

nanoANQ LDR

Anchor Module for Low Data Rate

Introduction

The nanoANQ LDR (Low Data Rate) is an anchor module for nanotron's 2.4 GHz wireless Real Time Locating System (RTLS). The application focus is in low data rate networks with long haul transmission lines and limited integration space. nanoANQ LDR supports flexible serial interfaces like RS-485, RS-422 or RS-232.

The nanoANQ LDR is a single channel anchor module with a small form factor of 4 cm x 2.4 cm for easy integration. nanoANQ LDR precisely detects the time of arrival stamp (TOA) of surrounding tag blinks required for Time Difference of Arrival (TDOA) location applications. In addition, nanoANQ LDR detects received signal strength (RSSI) values which enables in-depth location verifications.

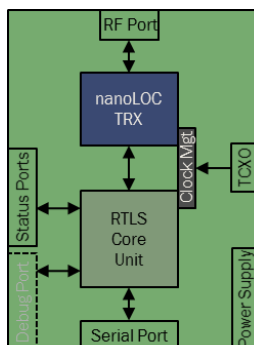


Figure 1 nanoANQ LDR Architecture

Figure 1 shows the architecture concept of nanotron's nanoANQ LDR module.

Key Features

Frequency range	ISM-band 2.4 GHz
.....	(2.4~2.4835)
Modulation.....	Chirp Spread Spectrum (CSS)
Transmission Modes.....	80/1 (80 MHz, 1 Mbps)
Signal detection rate	up to 900 /s
TOA capture accuracy < 1 ns (better than 30 cm)	
No. of RF channels	1
RF output power	configurable -22 ~ +16 dBm
RF sensitivity (80/1 mode)	-89 dBm
RF interface.....	50 Ohm RF Port
Data interface....	serial up to 1 MBaud using SLIP
Supply voltage	3.0 V ~ 5.5 V
Maximum supply voltage ripple	20 mVpp
Power consumption*	max. 120 mA during Tx
.....	max. 60 mA during Rx
Operating temperature range.....	-30 ~ 85°C
Dimensions	40 mm x 24 mm x 3.5 mm
Weight.....	7 g

* measured at 20°C, 3.3 V, 80/1 mode

Location Technology

Precise TOA Capture: The TOA of tag blinks can be captured with a resolution better than 1 nanosecond corresponding to 30 cm location accuracy. These precise TOA timestamps are the base to achieve high accuracy TDOA in an RTLS.

Anchor Synchronization: Anchors are synchronized in the range of sub nanosecond precision to provide high location accuracy for real-time TDOA.

RSSI Detection: nanoANQ LDR provides RSSI values of each Tag to support the ambiguity score resolution of nanoLES 3. This score helps to verify locations and helps to provide clear transitions from different geographic sections.

TCXO for High Timing Accuracy: For highest required timing accuracy, the connection of a 32 MHz TCXO source with a tolerance of ± 2.5 ppm over temperature is supported.

Communication

Concurrent Data Transmission: A location blink can additionally contain user payload allowing bi-directional user data exchange while positioning. This can be used for alarm exchange between the dispatcher and a worker.

IP-Compatibility: To be compatible with the IP based communication of nanotron's Location Server (nanoLES 3) it uses SLIP. Its serial interface supports speeds up to 1 MBaud.

Infrastructure Integration: Existing long-haul transmission lines (e.g. in underground mines) often provide low data rate infrastructure. nanoANQ LDR is designed to provide highest flexibility during RTLS integration for LDR-structures in conjunction with serial adapters like RS-485, RS-422 or RS-232, see Figure 2.

Full Duplex Serial Interface: The nanoANQ LDR provides a full duplex serial interface, which complements nanotron's existing Ethernet Anchors family. The integrated SLIP standard is used for communication.

Extended Feature Set

Small Form Factor: nanoANQ LDR enables efficient product designs by taking limited integration space into account.

Ecosystem Ready: nanoANQ LDR seamlessly integrates in nanotron's location engine nanoLES 3 for automated location calculation.

Anchor Setup: nanoANQ LDR is capable of ranging with other anchors to determine separation distances. This simplifies the setup and maintenance to cut time to market.

Easy Firmware Update: With the XMODEM protocol it is easy to update the nanoANQ LDR firmware.

Transparent Status Feedback: Four LEDs can be directly connected to the status ports displaying the state of Power, TX, RX and Alive to provide a transparent feedback during operation.

Sample Application

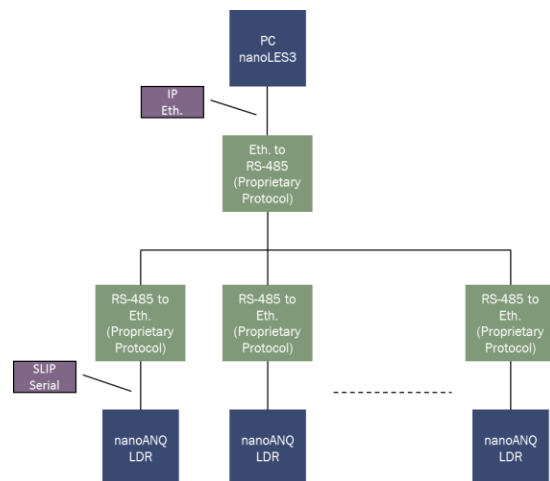


Figure 2 Application Example

Ordering Information

Order No.	Description
MN01ANQLD	nanoANQ LDR - Low Data Rate Anchor

About nanotron

Nanotron is a leading provider of electronic location awareness solutions. If knowing what, where and when is mission-critical to your business, rely on nanotron with Location Running. Nanotron's solutions deliver precise position data augmented by context information in real-time. Location Running means, reliably offering improved safety and increased productivity, 24 hours a day, 7 days per week: Location-Awareness for the Internet of Things (IoT).

Nanotron Technologies GmbH is a wholly owned subsidiary of Sensera Limited (ASX: SE1), an IoT solution provider that delivers sensor-based products transforming real-time data into meaningful information, action and value.

Visit www.nanotron.com or for more information on nanotron's complete line of products and tools or write to us at nanotron Technologies GmbH, Alt-Moabit 60, 10555 Berlin, Germany.

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