



NORTH AMERICA TRAFFIC™

WORLD LEADER IN TRAFFIC CONTROL SYSTEMS

RCF 3.4

Portable Traffic Signal - Technical Specifications



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Signal Controller Hardware

Each signal controller shall be capable of providing the following feedback information to the user:

- Audible low battery alarm sounds when voltage drops below predetermined level
- Audible feedback when buttons are depressed
- The battery voltage reading of all signal trailers in use
- Controller menu displays the following:
 - Signal status
 - Cycle time countdown
 - Battery voltage
 - Actuation status
 - Time of Day Plan
 - Radio communication
 - System Faults

Each signal controller shall meet the following operational requirements:

- Certified as meeting the NEMA TS-2 Environmental Standards
- Rated for temperatures of -40°C to +85°C (-40°F to +185°F)
- A 3 inch x 4 inch (7.62 cm x 10.16) backlit LCD display
- Housed in a lockable steel cabinet
- Capable of connection to external malfunction management unit and transfer flasher relay hardware (additional hardware required)
- Two (2) vehicle detection/actuation inputs
- Two (2) railroad preemption inputs
- Hardwire communication connection capabilities (optional hardware required)
- Remote monitoring capabilities by means of cellular or satellite communications
- Interface capabilities with TS1/TS2 controllers (with additional equipment)
- Operation of one (1) to eight (8) signal trailers on a jobsite
- Activation of advanced warning signals (optional hardware required)
- Plug and play installation

Signal Controller Software

Each signal controller shall have operating software capable of the following:

- Programming of the signal controller without the use of an external interface (i.e. micro terminal, laptop computer)
- Signal controller designation (i.e. Primary, Secondary 1, Secondary 2, etc.) occurs within the software, allowing for the flexibility to assign the designation to any signal controller
- Internal conflict monitoring continually checks for data corruption, communication failures and conflicting signals
- User selectable operating modes of:
 - Fixed time
 - Manual
 - Traffic Actuated
- Programmable signal timing of (one second increments):

- Red: 1 to 600 seconds
- Amber: 3 to 10 seconds
- Green (min): 1 to 300 seconds
- Green (max): 1 to 300 seconds
- Adjustable green extension times of 3 to 15 seconds
- Cycle time calculator functionality to determine appropriate red, green and amber timing based on distance between stop locations, the posted speed limit and vehicle count per day as entered by the operator
- User selectable traffic volume settings of light, moderate and heavy to modify the green time 'on the fly'
- Six (6) time of day plans based on time of day and day of week
- Turn phase functionality
- User selectable default modes of Solid or Flash red
- Operation in flash amber mode
- Manual override of fixed time operation at the signal controller or by means of wireless hand held radio remote. Manual operation shall not allow the user to interrupt the all red clearance time
- Quick setup by means of user selectable predefined work zone layouts
- Password protection

Radio Communication Systems

The radio communication system shall be capable of operating in the following manner:

- Operational distance of up to one-half ($1/2$) mile (804 meters) between signal trailers
- A minimum of seven (7) programmable operating addresses (transmitter frequencies)
- Spread spectrum frequency hopping to reduce interference

The radio communication system hardware shall consist of the following:

- High gain, 7 dB antenna
- Radio transceiver rated to operate in environments up to 90% humidity in temperatures ranging from
-40°C to +85°C (-40°F to +185°F)
- Components certified as compliant with FCC (Part 15, Subpart C, Section 15.247 Frequency Hopping Spread Spectrum Operating in 902-928 MHz Band)

Signal Heads and Display Requirements

The signal head displays shall consist of the following:

LED Lamps

- Signal lamp comprised of Light Emitting Diodes (LED)
- 12 inch (300 mm) diameter lamps
- High flux, 'incandescent look' lens
- 12 Volt input
- Meet the ITE VTCSH Light Emitting Diode (LED) Vehicle Signal Supplement 2005 standards
- Certified as compliant with FCC (47 CFR, Part 15:2006 15.109, Class A)

