READER 2.0

User Manual

NX-RDR-2000-LB/ NX-RDR-2000-HB

March 2025

nexite

Table of Contents

Table of figures

Introduction

The Nexite merchandise platform provides insight into customer behavior patterns by monitoring the interaction between customers and merchandise in real time.

With the Nexite platform, every merchandise item is tracked from the factory floor to the showroom floor, providing total shelf awareness with major benefits in store management and customer service.

This is accomplished by wireless automated and invisible tracking of all merchandise.

The main components of the system are:

- Nexite Management Console (cloud-based)
- Readers - Charging Nexite tags and collecting data transmitted by the Nexite tags.
- Nexite tags
- Backbone wiring connecting readers to a network cabinet
- Network cabinet housing PoE switches, patch panels, Wi-Fi router, power outlets and wiring

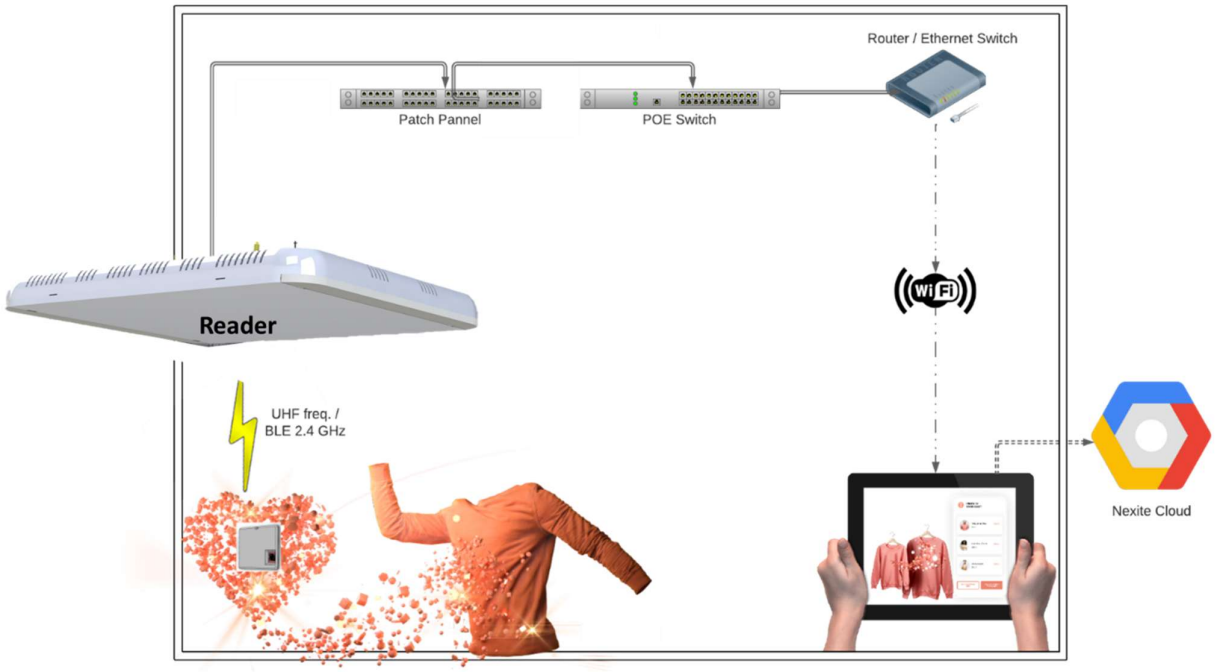

Figure 1 - Nexite tracking system

Product Overview

Reader's Functional Description

The reader serves three main functions:

- Transmitting RF energy in the UHF band to charge tags
- Receiving BLE packets in the 2.4GHz band to track tags
- Processing the received packets and sending them to the cloud

