



# INOGENI TOGGLE ROOMS XT

User guide

Version 1.1

November 18, 2024

## VERSION HISTORY

Version	Date	Description
1.0	October 11, 2024	First release. Preliminary version.
1.1	November 18, 2024	- Added precisions to API.

## CONTENTS

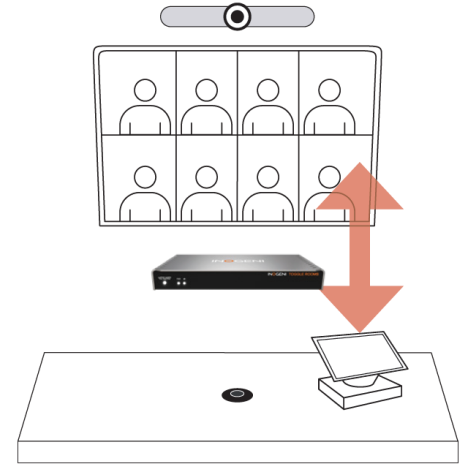
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## TYPICAL APPLICATIONS

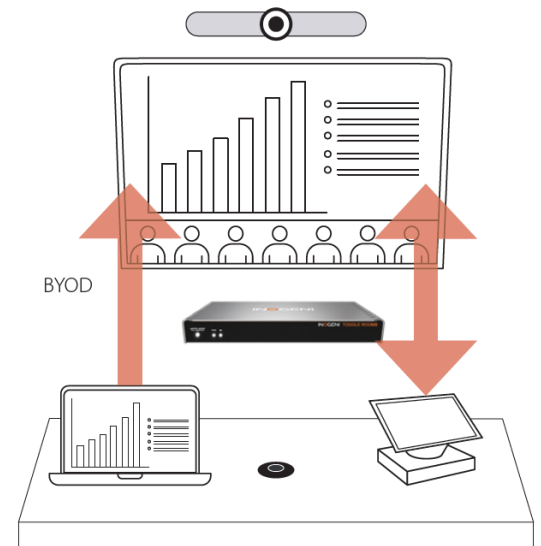
Here is a typical connection diagram used for the TOGGLE ROOMS device in a videoconferencing setup.

### ROOM PC MODE WITH BYOD CONTENT SHARING

In this mode, only the Room PC USB and HDMI connections are routed to the main USB and HDMI peripherals.

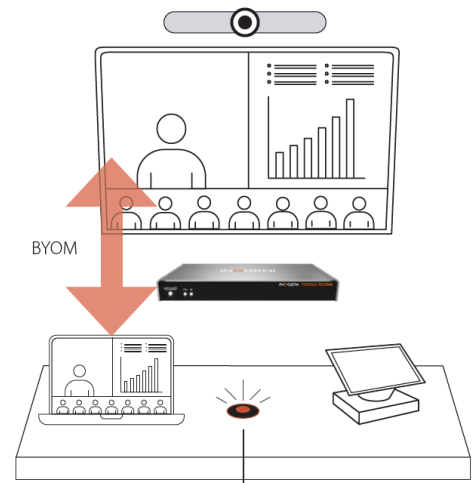


The Room PC is the system that is currently selected to the main USB and HDMI peripherals. However, if the user would like to send HDMI content from the laptop's USB-C or HDMI connection to the Room PC, it is possible to do so with the HDMI SHARE output connection.



### BYOM (BRING YOUR OWN MEETING)

In this setup, the laptop is the system that is currently selected to the main USB and HDMI peripherals.



# BLOCK DIAGRAM

Here is a simple block diagram to better understand the usage of the product.

