Nexite Reader 1.1
User Manual

September 2022

nexite

Contents

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 item of merchandise is tracked from factory floor to 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 to collect 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
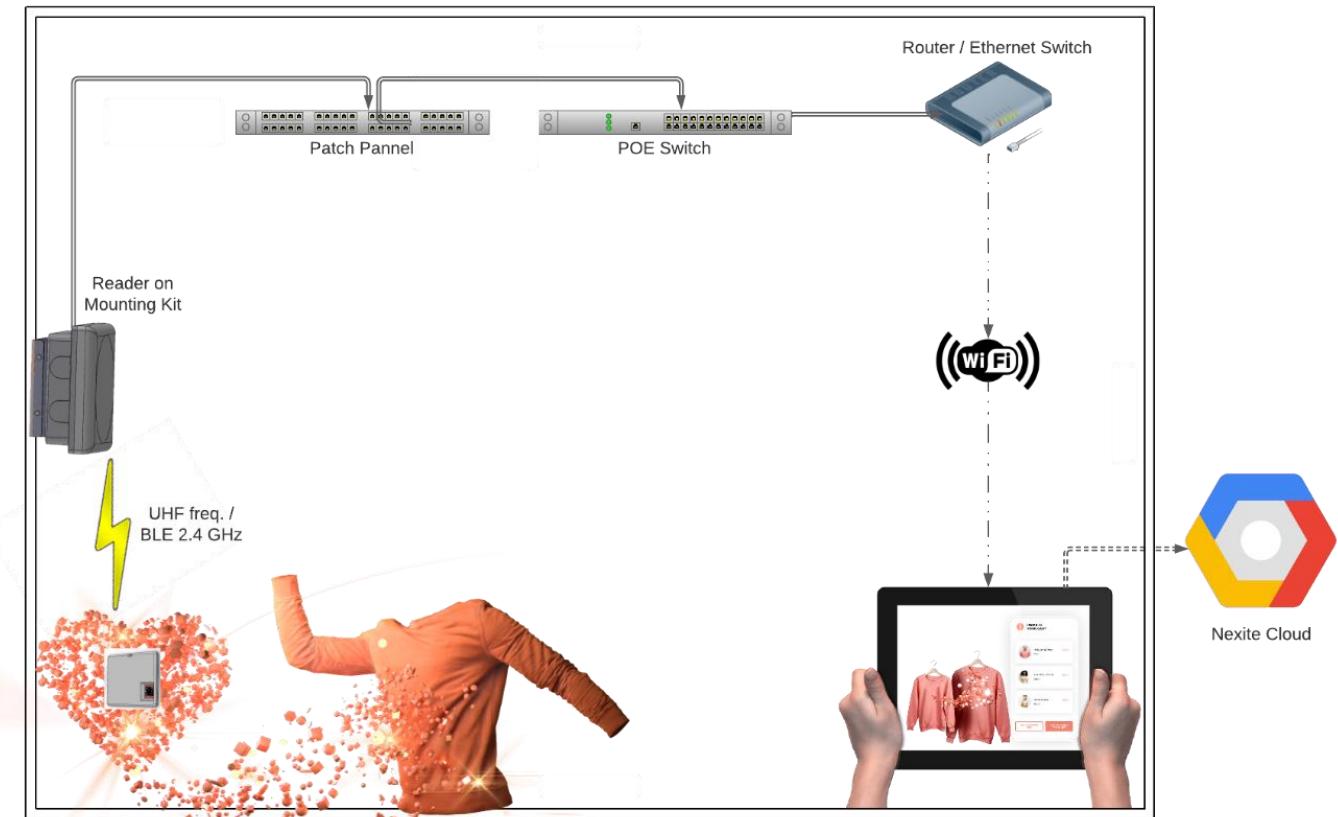
Figure 1: Nexite tracking system

