

Opus

Auto-trigger System

User's Manual

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1. Overview

1.1. The Opus system provides a Multimedia Guide for site visitors, incorporating in addition to the traditional high-quality audio playback multimedia content playback using its integral color screen. While the Opus Click provides a more “familiar” keypad interface, the Opus Touch model incorporates screen touch sensitivity input capability allowing for flexible user-interface schemes. The Opus portable Player can be used either with attached headphones connected to its built-in carrying strap, or using its built-in flipping speaker for flexibility and ease-of-use.



1.2. The Opus System incorporates a special feature to automatically trigger specific Content parts, by intercepting an “activation-zone” generated by pre-installed “Opus Auto-trigger Activator”. The Auto-trigger feature can activate:

- Playback of a specific Item (of any type)
- Playback of a specific Item synchronized to time-stamp supplied by external presentation control
- Switch to a specific Tour (preserving the previous Language)

This document instructs how to define and install a specific Auto-trigger system on site, including:

- ✓ Auto-trigger system description & elements
- ✓ Functionality
- ✓ Specifications
- ✓ Configuration options
- ✓ Site requirements
- ✓ Installation guidelines

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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 Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

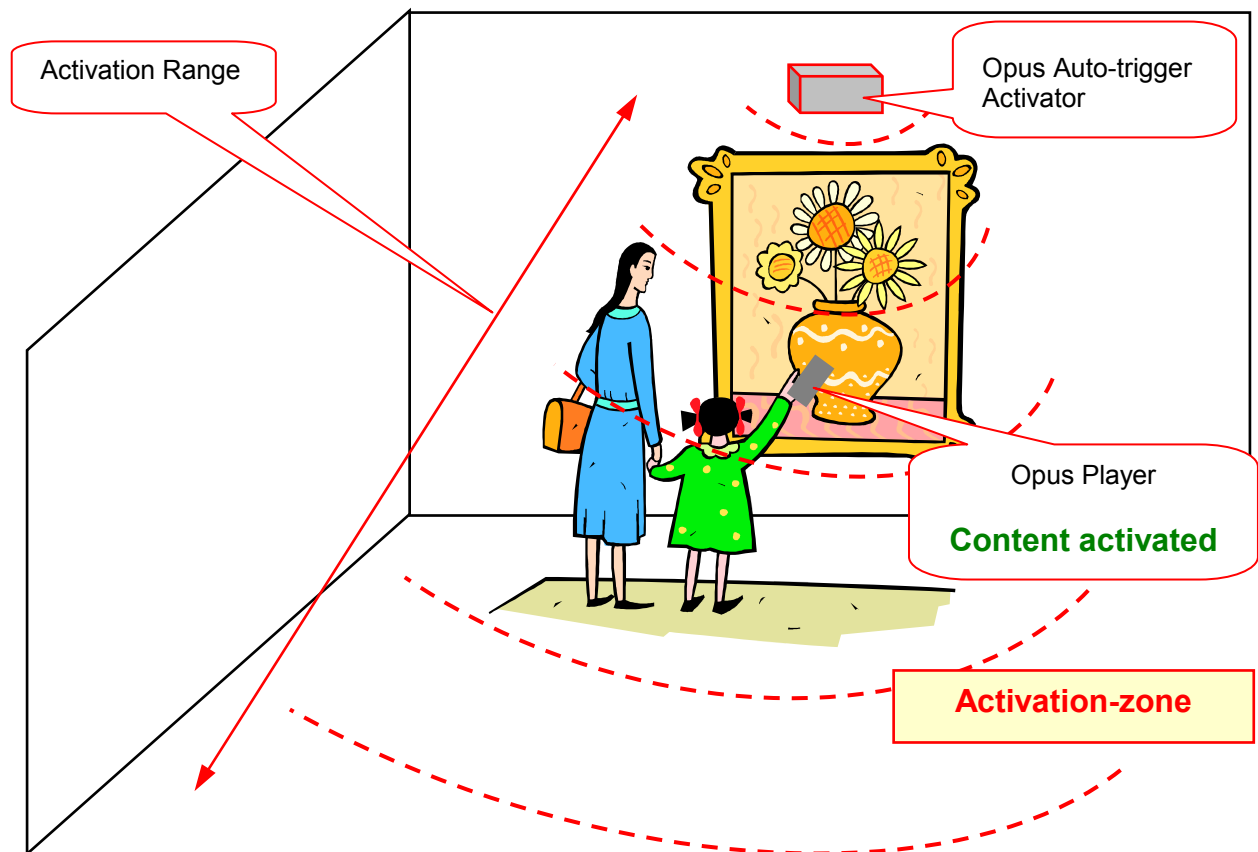
2. Description

2.1. Auto-trigger System Elements

2.1.1. The Auto-trigger system of Opus is constructed of the following elements:

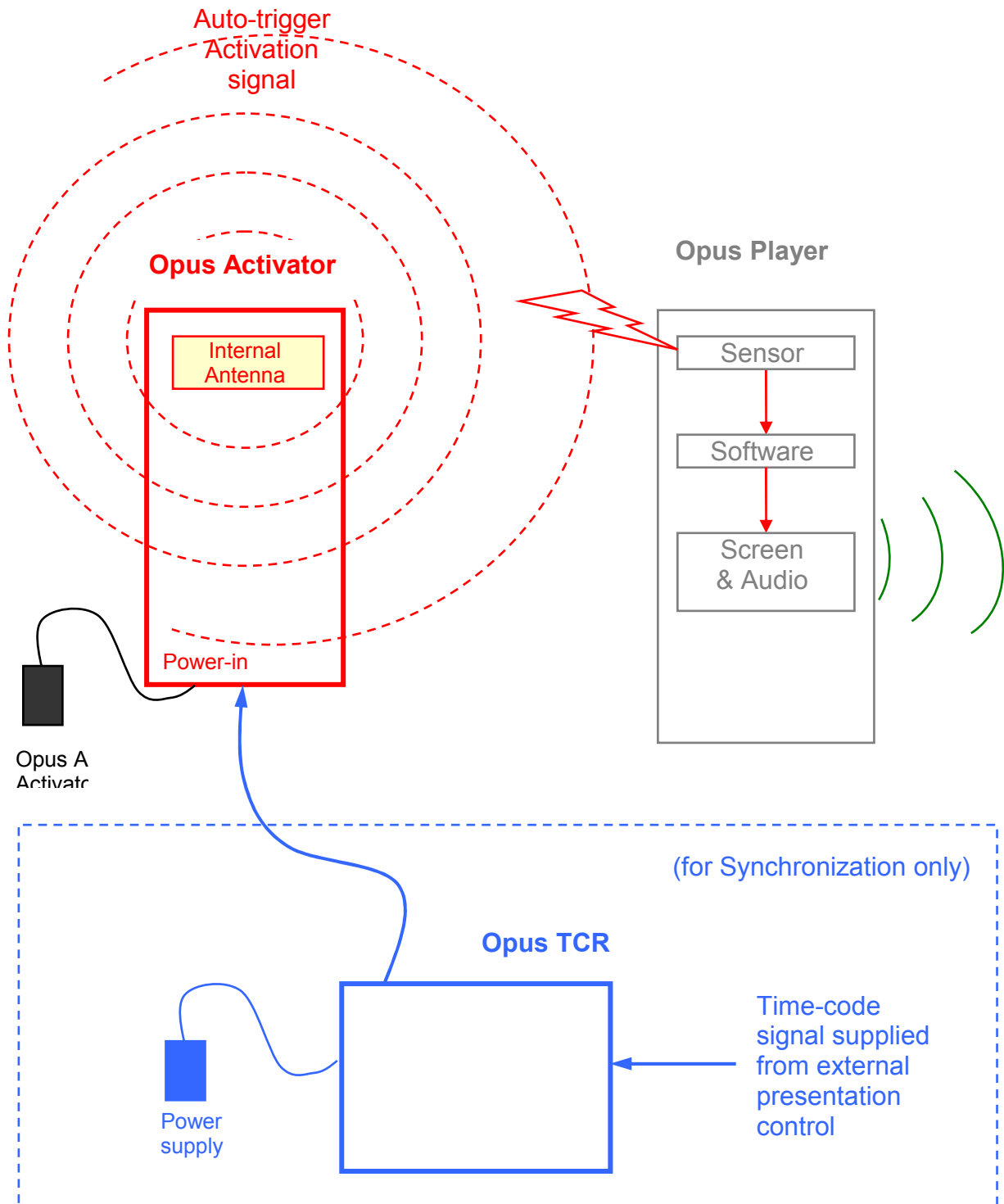
- 2.1.2.1. For the triggering locations – A dedicated Opus “**Auto-trigger Activator**” that creates an “**Activation-zone**” around it. This functionality is based upon specific RF technology. The Activator emits commands that specify which Item or Tour to activate, and adds the time-stamp for Synchronization.
- 2.1.2.2. For Synchronization – A dedicated “Time Code Reader” (“TCR”) that decodes the time-stamp signal supplied by the external presentation controller and sends it to the Activator.
- 2.1.2.3. Inside each Opus player:
 - An “Auto-trigger Sensor” that senses when the player has intercepted an Activation-zone.
 - Auto-trigger software in the Opus player that activates the Tour or Item upon interception, including the use of the time-stamp for Synchronization.