## TOGGLE ROOMS XT

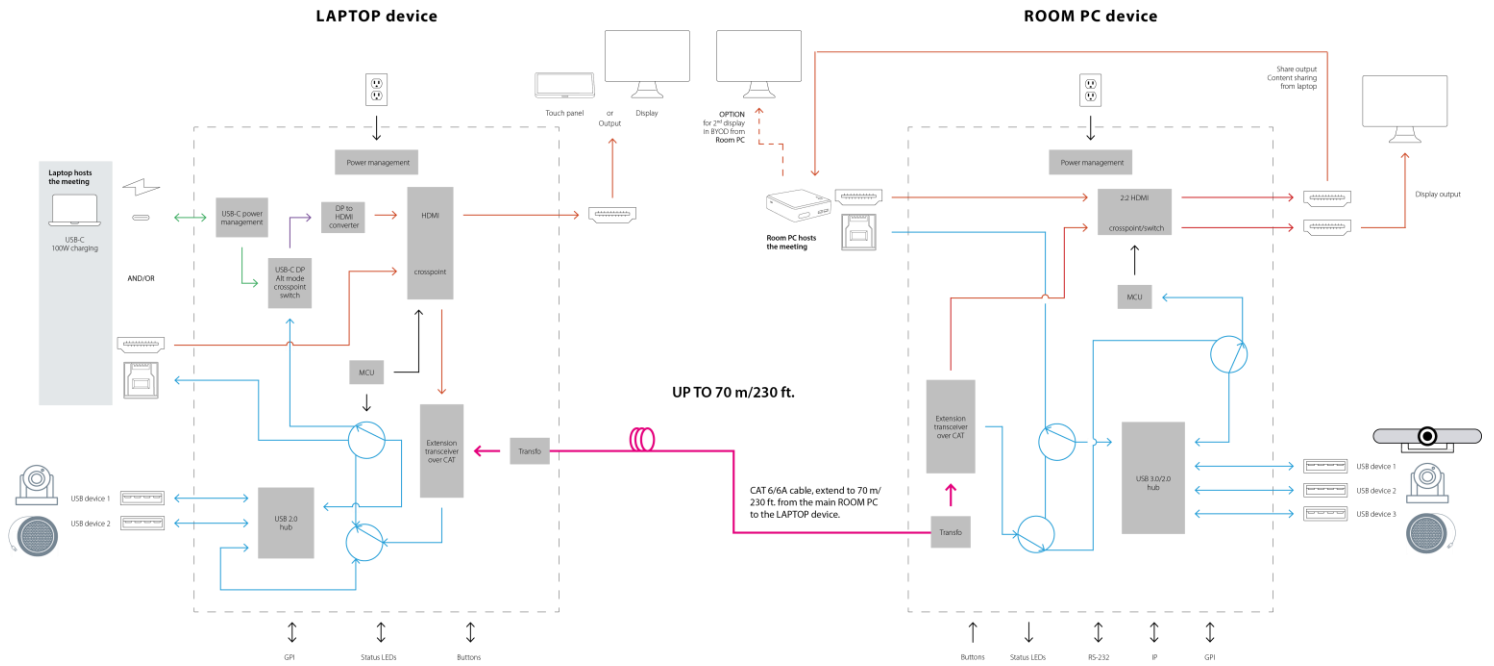


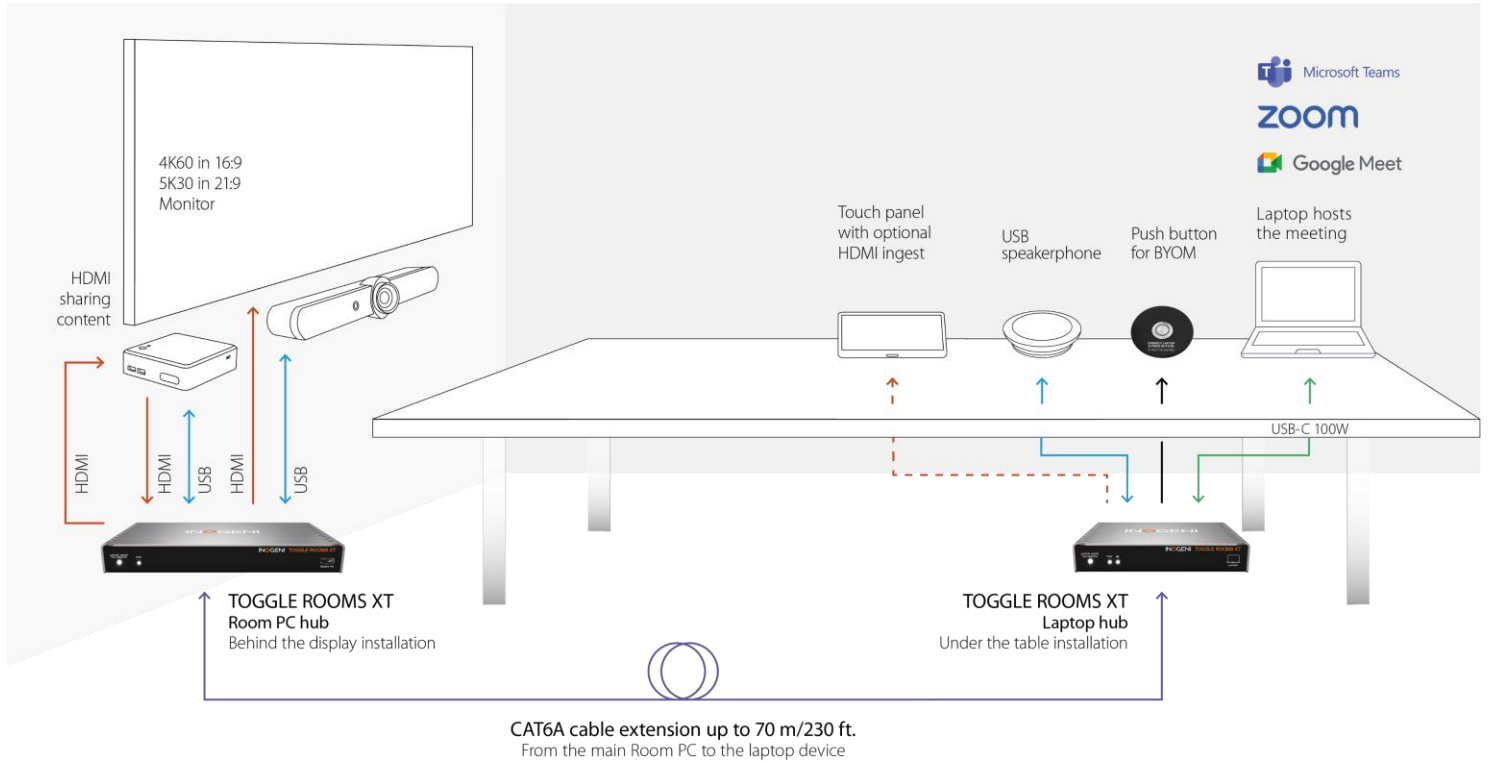
Figure 1: Basic block diagram when RoomPC and content sharing mode is activated.