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
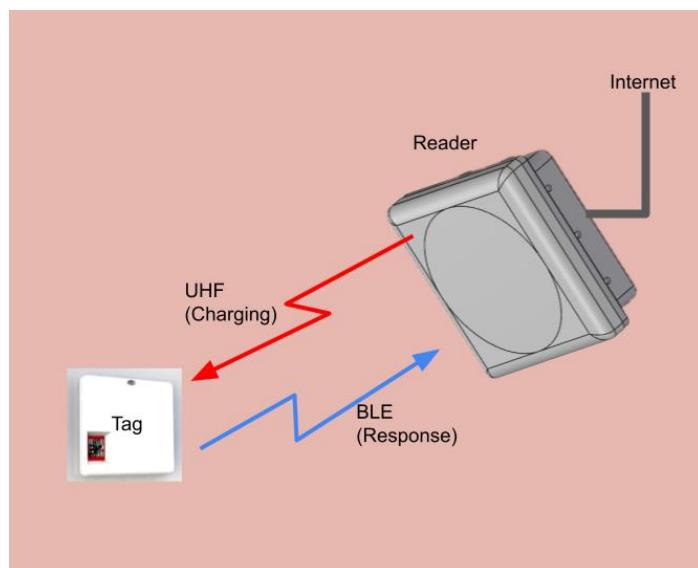
Figure 2: Reader's functionality

Transmitter section

The transmission section includes an RF generator (Synthesizer), power amplifier and antenna. The reader can work in 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 Receiver with 3 separate antennas. Each receiver is listening for tag transmissions on a different BLE channel (advertising channels 37, 38, 39).

Processing section

The processor block comprises a "Raspberry-Pi" Computer module running a Linux OS. The raspberry-Pi receives data packets from the three BLE receivers, processes them and communicates them to the cloud. In addition, it controls the transmitter section (namely, transmission parameters).

Appearance
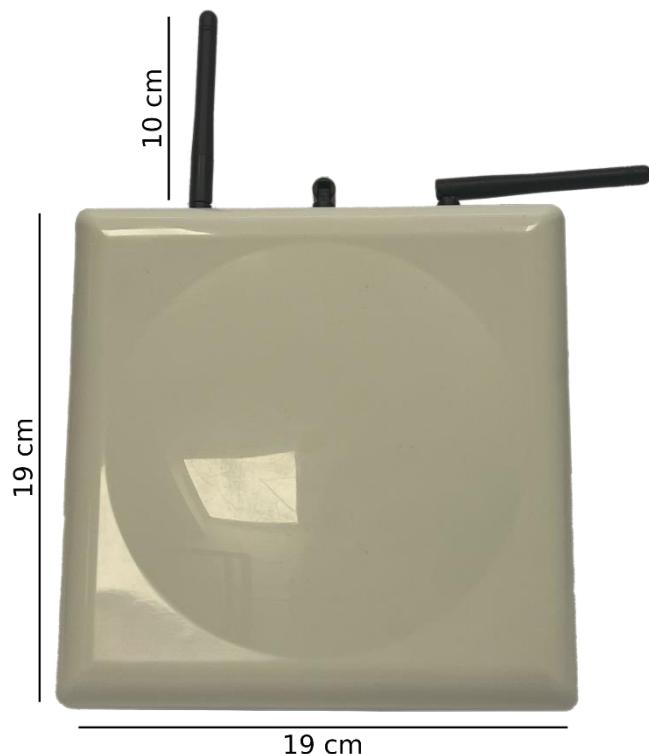
Figure 3: Nexite Reader 1.1 (front view)
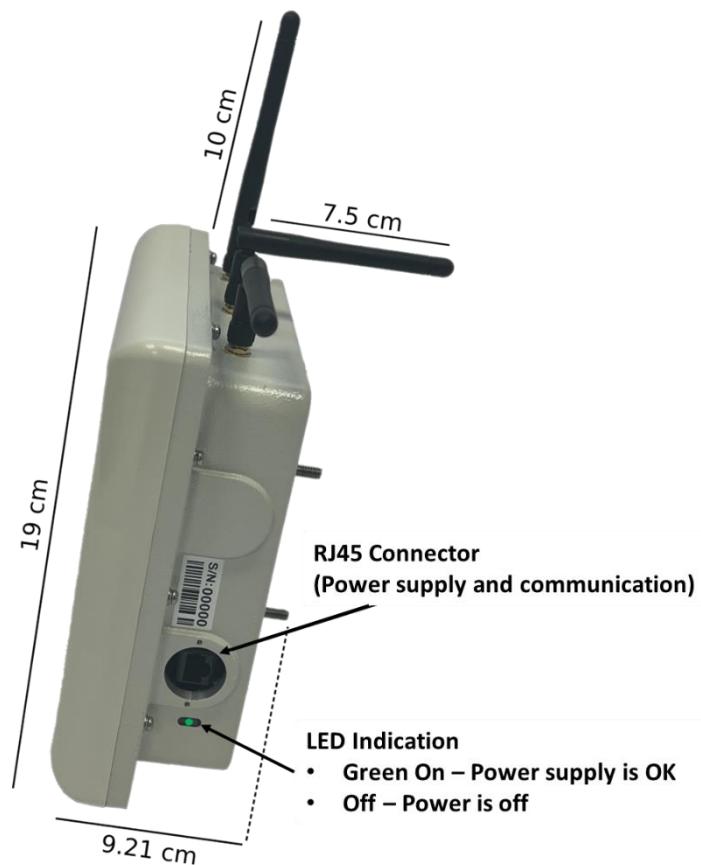
Figure 4: Nexite Reader 1.1 (Side view)

