      | Use the “0” button to advance to select the option desired. **M** = Mandatory, relay will activate for any service sold that is set as a Base. **S** = Selective, relay will activate only when a service set as an Extra Service is sold along with a Base service. **D** = Deselective, relay will NOT activate when a service with this output is selected. **C** = Conveyor, relay is activating the motor starter solenoid for the conveyor motor when a Panic circuit is wired to the designated relay. **R** = Roller, relay activates the roller up solenoid. Start time entered on Roller output will be for how long the roller up cylinder is activated. If you enter an extend time, the system will fire the roller up relay for the start time, then pause for the extend time and then fire for the start time a second time. This is known as an up down up. **A** = Auto Stop, relay is tied to a stop circuit for shutting down the car wash after the last vehicle exits the wash or there is no wash activity. In order for this to work, you must set the Auto Stop Period in the Wash Settings. **O** = This output is used to start the conveyor once you have a base service selected. **H** = This output will fire your Horn. The start time for this output is how long, in seconds, that the horn will blow for. The extend time is how long, in seconds, the system will delay starting the conveyor. **NOTE:** YOU MUST HAVE A HORN RELAY SETUP WITH A START TIME IN ORDER FOR THIS RELAY TO FIRE. **O** = This output is used to start the conveyor once you have a base service selected. **H** = This output will fire your Horn. The start time for this output is how long, in seconds, that the horn will blow for. The extend time is how long, in seconds, the system will delay starting the conveyor. **NOTE:** YOU MUST HAVE A HORN RELAY SETUP WITH A START TIME IN ORDER FOR THIS RELAY TO FIRE.
### Table 18: Outputs (Continued)

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
</table>
| **Part**  | Use the “0” button to advance to the part of car selection that the piece of equipment turns on.  
  \( \text{AC} = \text{All of the Car} \)  
  \( \text{FH} = \text{Front Half of the Vehicle} \)  
  \( \text{FB} = \text{Front Bumper On} \)  
  \( \text{RH} = \text{Rear Half of Vehicle} \)  
  \( \text{RB} = \text{Rear Bumper Only} \)  
  \( \text{TA} = \text{Activate from a tire switch for tires or wheels. On a Tire Output, The Start Time is Where In The Tunnel The Equipment Is and The Extend Time Is How Long The Output Will Stay On For.} \)  
  \( \text{ES} = \text{Entrance sign, relay will activate after vehicle is “Loaded” and shut off as vehicle reaches gate switch. An entrance sign can only be a Selective output and cannot be a Mandatory service.} \)  
  \( \text{EM} = \text{Entrance Management relay will activate after second tire hits the entrance management treadle which is wired into Input 10. This relay will stay activated until Min Car Length is reached.} \) |
| **Flash** | Enter \( \text{Y} \) for yes, or \( \text{N} \) for no if the relay is to flash on and off when it is activated. |
| **Extend** | Enter the number of pulses or inches, depending on the setup choice in Wash Settings, for how far past the actual length of the vehicle the piece of equipment should stay on.  
  **NOTE:** Many outputs must be turned on early in order to be “charged” up before the vehicle gets to it. The Extend feature allows the user to keep the relay activated so that the rear of the vehicle does not get missed. |
| **Look** | Enter the number of pulses or inches for the system to look back into the wash to see if there is another vehicle approaching. If there is another vehicle within the setting entered the system will leave that relay on to prevent frequent stopping and starting of electric motors which drives up utility charges. |
| **Wet** | Enter \( \text{Y} \) for yes, or \( \text{N} \) for no if the relay should activate during the Wet Down process in the morning which provides a quick and easy way to prepare the wash tunnel for opening. Select Wet Down, option [2] on the main menu and any outputs that were setup to activate at Wet Down will turn on and stay on for the time set in the Wash Setting menu option. |
| **Panic** | Two settings if a Panic circuit is wired to the system:  
  For the first setting, use the “0” button to select the desired option.  
  \( \text{Y} = \text{Turn on the relay if there is a Panic condition.} \)  
  \( \text{N} = \text{Turn off the relay if there is a Panic condition.} \)  
  \( \text{X} = \text{Leave the relay in whatever status it was when a Panic condition occurs.} \)  
  For the second setting, Staggered Start time, enter “0” if the output is to restart when the conveyor restarts, or enter the number of seconds after the release of a Panic condition the user wants the equipment to restart prior to the conveyor restarting. |
Output Settings

Follow these procedures to set or change the settings for the Outputs in the Tunnel Master® Jr. Controller program.

Table 19: Output Settings

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Press the number 2 key to select the <strong>Outputs</strong> menu option.</td>
<td>Output __Name __________ Start __ Type __ Part __ Flash __ Extend ______ Look _____ Wet _ Panic _ - ___ F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>4</td>
<td>From the numeric keypad, type the desired number for the output. NOTE: See “Wash Configuration” on page 51.</td>
<td>Output 01 Name __________ Start __ Type __ Part __ Flash __ Extend _____ Look _____ Wet _ Panic _ - ___ F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>5</td>
<td>Press the <strong>ENT</strong> button on the display keypad to advance to the next setting.</td>
<td>Output 01 Name Start __ Type _ Part __ Flash _ Extend _____ Look _____ Wet _ Panic _ - ___ F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>6</td>
<td>From the numeric buttons, type the number of the Output.</td>
<td>Output 01 Name Roller Start __ Type _ Part __ Flash _ Extend _____ Look _____ Wet _ Panic _ - ___ F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
</tbody>
</table>
### Tunnel Master® Jr. User Manual

#### Wash Configuration

Press the **ENT** button on the display pad to advance to the next setting.

