RR-N-140
NAVIGATION SYSTEM

ROBOTIC RESEARCH

The RR-N-140 Navigation System provides accurate absolute and relative 3D (6 DOF) localization information for ground vehicles of all sizes. It is designed specifically for use on unmanned ground vehicles and is heavily customizable to incorporate a wide variety of sensor inputs into the navigation solution.

APPLICATIONS

FEATURES AND BENEFITS

- ❑ Accurate, real-time navigation/localization solution for wheeled or tracked ground vehicles
- ❑ Adaptable for use on surface vessels
- ❑ Exceptional localization performance in GPS-denied or compromised areas
- ❑ Dual antenna GNSS for zero-speed heading detection and redundancy
- ❑ Rugged IP67 Construction designed to meet shock and vibration environments typical of military vehicles
- ❑ Up to 4X configurable vehicle speed / encoder inputs
- ❑ Configurable GNSS and IMU options allow tailored solutions for all levels of performance
- ❑ Customizable to directly interface with and process a variety of sensor inputs (e.g. LADAR, Stereo and Monocular Cameras, Ultra-Wideband Ranging Radios)
- ❑ Easy integration with the Robotic Research Warfighter Localization family of systems (WarLoc™)
- ❑ Web interface for user-level diagnostics and configuration
- ❑ Ethernet, CANbus, and RS-232 Serial Data Interfaces
- ❑ Independent Ethernet ports for separation of navigation solution and sensor processing data
- ❑ Robust Built-in-test (BIT) error reporting during runtime
- ❑ Redundant IMU and GNSS options available for fault-tolerance
- ❑ NTP Server and GPS PPS signals for time synchronization

For More information, please contact:
Robotic Research, LLC - 555 Quince Orchard Road, Suite 300, Gaithersburg, MD 20878
Contact Janet Hughes, jhughes@roboticresearch.com, 240-631-0008

RR-N-140
NAVIGATION SYSTEM

ROBOTIC RESEARCH

Physical Characteristics	
Input Voltage	9.5-36.0 VDC
Max Power Consumption	22.0 W (GNSS/INS) 39.0 W (w/Sensor Processing)
Dimensions (max)	7.2"L x 6.4" W x 2.9" H (183mm x 163mm x 73mm)
Weight	4.0 lbs (1.81 kg)
Operational Temperature	-20 °C to 65 °C (GNSS/INS) -20 °C to 55 °C (w/Sensor Processing)[2]
Environmental Protection	IP67
Shock	MIL-STD-810G Method 516.6 (40g/20ms)
Vibration	MIL-STD-610G Method 514.6 (Composite Wheeled Vehicle)
EMI/RFI	Designed to meet MIL-STD-461G
Data Interfaces	1X 10/100 Ethernet 1X Gigabit Ethernet 1X CANbus Up to 4X Wheel Encoder Inputs (including single-ended and differential quadrature encoders) 2X USB 2.0 4X RS-232 GPS-PPS Output GPS-Mark Timestamp Input

GNSS/GPS Performance[3]	
Constellation/ Signal Tracking	GPS L1/L2 GLONASS BeiDou Galileo SBAS QZSS
Accuracy (RMS)	Single Point L1/L2: 1.2m Single Point L1: 1.5m SBAS: 0.6m DGPS[4]: 0.01m+1ppm
Static Heading Accuracy (RMS)	2m Baseline: 0.08° 4m Baseline: 0.05°
Antenna LNA Power	2X 100mA @ 5.0 VDC

IMU Performance	
Angular Rate Range	±1000 °/s
Angular Bias In-Run Stability	5° / hr (MEMS) 0.05°/hr (FOG)
Angular Bandwidth	250 Hz (MEMS) 440 Hz (FOG)
Linear Accel Range	±16g
Linear Bias In-Run Stability	0.1 mg
Linear Bandwidth	250 Hz

System Performance[3]	
GNSS Outage Position Accuracy	0.5% DT(Distance Travelled)
Initialization Time	<3 minutes
Maximum Velocity	515 m/s

ORDERING INFORMATION

RR-N-140 - [ ]

Encoder Input Options[1]
IS : Standard Option. 4X single-ended encoders with isolated 5V power supply
ID : 4X Differential Encoders with isolated 5V power supply
PU : 4X Single-Ended Encoders with Pull-up Resistors and isolated 5V power supply
N : No Encoder Input

[1] *Other encoder options available upon request*
[2] *Extended-temperature options available to bring Operational Temperature to -20- +70°C.*
[3] *For standard configuration system and at least one Quadrature Wheel Encoder input*
[4] *Requires RCTM correction source*

For More information, please contact:
Robotic Research, LLC - 555 Quince Orchard Road, Suite 300, Gaithersburg, MD 20878
Contact Janet Hughes, jhughes@roboticresearch.com, 240-631-0008