
Errata No. 1

Revision Date: February 2017

The following is a list of changes made to the 332S Cabinet; attached drawings will hi-light the changes in red.

Page 1:

- Additional wiring shown fed from TB7 to TB8, TB9 and TB10 in Side View (Left and Right)
- Added Ped Pushbutton Comm Bus note and wire from TB1-3 to Ped Pushbutton Comm Bus in Side View (Left)
- Relocated cabinet light power supply from center of cabinet in Side View (Right)
- Modified TB7 layout and added Isobar power feed in Side View (Right)
- Added TBB and TBS jumper wiring in Side View (Right)
- Modified PDA securement method, removing wing nut in back of cabinet and added bracket in front of the cabinet
- Modified TB11 layout to physically separate 24 Vdc and 24 Vdc Controlled
- Added TB0 note to callout fuse

Page 2: No Changes

Page 3:

- Added note and wire from TB1-3 for Ped Pushbutton Comm Bus
- Added TB7, TB8, TB9, TB10, and TB11 to terminal block definitions
- Modified TB1 to show physical barrier separation
- Added TB11 to show wiring layout and physical barrier separation
- Modified TB4 to show as spare terminal block, wiring to be tied and bundled to farthest input file.
- Added ground wire to TB2-12 for GPS Clock from TB11-16

Page 4:

- Corrected TB1-1 to TB11-7 in C5 Connector
- Updated wiring layout in Detector Test Panel Wiring
- Modified C5-24 to be 24 Vdc Controlled

Page 5:
• Added note for Output File 2L (Aux File) to identify +24 Vdc Controlled
• Added notes to Output File 1L (Rear) TB02 to identify TB11 termination points

Page 6:
• Added Power Distribution Assembly definition to Legend
• Added Battery Backup Controller and Terminal Block-Battery Backup definitions to Legend
• Added Power Supply for Cabinet Light to Legend
• Added Second light for front door wiring to PDA #2 Elementary Diagram
• Added TBS and TBB jumper wiring to PDA #2 Elementary Diagram
• Updated terminal block locations to PDA #2 Elementary Diagram
• Added #10 gauge wiring to required locations in PDA #2 Elementary Diagram
• Modified Railroad Interconnect detail to show 2A fuse.
• Modified T3-2 to show wiring for 24 Vdc Controlled from TB11-7 in ODOT PDA 2 Layout (Rear View)
• Added wiring layout for 24 Vdc Controlled to PDA #2 Elementary Diagram
• Added Output File 1L and Output File 2L to PDA #2 Elementary Diagram

Page 7:
• Added Page for 206L Power Supply Hold Down detail.

Microcontroller Signal Specs:
• Added TB10 & TB11 to Section 3.1.1.3
• Modified Terminal Blocks for TB1 to be multi-conductor models to allow for four wire connections in Section 3.1.1.3
• Modified language for providing Cabinet Prints in Section 3.5.2.1
• Modified requirements for Surge Protection Device used on Twisted Pair Copper Communications in Section 3.6.2.1
• Removed language in Section 4.2.2
• Added language to identify type of fuse to be used for Model 255 Two-Channel AC Isolators in Section 5.4.1.3
• Modified method of securement for 206L Power Units in Section 7.1.1.3
• Modified language for Railroad Preemption Testing procedure in Section 8.7.3.10
Oregon Department of Transportation

Standard Specification

for

Microcomputer Signal
Controller – Errata 1

February 1, 2017
The following Standard Specification for Microcomputer Signal Controller dated July 1st, 2014 and Appendix A dated July 2nd, 2014 should be modified or added.
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CHAPTER 2: GENERAL SPECIFICATIONS

SECTION 1- SPECIFICATIONS

2.1.1.1 All devices must meet the general specifications in the following specifications, as well as the ODOT Standard Specification for Microcomputer Signal Controller dated September 4, 2001, ODOT Standard Specifications for Microcomputer Signal Controller dated July 1, 2014, the Caltrans TEES Specifications as published March 12, 2009 and Errata 1 dated January 21, 2010.

2.1.1.2 In case of conflict, the Engineer will resolve any discrepancies between these documents in the following order or precedence:

- ODOT Standard Specification for Microcomputer Signal Controller – Errata 1 dated February 1, 2017
- Caltrans TEES Specifications dated March 12, 2009 and Errata 1 dated January 21, 2010

CHAPTER 3: SPECIFICATIONS FOR CABINET MODELS 332S, 332, 334, AND 336

SECTION 1- CABINET COMPOSITION

3.1.1 Requirements

3.1.1.2 The Model 332S Cabinet shall consist of the components shown on the cabinet print in Appendix A.

3.1.1.3 Terminal blocks (TB1 – TB11) shall be DIN rail mounted and labeled by mechanical means. All terminal blocks shall be one piece or factory assembled, sectional, color coded, double terminal, barrier type, with binder screw terminals. All wiring shall be terminated with insulated wire ferrules. Terminal blocks shall not interfere with the access or opening up to 60 degrees of back panels on devices mounted in the front of the cabinet. The terminal blocks shall meet the following minimum specifications:

- Listing: UL1059
- Voltage Rating: 600V
- Current Rating: 30A
- Wire Range: 10AWG to 22AWG
• Terminal blocks for TB1 shall be multi-conductor models that have a four wire connection.