## CONNECTIVITY DIAGRAM

Here is a simple connectivity diagram showing

### NEW TOGGLE ROOMS XT USB/HDMI VIDEOCONFERENCE HOST SWITCHER

4K BYOD/BYOM for large room: 3 host switcher for USB/HDMI devices with an extension



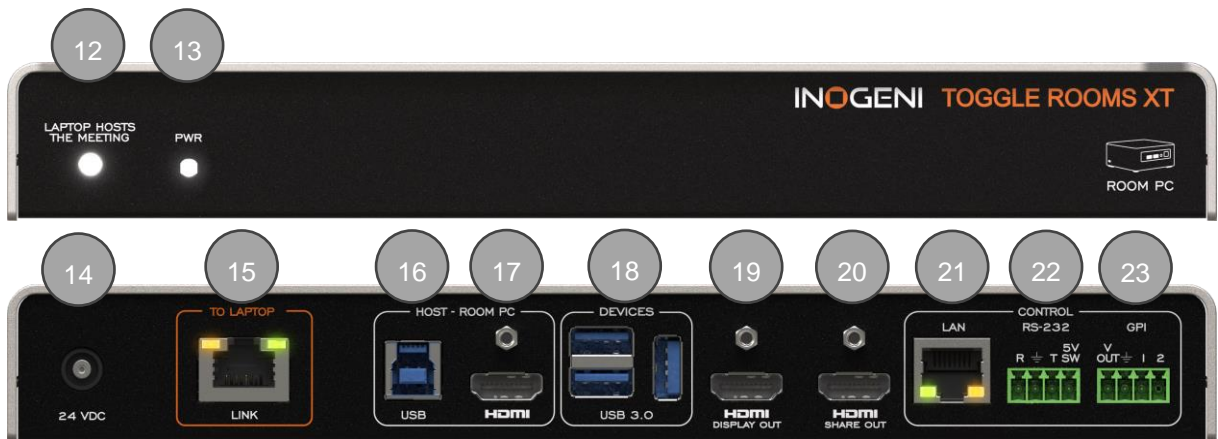
## DEVICE INTERFACES

Here are the devices interfaces.

### LAPTOP HUB



### ROOMPC HUB




#### Items

	Items	
LAPTOP HUB	1	LAPTOP HOST THE MEETING button. This button will connect HDMI and USB peripherals to the laptop connection for BYOM.
	2	PWR and charging status leds.
	3	USB-micro management connection.
	4	24VDC power input.
	5	HDBaseT link.
	6	USB-C laptop connection.
	7	USB-B laptop connection.
	8	HDMI laptop connection.
	9	HDMI laptop output connection.
	10	USB2.0 devices.
	11	GPI/button interface.
ROOMPC HUB	12	LAPTOP HOST THE MEETING button. This button will connect HDMI and USB peripherals to the laptop connection for BYOM.
	13	PWR status led.
	14	24VDC power input.
	15	HDBaseT link.
	16	USB-B Room PC connection.
	17	HDMI Room PC connection.
	18	USB3.0 devices.

<b>19</b>	HDMI display output.
<b>20</b>	HDMI share output from laptop.
<b>21</b>	LAN interface.
<b>22</b>	RS232 and remote interface.
<b>23</b>	GPI interface.