2.1.2. The following illustrates the system basic principles:



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2.1.3. The following shows the system block diagram:



2.2. Auto-trigger compatible Opus Player

- 2.2.1. The Auto-trigger ingredients in Opus player are internal and are not observed externally.
- 2.2.2. All Opus players contain as standard the appropriate hardware & software for Auto-trigger functionality.

2.3. Opus Auto-trigger Activator

- 2.3.1. The following shows the Opus Auto-trigger Activator:

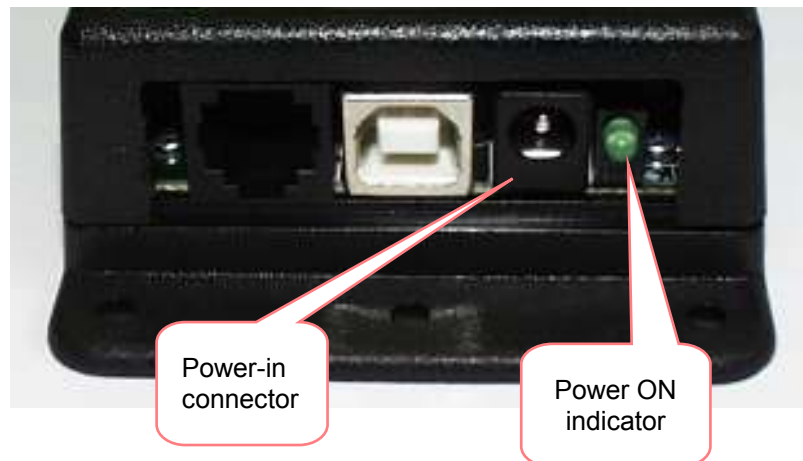


- 2.3.2. Specifications:

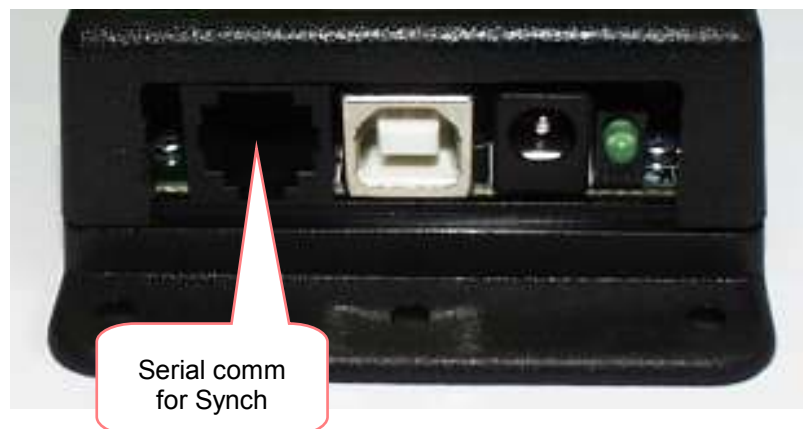
- Dimensions: 100 x 60 x 30 mm (excluding power-supply)
- Weight: 105 g (excluding power-supply)
- Power-in: 5V 0.1A DC, supplied by external power-supply 100-240V AC (Included with product)
- Power consumption: < 500 mW
- Activation signal parameters:
 - Frequency: 2.4GHz ISM/SRD band
 - Power: -10 dBm (maximum)
- Activation Range: up to 30 meters, see further details in the Configuration chapter
- Activation zone pattern: **spherical** around the Activator (3D)

