Navtech 77GHz FMCW Radar

Description

The Navtech 77GHz Millimetre Wave FMCW radar is a high performance radar system designed for use in industrial sensor applications. Intended for continuous use in harsh environments the system is extremely rugged with built in self-test, condition monitoring and calibration. Due to the likely positioning of the radar on vehicles when used in obstacle detection and navigation applications the radar enclosure and raydome are design to withstand the impact from small objects such as stones etc.

With the scanner and raydome the unit provides a full 360 degrees scan at 2.5 Hz with target ranges up to 200m and range accuracy down to +/- 0.03m. Different scan rates are possible. The standard beam width is 1.8 degrees. The unit is available without the scanner and raydome giving a single stationary beam. Other beam widths are also available.
The radar signal is digitised and processed within the unit by a high speed DSP system. As standard the system will provide range and bearing information to the nearest target that is above a predefined size. Other application specific processing requirements can be developed. Alternatively, customer developed DSP code can be downloaded to the system using the PC based development package. This allows updating of the DSP software via an RS232 interface. All that is required is a PC or laptop. Software to do this is available and runs under Microsoft Windows NT and 2000. This software also enables software maintenance updates to be performed in the field.

Two RS232 and one CAN bus interface are provided as standard. Either one of the RS232 ports or the CAN bus interface is used to receive the processed radar data. The other RS232 port can be used for updating DSP software. Two other interface options are available for receiving the processed radar data, Ethernet and a high-speed serial data link. The high-speed serial data link can provide data at up to 20M/bytes/S. This can be used to provide a ‘real time’ visual display of the raw radar data.

![Radar Front End Block Diagram](image-url)
Specification

Transmit frequency  76 to 77 GHz
Transmit Power  15dBm
VCO Bandwidth  up to 600MHz
Beam width  Antenna dependent, currently 1.8 degrees
Sweep time  1mS default (other sweep times optional)
Max Range  >200 m
Range Accuracy  ± 0.03m
Scanner Resolution  0.09 degrees
Scanner field of view  360 degrees
Scan Speed  2.5 Hz. (other speeds optional)
Interfaces  CAN or RS232, (Ethernet and high speed serial optional)
Supply voltage  +24V nominal (18-36V)
Size  321x321x438 mm  (Radar 321x321x171 mm + Optional Raydome and Scanner 249 mm Wide x 267 mm High)
Environmental  IP66, NEMA-4X
Temperature  -20 to +70 degrees C
Vibration  6.8g  5-200 Hz