## LEDS BEHAVIOR

Here are the LEDs behavior:

LAPTOP HOSTS THE MEETING	
<b>OFF</b>	Laptop not selected.
<b>SOLID</b>	<p>Laptop selected. When user presses the button and a laptop is connected, there will be pulses on the integrated led to indicate which laptop is selected:</p> <ul style="list-style-type: none"> <li>- <b>1x</b> pulse: the "Laptop USB-C" host is selected.</li> <li>- <b>2x</b> pulses: the "Laptop USB-B + HDMI" host is selected.</li> </ul>
<b>BLINK</b>	<p>Error condition.</p> <ol style="list-style-type: none"> <li>1. When the user tries to switch to laptop if this one is not present or if USB or HDMI connections are missing.</li> <li>2. When the user tries to switch host if button is locked through our API.</li> </ol>
PWR	
<b>OFF</b>	Device not powered.
<b>SOLID</b>	Device powered.
Charging 	
<b>OFF</b>	Laptop is not charging.
<b>SOLID</b>	Laptop is charging.

## OPERATING MODES

Here are the operating modes supported by the device. They will be explained here.

### ROOM PC MODE WITH BYOD CONTENT SHARING MODE

**This is the default mode.** In this mode, only the Room PC USB and HDMI connections are routed to the main USB and HDMI peripherals.

The Room PC is the system that is currently selected to the main USB and HDMI peripherals. However, if the user would like to send HDMI content from the laptop's USB-C or HDMI connection to the Room PC, it is possible to do so with the HDMI SHARE output connection.

The user can also initiate a BYOM session on their laptop but a user trigger (front button, INO – BUTTON KIT or API call) needs to be done.

### BYOM MODE

In this mode, the laptop is the system that is automatically selected to the main USB and HDMI peripherals when detected. The Room PC is completely disconnected from the setup. When the laptop gets disconnected, the Room PC takes over until a new laptop is plugged in.

### CUSTOM MODE

In this mode, the user can configure the USB and HDMI switching modes independently.

#### AUTOMATIC

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This mode will switch automatically to the last source (USB or HDMI) connected if the operation mode is set to Custom. If the current source is disconnected, the device will switch back to the other source if it is detected. Push-button action and remote control are also supported.

#### MANUAL

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The manual mode will enable you to force a specific source selection. Push-button action and remote control are also supported.

#### MANUAL WITH FALLBACK

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The manual mode with fallback supports the same features as the manual mode. It will only add the possibility to switch to the other detected source connection automatically if the selected source is disconnected.

#### USB FOLLOWS HDMI

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In this mode, the USB host selection depends on the HDMI source selected. If the HDMI display switching mode is set to "Automatic", the selected USB host will be the one associated to the last detected HDMI display source.

Applicable only on the USB host switching mode.

#### HDMI FOLLOWS USB

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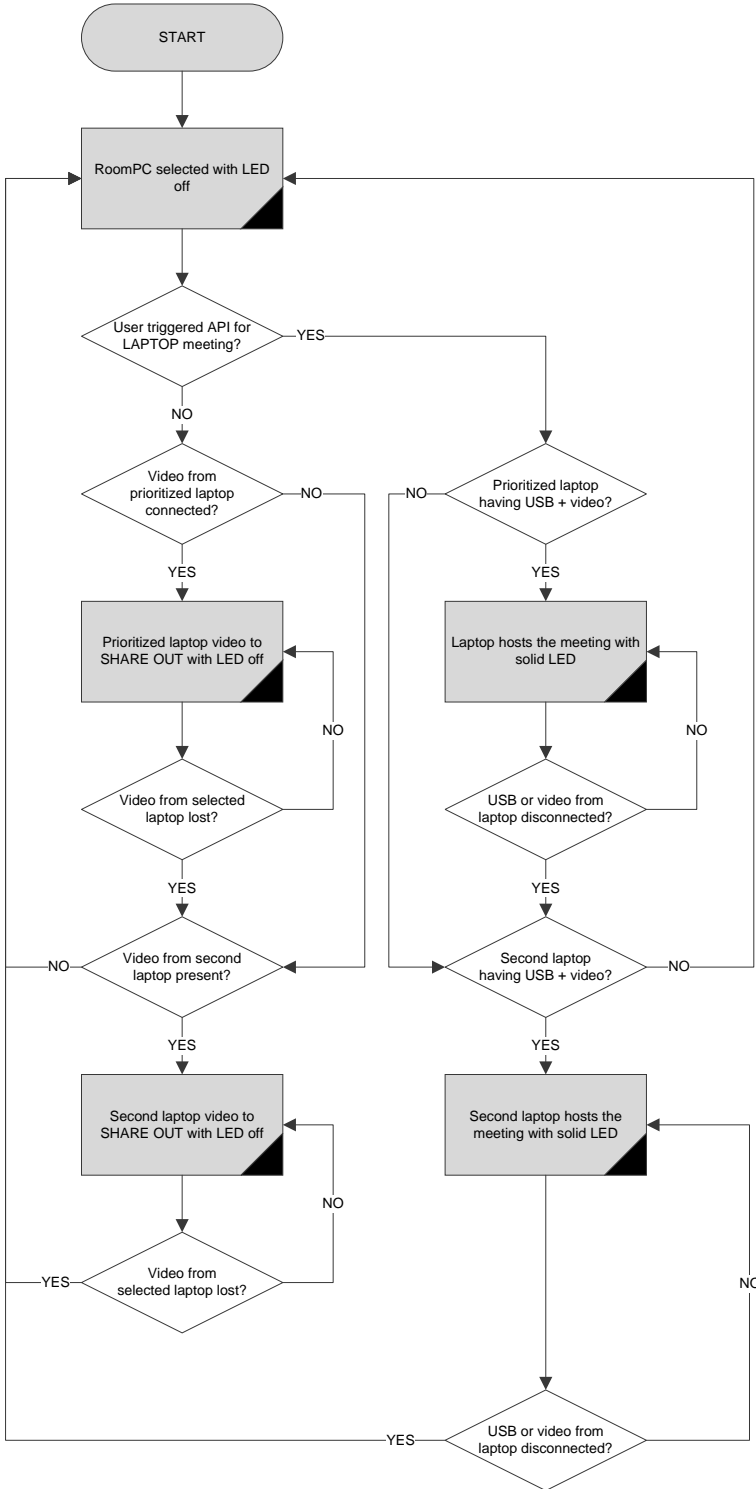
In this mode, the HDMI source selection depends on the USB host selected. If the USB host switching mode is set to "Automatic", the selected HDMI display source will be the one associated to the last detected USB host.