**Output 01** Name Roller  
Start _ _ Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

8. Using the numeric buttons enter the Start time in inches or pulses depending on the wash setting selection.

**Output 01** Name Roller  
Start 0084 Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

Press the **ENT** button on the display pad to advance to the next setting.

**Output 01** Name Roller  
Start 0084 Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

9. Repeat steps 8 and 9 until the settings for Type, Part, Flash, Extend, Look and Wet are completed.

**NOTE:** Review the settings in Table 18 on page 63.

10. Press the **ENT** button on the display pad to advance to the Panic setting.

**Output 01** Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

11. From the **0** button on the numeric keypad, advance to the desired setting, either **Y** for yes or **N** for no.

**Output 01** Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

12. Press the **ENT** button on the display pad to advance to the second setting in the Panic option.

**Output 01** Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0

**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE**

### Table 19: Output Settings

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
</table>
| 7    | Press the **ENT** button on the display pad to advance to the next setting. | Output 01 Name Roller  
Start _ _ Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 8    | Using the numeric buttons enter the Start time in inches or pulses depending on the wash setting selection. | Output 01 Name Roller  
Start 0084 Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 9    | Press the **ENT** button on the display pad to advance to the next setting. | Output 01 Name Roller  
Start 0084 Type _ Part _ _ Flash _  
Extend _ _ _ _ Look _ _ _ Wet _ Panic _ - _ _  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 10   | Repeat steps 8 and 9 until the settings for Type, Part, Flash, Extend, Look and Wet are completed.  
**NOTE:** Review the settings in Table 18 on page 63. | Output 01 Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 11   | Press the **ENT** button on the display pad to advance to the Panic setting. | Output 01 Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 12   | From the **0** button on the numeric keypad, advance to the desired setting, either **Y** for yes or **N** for no. | Output 01 Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
| 13   | Press the **ENT** button on the display pad to advance to the second setting in the Panic option. | Output 01 Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0  
**F1=PREV** **F2=NEXT** **F3=ERASE** **F4=SAVE** |
Services menu option is where the user will initially setup and edit the wash services that will be available on the system. The basic controller configuration allows for up to 16 services, and the roller control as service 17. There is an option to add an additional entrance Keypad that will provide for an additional 16 services for a total maximum of 32 services.

**NOTE:** YOU MAY NOT MAKE CHANGES TO THE SERVICES WHILE IN A SHIFT. THE CAR COUNT MUST BE 0. YOU MAY BUMP A SHIFT AT THE KEYPAD OR THE RELAY BOX.

---

### Table 19: Output Settings

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
</table>
| 14   | From the numeric keypad, type the number of seconds of delay for this relay to turn on before the conveyor will restart. **NOTE:** If you do not wish this relay to stagger start, enter 0. | Output 01 Name Roller  
Start 0084 Type R Part AC Flash N Extend 000 Look 000 Wet N Panic N - 0  
F1=PREV F2=NEXT F3=ERASE F4=SAVE |
| 15   | Press the F4 button to save the service. | Output _ _Name _ _ _ _ _ _ _ _ Start _ _ Type _  
Part _ _ Flash _  
Extend _ _ _ Look _ _ _ Wet _ Panic _ - _ _  
F1=PREV F2=NEXT F3=ERASE F4=SAVE |
| 16   | Press the MENU button to return to the previous menu screen. | [1] Services[4] Wash Settings  

---

See “Bump a Shift or Manually Close Current Shift” on page 78.
The following table is a list of menu items within the Services menu and a brief explanation of their function.

### Table 20: Services Menu Item Descriptions

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Enter a numeric value of 01 up to 16. These numbers represent the wash services options that will be available and their location on the Entrance Keypad. The numbers represent a PLU # or Price Look Up for the system to refer to when displaying and printing reports.</td>
</tr>
<tr>
<td>Name</td>
<td>Use the numeric keys to enter the name of the service to be programmed.</td>
</tr>
<tr>
<td>Price</td>
<td>Use the numeric keys to enter the price for the service being programmed. <strong>NOTE:</strong> To enter a decimal point, press the number 0 key two times.</td>
</tr>
</tbody>
</table>
| Type      | Use the 0 button to advance to the type of service.  
B = Basic: The service will include all mandatory outputs be activated for when sold.  
E = Extra Service: Those services which are sold as add-ons to a basic wash service, i.e., Polish Waxes. |
| Rate      | From the numeric buttons, press the 0 button to advance through the available options. Setting the desired tax rate will determine how much and which taxes will be applied to the service when it is sold.  
0 = Non Taxable: There will not be any taxes applied to the sale of the service.  
1 = Tax Rate 1: The tax rate set in Tax Rate 1 in the wash settings menu.  
2 = Tax Rate 2: The tax rate set in Tax Rate 2 in the wash settings menu.  
3 = Both 1 & 2: Both Tax Rate 1 and 2 will be applied to the sale of the service. |

Follow these procedures to set or change the Services in the Tunnel Master® Jr. controller program.