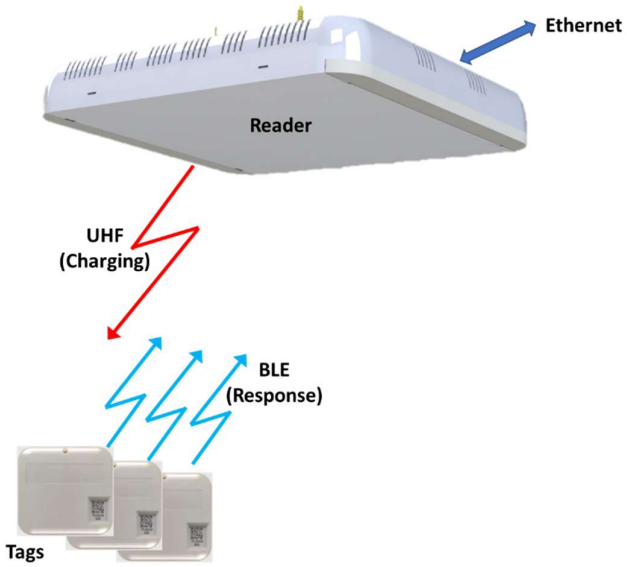

Figure 2 - Reader's functionality

Transmitter section

The transmission section includes: RF generator (Synthesizer), power amplifier and antenna. The reader can work at a wide range of frequencies, power levels and waveforms, to comply with regional regulations. The actual operating parameters are defined by software, based on a configuration message received from the cloud.

Receiver section

The receiver section includes 3 individual BLE Receivers connected to an internal BLE antenna array. Each BLE receiver is configured to receive tag transmissions on a different BLE channel (advertising channels 37, 38, 39).

Processing section

The reader is using NXP iMX.RT series micro controller for the following processing tasks:

- Processing data packets from the BLE tags
- Controlling the transmitter section
- Communication with the cloud

Appearance

Figure 3 - Nexite READER 2.0 (Front view)

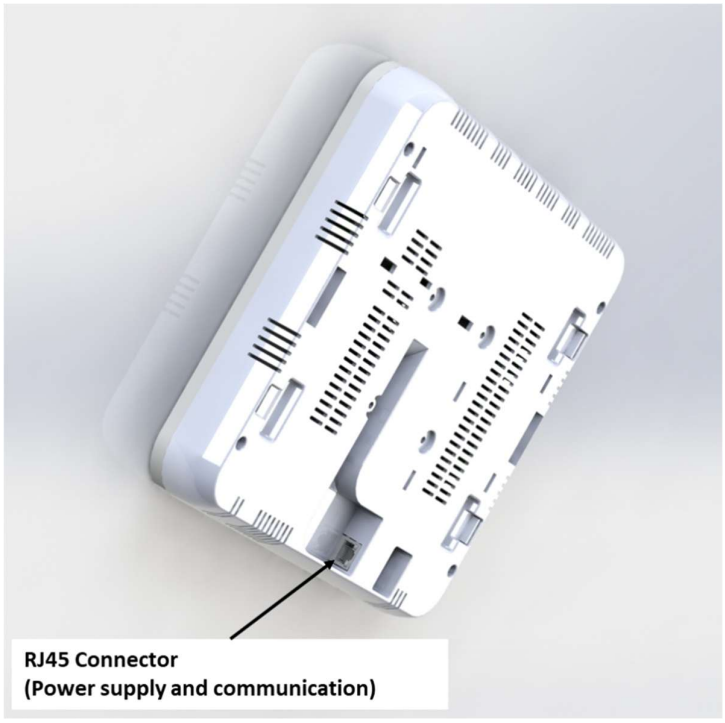

Figure 4 - Nexite READER 2.0 (Rear view)