2.4. Functionality

- 2.4.1. The Activator is installed in the area defined as the “Activation zone”. It emits the Activation signal continuously upon connection to power-line (after a 10sec boot process). A green light indicator on the Activator box edge next to the power-in connector designates it is ON, and a series of internal beeps designates “boot” and start of signal emission.

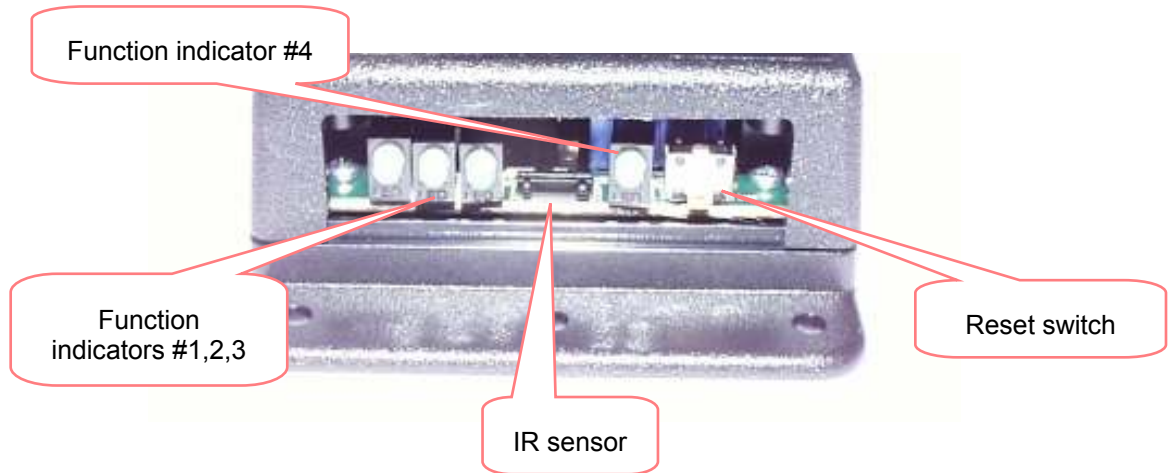


- 2.4.2. Communication port for Synchronization functionality:

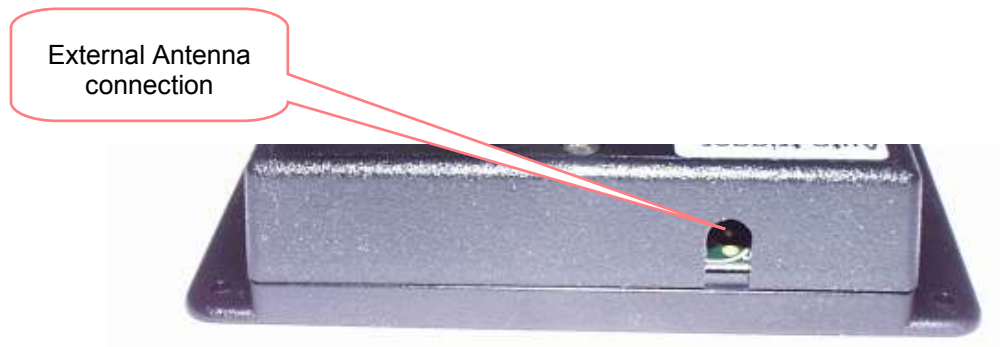


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2.4.3. Opposite edge Activator functionalities:



2.4.4. Optional connection to external RF antenna:



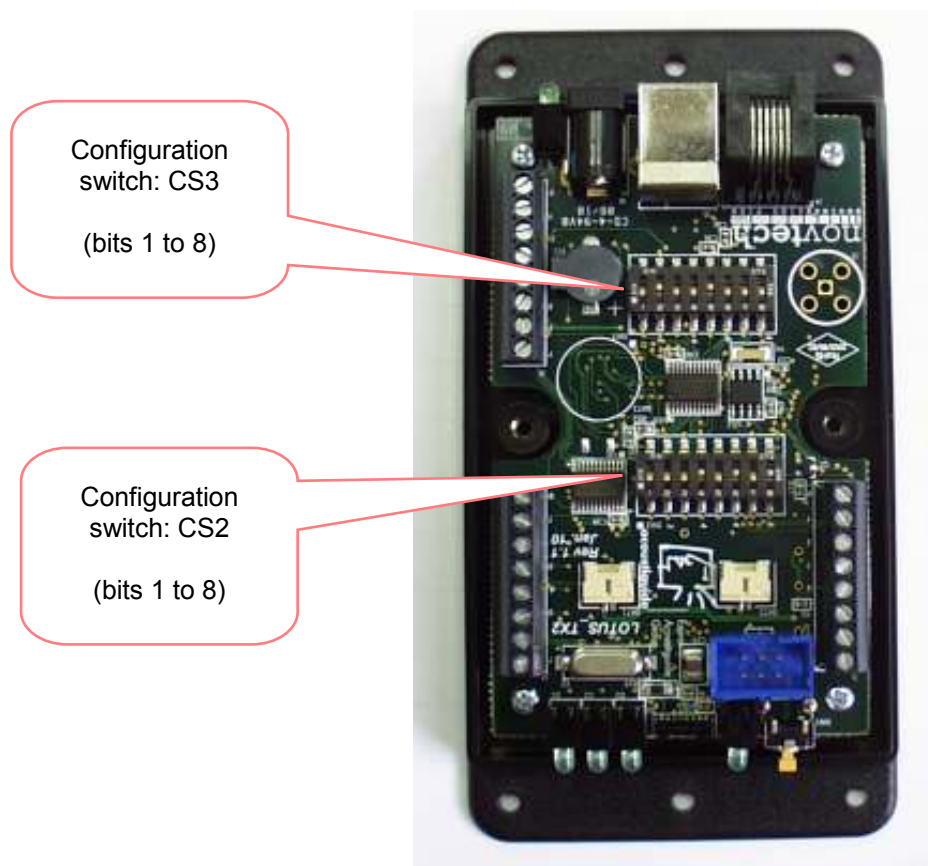
2.4.5. The Opus player senses the Auto-trigger Activation signal in the “on” and “sleep” modes.

2.4.6. Upon interception, the pre-defined Content is activated in the player. This can be a specific Item-playback (Start, Synch or Stop) or a specific Tour-switch.

3. Configuration

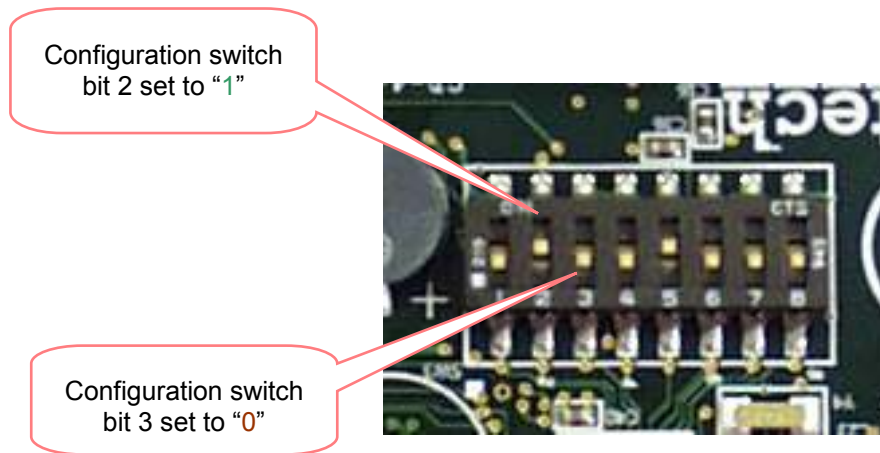
3.1. Activators

- 3.1.1. The amount of Activators per Site depends upon the site specifics. In general, one Activator could cover an entire Activation zone.
- 3.1.2. Due to the fact that human-body attenuates the RF signal significantly, the preferred location for the Activator is above “human height”, so the signal emission is “from high above towards the floor”.
- 3.1.3. The Activator includes internally 2 sets of configuration switches (CS), which are accessible when the top-cover is removed by opening the box top 2 screws:

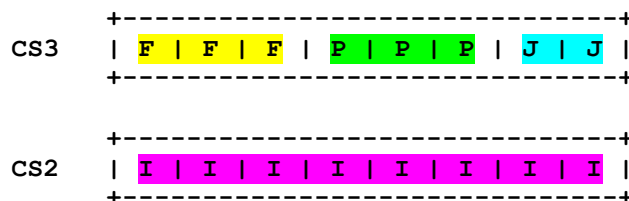


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- 3.1.4. Each configuration switch set has 8 single-bit switches marked 1 to 8 (left to right). Each single-bit switch can be set to either “0” (bottom side) or “1” (top side), as follows:



- 3.1.5. The following maps the fields of the Configuration Switches functions:



- 3.1.6. The following describes the setting of the Auto-trigger functionalities:

- **F** field – Activator’s Major function (3 bits)

Set to	011	for Auto-trigger a Tour Switch
	100	for Auto-trigger an Item playback Start
	101	for Auto-trigger an Item playback Stop
	110	for Synchronizing an Item playback
- **P** field – Emission Power level (3 bits binary combination, resulting in 8 levels, with 4 dB difference between steps)

Set to	111	for highest power level (-20 dBm)
	110	to reduce 4 dB
	101	to reduce 4 dB more
	...	
	000	for lowest power level (-48 dBm)

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➤ J & I fields –

- For Auto-trigger Tour Switch mode:

J should be set to 00 constant
I set to 0000001 which means switch to Tour #1
0000010 which means switch to Tour #2
till
00111110 which means switch to Tour #62
00111111 which means switch to Tour #63

- For Auto-trigger Item playback Start, Synch & Stop modes:

J & I set to 00 0000000 which means start, synch or stop Item #0
00 0000001 which means start, synch or stop Item #1
till
11 11111110 which means start, synch or stop Item #1022
11 11111111 which means start, synch or stop Item #1023

3.1.7. Specification of “activation zone” sizes as per parameter settings can be seen in the following table:

<u>Emission Power</u>	<u>Range (in meters)</u>
7	30
6	23
5	15
4	7
3	4
2	2
1	1
0	0.5

Note: The resulting “activation zone” range relates to the radius of the “**sphere**” around the Activator.

Note: These “activation zone” range specifications are approximate and may deviate, since they are heavily affected by environmental parameters like walls, objects, temperature, materials and interference. Some trial-and-error pre-installation should take place. See further description in the Installation Guidelines chapter.

3.2. Site requirements

3.2.1. A detailed definition of the required “Activation zones”, including their dimensions and the distances between them. Note that it is a 3D situation since the Activation signal is emitted in all directions, so upper and lower floor may be affected.

3.2.2. An electricity socket for each Activator near its installation location.

3.2.3. For Synchronization functionality:

- An electricity socket for each TCR.
- Time-code signal from the external presentation control:
 - Time-code protocol: LTC, SMPTE, 25fps
 - Time-code starting with 00:00:00 at presentation's start point
 - Signal level between 100mV ptp to 10V ptp
 - Accessible on an audio channel that is output from the presentation source in an analogue form, RCA connector
 - Delivered at the exhibit area, at the allocated place for the Opus Synch System (TCR and Activator)

Note: The DC power-in cable may be extended with proper DC wires up to 20 meters.

