# ITC-220™ Wayside Transceiver

## High Performance Wireless Links for Railroad Applications

CalAmp®

## Experience The Advantage

- AAR Standard S-5702
- ANSI/TIA-603-C-2004
- MIL-STD-810E
- American Recovery and Reinvestment Act–Buy American Provision

### Remote Radios for Locomotive In-Cab

CalAmp's line of ITC-220™ radios for locomotive, base station and wayside applications are manufactured specifically for use by North American Railroads for Positive Train Control (PTC) applications. PTC is a technology solution that prevents train-to-train collisions, over-speed derailments, movement of a train through a switch left in the wrong position, and incursion of trains into maintenance of way work limits.

Operating between 217.6 and 222.0 MHz, these multi-channel software defined radios meet railroad requirements for Inter-operable Train Control (ITC).

These radios are designed to meet relevant railroad specifications for operation in the harshest environments. With high power capacity, CalAmp's ITC-220™ radios provide wireless packet data transport between Locomotives, Base Stations, and Wayside locations.

Wayside radios are remote, fixed location radios installed at waysides. They provide wayside signal status, switch position, and track integrity information to locomotives. They must communicate with locomotives even when there is no Base radio coverage. Wayside radios also enable wayside sites to communicate with the Back Office for maintenance and other purposes. Some Wayside radios may have access to the Back Office through a broadband connection.

# ITC-220™ Specifications

## General

| | |
|---|---|
| Frequency Range | 217.6 - 222.0 MHz |
| Channel Spacing | 25 KHz |
| DC Input Voltage Range | 10.9-15.5v; Damage limit 17 VDC |
| DC Current Drain | Transmit: 10A max into 50 ohm load; 7.5A typical; Receive: 1A max while receiving |
| DC Power Connector | Wago p/n 231-833/001-000 |
| Antenna Connector | Type N female |
| GPS Receiver | Active or passive antenna: Antenna power 3.3V 50mA max;Connector TNC Female |
| External Interface | (2) Ethernet 10/100 MBPS: Data Network Port RJ-45; Maintenance Port RJ-45 |

## Configuration Interface

| | |
|---|---|
| Module | SD Card |
| Display | Activity/Diagnostic LED's on front panel |
| Regulatory | Complies with FCC Parts 2, 15, and 90 |

## Environmental

| | |
|---|---|
| Temperature Range | -40° to +70° C (Operating)<br>-55° to +85° C (Storage) |
| Operating Humidity | 0-95% non-condensing |
| Frequency Stability | ± 0.1 ppm over operating temperature range |

## Transmitter

| | |
|---|---|
| RF Output Power | 25W PEP; Adjustable 7.5-25W PEP |
| Output Impedance | 50 ohms; Operating VSWR < 3.1 |
| Modulation Waveforms | 16 kbps pi/4DQPSK (linear) |
| Occupied Bandwidth | Meets 47 CFR90.210(f ),<br>Five aggregated channels |
| Modulation Designers | 16 kbps: 8K90DXW |
| Conducted Spurious Emissions | -25 dBm max |
| Max Duty Cycle Rating | 10% |

## Receiver

| | |
|---|---|
| Max Usable Sensitivity | 16 kbps -111 dBm; 32 kbps -108 dBm |
| Static BER | $<10^{-4}$ |
| Adjacent Channel Selectivity | 70 db@25 kHz |

## Physical

| | |
|---|---|
| Dimensions | 15.5 x 9.5 x 2.0" (2.5 x 24.1 x 5.0 cm) |
| Weight | 7.7 lbs (3.5 kg) |

**About CalAmp**

CalAmp (NASDAQ: CAMP) is a telematics pioneer leading transformation in a global connected economy. We help reinvent businesses and improve lives around the globe with technology solutions that streamline complex IoT deployments and bring intelligence to the edge. Our software applications, scalable cloud services, and intelligent devices collect and assess business-critical data from mobile assets, cargo, companies, cities and people. We call this The New How, powering autonomous IoT interaction, facilitating efficient decision making, optimizing resource utilization, and improving road safety. CalAmp is headquartered in Irvine, California and has been publicly traded since 1983. LoJack is a wholly owned subsidiary of CalAmp. For more information, visit calamp.com, or LinkedIn, Twitter, YouTube or CalAmp Blog.


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