### Table 21: Change or Set Services Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
</table>
[3] Configure Wash |
| 2    | Press the numeric key 3 to select the **Configure Wash** menu option. | [1] Services[4] Wash Settings  
| 3    | Press the numeric key 1 to select the **Services** menu option. | Service _ _ Name Price Type Rate  
F1=PREV F2=NEXT F3=ERASE F4=SAVE |
| 4    | Using the numeric keypad enter the desired PLU# for the service. **NOTE:** Review button functions on page 31. | Service 01 Name Price Type Rate  
F1=PREV F2=NEXT F3=ERASE F4=SAVE |
### Table 21: Change or Set Services Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the ENT button on the display pad to advance to the next setting.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name _ _ _ _ _ _ Price Type Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>6</td>
<td>Using the numeric buttons enter in the name of the service.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price Type Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>7</td>
<td>Press the ENT button on the display pad to advance to the next setting.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price _ _ _ Type Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>8</td>
<td>Using the numeric buttons enter the price of the service. Use the 0 button for a decimal point.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>9</td>
<td>Press the ENT button on the display pad to advance to the next setting.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>10</td>
<td>Using the numeric button 0 scroll to the desired type of service, B, for Basic, E for Extra Service.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type B Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>11</td>
<td>Press the ENT button on the display pad to advance to the next setting.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type B Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>12</td>
<td>Using the numeric buttons enter the desired tax rate option, 0, 1, 2, or 3.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type B Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>13</td>
<td>Press the F4 button to save the service.</td>
<td>Service 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name GOLD WASH  Price 9.99 Type B Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1=PREV F2=NEXT F3=ERASE F4=SAVE</td>
</tr>
<tr>
<td>14</td>
<td>Press the MENU button to return to the previous menu screen.</td>
<td>[1] Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] Outputs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[5] Set Date Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] Output Lists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[6] Set Password</td>
</tr>
</tbody>
</table>
### Assign Outputs to Services

Follow these procedures to set or change the Outputs that will be activated for the various service options.

**Table 22: Assign Outputs to Services Instructions**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Display</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[3] Configure Wash</td>
</tr>
</tbody>
</table>
| 2    | Press the numeric key **3** to select the **Configure Wash** menu option. | [1] Service [4] Wash Settings  
| 3    | Press the numeric key **3** to select the **Output Lists** menu option. | Service _ _  
|      |        | Outputs |
| 4    | Using the numeric keypad enter the PLU# of the service to be programmed. | Service 03  
|      |        | Outputs |
| 5    | Press the **ENT** button on the display pad to advance to the next setting. | Service 03  
|      |        | Outputs _ _ |
| 6    | Using the numeric buttons enter in the number corresponding to the Selective or Deselective output the user wishes to have activated when this service is processed. | Service 03  
|      |        | Outputs 05 |
| 7    | Press the **ENT** button on the display pad to advance to the next setting. | Service 03  
|      |        | Outputs 05, |
| 8    | Repeat steps 6 & 7 until all desired outputs have been programmed. | Service 03  
|      |        | Outputs 05, 06 |
| 9    | Press the F4 button to save the Output List assigned to this service. **NOTE:** The input will be saved and the display will be ready to start new input. | Service _ _  
|      |        | Outputs |
| 10   | Repeat steps 4 – 9 until all Services, which need outputs assigned in the Output Lists have been programmed. | |
| 11   | Press the **MENU** button on the display pad to return to the previous menu. | [1] Service [4] Wash Settings  
CHAPTER 7: Entrance Keypad

The Entrance Keypad is the service/output station at the front of the car wash.

- Services sold to the customer are entered into the Entrance Keypad.
- Vehicles are processed at the front of the wash with Entrance Keypad.
- Stack N Control can be managed at the Entrance Keypad.
- Some equipment diagnostics occur at the Entrance Keypad.

**Entrance Keypad**

After the Wet Down has been completed, the operator is now ready to process vehicles. As the vehicles are guided onto the conveyor, the attendant can **load** the vehicle into the Entrance Keypad at the front of the wash. The process is simple and easy.

Entrance Keypad Functions

NOTE: In order to utilize the full functionality of the Entrance Keypad, Tunnel Master® Jr. it is very important that the electrician adhere to the wiring instructions provided with the Relay Box.

After selecting service(s), but before the Roller button, press the $ button and it will act as a confirmation button and prints a receipt (optional printer must be attached).

The up arrow button will bump the current shift, moving the car counts back to 0. Also if a printer is set up, this will print off the reports. This works when the input device is set to either K or C.

The Car button is the Roller button.

Figure 27. Entrance Keypad
The following buttons are the functions for the Entrance Keypad.

**Table 23: Entrance Keypad Buttons**

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
<td>After all desired services have been entered, but before the Roller button is pressed, press the $ (dollar) button to confirm services. If optional printer is available, a receipt will print too.</td>
</tr>
<tr>
<td>9</td>
<td>Numeric buttons (1-16) are used to program services or retracts into system prior to processing vehicle.</td>
</tr>
<tr>
<td><img src="image" alt="Car Icon" /></td>
<td>The car icon is on the Roller button and when selected will activate the roller relay.</td>
</tr>
<tr>
<td>AC</td>
<td>In ICS-POS mode, when the AC button is selected, the stack displays in blinking Led lights on the numeric buttons. Number one is the closest to the tunnel entrance. The stack blinks for 5 seconds.</td>
</tr>
</tbody>
</table>

**NOTE:** All buttons, with the exceptions of the AC, and $ (dollar) buttons, have red indicator lights in the upper left-hand corner of the button. These red indicators will light after the button is selected and stay lit until the vehicle has started through the gate switch and reached minimum car length.

