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1. General

Nexmosphere's X-Eye Motion sensor detects the amount of motion within it's detection area. This document provides explanation of the available functionalities and instructions on how to install and integrate the sensor into your digital signage installation.

The information in this document is created for users who are familiar with the Nexmosphere API and are able to control a basic setup with a Nexmosphere API controller. If this is not the case yet, please read the general documentation on the Nexmosphere serial API first.

2. Product overview

The X-Eye Motion sensor is available in 1 model: **XY-320**. The X-Eye Motion sensor continuously sends out electromagnetic waves. These waves reflect on objects and persons and are then received back by the sensor.

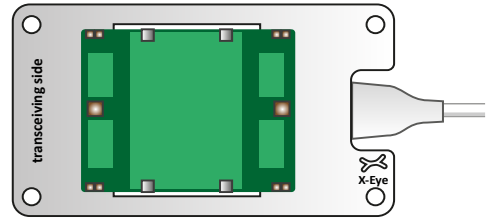Utilizing the doppler-effect, the sensor can calculate the amount of motion within its detection field.
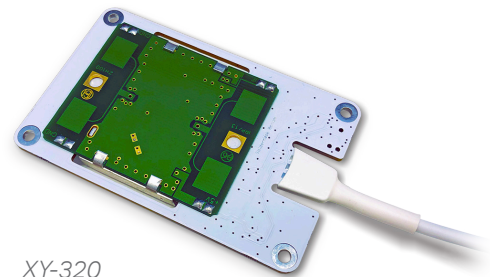
XY-320

3. Functionalities and API commands

The X-Eye Motion sensors provides the following functionalities:

1. **Detect motion** - detect motion within its detection field

This information is translated into an API message which has the following format:

X001A[*X*]	X= *amount of motion*	value between **0-50**

The following section will cover this functionality in detail. Please note that for each API example in this document, X-talk interface address 001 is used (X001). When the sensor is connected to another X-talk channel, replace the "001" with the applicable X-talk address.

3.1 - Motion detection

When the sensors detects motion - typically when a person moves within its detection field - the sensor will trigger an API command indicating the amount of motion which was detected. When applying these commands, please consider the following:

*   The higher the number, the higher the amount of motion detected. When no motion is detected, the output will be 0.
*   The amount of motion is a determined by the size, velocity and direction of the object or person which is moving. Please see section 4, page 3 for more info.
*   The detection area/range of the motion sensor can be adjusted. Please see section 5 "Settings", page 5.

Example commands

Motion detected, amount of motion is "4"
X001A[4]

Motion detected, amount of motion is "12"
X001A[12]

*Motion detected, amount of motion is "23"*
X001A[23]

No motion detected (amount of motion is "0")
X001A[0]

4 - Installation requirements and guidelines

When integrating an X-Eye Motion sensor into your digital signage installation, several installation requirements and guidelines need to be taken into account in order for the sensor to perform optimal and operate stable.

4.1 Connection Diagrams

The X-Eye Motion sensor can be connected to any X-talk interface and is therefore compatible with all Xperience controllers. Make sure the X-Eye Motion sensor is connected to the X-talk interface before powering the Xperience controller. Otherwise, the X-Eye Motion sensor will not be recognized by the Xperience controller and no sensor output will be provided.
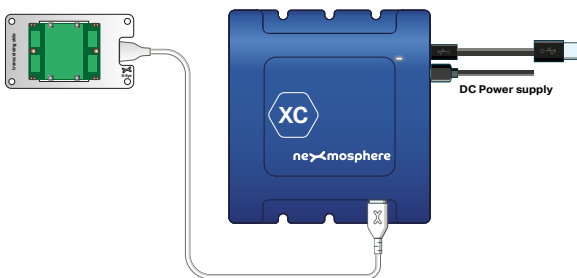
Example connection to XC Controller
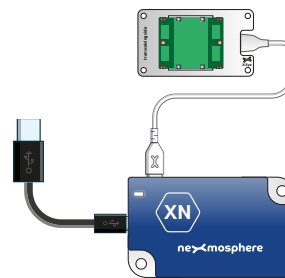
Example connection to XN Controller

4.2 Hardware integration guidelines

Sensor output

The amount of motion which the sensor detects is determined by the size, velocity and direction of the object or person which is moving within the sensor's detection field:

- The larger the size, the higher the amount of motion
- The higher the velocity, the higher the amount of motion.
- The more perpendicular the direction of the motion in relation to the sensor, the higher the amount of motion

Sensor placement

The sensor output is influenced by the direction of the motion in relation the sensor. Therefore we recommend to place the sensor in such a way that people typically move towards or away from the sensor.

When the sensor is placed in such a way that people typically move in parallel with the sensor (for example in a ceiling), the output of the sensor will be significantly lower.
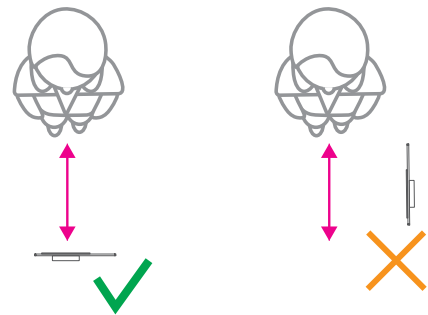
Top panel

The X-Eye Motion sensor can be installed behind any **non-metal** surface, creating a completely invisible solution. Although there is no maximum recommended thickness, please note that the type and thickness of the material behind which the sensor is placed does influence the output number which indicates the amount of motion.