10 cm

7.5 cm

19 cm

RJ45 Connector
(Power supply and communication)

LED Indication
- **Green On – Power supply is OK**
- **Off – Power is off**

9.21 cm

SN:00000

16.419 cm

19 cm
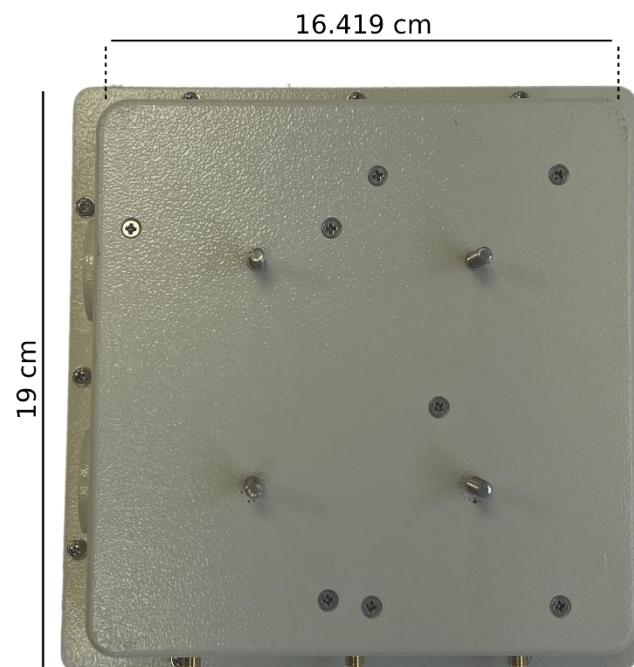
Figure 5: Nexite Reader 1.1 (Rear view)

Figure 6: Black BLE antenna

Figure 7:Fitting room antennas with mount

Connector to
Anntena

Connector to
Nexite Reader

Figure 8: Fitting room antenna cable

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 15.247 - Digital Transmission System (DTS), a Frequency Hopping Spread Spectrum (FHSS) system or a Hybrid system.