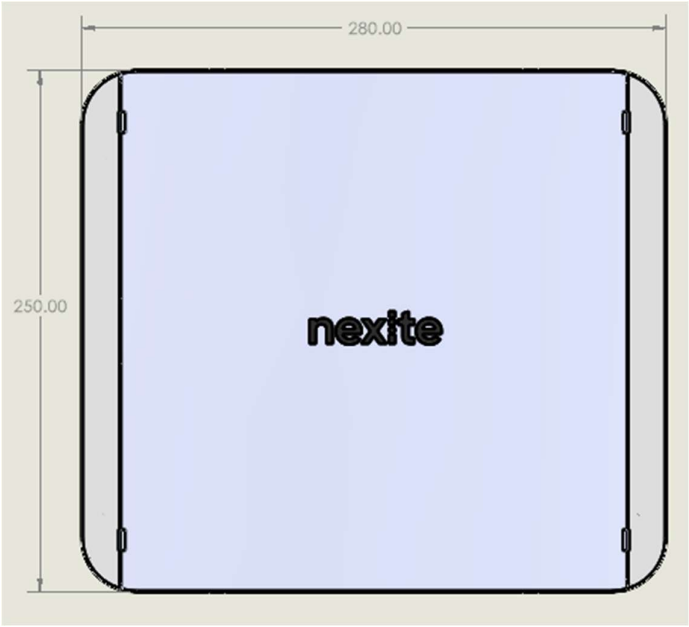

Figure 5 - Nexite Reader - Physical dimensions

Applicable standards

- ETSI EN 302 308 V3.3.1 Harmonized European Standard Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W and in the band 915 MHz to 921 MHz with power levels up to 4 W
- FCC Section 18 Title 47 – UHF Wireless Power Transmission (WPT), a Frequency Hopping Spread Spectrum (FHSS) system or a Hybrid system.

Technical parameters

Technical parameters – ETSI EN 302 208 configuration

Parameter	Value		Comments
SKU (PN)	NX-RDR-2000-LB	NX-RDR-2000-HB	
Operating frequency	Lower band 865MHz – 868MHz	Upper band 915MHz – 921MHz	Refer to appendix A – Operational frequencies ETSI EN 302 308
Output power	20 – 30dBm	20 – 32dBm	Conducted power into the antenna port *
Spectrum usage*	Fixed frequency, Frequency hopping		
Waveform	Constant wave (CW) Intermittent (Duty-cycle)		Software - controllable
UHF Antenna	5.5dBiC	6dBiC	RHCP
BLE antenna	3dBi		Receive only
Input power	PoE		The reader is powered over Ethernet (IEEE 802.3at)
Power consumption	10 Watt Max.		
Communication interface	10/100 Base-T		Same as PoE port
Physical dimensions	280 x 250 x 45 mm		Mounting bracket excluded
Weight	1 kg		Mounting bracket excluded
Temperature range	5°C to 35°C		

* In accordance with EN 302 208

Technical parameters – FCC section 18 title 47 configuration

Parameter	Value	Comments
SKU (PN)	NX-RDR-2000-HB	
Operating frequency Note1	902.5MHz – 927.5MHz	
Output power Note1	+23.08 dBm	Max. Conducted power into the antenna port
Spectrum usage/waveform Note1, Note 2	Frequency hopping spread spectrum (FHSS) modulation	1. Software controllable 2. At least 50 hopping frequencies
UHF Antenna	6.02 dBiC	3.02dBi
BLE antenna	3dBi, RHCP	Receive only
Input power	PoE	The reader is powered over Ethernet (IEEE 802.3at)
Power consumption	10 Watt Max.	
Communication interface	10/100 Base-T	Same as PoE port
Physical dimensions	280 x 250 x 45 mm	Mounting bracket excluded
Weight	1 kg	Mounting bracket excluded
Temperature range	5°C to 35°C	

This device complies with part 18 of the FCC Rules.

Note 1 - Those parameters of the product cannot be changed; only the manufacturer or anyone on his behalf can change these features.

Note 2 - The UHF transmission is FHSS only.

Mounting Nexite READER 2.0

The installation process starts with preparing the relevant parts for mounting the reader. Parts required vary between different locations and mounting types.