SECTION 5- CABINET WIRING

3.5.2 Cabinet Wiring Diagram

3.5.2.1 Agency provided cabinet prints will be furnished on current ODOT drawings for the appropriate cabinet model. Copies will be made available within 14 days of request from TSSU. The drawings are available from the Traffic Standards unit.

3.5.3 Conductors

3.5.3.4 All conductors within the Power Distribution Assembly #2 Elementary Diagram, unless otherwise specified, shall be stranded No. 14 (or larger).

SECTION 6- CABINET TRANSIENT SURGE SUPPRESSION REQUIREMENTS

3.6.2 Twisted Pair Copper Communications Surge Protection Requirements

3.6.2.1 A surge protection device (SPD) shall be furnished to provide protection from electrical transients over twisted pair communications. The minimum performance specifications for the SPD (Phoenix Contact DT-TELE-RJ45 or approved equal) are:

• Listing: IEC-61643-21, 2012
• Peak surge current: 10kA (8x20us)
• Clamping voltage: 50 to 185 Volts
• Insertion loss: 0.3 dB @ 10 MHz
• Operating temperature: -40°F to 165° F
CHAPTER 4: SPECIFICATIONS FOR TRAFFIC SIGNAL CONTROLLERS

SECTION 1- GENERAL REQUIREMENTS

SECTION 2- MODEL 2070 CONTROLLER

4.2.2 Assembly

4.2.2.2 The 2070-6A 1200 Baud Modem Module may be supplied as a separate item as an option to the Agency if specified in the special provisions. Removed

CHAPTER 5: SPECIFICATIONS FOR INPUT DEVICES

SECTION 4- MODEL 255 TWO-CHANNEL AC ISOLATOR

5.4.1 Requirements

5.4.1.3 Model 255 Two-Channel AC Isolators shall be protected with a 2 Amp Glass Slow Blow type fuse.

CHAPTER 7: SPECIFICATIONS FOR POWER SUPPLY AND MONITOR UNITS

SECTION 1- MODEL 206L POWER UNIT

7.1.1 Requirements

7.1.1.1 Model 206L Power Supplies shall conform to the CALTRANS TEES Specifications in Chapter 3, with exception to 7.1.1.3 below.

7.1.1.3 Unit Chassis – The unit chassis shall be vented. The power supply cage and transformers shall be securely braced to prevent damage in transit. When resident in the PDA, the units shall be held firmly in place by its stud screws and front latch attachment.

SECTION 2- MODEL 210 MONITOR UNIT

7.2.2 Wiring Diagram Assignments

7.2.2.1 See Appendix A
CHAPTER 8: TESTING AND EQUIPMENT ACCEPTANCE

SECTION 7- TRAFFIC SIGNAL FIELD INSPECTION AND TURN ON

8.7.3 Inspection Procedures

8.7.3.10 Verify railroad preemption where applicable.

- Use test switch to place railroad preemption call to traffic signal controller. A railroad preemption call shall be indicated on the traffic signal controller.
- Verify proper clearout and controller phasing.
- Verify proper operation of part time restriction signs where applicable.
- The railroad preemption call shall terminate when the test switch is deactivated and normal traffic controller operation shall resume.

APPENDIX A: 332S CABINET PRINT

APPENDIX B: COMMUNICATIONS BRACKET
## Controller (C1) and C11 Wiring Details

<table>
<thead>
<tr>
<th>Program Name</th>
<th>C1 Connector</th>
<th>C4 Connector</th>
<th>Input Terminals</th>
<th>Field Terminals</th>
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<tbody>
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<td>DC End</td>
<td>C1-1</td>
<td>C4-1</td>
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<td>6</td>
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<td>4 DRAKE</td>
<td>C1-2</td>
<td>C4-2</td>
<td>10</td>
<td>10</td>
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<tr>
<td>4 RED</td>
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<td>C1-6</td>
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### C11 Connector Wiring

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<th>Program Name</th>
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<th>Input Terminals</th>
<th>Field Terminals</th>
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<td>C1-13</td>
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<td>C5-4</td>
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<td>10</td>
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<tr>
<td>2 YELLOW</td>
<td>C1-17</td>
<td>C5-5</td>
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</tbody>
</table>

