

# 1. General

The Nexmosphere XR range offers a range of wireless pick-up sensors based on RFID technology. This document offers information and guidelines on how the products from the XR range should be used and installed for stable and responsive operation.

# 2. Intended use

The XR range consists out of 3 types of products:



Antenna Driver (XR-DR1)



Tags (XAR-...)

The Nexmosphere XR range is designed to be used for creating integrated wireless pick-up solutions in retail environments. This means that any of the XR-antennas connected to the XR-DR1 Antenna driver is able to detect a Tag provided/specified by Nexmosphere. This creates a pick-up sensor which can detect whether a tag is being picked-up or placed back into the antenna field. By connecting one or multiple pick-up sensors to one of the Xperience controllers, a typical retail application such as "Lift & Learn" or "Place & Learn" can be created.

In order to create one pick-up sensor, the following connections must be made:



The Nexmosphere Antenna Driver, Antennas & Tags are electronically designed to work optimally in combination with each other. Third party antennas and/or antenna drivers are not supported. Third party tags are only supported when compliant with specifications (available on request) provided by Nexmosphere.

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# 3. Hardware integration

When integrating XR products in a retail environment such as POS displays or store fixtures, several instructions and guidelines need to be taken into account in order to guarantee optimal stability and responsiveness:

# 3.1 - Clearance between XR Antenna and metal objects

Metal objects in or near the electromagnetic field of the antennas can cause interference which results into unstable behavior of the sensor. Make sure that the minimum clearances indicated in the **table below** are implemented accordingly.

#### 3.2 - Clearance between multiple XR Antennas

When using multiple XR antennas, the electromagnetic fields of the antennas will interfere with each other when placing the antennas too close to each other. Therefore please make sure that the minimum spacing indicated in the **table below** are taken into account.

### 3.3 - Detection range

Each antenna has a specific detection range. When installing the antennas, make sure that the distance between the tag and the antenna is within this range, indicated in the **table below**. Although all materials -except metal- can be used for the top cover on the antenna, the type of material used can have a minor influence (both positive & negative) on the detection range. We recommend to always test and validate the final setup before starting production.





#### values below only apply to the default gain setting (38dB) and single tag detection

Antenna	Orientation	A (mm)	B (mm)	C (mm)	<b>D (mm)</b> >2 antennas	E (mm)
XR-A80	landscape	>25	>32	>84	>45	<40
XR-A80	portrait	>32	>25	>84	>55	<40
XR-A70	landscape	>32	>42	>60	>45	<25
XR-A70	portrait	>42	>32	>60	>70	<25
XR-A60	landscape	>60	>74	>46	>85	<22
XR-A60	portrait	>74	>60	>46	>115	<22
XR-A50	landscape	>210	>280	>98	>300	<33
XR-A50	portrait	>280	>210	>98	>400	<33
XR-A65	landscape	>42	>77	>74	>60	<36
XR-A65	portrait	>77	>42	>74	>120	<36
XR-A55	landscape	>49	>98	>66	>70	<32
XR-A55	portrait	>98	>49	>66	>150	<32
XR-A45	landscape	>116	>200	>90	>170	<43
XR-A45	portrait	>200	>116	>90	>285	<43
XR-C05	n/a	>27	>27	>78	>38	<38
XR-C10	n/a	>42	>42	>78	>60	<32

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# 3.4 - Merchandise containing metal

Metal objects in or near the electromagnetic field of the antennas can cause interference which results in unstable behavior of the sensor. Therefore the XR range is not able to detect a tag which is placed on merchandise containing metal.

If nevertheless the XR range is used with metal products, a suggested solution is to place a non-metal platform between the merchandise and the tag, creating space between the electromagnetic field and the metal merchandise. The results of this solution vary highly depending on the specific characteristics of the setup. In any case, it is discouraged to use metal merchandise with the XR range. For setup-specific advice please contact support@nexmosphere.com.



## 3.5 - Mounting XR-DR1 antenna driver

The XR-DR1 antenna driver should be mounted outside the antenna area in order to prevent interference and unstable behavior.



#### 3.6 - Excess cable

In case of excess cable length (for example the CAX-M6W), it is recommended to mount this in straight lines or in an "8" pattern instead of rolling the cable up in a circle. A cable rolled-up in a circle can create a coil which can interfere with the electromagnetic field of the antenna. Also keep in mind that shorter cables (e.g. CAX-M4W) are available.

# 3.7 - Tag placement

The tag should be placed on the merchandise in such a manner that it does not contain any sharp folds and that the angle between the tag and antenna does not exceed 30 degrees. Placing the tag on a highly curved object (.e.g lipstick) will also cause unstable behavior. The flatter a tag is placed on the merchandise, the better the responsiveness will be.

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# 3.8 - Tag size

The default Nexmosphere XAR-T.. tags are circular tags with a diameter of 26mm. When using tags with a different shape and/or size, the behavior and critical values of the XR range will change. Please contact support@nexmosphere. com for application-specific advice.

Third party tags are only supported when compliant with specifications (available on request) provided by Nexmosphere.



# 3.9 - Detecting multiple tags on 1 antenna (Multitag)

The XR-DR1 antenna driver is able to detect up to 4 tags simultaneously on one antenna. In this situation, the RFID Tags should have a minimum clearance of 10mm between them. Also, each RFID tag should have a different number.

Multitag detection only works stable on the default gain setting (38dB).

When placing multiple tags on one antenna, the detection range for 100% stable operation can be 2-3mm less than the single-tag detection range indicated in the table on page 2, depending on the specific setup and environment.

Please keep in mind that the detection time of a pick-up or place-back can be longer when placing multiple tags on one antenna simultaneously.



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# 4. Testing & expected behavior

In order to test if the installed XR setup works as expected, please follow the following test procedure:

4.1 First, connect the XR Driver + Antenna to an Xperience controller. Secondly, power up the system.Do not yet place a tag on the antenna.

The white status LED should be lit continuously.



# **4.2 Place a - programmed- tag on the antenna** The white status LED should go off immediately and should not blink at any time.

### 4.3 Remove the tag from the antenna

The white status LED should go on immediately and should not blink at any time.

# 4.4 Place the tag back on the antenna

Check if the red status LED is completely off. In case the red status LED blinks, the interference level is too high.

For system integrators who use the XR Range with the API controllers, it is also possible to activate a more detailed distortion detection by changing setting 5 to [2]. In this setting, 3 levels of distortion (light, medium & high) are detected and indicated via the status LED. Please see the API document for more info.

In case any of the 4 steps above does not provide the expected result, please check the installation guidelines in this document.

Please contact **support@nexmosphere.com** for any support questions you may have.

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