- Life expectancy of 100,000 hours
- A rear-facing 4 inch (100 mm) amber LED lamp mounted on the signal. Rear-facing lamp behavior must be displayed as:
 - Flashing = Phase status is GREEN
 - Solid = Phase status is RED

Signal Lamp Housing

- Three section, consisting of Red, Green and Amber signal lamps
- ITE certified polycarbonate housing
- Aluminum back plate (back board)
- Ball cap visors, extending over each LED lamp by 10 inches (25.4 cm)

Signal Display Operational Requirements

The signal head displays shall be configured as per the following standards and requirements:

- Height of signal head measured from bottom of the back board to the surface of roadway shoulder is 9 feet (2.74 meters)

Power Systems

The power supply system shall consist of the following:

Batteries

- Eight (8), 6 Volt deep cycle batteries with 928 amp hours of storage at 12 VDC supply
- Autonomy of twenty-one (21) days of continuous, twenty-four (24) hours per day use
- Housed in a lockable, steel box and seated on a rubber mat
- Secured with steel hold-downs to eliminate movement during travel
- Anticorrosion spray applied to terminal posts

Battery Charger

- 75 Amp smart charger
- External, corrosion proof plug for connection to a 120 VAC source
- In-line surge protection

Solar Panel

- 198 Watt solar array with rotation range of 180 degrees and a tilt range of 0 to 60 degrees
- Panels welded to the mounting bracket for theft prevention
- Panel mounting bracket is secured to the trailer by way of antitheft mechanism
- Housed in anodized aluminum frame
- UL1703, IEC 61215, VDE Certification
- Manufactured under ISO9001 and ISO14001 standards
- Conversion efficiency of +16%
- Maximum Power 198 watts
- Tolerance +10% /-5%
- Maximum Power Voltage 18.0 Volts
- Maximum Power Current 11.0 Amps

- Open Circuit Voltage 20.3 Volts
- Short-Circuit Current 11.0 Amps
- Loss of output is 10% or less within 12 years and less than 25% within 25 years

Wiring

All wiring and connection points on the signal trailer shall meet the following standards and requirements:

- Wires meet applicable SAE, UL and ITE standards
- Wire protection - Wire Loom 100% of length, Metal conduit - 90%
- Wire connectors meet standards for applicable UL standards
- Terminal blocks coated to prevent corrosion
- Installation procedures follow ISO 9001 quality guidelines

Hand Held Radio Remote Control and Manual Operation

The wireless hand held radio remote shall have the following physical and operational attributes:

- Three color coded buttons:
 - RED – All stop
 - GREEN – Phase 1 green activation
 - BLACK – Phase 2 green activation
- Expiration of the ‘all red’ clearance time before a green phase command is recognized and accepted
- Two (2) second button delay to prevent accidental activation
- A red LED indicator light confirms receipt of command
- Weighs less than 0.5 lbs (227 grams)
- Powered by four (4) AA batteries that power the unit for a minimum of six (6) months with daily use
- Splash resistant (to water)
- Includes a nylon pouch with a belt clip and spare AA batteries

Trailer Structure

Frame

The trailer frame shall be fabricated using the following parts and processes:

- 2 inch x 4 inch, 1/4 inch gauge steel tongue
- 2 inch x 4 inch, 1/8 inch gauge steel bumpers and side rails
- 2 inch x 2inch, 1/8 inch gauge steel light post
- Welding performed and inspected by welders, under ISO 9001 quality guidelines
- Three (3) swivel screw jacks to level and stabilize, with minimum 2,000 lbs (907.18 kg) lift capacity per jack
- 2 inch class I and II ball coupler
- 1/4 inch, high test grade safety chains
- #9 Dexter Torsion bar suspension axle
- ST175/80R13 tires

The trailer frame shall comply with the following operational requirements:

- Maximum assembled weight of 1,240 lbs (562.45 kg)
- 2 inch (5.08 cm) red and white retro-reflective tape around perimeter of the frame
- Brake and turn lights conform to US DOT and Canadian transportation regulations