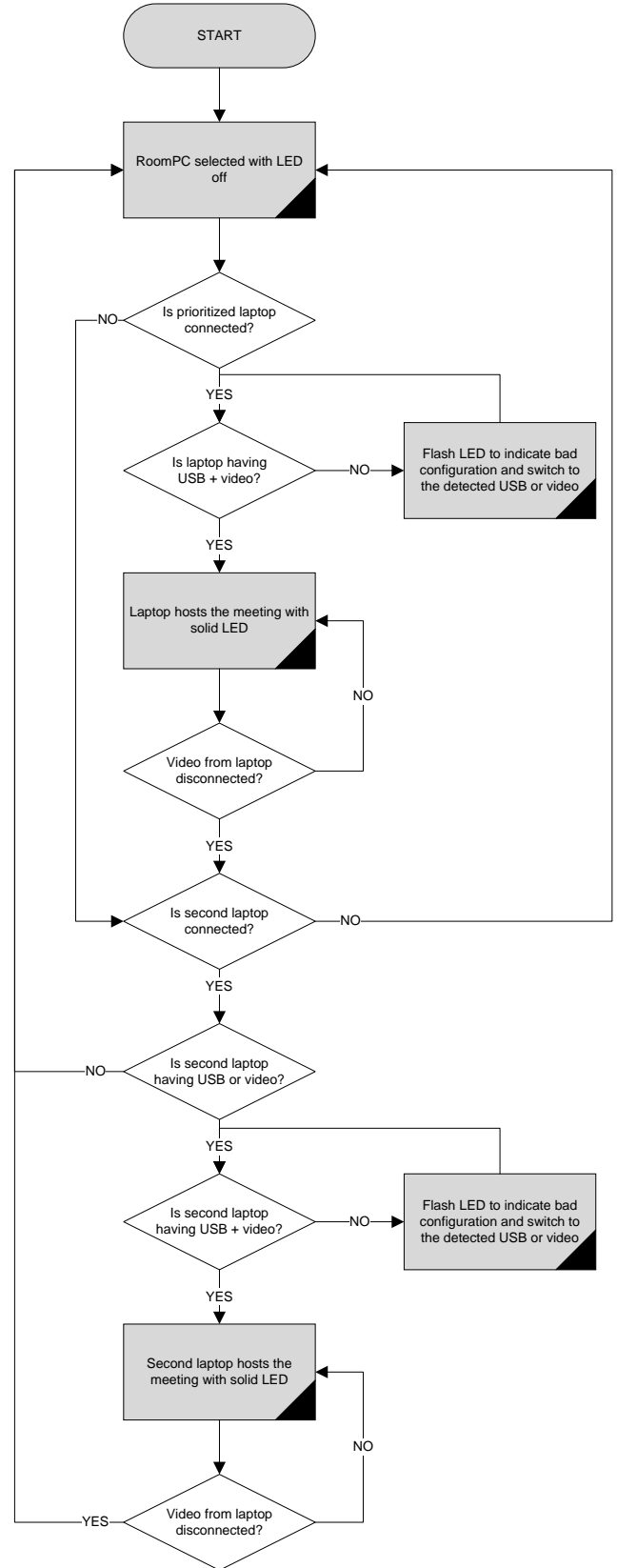
**NOTE:** You cannot set "USB follows HDMI" and "HDMI follows USB" modes simultaneously.