### Typical Wiring Diagram

- **C11 Plug PINOUT**
- **C1 Plug PINOUT**

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**Deleted Text:**

### Diagram Notes

- Input Snd
- DC End
- C1 Connector
- C4 Connector
- C11 Connector
- C5 Connector
- Input Terminals
- Field Terminals

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**Controller Test Panel Wiring**

- Typical Wiring Diagram
- C11 Plug PINOUT
- C1 Plug PINOUT

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- Description: [Description]

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1. Electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:

- Nominal Voltage: 120 Volts AC or more
- Peak Surge Current: 10,000 Amperes or more
- Mounting: "35mm x 15mm" DIN Rail
- Listing: UL489 or UL1077

2. Communications Surge Protection Device - Each incoming communication line prior to the router/switch connection shall be protected from electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:

- Nominal Voltage: 120 Volts AC or more
- Peak Surge Current: 10,000 Amperes or more
- Mounting: "35mm x 15mm" DIN Rail
- Listing: UL489 or UL1077

3. Circuit Breaker - Each communication rack shall be protected from overload conditions using a supplemental circuit breaker. Each circuit breaker shall meet the following specifications:

- Nominal Voltage: 120 Volts AC or more
- Current Rating: 15 Amperes
- Dimensions: 1.65" x 3.9" x 2.0"

Notes:
1. Pre-wire assembly in accordance with wire diagram shown.
2. RuggedCom Power Connector shall be Phoenix Contact Combincon plug P/N 7M125/051-5/15-050 or approved equal.
3. Labeling - Clearly and permanently label all components as shown and each terminal with printed labels. For devices that do not have slots for labels, apply labels via adhesive to the top surface of the device.
4. Network switch is to be furnished and installed.
5. Pre-wire RJ11 Pigtails with outdoor rated, 2 pair - Category 3 UTP cable.
Specifications:

1. Power Surge Protection Device - Each communication rack shall be protected from electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:
   - Current Rating: 10 Amperes or more
   - Nominal Voltage: 120 Volts AC
   - Max Continuous Current: 10 Amperes or more
   - Mounting: "35mm x 15mm" DIN Rail
   - Listing: UL498

2. Circuit Breaker 10A - Each communication rack shall be protected from overcurrent conditions using a supplemental circuit breaker. Each circuit breaker shall meet the following specifications:
   - Current Rating: 10 Amperes or more
   - Voltage Rating: 120 Volts AC
   - Mounting: "35mm x 15mm" DIN Rail
   - Listing: UL489 or UL1077

3. All terminal blocks shall be DIN rail mounted and meet the requirements of UL1059. All terminal blocks shall have a voltage rating of 300 Volts or more, current rating of 15A or more, and shall be one piece or factory assembled, rectangular, double terminal, barrier type, with blind screw terminals. Fused terminal blocks shall be provided for protecting equipment which are not internally fused. Fuses shall be replaceable, quick acting and sized as shown.

4. Wiring - All point-to-point wire shall be UL 1015, 600V PVC insulated, stranded, tinned copper. Black (hot) and white (neutral) wire shall be 16 awg, green/yellow (ground) wire shall be 16 awg, insulated wire ferrules. Adhesive back cable tie mounts and mini black "35mm x 15mm" DIN Rail spacers shall be included with binder screw terminals. Fused terminal blocks shall be provided for protecting equipment which are not internally fused. Fuses shall be replaceable, quick acting and sized as shown. Ground terminal blocks shall be electrically and mechanically connected to the DIN rail, green in color and accept wire sizes ranging from .022 to .012 AWG.

5. Grounding and Bonding - Electrical grounds shall be bonded to the 10-32 x 1/2" green bonding screw. All grounding and bonding shall be in accordance with UL467.

6. NEMA 5-15R Duplex Receptacle shall meet the following specifications:
   - Current Rating: 15 Amperes
   - Nominal Voltage: 120 Volts AC
   - Mounting: "35mm x 15mm" DIN Rail
   - Listing: UL498

Notes:

1. Assemble components on a DIN rail as shown. Use additional DIN rail spacers, end plates and end plates as necessary.
2. Network switch is state furnished and installed.
3. Pre-wire assembly in accordance with wire diagram shown.
4. RuggedCom Power Connector shall be Phoenix Contact Combincon plug P/N: MVSTBW-2.5/5(3)-STF-5.08 or approved equal.
5. RuggedCom Power Connector shall be Phoenix Contact Combincon plug P/N: MVSTBW-2.5/5(3)-STF-5.08 or approved equal.
6. Grounding and Bonding - Electrical grounds shall be bonded to the 10-32 x 1/2" green bonding screw. All grounding and bonding shall be in accordance with UL467.