Applicable documents

- Safety distance analysis for radiation exposure
- Mounting Kit MT-120018/A Installation instructions

Technical parameters

Parameter	Value	Comments
Operating frequency	865 – 928 MHz	Region-dependent *
Output power	12 – 33 dBm	Conducted power into the antenna port *
Spectrum usage*	Fixed frequency, Frequency hopping	
Waveform	Constant wave (CW) Intermittent (Duty-cycle)	Software - controllable
UHF Antenna	7.5dBi, RHCP	
BLE antenna	0dBi, Linear	
Input power	PoE+	The reader is powered over Ethernet (IEEE 802.3at) +54VDC
Power consumption	15 Watt	
Communication interface	10/100 Base-T	Same as PoE port
Physical dimensions	190 x 190 x 92 mm	Mounting bracket and BLE antennas excluded
Weight	1.4 kg	Mounting bracket excluded
Temperature range	5°C to 35°C	

* In accordance with EN 302 208 / FCC section 15.247

FCC compliance notice

FCC ID: 2A6MX13EA2A6MX

Notes –

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.

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.

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.

Mounting Nexite Reader

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 other options.

Installation options:

- Above the ceiling (drywall or drop ceiling): Without mounting kit

- Below Ceiling: Fixed mounting kit

- Below Ceiling/Wall: Adjustable mounting kit

Mounting Nexite readers above the ceiling

Required parts:

1. Nexite Reader
2. 3 BLE antennas

- In case of a drywall ceiling, cut a hole approximately 30x30cm (12"x12"), insert the reader above the ceiling and seal the drywall. Make sure the Nexite Reader front antenna is facing down, towards the store floor. For easier access it is recommended to use a plasterboard access panel.

- In case of an acoustic ("drop") ceiling, lift one panel, install the reader   and s   secure it to a fixed anchor using a lanyard (not provided as part of the installation kit). Return the panel to its place.

- Mounting kit is not required for above-ceiling installation.

Mounting Nexite readers below the ceiling

When installing above the ceiling is not possible, and no pan/tilt angle is required, use the fixed mounting bracket to mount the readers below the ceiling.   .

Required parts:

- Nexite Reader

- MP000015 Mounting Kit

- 3 BLE antennas

Refer to Appendix B for the MP000015 Mounting kit installation.

Mounting Nexite Reader on the ceiling/wall

When pan angle is required, or adjustable mounting kit is explicitly stated, use this method.

Required parts:

- Nexite Reader

- MT-120018/A mounting kit

- 3 BLE antennas

Refer to Appendix A for MT-120018/A Mounting kit installation.

Mounting Nexite readers in the fitting rooms area

The installation process in the fitting room is different from other store locations. To increase sensitivity to reception, the installer needs to add a dedicated BLE directional antenna kit. These antennas improve the ability to track items in the fitting room.

Required parts:

- Nexite Reader

- MT-120018/A (swivel mount) or MP000015 (fixed mount), depending on the required installation angle

- Fitting room BLE antenna

- 3 Fitting room antenna cables

Refer to Appendix A for MT-120018/A Mounting kit installation.

Connecting Nexite reader BLE antennas

Nexite Reader requires Bluetooth antennas to track Nexite Tags around the store.

To connect BLE antennas:

1. In case of installing a Nexite reader in the fitting room:
   A. Connect the 3 Fitting room antenna cables to the Nexite reader antenna connectors.
   B. Connect the 3 Fitting room antenna cables to the Fitting room antennas.
   C. Screw (using M6 Allen screws) the Fitting room antenna's mount to the dedicated holes in the Nexite Reader.

Figure 9: M6 Allen screws

Figure 10: Fitting room antenna mount screw holes

Figure 11: Fitting room antenna mount

2.   In any other case of Nexite Reader installation:

    A.   Connect the 3 BLE antennas to the 3 antennas connectors on the Nexite Reader. Make sure to screw them tightly.

    B.   Change the orientation of each antenna as depicted　below. Notice the order of the antenna's direction

Figure 12: Antenna orientation

Preparation for connecting Nexite Reader

Properly connected readers track the clothing in the store. This process provides the customer full visibility of their merchandise.