## Room PC with BYOD Content sharing



## BYOM



## SPECIFICATIONS

Here is the complete specification.

Main feature	
<b>Description</b>	The TOGGLE ROOMS XT 4K60 USB/HDMI switcher effortlessly connects to five USB devices and an HDMI display. Seamlessly switching between 3 hosts, it automatically transitions to a connected laptop, providing convenient charging capabilities of up to 100W via USB-C. In addition, this versatile solution allows for remote control through RS-232 or GPI and ensures a seamless and user-friendly experience in any videoconference setting.
<b>Link technology</b>	HDBaseT 3.0
<b>Link range</b>	Up to 40 m when using 4K60 Up to 70 m when using 1080p60
<b>Link medium</b>	CAT6A U/FTP

Laptop hub	
<b>USB-C connector (host #1)</b>	Supports USB-C DisplayPort Alternate Mode <ul style="list-style-type: none"> <li>• DisplayPort up to 3840x2160p60 / 4096x2160p60</li> <li>• USB 2.0 (480 Mbps)</li> <li>• Charges up to 100W</li> <li>• USB-C cable locking option</li> </ul>
<b>USB connector (host #2)</b>	USB 2.0 Type-B
<b>HDMI input connector (host #2)</b>	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
<b>HDMI output connector</b>	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
<b>USB devices connectors</b>	USB 2.0 Type-A ports for peripherals
<b>LINK connector</b>	HDBaseT 3.0 interface
<b>GPI</b>	4-POS terminal block connector 2x Contact-closure control GPI: <ul style="list-style-type: none"> <li>• Controlled by open-drain IO (short to ground) or driven IO</li> <li>• Supported voltage range: 0 to 12V max</li> <li>• Voltage threshold is 2.3V</li> </ul> VOUT: <ul style="list-style-type: none"> <li>• Able to power up the LED on the button of our INO-Button accessory</li> <li>• Logic-low level: 0 @ 0.5V</li> <li>• Logic-high level: 4.5 @ 5V</li> </ul>
<b>Power connector</b>	24VDC/160W

Room PC hub	
<b>LINK connector</b>	HDBaseT 3.0 interface
<b>USB connector (host #3)</b>	USB 3.0 Type-B / 5 Gbps
<b>HDMI input connector (host #3)</b>	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
<b>HDMI display output</b>	Up to 3840x2160p60 / 4096x2160p60 HDMI with cable locking option
<b>HDMI share output</b>	Up to 3840x2160p60 / 4096x2160p60 HDMI with cable locking option
<b>USB devices</b>	3x USB 3.0 Type-A ports. 1.8A shared between downstream ports
<b>GPI</b>	4-POS terminal block connector 2x Contact-closure control GPI: <ul style="list-style-type: none"> <li>• Controlled by open-drain IO (short to ground) or driven IO</li> <li>• Supported voltage range: 0 to 12V max</li> <li>• Voltage threshold is 2.3V</li> </ul> VOUT: <ul style="list-style-type: none"> <li>• Able to power up the LED on the button of our INO-Button accessory</li> <li>• Logic-low level: 0 @ 0.5V</li> <li>• Logic-high level: 4.5 @ 5V</li> </ul>
<b>IP interface</b>	10/100Mbps Supports DHCP or static addressing IP control available through RESTAPI and Telnet connections
<b>RS-232 interface</b>	4-pos terminal block connector Baud rates: 9600 [default], 19200, 38400 and 115200