**NOTE:** To clear a button selected in error, simply press the button again, and the LED light will go out.

You can add services, remove services, select retracts, and remove a car from the stack with the Entrance Keypad. First, setup your Relay Box to Keypad for stacking.
Entrance Keypad to Process Vehicles (Non-Stacking)

These are the steps to follow for a non-stacking system.

**Table 24: Process Vehicles (Non-Stacking)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Non-Stacking Action</th>
<th>Keypad Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>On the numeric keypad, press the button associated with the service the customer has purchased.</td>
<td>The red indicator light will light up indicating the input has been accepted.</td>
</tr>
<tr>
<td>2</td>
<td>Press any additional extra service buttons for other services the customer may have purchased.</td>
<td>The red indicator light will light up for each additional service button pressed indicating the input has been accepted.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Any service selected accidentally can be un-programmed or cleared by pressing the service button again.</td>
<td>The LED light will go out, indicating the service is no longer programmed.</td>
</tr>
<tr>
<td>3</td>
<td>Press the Receipt button to print a customer receipt, if there is a receipt printer attached to the Entrance Keypad.</td>
<td>Customer receipt will print out.</td>
</tr>
<tr>
<td>4</td>
<td>After all the desired services are “loaded” and the vehicle is staged and ready to be washed, press the “Roller” button (the button with the car on it) to fire roller and start the vehicle through the wash. <strong>NOTE:</strong> Once the roller button has been pressed the roller relay will be activated and a roller will come up to process the vehicle through the wash.</td>
<td>The indicator light on the roller button will light up indicating that the input has been accepted. The light will remain lit until the roller sequence is complete.</td>
</tr>
<tr>
<td>5</td>
<td>When the vehicle starts through the wash breaking the gate switch and reaching the minimum car length required, all numeric lights on the keypad will go out. <strong>NOTE:</strong> All the indicator lights will stay lit until there has been enough chain travel to reach minimum car length set in wash settings.</td>
<td>All indicator lights will go out after the car has reached minimum car length. When the lights go out, this indicates the next wash is ready to be programmed.</td>
</tr>
</tbody>
</table>
Entrance Keypad to Process Vehicles (Stack)

For Stack with Keypad Only, these are the steps to follow:

**Table 25: Process Vehicles Stack Instructions**

<table>
<thead>
<tr>
<th>Status</th>
<th>Step</th>
<th>Stacking Action</th>
<th>Keypad Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready</td>
<td>1</td>
<td>Press the numeric button associated with the service that the customer has purchased.</td>
<td>The red indicator light will light up indicating the input has been accepted.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Press any additional extra service buttons for other services the customer may have purchased.</td>
<td>The red indicator light will light up for each additional service button pressed indicating the input has been accepted.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Press the Receipt button to add the car to the stack.</td>
<td>The number that corresponds to the stack will flash for 5 seconds. Then the light will turn off. If no base wash is selected, this key is ignored. If you want to print a receipt, hit the button a second time.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Press the Roller Button to process the next car on the stack.</td>
<td>The Roller light will turn on and the roller will fire. If you have auto roller set to Y, this is not necessary.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Vehicle will start through the wash breaking the gate switch.</td>
<td>Once the car reached minimum car length, the car will come off of the stack.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>To clear any services selected, press the AC button.</td>
<td>This will clear any services if selected. If no services are selected, the AC key will toggle you in and out of the stack pick, if cars are on the stack.</td>
</tr>
<tr>
<td>Stack</td>
<td>1</td>
<td>Press the AC button to view the cars on the stack.</td>
<td>You will see the lights on the numbers flashing if there are any cars on the stack. This status will only stay active for 5 seconds of inactivity before it will return you to the Ready status.</td>
</tr>
<tr>
<td>Pick</td>
<td>2</td>
<td>If you press a flashing number key.</td>
<td>This will take you to the stack edit status and the services for that car will display.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>If you press the Receipt button.</td>
<td>This will print the last car added to the stack, if there are cars still on the stack.</td>
</tr>
</tbody>
</table>
Change Service and/or Add Retract
To modify a car’s service in the stack, follow these instructions:

1. On the keypad, press the AC button. The flashing lights indicate how many cars are in the stack. The lights flash for 5 seconds. Number 1 being closest to the tunnel entrance.

2. Press to select the numeric button that represents the car in the stack you would like to modify. The service that is selected for that car will light up on the keypad.

3. If necessary, press to select the numeric button of the service you wish to clear.

4. If necessary, press to select the numeric button of the new wash service or retract you wish to select.

5. Press the $ (dollar) button to confirm the wash selection. The lights will flash again displaying the cars on stack.

NOTE: Setup for Retracts is on the Tunnel Master® Jr. services page.

Add a Car to Stack
To add a new car to the end of the stack, follow these steps:

1. On the keypad, press a numeric button to select a service.

2. Press the $ (dollar) button. LED lights blink for five seconds displaying the cars currently in the stack. The newly added car with the service is added to the end of the stack.