The most aesthetic option is to mount the Nexite Reader above the ceiling. If the option of mounting above the ceiling is not available, consider one of the other options below.

Installation options:

- Above the ceiling (drywall or drop ceiling): Without a mounting kit
- Below Ceiling: Fixed mounting kit
- Below Ceiling/Wall: Adjustable mounting (swivel)
- Align with ceiling - flush mounting

For more details refer to the “Nexite installation guide”.

Figure 6 - Above the ceiling (drywall or drop ceiling) installation concept

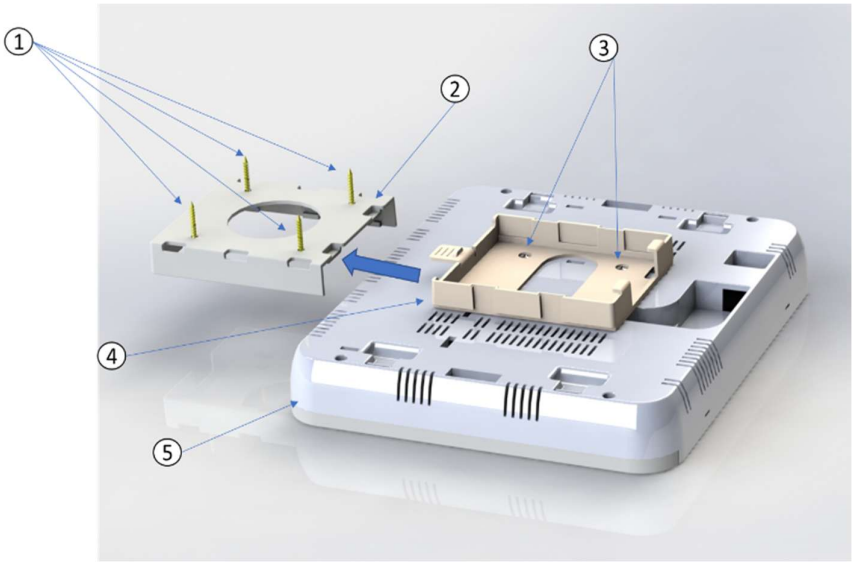

Figure 7 - Fixed mounting kit – Installation illustration

Figure 8 - Swivel mounting kit – Installation illustration

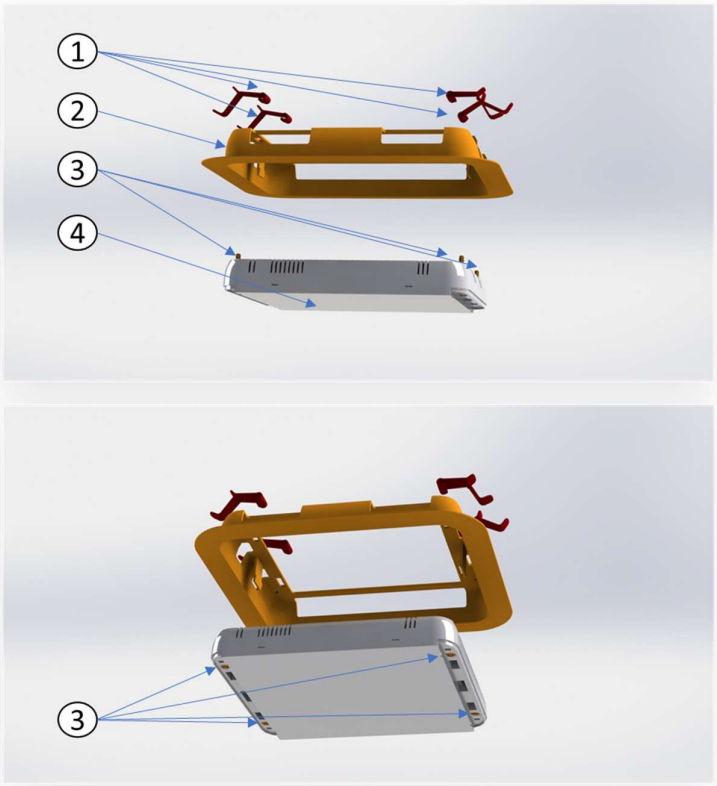

Figure 9 - Flush mounting kit – Installation illustration

FCC compliance notice

FCC ID: 2A6MX13EA2BCXC

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Important Note –

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important Note –

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator and your body.