	Data bits: 8 Stop bits: 1 Parity: None Flow control: None
<b>Power connector</b>	24VDC/36W
<b>HDMI video</b>	
<b>HDCP compliance</b>	Compliant with HDCP2.3, HDCP2.2 and HDCP1.4
<b>HDMI compliance</b>	Compliant with HDMI2.0b, HDMI1.4 and DV11.0
<b>Sampling frequency</b>	600MHz
<b>Video scaling</b>	Crosspoint switch supports video downscaling from 4K to 1080p.
<b>Chroma subsampling</b>	YUV/RGB 4:4:4, 4:2:2
<b>CEC</b>	Ability to send CEC commands to connected HDMI display sink.
<b>HDMI audio</b>	
<b>Audio</b>	Audio passthrough from input to output
<b>Formats</b>	LPCM, Dolby Digital, DTS up to 192kHz
<b>Control</b>	
<b>Control options</b>	Front button – For laptop selection RS232 GPI LAN USB
<b>Compatibility</b>	
<b>Operating system</b>	NO driver installation necessary Windows 7 and above (32/64-bit) macOS 10.10 and above Linux (kernel v2.6.38 and above)
<b>Physical details</b>	
<b>Room PC hub - Dimensions (W x L x H)</b>	25.10 cm x 11.57 cm x 3.26 cm 9.88" x 4.56" x 1.28"
<b>Room PC hub - Power supply</b>	36W (85-264VAC 50/60Hz to 24V/1.5A DC)
<b>Room PC hub - Weight</b>	760 g (1.68 lbs)
<b>Laptop hub - Dimensions (W x L x H)</b>	18.4 cm x 11.57 cm x 3.26 cm 7.24" x 4.56" x 1.28"
<b>Laptop hub - Power supply</b>	160W (85-264VAC 50/60Hz to 24V/6.67A DC)
<b>Laptop hub - Weight</b>	580 g (1.28 lbs)
<b>Package contents</b>	1 x TOGGLE ROOMS XT – ROOM PC device 1 x TOGGLE ROOMS XT – LAPTOP device 1 x USB-C to USB-C cable – 1.8 m /6 ft. 1 x USB 3.0 cable (USB-A to USB-B) – 1 m/3 ft. 3 x terminal block 4-pos 4 x mounting brackets 8 x M2.5 mounting screws for brackets on product 8 x screws for Toggle Rooms devices for table/wall mount 1 x power supply 85-264VAC 50/60Hz to 24V/6.67A DC for a LAPTOP hub 1 x power supply 85-264VAC 50/60Hz to 24V/1.5A DC for a ROOM PC hub 2 x international adapters included in the box (USA/CA or EU/UK/AU/BIS) 1 x Quick Start Guide / Thank You card 4 x PSU mounting bracket 8 x screws for PSU table/wall mount 8 x rubber feet
<b>Operating temperature</b>	0°C to 45°C 32°F to 113°F
<b>Storage temperature</b>	-40°C to 105°C -40°F to 221°F
<b>Relative humidity</b>	0% to 90% non-condensing

<b>Mounting options</b>	Ability to mount under the table or on a wall
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<b>Information</b>	
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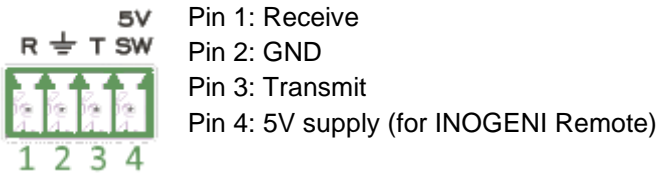
<b>UPC code - US &amp; CAN</b>	051497418717
<b>UPC code - International market EU/UK/AU/BIS/</b>	051497418724
<b>Origin</b>	Canada
<b>Warranty</b>	5 years

<b>Certifications</b>	
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<b>Device</b>	FCC, CE, UKCA, RoHS, IEC62368, RCM, SoV
<b>Power supply</b>	FCC, CE, UKCA, RoHS, IEC62368, RCM, CCC, CB, EAC, VI, UL
<b>TAA-compliance</b>	Yes

## SERIAL COMMUNICATION PROTOCOL

Here is the complete list of commands provided through the serial connection. As written on the back of the device, here is the pinout of the terminal block.



**NOTE:** The user needs to put a **space character between the command name and argument.**

You need to add a carriage return `<CR>` character and a line feed `<LF>` character at the end of the command string.

Typically, commands will return `"ACK<CR><LF>"` in case of success and `"NACK<CR><LF>"` in case of failure.

**Baud rate:** 9600 [default] // **Data bits:** 8 // **Stop bits:** 1 // **Parity:** None // **Flow control:** None

See the "API Commands" section for all the commands available.

## REST API

You can enable a bearer authentication in the HTTP header (Authorization: Bearer <token>) through our configuration page to increase security on the API.

There will be a return code to each call with the following commands:

200 => success

400 => error

401 => authorization error

The return body will usually be JSON formatted with a `"message"` field containing a JSON string explaining the cause of the error or "success" in case of success. Note that we are using self-signed certificates.

It is also possible to embed arguments to an API call inside the URL to ease configuration with some control systems with the following topology:

**GET** `https://<IP>/api/v1/<COMMAND>?<ARG1>=value&<ARG2>=value`

where `<COMMAND>`, `<ARG1>` and `<ARG2>` are command and associated arguments.

For example, using the `usbHost` command, you can issue the following request:

**GET** `https://<IP>/api/v1/usbHost?host=1`

This request will set the USB host to laptop USB-C port.

The following commands allow to perform password management and bearer token management. The authentication used is basic auth, and we use the same user and password as the webpage (default user=admin and password=[SERIAL\_NUM] where [SERIAL\_NUM] is the serial number of the device located under the unit).