Remove a Car from Stack
Select the car in the stack, remove the service, and then confirm. At that point, the car will no longer be in the stack.

1. On the keypad, press the AC button.

2. Select the lit up buttons or services to clear. The button’s lights will go out.

3. Press to select the $ (dollar) button. The stack will blink and you will no longer see the car you removed light up and the cars move up in the stack. (i.e. if you had three cars on stack in position 1, 2 and 3 shown on the numeric keypad, and you removed the 2nd car. Then only lights 1 and 2 will be lit.)
View Service Counts for the Current Shift

There will be times during the course of daily operations that management personnel will want to review sales counts. From the View Counts menu, this option allows the user to quickly determine how many of each service option have been processed during the current shift.

If the user did not purchase the optional report printer, the Viewing Counts menu option will be the only way they can track sales during a shift.

Once the shift is either manually closed or automatically bumped by the system, the counts will be cleared back to zero to start the new shift. For this reason, if the user wishes to verify a register report to the controller counts these numbers must be written down at the end of each shift before the shift is closed.

**NOTE:** To clear a button selected in error, simply press the button again, and the LED light will go out.

### Table 26: View Service Counts Instructions

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the Main Screen display, access the Main Menu by pressing the <strong>Menu</strong> button. <strong>NOTE:</strong> If a password has been set, it will be necessary to enter the password before the Main Menu can be accessed.</td>
<td>[1] Bump Shift [4] View Counts [2] Wet Down Wash [5] Print Reports [3] Configure Wash</td>
</tr>
<tr>
<td>2</td>
<td>Press the numeric 3 key to select <strong>View Counts</strong>. <strong>Unloaded</strong> = Vehicles washed without a service being programmed. <strong>Cars</strong> = # of cars washed <strong>Violations</strong> = Number of times maximum car length exceeded.</td>
<td>00 – UNLOADED 0000  CARS WASHED: 135 VIOLATIONS: 0</td>
</tr>
<tr>
<td>3</td>
<td>Press the <strong>ENT</strong> button on the display keypad to advance to additional services.</td>
<td>Press [ENT] to Continue, [MENU] to Exit</td>
</tr>
<tr>
<td>4</td>
<td>Repeat Step 3 to review up to 32 possible services. <strong>NOTE:</strong> Any service number skipped in the service setup will display as <strong>EMPTY</strong>.</td>
<td>EXTERIOR W 0052 05- POLISH WAX 0023 SILVER WAS 0023  06-CLEAR COAT 0015 GOLD WASH 0015 07-[EMPTY]0000 PLATNUM W 0009 08-[EMPTY]0000</td>
</tr>
</tbody>
</table>

### Bump Shift

There are two ways to break or close a shift. The first is to go into Wash Settings and select **Yes** for the Auto Shift menu option. This option will automatically close the shift at midnight each night. The second option is to go to the main display menu and select Bump Shift. This option allows the user to close a shift manually at a time selected by the user. This option would be used by
operators that wish to balance their shifts at the end of the day instead of waiting until the next morning.

It is very important that one of the two options be used each day. Failure to close a shift will result in car and service counts being inaccurate, as they would run multiple days into one shift. You may also close your shift by pressing the up arrow on the entrance keypad.

Pressing the up arrow key on the Entrance Keypad will reset your current car count!

**Bump a Shift or Manually Close Current Shift**

**Table 27: Manually Close or Bump the Current Shift Instructions**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Screen Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Access the Main Menu by pressing the “Menu” button on the display pad. <strong>NOTE:</strong> If a password has been set it will be necessary to enter the password before the main menu can be accessed.</td>
<td>[1] Bump Shift[4] View Counts [2] Wet Down Wash [5] Print Reports [3] Configure Wash</td>
</tr>
<tr>
<td>2</td>
<td>Press the numeric key 1 to select <strong>Bump Shift.</strong> <strong>NOTE:</strong> A shift report will print automatically at this point if there is an optional report printer attached.</td>
<td>Bump Shift Bump Shift (Y/N)?</td>
</tr>
<tr>
<td>3</td>
<td>Using the numeric keypad press either Y for yes, or N for no to close the shift at this time.</td>
<td>Bump Shift Bump Shift (Y/N)? N</td>
</tr>
</tbody>
</table>
CHAPTER 8: Trouble Shooting

System Diagnosis
The following diagnostic procedures are provided for use only when the ICS Tunnel Controller System has stopped responding or is not functioning. If you determine after reviewing the diagnostic procedures the system is malfunctioning, write down the specific conditions and contact ICS technical support:

800-246-3469

Entrance Keypad
Before examining the ICS Tunnel Master® Jr. Relay Box Controller, a test should be performed at the Entrance Keypad to ensure that it is functioning properly. Press the AC (All Clear) key located in the lower right corner of the numeric keyboard two or three times while there are no cars in or near the gate switch. Now press any of the numbered service buttons on the keypad. The indicator light should turn red as soon as the service button is pressed.

Check the Power light in the upper right hand corner of the keypad to verify that it is lit. If the light is not lit then the keypad is not receiving power from the ICS Tunnel Master® Jr. Relay Box Controller.

Check the Logic light in the upper right hand corner of the keypad. This light should be blinking indicating that the system processor is functioning.

