

By focusing on the unique needs of each customer, Central Railway Manufacturing has worked with leaders in the freight transportation industry to address timing, navigation and positioning requirements to turn their precision railroading goals into a reality.

Precision Navigation Module / On-board Network

Central Railway Manufacturing's equipment portfolio includes the PNM/OBN, the Precision Navigation Module / On-board Network. The PNM/OBN is a fully featured AAR-S9102 and S9103 precision positioning and locomotive time solution, capable of connecting GNSS and time-based inertial functions to Ethernet on-board networks. The CRM PNM/OBN also incorporates user-accessible high-powered edge processing to its positioning and time management engines in a compact, standalone form factor.

Insight into PNM/OBN technology...

The PNM/OBN employs a survey grade GNSS receiver and an embedded real time clock (RTC) to a dedicated positioning microcontroller and a quad-core customer accessible edge processor. This architecture is designed to support cutting edge industry standard navigation requirements via Ethernet but also legacy navigation applications through serial port applications.

- 1 x GNSS RF receiver inputs
- 2 x NMEA legacy serial ports
- 3 x 10/100/1000 Ethernet
- 2 x Cell Modems
- 1 x WiFi
- 1 x Bluetooth

The PNM/OBN GNSS receivers also support a wide array of RTK positioning and correction standards such as NTRIP, RTCM, PPP, SBAS and Differential modes.



Your data at your fingertips...

The PNM/OBN is part of the CRM Enabling Technologies suite of products whose focus is to allow customers to leverage their own networks and data mining infrastructure to connect to and utilize on-board telemetry. The CRM PNM/OBN not only conforms to industry-driven precision navigation standards, but also allows customers to gain direct access to raw data streams such as accelerometer data.

In addition to hosting on of the most state-of-the-art GNSS receivers in the industry, the CRM PNM/OBN is a powerful standalone locomotive edge processing platform that boasts a state-of-the-art quad-core applications processor capable of hosting Linux customer data mining, analytics, routing, and locomotive configuration management applications with the capability to support more than 256GB of user storage. The PNM/OBN supports a wide range of scripting engines such as Python® to enable all manner of customer-driven processing and rules functions without the need for additional cards.

Precision Navigation Module

PNM/OBN Detailed Characteristics

Processor: i.MX8M-Plus Application Processor
4 x ARM Cortex® 64-bit A53 at 1.5GHz
Neural Processing Unit (NPU) at 2.3 TOPS

Memory: 3GB LPDDR4

More than 256GB User and Application FLASH

2GB Secured OS/Boot FLASH

Connectivity: 3 x 10/100/1000Mbps Ethernet
-VLAN, QOS, Port Iso/Fwd

1 x Bluetooth Receiver
2 x Isolated RS-232 Serial
2 x CAN 2.0 Connections
-Single termination or pass-through

1 x HDMI connection
2 x USB 2.0

Wireless: 1 x WiFi 802.11 a/b/g
2 x Cellular Modem

-CDMA/GSM 3G/4G/LTE

1 x GNSS with RTK, L-band Corr.

-GPS L1/L2/L5
-GLONASS G1/G2/G3
-BeiDou B1/B2
-Galileo E1/E5a+b

Power: 74VDC nominal

24VDC nominal

6W Typical, 9W peak

Environment: -40°C to +70°C Operating

0% to 95% RH Non-condensing

AAR-S9401 Shock and Vibration