To connect readers:

11. Prepare CAT5e Ethernet cable from the Nexite Reader location to the network cabinet. The cable should be terminated with a female RJ-45 connector, preferably Keystone type.

12. Use a cable tester to verify that the Ethernet cable is properly connected.

13. Connect the reader to the reader-end of the cable using a short patch cord.

14. In the network cabinet, connect the Ethernet cable to the back of the patch panel.

15. Connect a short patch cord (30 cm/11.8 in) from the patch panel to an available port in the PoE switch.

16. Label the patch panel and incoming cables with the appropriate Nexite Reader name, as provided by the Nexite store plan

Assigning a virtual Nexite reader

After the physical installation of the Nexite reader, assign it virtually by using the Nexite Management Console. Nexite provides the names of the readers (e.g., MF-1, MF-2).

1. Login to the console at https://console.nexite.cloud/.

2. From the Management Console, click your chain name > your branch name > **Readers** tab.

	Floor Plans	Readers	Prices		
+ Add					
Reader Name		Reader ID	Serial Number	Firmware Version	
● MF-1		16820	1	N/A	✎ 🗑
⑦ MF-2		17737	Assign	N/A	✎ 🗑
⑦ MF-3		17738	Assign	N/A	✎ 🗑
⑦ MF-4		17739	Assign	N/A	✎ 🗑
⑦ MF-4		17740	Assign	N/A	✎ 🗑

Figure 13: List of Nexite Readers

3. Find the matching reader name and click **Assign**.
4. Type the reader number.
5. Click **SAVE**.
6. Connect the reader to the RJ-45 cable (power and network) and check that the reader status is changed to yellow in the Nexite Management Console. This process can take up to 3 minutes.

Verifying Nexite reader connectivity

By verifying reader connectivity, the installer ensures that the Nexite tracking system is working properly.

Check that each Nexite Reader is receiving BLE packets from Nexite iBeacon by putting the iBeacon below the reader. The Nexite Reader state changes from yellow to green in the Nexite Management Console. The iBeacon is only for installation testing and to verify that the Nexite Reader can detect the three channels of BLE.

Figure 14:iBeacon front

Figure 15: iBeacon back, on/off button

When the reader is connected properly, Channels 37, 38, and 39 are gray, and the state of the reader is online.

State	● Online
Last Transmission	a few seconds ago
Uptime	1 hour
Reader ID	123
Serial Number	123 Un-assign
Current Firmware Version	123123 Update
BLE Dongle Version - Channel 37	1.2.123.NEX
BLE Dongle Version - Channel 38	1.2.123.NEX
BLE Dongle Version - Channel 39	1.2.123.NEX

Figure 16: Fully functional reader

To verify that the readers are connected in the Nexite Management Console:

1. Log in to the Nexite Management Console at https://console.nexite.cloud/.
2. Click your chain name > your branch name > **Readers**.
3. Select a reader in the **Reader Name** tab. The **Info** tab window appears.
4. Turn on the iBeacon tag by holding the button for three seconds. The light turns green on the iBeacon. It blinks green LED before it starts transmitting BLE packets to the reader.
5. Position the iBeacon below the reader. The iBeacon detects three channels: 37, 38, 39. The channel color is gray and the circle next to State is green when the reader is properly connected.

State	○ Partially online
Last Transmission	a few seconds ago
Uptime	1 hour
Reader ID	123
Serial Number	123 Un-assign
Current Firmware Version	123123 Update
BLE Dongle Version - Channel 37	1.2.123.NEX
BLE Dongle Version - Channel 38	1.2.123.NEX
BLE Dongle Version - Channel 39	1.2.123.NEX

Figure 17: Partially functional reader

6. If the **State** is yellow and one of the **Channels** is red, it means that the reader is connected to the power and the power is on, but the iBeacon tags are not detected by the Nexite Reader. In this case, verify that the antennas are correctly installed. In a case where reconnecting the antennas does not solve the problem, the Nexite Reader is defective, and the installer needs to switch it for a different one.

