

# R3500



The flexible on train broadband solution

Nomad Digital



Introducing the ultimate In broadband technology for the rail sector, the R3500 from Nomad is our flagship product in our leading edge R3000 series. For the modern rail fleet, broadband communications can deliver a host of operational and security applications, as well as enhanced passenger services. These applications deliver increased revenue, reduced costs and increased passenger satisfaction.

Nomad's R3500 is equipped with leading technology to enable constant connectivity from train to shore. Using a range of WAN backhaul networks, including 3G, HSDPA / HSUPA, EDGE, CDMA-2000, EV-DO, UTMS WCDMA, and 802.12, the R3500 is capable of high speed, low latency connection to ensure a high quality of service throughout a train's journey, whilst maintaining a secure connection.

With its ruggedized design, which is fully compliant with all rail EMC, shock and vibration standards (EN 50155), the R3500 performs in the most challenging environments. Complete with a range of power supplies, including Power over Ethernet (PoE), the R3500 can be deployed in any train fleet.

A range of interfaces including 10/100 Base T Ethernet ports, RS232 serial ports and USB 2.0 enable a number of application usages, such as Passenger Information Systems, ticketing applications and CCTV.

The R3500 is equipped with the ability for linking with R3400 Carriage Boxes and Access Points to create a Local Area Network connection for operational staff and passengers to enjoy a reliable WiFi service at high speeds. In tandem with the Nomad Fleetmanager system, the R3500 enables total remote management and monitoring of the on board service.

The ability of the R3500 even extends to caching information, such as train operation of web traffic for passengers. The R3500 is expandable enough to add a second CPU dedicated to such applications as media serving.

Coming complete with the latest in GPS technology, the R3500 is able to assist in fleet tracking and coupled with Fleetmanager allows for a host of operational benefits.

Rugged system design

EN50155 Rail approved

Extensible CompactPCI design

Connection to WIMAX, 3G HSDPA, WiFi

802.11 a/b/g access points

12 Channel GPS module

Automatic recovery & rollback on updates

Minimum 2x 10/100 Ethernet ports

Encrypted communication between train & NOC

Ability for configuration to any design

[www.uknomad.com](http://www.uknomad.com)

## Dimensions

483mm (W) x 295mm (D) x 133mm (H)

## Surface Mount

Aluminium rack-mount chassis typically 19" but with variations attached

## General

Rugged system design  
No moving parts

## Weight

5.3kg (may vary due to selected options)

## Materials

Aluminium case

## Power Input

Range of power suppliers including  
24-30v DC, 50-90v DC, 100v DC, 110v DC,  
110 AC, 220v AC

## Power Consumptions

30w

## Antenna Connectors

Typical configuration includes GPS via TNC on front plate  
HSDPA / HSUPA via N-Type on front plate

## Interface Ports

2x Fast Ethernet via D-sub with option to extend to  
6x Fast Ethernet via D-sub expansion card  
2x USB 2.0  
1 x VGA connector  
Options include RS232, RS422, RS485

## Processor

Range from InTel Celeron to INTEL Core Duo

## Memory

512MB RAM upgradeable to 4MB RAM

## Operating System

Linux mounted on Compact Flash  
Industrial CF card for long term high availability  
Remote updates and patches via Nomad Fleetmanager system

## WAN Radio Options (Unlimited number or variations)

Edge | UMTS | HSDPA | HSUPA  
WiMAX 802.16 die  
WiFi 802.11 a/b/g/n  
CDMA-2000 EV-DO  
Flarion OFDM  
GSM-R  
Satellite

## WAN Interface

WiMAX 802.16e  
WiFi 802.11  
EDGE / GPRS  
COMA - 2000 EV-00  
3GTD-CDMA  
3G UMTS HSDPA  
3G UMTS HSUPA

## GPS

20-parallel-channel GPS receiver  
GPS Band/Code: L 1 frequency, CIA code  
Integrated TCXO, RTC  
Horizontal accuracy: better than 2.1 m (CEP) 5.2m 2dRMS  
GPS modes  
- TricklePower™ mode for power saving  
- Push-To-Fix™ mode  
Protocol NMEA0183  
- SiRF® binary messages: altitude, longitude, elevation  
velocity, heading, time, satellite tracking status,  
command / control messages  
- SiRF® binary interface: raw data  
Antenna voltage supervision  
3GPP compliance  
Optical isolation 1kV DC

## GPS Sensitivity

Acquisition: -155 dBm  
Navigation: -157 dBm  
Tracking: -159 dBm

## GPS Acquisition

Hot Start - 0.5 seconds  
Warm Start - 32 seconds  
Cold Start - 34 seconds

## Gateway Services

Nomad proprietary seamless switching, DHCP, SNTP, NAT, PAT

## Storage

Optional SATA drive storage. using 2.5 or 3.5 solid state or  
mechanical drives with RAID options

## Management

Remote SSH  
SNMP  
Integrated into Nomad Fleetmanager system  
Watchdog  
Self-healing algorithms to improve uptime and robustness  
Telemetry / Heartbeat output to Nomad Fleetmanager  
Health monitoring of all network connected devices and  
reporting to Nomad Fleetmanager

## MTBF

> 50,000 hours, depending on options selected

## Optional Extras

Content server with mass storage & RAID  
Web server  
Local landing pages / passenger portal  
Web page caching  
Many variants of input/output modules can be added  
File transfer

## Environmental

-30C to + 70C operating  
-40C to +85C storage

## Compliance

EN 50121-3-2  
EN 50155

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