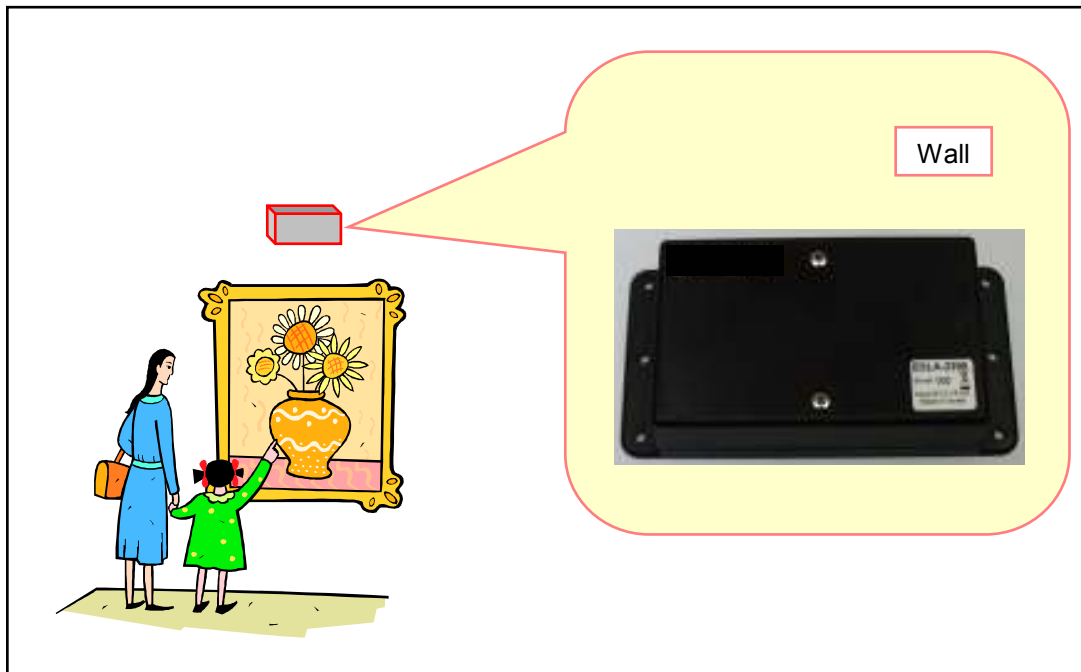
4. Installation

4.1. Installation Guidelines

- 4.1.1. As described already, in general one Activator can cover one “Activation zone”.
- 4.1.2. The preferred location is to install the Activators above people’s height, since the human-body has an attenuation effect of the activation signal, so interception through a crowd is less reliable.
- 4.1.3. Installation of more than one Activator in the same “Activation zone” is possible, even if their corresponding area coverage have some overlap. There are 2 cases that require multiplicity of Activators:
- Need to cover a very wide area. In this case the area should be partitioned and Activators installed accordingly.
 - A “narrow strip” area that dictates using lower-emission-level Activators. In this case 2-3 Activators should be installed along the length of the required zone.
- Consult Espro Acoustiguide R&D department in any special cases. In addition, some experience should be gathered by Tech/Operation in the field.
- 4.1.4. Before final fixture to the site’s wall or building structures, try and test the foreseen location for the Activator. In many cases there are significant differences when moving the Activators location within the required area. Since testing needs the Activator to be above people’s height, use a plastic pole with the Activator attached to its top. There is also a need to extend the DC power to the Activator for the temporary testing.
- 4.1.5. To aid the installation, a special function is incorporated into the Opus Players that displays the intensity of the intercepted RF signal. Key the “9” “8” “0” “3” “▶” keys sequence to activate it.
- 4.1.6. Specific means for attaching the Activator to the wall / ceiling should be prepared in advance to the installation. This is NOT part of the Activator product, since it varies according to the site specifics. The most convenient method is using the Activator case flange holes for screws.
- 4.1.7. For Synchronization functionality:
- ✓ The TCR can be installed up to 1 meter away from the Activator.
 - ✓ There is a customized cable connecting between the 2 boxes.

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4.1.8. The preferred orientation of the Activator is illustrated in the following diagram:



4.1.9. Activator mounting to the wall or any other surface should be in a way that will not “block” the RF signal emission coming out of the Activator’s box, i.e. do not use any metal material.