For example: when placing the sensor behind a brick wall, the output number in the API message indicating the amount of motion will be lower than when placed behind a 3mm acrylic panel.

Shape and size detection area

The shape of the detection area is indicated in the visuals on the right. The size of the detection area can be adjusted. Please see section 5 "Settings", page 5.
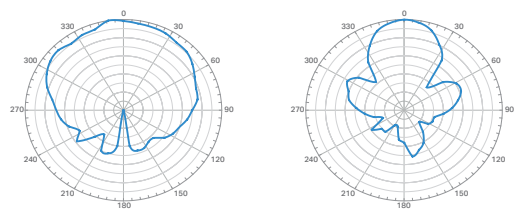
Avoid overlap detection areas

When installing multiple X-Eye Motion sensors, please make sure to avoid any overlap of detection areas. This will prevent cross-interference and unstable behaviour.
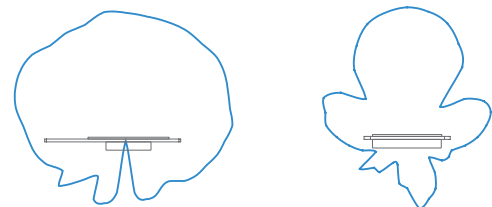
Transceiving side

The X-Eye Motion sensor has a transceiving side and non-transceiving side. This is indicated on the sensor. Make sure the sensor is placed in such a way that the transceiving side is faced towards the direction in which motion needs to be detected.

5 - Settings

The X-Eye Motion sensor has multiple settings which determine the behaviour and output of the sensor. The settings can be adjusted by sending X-talk setting commands via the API. After a power cycle, the settings always return back to default.

Setting 1: Status LED behaviour

1. LED on	`X001S[1:1]`
2. LED off	`X001S[1:2]`
3. LED on, blink at trigger (default)	`X001S[1:3]`
4. LED off, blink at trigger	`X001S[1:4]`

Setting 3: Measurement duration

Set measurement duration   `X001S[3:X]`

X is a value between **1-250** and its default value is **25**. The measurement duration determines how long the sensor measures motion before an API output trigger is provided. The sensors does a cumulative measurement of the motion detected. Therefore, increasing the measurement duration will make the output from the sensor less responsive, but will also increases the resolution of the output.

For example: when a person is performing the same continuous movement, the sensor's output will be higher when the measurement duration is increased, as the duration during which the sensor can sense motion and "add" to the cumulative measurement is longer

Vice versa, decreasing X will result into a faster response of the sensor when movement is detected, but also decreases the resolution.

Setting 5: Size/range of detection area

Set size detection area   `X001S[5:X]`

X is a value between **1-125** and its default value is **12**. It has an inversed correlation with the size of the detection area. So the lower the X value, the larger the detection area and vice versa.

Indication of detection area (indicated as the range in the perpendicular direction of the sensor):

1 =   +/- 10 meter range
12 =   +/- 3.5 meter range (default)
25 =   +/- 2 meter range
*125 =   +/- 1 meter range*

6. Quick test

In order to test if the X-Eye Motion sensor is installed correctly, please follow the test procedure below:

Step 1 - Setup

First, connect the X-Eye Motion sensor to an Xperience controller. Secondly, power the Xperience controller.

The green status LED of the X-Eye Motion sensor should go on. The status LED of the controller will start to blink and once power-up is completed will be lit continuously

Connect to powered USB port
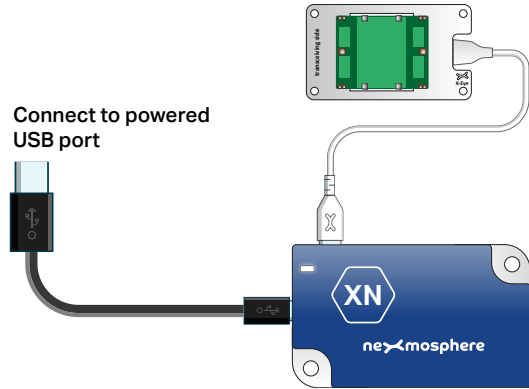
Step 2 - Test detection

Move in perpendicular direction towards or away from the sensor.

Both the green status LED of the sensor and the status LED of the controller should blink once.

sensor

LED BLINK
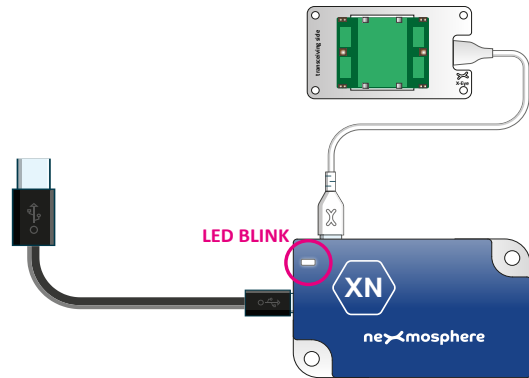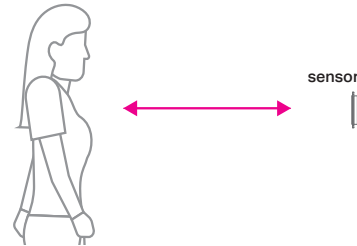
In case any of the 2 steps above do not provide the expected result, please check the installation guidelines in this document.

For a full test we recommend to connect the setup to a mediaplayer or PC and test all API commands listed in this document (see section 3, page 2). For more information on how to setup a test for your controller, please see the Quick Start Guide of the Xperience controller you are using. These are available on nexmosphere.com/support-documentation

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