Powder Coat and Steel Preparation

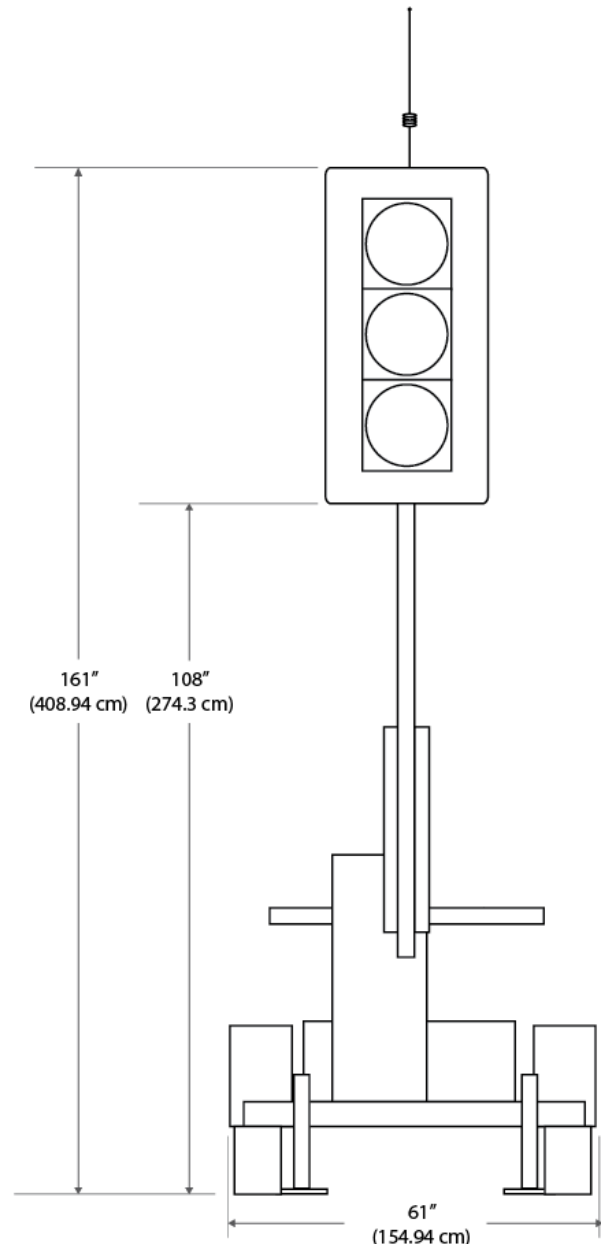
The powder coat process and materials shall comply with the following:

- Shot blasting preparation
- Dry-off and cure oven
- Powder coating procedures comply with ASTM B117 specifications for resistance to salt air environment
- 'North America Traffic' FHWA safety orange powder color

Dimensions

The trailer frame shall conform to the following dimensions:

- Length
 - Operating: 13 feet (3.96 meters)
 - Stowed: 14 feet (4.27 meters)
- Width
 - Operating: 5.08 feet (1.55 meters)
 - Stowed: 5.08 feet (1.55 meters)
- Height
 - Operating: 13.42 feet (4.09 meters)
 - Stowed: 7.58 feet (2.31 meters)
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Optional Equipment

If peripheral equipment is required, the following shall be used:

Remote Monitoring Systems

Cellular/GPS

- Digital cellular response system for use anywhere that has cellular reception
- Communicates system faults to four (4) cell phone numbers via text message and four (4) email addresses
- GPS system allows for asset location tracking and geo-fencing via secured website

Satellite

- Satellite based response system for use anywhere in the world, specifically in remote areas that do not have cellular coverage
- Communicates system faults to four (4) cell phone numbers via text message and four (4) email addresses
- GPS system allows for asset location tracking

Vehicle Detection

Microwave Traffic Sensors

- MS-Sedco model TC-26B
- User adjustable range and delay settings
- Detection range of up to 250 feet (76.2 meters)
- Approach or depart detection selection
- Detects vehicle movement as low as 1 mph (1.6 km/h)
- Vehicle extension times of 3 to 15 seconds