15

Appendix A

Refer to Mounting Kit MT-120018/A Installation instructions

Nexite Reader can be installed on a wall, ceiling, poles, or other stand that is appropriate to MT-120018/A Mounting Kit radius.

Nexite Reader installation steps:

1.   Connect base bracket from MT-120018/A Mounting Kit to the rear of the Nexite Reader.
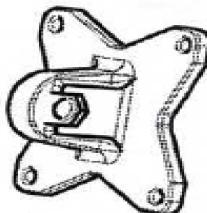

Figure 18: Base Bracket

2.   Connect the Wall / Pole bracket from MT-120018/A Mounting Kit to the location that you want to install Nexite Reader on the wall/ceiling.

3.   Connect between Wall / Pole bracket to base bracket with: M8X40, Washer flat M8, Nut M8.
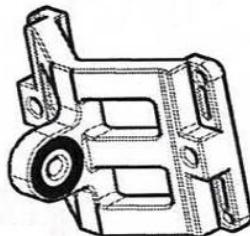

Figure 19: Wall / Pole Bracket

   Note: If you want to rotate the Nexite Reader in 90 degrees, connect the Arm Bracket between Base Bracket to Wall / Pole bracket.
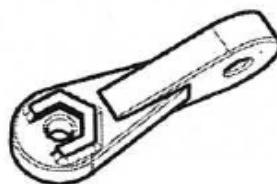

Figure 20: Arm Bracket

Appendix B

Mounting Kit MP000015
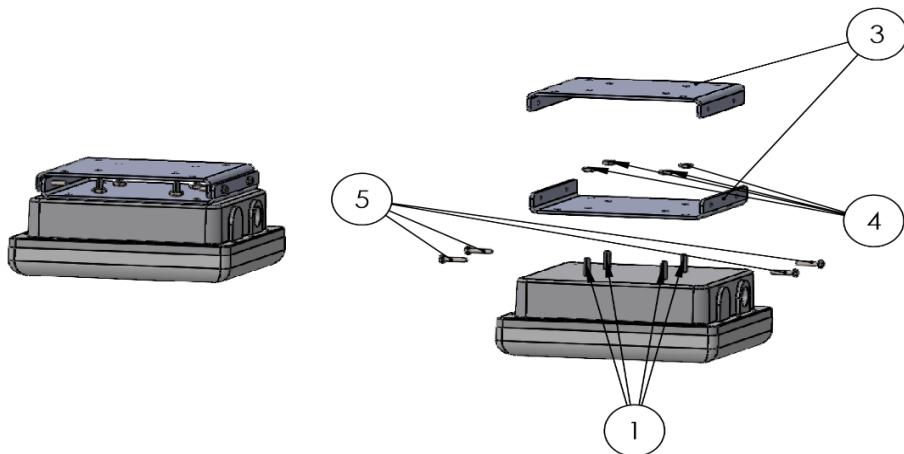
Figure 21: Mounting Kit MP000015

Item #	Part Number	Quantity
1	Plastic spacer	1
3	Mount	2
4	M5 Nut	4
5	M4x10	4

Figure 22: Mounting Kit MP0000015 part list

Installation process:

1. Attach 4 plastic spacers (1) on the Nexite Reader's 4 screws (back).
2. The mount is made of two identical parts (3). Connect one of the parts to the back of the reader using 4 x M5 nuts.
3. Attach the nuts (4) to the four screws and tighten them. Make sure to place a washer and a spring washer as illustrated in the diagram.
4. Attach the ceiling mounting kit (3) to the ceiling using four screws on the dedicated holes.
5. Attach the two mounting kits mounts to each other using four screws (5), two on each side.