Check the Data light in the upper right hand corner of the keypad. This light should be blinking indicating that the keypad is communicating with the ICS Tunnel Master® Jr. Relay Box Controller.

Wash Controller Response
At the Controller Relay Box, verify that there is a read out on the display at the top of the relay box. If not, the relay box may not have power.

Check the +5V DC light located in the upper left corner of the relay box display panel. This light should be lit at all times to verify that the controller has power.

Check the Logic light in the upper left corner of the relay box display panel. This light should be blinking indicating that the system processor is functioning.

Wash Controller Input Check
Check the inputs indicator lights in the upper left corner of the relay box display panel are displaying properly. There are four possible inputs into the Controller that if not functioning could cause the system to not respond properly:

- **Clock** – With the conveyor running the clock light should be blinking consistently. This insures that the pulse switch is operating properly. If this is not operating properly, you can go into the wash settings and change Auto Pulse to Y. With this option turned on, the controller will simulate a pulse count. In order for this to work properly, you must have the Auto Pulse Period correct in the wash settings.
• **Gate** - With the conveyor running and a vehicle passing through the gate switch (electric eye) the Gate indicator light should stay lit the entire time a vehicle is activating the gate switch. If this function is not operating properly, you can go in to the wash settings and change the Auto Gate to Y. With this option set to Y, the controller will simulate the gate sensor. This will tell the system that every car that goes through the tunnel is the Max Car Length value that is set in the wash settings. In order for this function to work properly, you must set the Auto Gate Delay in the Wash Settings. The Auto Gate Delay is the distance from where the start of the car normally is and the Gate sensor.

• **Tire** – With the conveyor running and a vehicle passing through the tire switch, the Tire indicator light should stay lit the entire time a vehicle is activating the tire switch.

• **Panic** – If a Panic circuit has been wired into the controller, anytime a stop switch is activated the Panic indicator light will go out. Once the stop switch or circuit is open again the light will come back on and the conveyor will become operable again.

**NOTE:** If any of the above inputs are not functioning properly, first check the device. If the device is working properly, then check the wiring to the circuit board in the relay box for loose or disconnected wires to the termination points in the upper left corner of the Relay Box.

**NOTE:** In some cases, a low oil level switch for the hydraulic power pack may be wired into the panic circuit. As a precaution, always check the oil level in the power pack to be sure there is enough oil.

**Entrance Keypad Diagnostics**

To test the keypad, there is a diagnostic mode you can put it in to verify its functionality. Remove the four screws and remove the top of the keypad. Flip it over, you will see the DIP switch settings. Turn DIP switch 4 on, and press the reset button to the immediate left of the DIP switches. Now, the number LED’s will be flashing. If you press a number once, it will go solid, if you press it again, it will shut off, if you press it again, it will flash again. Do this for each one of the numbers. The roller button will be off, if you press it once, it will turn on, if you press it again, it will turn off. If you press the AC button, it will toggle all of the number keys. If you press the $ key or the up arrow, the printer will print, “this is a test…,” every time you press either button. If any of these keys do not respond correctly, contact your distributor for a replacement keypad.

**Table 28: Relay Box Troubleshooting**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ribbon cable is not plugged in.</td>
<td>Re-attach Ribbon cable.</td>
</tr>
<tr>
<td></td>
<td>Ribbon cable is not correct.</td>
<td>Re-attach Ribbon cable.</td>
</tr>
<tr>
<td></td>
<td>Panic Condition is present.</td>
<td>Disable the panic.</td>
</tr>
<tr>
<td></td>
<td>Equipment Problem.</td>
<td>Contact your equipment vendor.</td>
</tr>
</tbody>
</table>
Table 28: Relay Box Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay not firing.</td>
<td>Fuse Blown.</td>
<td>Test fuse at bottom of board.</td>
</tr>
<tr>
<td></td>
<td>Output not selected for Service PLU# in Outputs List.</td>
<td>Add relay to outputs list for selected service PLU#.</td>
</tr>
<tr>
<td></td>
<td>Ribbon cable(s) is incorrectly plugged in.</td>
<td>Re-attach Ribbon cable.</td>
</tr>
<tr>
<td></td>
<td>Check position of relay toggle switch.</td>
<td>Move switch to down position.</td>
</tr>
<tr>
<td>No relays firing.</td>
<td>No power to Relay Box.</td>
<td>Check 120VAC power to relay box.</td>
</tr>
<tr>
<td></td>
<td>Pulse / Gate not operating correctly.</td>
<td>See “Wash Controller Input Check” on page 79.</td>
</tr>
<tr>
<td>My display is too dark.</td>
<td>Contrast is not set correctly.</td>
<td>Adjust contrast dial as needed.</td>
</tr>
<tr>
<td>None of my selective outputs are firing.</td>
<td>Unloaded car.</td>
<td>If a roller is fired with no services selected, the controller will only fire Mandatory outputs. This is known as an unloaded car.</td>
</tr>
</tbody>
</table>