IC Warnings, Radiation Exposure

This device complies with Innovation, Science, and Economic Development Canad licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil nedoit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

L'appareil est conforme aux limites d'exposition aux rayonnements spécifiées par la FCC/ISED pour les environnements non contrôlés. La distance entre le radiateur et le corps doit être d'au moins 20 cm lors de l'installation et du fonctionnement de l'appareil.

Cet émetteur ne doit pas coexister ou fonctionner conjointement avec toute autre antenne ou

Appendix A- Operational frequencies according to ETSI EN 302 208

According to ETSI regulation EN 302-208 there are two designated frequency bands -

- Lower band -
  - 865MHz to 868MHz
  - The UHF transmitter shall use any of the four specified high-power channels illustrated in the following figure
  - Channel band-width – 200KHz

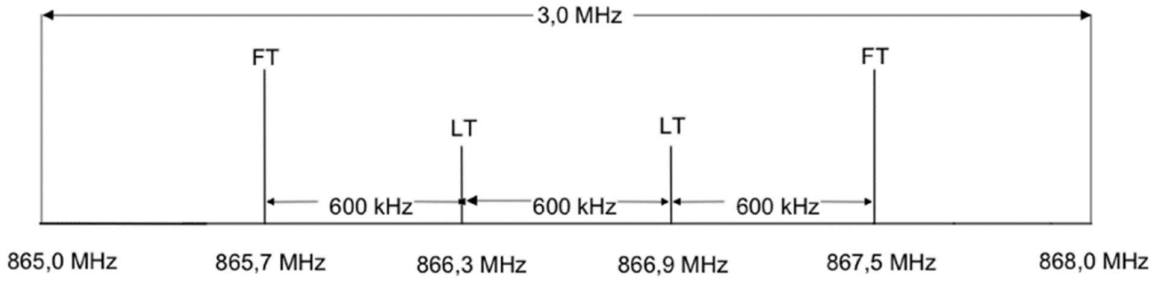

Figure 10 - EN 302 308 Lower band designated frequencies

- Upper band
  - 915MHz to 921MHz
  - The UHF transmitter shall use any of the four specified high-power channels illustrated in the following figure. Note - Some countries/regions may limit the operation to a specific frequency.
  - Channel band-width – 400KHz

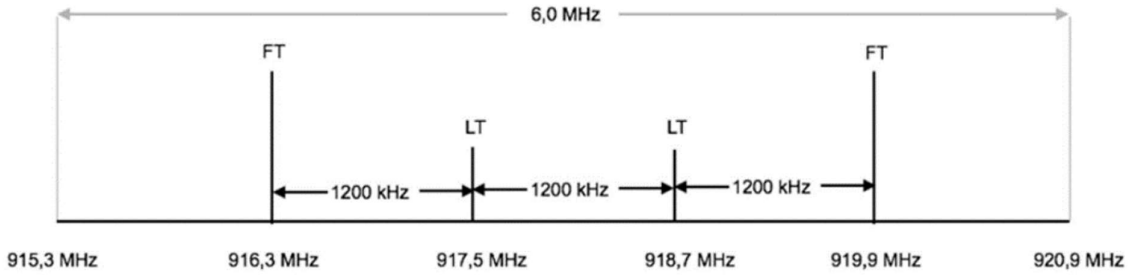

Figure 11 - EN 302 308 Upper band designated frequencies