Table 29: Entrance Keypad Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keypad not responding.</td>
<td>Keypad address not correct.</td>
<td>In most circumstances, the keypad address in the wash settings should be 5.</td>
</tr>
<tr>
<td></td>
<td>Loss of power to Entrance Keypad.</td>
<td>Check Power LED, if voltage present LED will flash.</td>
</tr>
<tr>
<td></td>
<td>No power to Tunnel Master® Jr.</td>
<td>Reconnect 120VAC to relay box.</td>
</tr>
<tr>
<td>LEDs are coming on randomly.</td>
<td>Wires and/or plugs loose.</td>
<td>Re-connect as necessary.</td>
</tr>
<tr>
<td></td>
<td>Jumpers set up incorrectly</td>
<td>Check the proper jumper settings.</td>
</tr>
</tbody>
</table>

Table 30: Miscellaneous Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roller keep coming up.</td>
<td>Check the pulse switch.</td>
<td>Please refer to “Wash Controller Input Check”</td>
</tr>
<tr>
<td>Equipment timing is off.</td>
<td>Check the pulse switch.</td>
<td>Please refer to “Wash Controller Input Check”</td>
</tr>
</tbody>
</table>
### Table 30: Miscellaneous Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>My receipts are not printing.</td>
<td>Printer is turned off.</td>
<td>Confirm printer is turned on and error light is off.</td>
</tr>
<tr>
<td></td>
<td>Receipt Address is incorrect.</td>
<td>Go in to wash settings and verify that the receipt address is correct. If the receipt printer is hooked up to the keypad, it should be address 5. If the receipt printer is hooked up to the relay box, then the address should be 0.</td>
</tr>
<tr>
<td>My reports are not printing</td>
<td>Printer is turned off.</td>
<td>Confirm printer is turned on and error light is off.</td>
</tr>
<tr>
<td></td>
<td>Report Address is incorrect.</td>
<td>Go in to wash settings and verify that the report address is correct. If the report printer is hooked up to the keypad, it should be address 5. If the report printer is hooked up to the relay box, then the address should be 0.</td>
</tr>
<tr>
<td>All of my equipment is shutting off half way through the tunnel.</td>
<td>Faulty Gate Switch. Invalid/Max car violation.</td>
<td>Test your Gate switch. If you have photo eyes, put something in front of them and see if the gate light on the relay box comes on. If you have a loop, put something metal over the loop and see if the gate light on the relay box comes on. If the gate does not function properly, set Auto Gate to Y. See “Wash Controller Input Check” on page 79.</td>
</tr>
<tr>
<td></td>
<td>Min. Car Length set too high.</td>
<td>If your Min Car Length is set too high, and a car that is less than the min car length comes through the eye, the system will not register it as a car and the equipment will shut off.</td>
</tr>
<tr>
<td>I am getting unloaded cars on my shift reports.</td>
<td>Cars not being loaded properly.</td>
<td>Roller is called up manually without a service being loaded.</td>
</tr>
<tr>
<td></td>
<td>Anti-bounce is set incorrectly.</td>
<td>Your anti bounce should be higher than your pulse length and less than your min car length.</td>
</tr>
</tbody>
</table>
Appendix

The following three appendixes are three different scenarios you might have at your car wash:

- **Figure A, “1 Relay box, Keypad and Printer.”**
- **Figure B, “2 Relay Boxes, Keypad and Printer.”**
- **Figure C, “2 Relay Boxes, 2 Keypads, 2 Printers.”**
APPENDIX A: 1 Relay box, Keypad and Printer

Tunnel Master® Jr. Controller Equipment Layout & Addressing

1 Relay Box, 1 Keypad, Report/Receipt Printers
(See System Installation Guide for wiring instructions)

Relay Box/Controller
Equipment Room
(Mounted in dry environment)

Report Printer
(Report Printer)

Next to Relay Box
1. Report printer power to 120 VAC outlet on same dedicated 120 VAC circuit as Relay Box.
2. Communication from Relay Box.
3. Report Address set to 0 if attached to primary relay box or same address as Keypad if it is attached to a Keypad.

Entry Keypad
Wash Entrance

Receipt Printer
(Report Printer)

Wash Entrance
1. Receipt printer power to 120 VAC outlet on same dedicated 120 VAC circuit as Relay Box.
2. Communication from Keypad.
3. Receipt Address set to same address as Keypad if it is attached to.

Conduit A
A dedicated 100 VAC circuit shall be run with 14/3 copper-shielded wire with an insulation rating of 300V through a listed 3/4" conduit and secured with listed conduit hubs.

Conduit B
A 3/4" listed conduit shall be run from the Relay Box to the Keypad and secured with listed circuit hubs. This conduit will contain communication wire and three 18 gauge conductors both should have an insulation rating of 300V.

Figure 28. Appendix A - 1 Relay Box/1 Entrance Keypad/1 Receipt Printer
APPENDIX B: 2 Relay Boxes, Keypad and Printer

Tunnel Master® Jr. Controller Equipment Layout & Addressing

2 Relay Boxes, 1 Entry Keypad, Report/Receipt Printer
(See System installation Guide for wiring instructions)

Relay Box/Controller Equipment Room
1. Relay Box power supplied by dedicated 100VAC circuit.
2. Supply separate 24VAC and 120VAC power to common (C) of side of upper and lower termination points on each relay respectively.

2nd Relay Box Equipment Room
1. Relay Box powered by dedicated 100VAC circuit from 1st Relay Box.
2. Loop separate 24VAC and 120VAC circuits in 1st Relay Box to common (C) in 2nd Relay Box.
3. Relay address set to 2 in wash settings.

Entry Keypad Wash Entrance
1. Keypad power supplied by 24VAC from Relay Box.
2. Communication cable from Relay Box.

Report/Receipt Printer Wash Entrance
1. Receipt printer power to 100VAC outlet on same dedicated 100VAC circuit as Relay Box.
2. Communication from Keypad.
3. Report Address set to same address as Keypad if it is attached to, in this example: $.
4. Receipt Address set to same address as Keypad if it is attached to, in this example: $.

Figure 29. Appendix B - 2 Relay Boxes/1 Entrance Keypad/1 Receipt Report Printer
APPENDIX C: 2 Relay Boxes, 2 Keypads, 2 Printers

Tunnel Master® Jr. Controller Equipment Layout & Addressing

2 Relay Boxes, 2 Entry Keypads, Report/Receipt Printer
(See System Installation Guide for wiring instructions)

Figure 30. Appendix C - 2 Relay Boxes/2 Entrance Keypads/Report Receipt Printer
# Index

**A**
- Actions 79
- Add a Car to Stack 76
- Add Retract 76
- Amperage 14
- Anti 30
- Anti-Collision Wiring 30, 31
- Assign Outputs to Services 70

**B**
- Bump a Shift or Manually Close Current Shift 78

**C**
- Change Service and/or add Retract 76
- Comm cable terminations 42
- Communications wiring 41
- Configure Wash Menu 57
- Conveyor Roller Locator 27

**D**
- Default Configuration Settings 17
- DIP 38
- DIP Switch Settings 38

**E**
- Electric Eye Wiring 24
- End time
  - timed outputs 63
- Entrance 26
- Entrance Keypad DIP Switch Settings 45
- Entrance Keypad Jumper Settings 44
- Entrance Keypad Mounting 41
- Entrance Keypad to Process Vehicles (Non-Stacking) 74
- Entrance Keypad to Process Vehicles (Stack) 75
- Entrance Keypad Wiring 41
- Entrance Management System Wiring 26

**F**
- Features 12
- Frequency 14

**G**
- Gate inputs 16
- Gate Switch 24
- General settings 47

**I**
- Input 32
- Input Terminal 71
- Input terminal

**P**
- Panic 29
- Panic Stop Circuit Wiring 29
- Panic Stop Wiring 29
- Password 54
- Password Protected Menu 55
- Power
  - supply 14
- Pulse/Proximity Switch Wiring 22
- Push Button Wiring 33
- Push Button Wiring 1 Row 8 Columns 33
- Push Button Wiring First 8 Buttons 34
- Push Button Wiring for Second 8 Buttons 35

**R**
- Relay 20, 36
- Relay Box Display Keypad 52
- Relay Box Jumper Settings 36
- Relay Box Mounting 15
- Relay Box Wiring 15
- Remove a Car from Stack 76
- Report Printer Wiring 48
- Roller 27, 28
- Roller Locator Wiring 27, 28
- RS-485
  - COM terminal wiring diagrams 42
- Rules for Installation 19

**S**
- Second Entrance Keypad Mounting 42
- Second Entrance Keypad Wiring 43
- Shift Break 77
- Start time
  - timed outputs 63

- wet down 72
- IPX0 rating 14
- Keypad Installation 41
- Logging in 21
- Operating temperature 14
- Output 19
- Output overview 19
- Output Settings 65
- Outputs
  - timed outputs 63
Supply voltage 14

T

Tire 25
Tire inputs 16
Tire Switch Wiring 25

Troubleshooting
   Clock Indicator 79
   Entrance Keypad 79
   Entrance Keypad Diagnostics 80
   Gate Indicator 80
   Panic Indicator 80
   Tire Indicator 80
   Wash Controller Input Check 79
   Wash Controller Response 79

Troubleshooting
   Miscellaneous 81
   Relay Box 80

Truck bed sensor. See Ultrasonic sensor

U

Ultrasonic sensor
   wiring 42

V

Version 12
Version Considerations 12
View Service Counts 77

W

Wash Setting Descriptions 58
Wet down
   input terminal 72
Wiring
   communications 41
**Change History**

<table>
<thead>
<tr>
<th>Document Version</th>
<th>Date</th>
<th>Reviewer Initials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>07/31/2015</td>
<td>WLS, BM, ES, SS, WS</td>
<td>Second release.</td>
</tr>
<tr>
<td>3.0</td>
<td>02/11/2016</td>
<td>WLS, BM, CB</td>
<td>Third release. Updated Communication Cable Termination drawing.</td>
</tr>
<tr>
<td>4.1</td>
<td></td>
<td>WLS, TR, BM</td>
<td>Updated Resetting Default Configuration Settings, Figure 3 and 12, and formatting.</td>
</tr>
<tr>
<td>4.5</td>
<td>8/22/2016</td>
<td>WLS, BM, TR, NR</td>
<td>Updated page 65 and new book graphics</td>
</tr>
<tr>
<td>4.8</td>
<td>9/13/2019</td>
<td>WLS</td>
<td>Updated a few numbers and descriptions on Page 17, 21, 66, 75, and 89.</td>
</tr>
</tbody>
</table>
If you have any questions or concerns, please contact ICS Technical Support: 800-246-3469.

MISSION STATEMENT:

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.