Command URL / Description	Body arguments	Return body
<b>HTTP POST</b> <b>https://&lt;IP&gt;/api/v1/</b> <b>changeUsername?</b> <b>username=&lt;newUsername&gt;</b>		<pre>{   "message": &lt;String&gt; }</pre>
Change the username to <newUsername>.		
<b>HTTP POST</b> <b>https://&lt;IP&gt;/api/v1/</b> <b>changePassword?</b> <b>password=&lt;newPassword&gt;</b>		<pre>{   "message": &lt;String&gt; }</pre>
Change the password to <newPassword>.		
<b>HTTP GET</b> <b>https://&lt;IP&gt;/api/v1/</b> <b>getAccessToken</b>		<pre>{   "token": &lt;String&gt; }</pre>
Return the bearer token.		If no bearer token is set, the "token" field will be null.
<b>HTTP POST</b> <b>https://&lt;IP&gt;/api/v1/</b> <b>generateAccessToken</b>		<pre>{   "message": &lt;String&gt; }</pre>
Generate random access token.		

The bearer token is generated using a random process. The format of the bearer token only supports the following:

- Alphanumeric (A to Z) upper and lowercase characters.
- Numbers 0-9.

See the "API Commands" section for all the commands available.

## TELNET

You can use any telnet application to communicate with the device using TCP. Make sure to use the right IP address and **port 23**.

Use the serial communication protocol to configure the device.

The `quit` command can be used to ask server for disconnection.

See the "API Commands" section for all the commands available.

## API COMMANDS

Here is the list of the RS232 and RESTAPI commands available for the device. The two interfaces share the same API.

**TX** When command have all body arguments, it will apply the configuration to the device.

**RX** When command does not have any body arguments or only first argument is provided, it will return information from the device.

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
<b>AUTOHDMICECPWR</b> - <b>autoHdmiCecPwr</b>	Get/Set the automatic CEC power control of the connected display. When enabled, the device will turn on/off the display depending on the actual state of the HDMI source routed to the display.  <enable> options: 0 => OFF 1 => ON	TX <enable>	ACK<CR><LF>	enable=<enable>	{ "message": <String> }
		RX	ENABLE=<enable><CR><LF> ACK<CR><LF>		{ "enable": <enable>, "message": <String> }
<b>BAUDRATE</b> - <b>baudrate</b>	Set RS232 baud rate.  <baudrate> options: 0 => 9600 1 => 19200 2 => 38400 3 => 115200	TX <baudrate>	ACK<CR><LF>	baudrate=<baudrate>	{ "message": <String> }
		RX	BAUDRATE=<baudrate><CR><LF> > ACK<CR><LF>		{ "baudrate": <baudrate>, "message": <String> }
<b>BTNLOCK</b> - <b>btnLock</b>	Get/Set the button lock status.  <lockState> options: 0 => Not locked 1 => Locked	TX <lockState>	ACK<CR><LF>	btnLock=<lockState>	{ "message": <String> }
		RX	BTNLOCK=<lockState><CR><LF> > ACK<CR><LF>		{ "btnLock": <lockState>, "message": <String> }
<b>CECPASSTHROUGHEN</b> - <b>cecPassthroughEn</b>	Get/Set CEC passthrough setting from source to display. This setting allows CEC commands to be sent or not from the video source to the connected display. Manual CEC commands will continue to work regardless of this setting.  <enable> options: 0 => OFF 1 => ON [default]	TX <enable>	ACK<CR><LF>	enable=<enable>	{ "message": <String> }
		RX	ENABLE=<src><CR><LF> ACK<CR><LF>		{ "enable": <host>, "message": <String> }
<b>CECTOGGLEMUTE</b> - <b>cecToggleMute</b>	Toggle mute control.	TX	ACK<CR><LF>		{ "message": <String> }
<b>CECVOLDOWN</b> - <b>cecVolDown</b>	Decrease display volume.	TX	ACK<CR><LF>		{ "message": <String> }
<b>CECVOLUP</b> - <b>cecVolUp</b>	Increase display volume.	TX	ACK<CR><LF>		{ "message": <String> }
<b>DISPLAYSRC</b> - <b>displaySrc</b>	Get/Set which HDMI source to be routed to display output.  <src> options:	TX <src>	ACK<CR><LF>	displaySrc=<src>	{ "message": <String> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
	0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI 3 => OFF	RX	DISPLAYSRC=<src><CR><LF> ACK<CR><LF>		{ "displaySrc": <src>, "message": <String> }
<b>DISPLAYSWMODE</b> <b>-</b> <b>displaySwMode</b>	Get/Set HDMI display source switching mode. The operation mode must be set to "Custom" to use this.  <swMode> options: 0 => Automatic mode [default] 1 => Manual mode 2 => Manual mode with fallback 3 => HDMI follows USB mode	TX <swMode>	ACK<CR><LF>	displaySwMode=<swMode>	{ "message": <String> }
		RX	DISPLAYSWMODE=<host><CR><LF> ACK<CR><LF>		{ "displaySwMode": <swMode>, "message": <String> }
<b>EDID</b> <b>-</b> <b>edid</b>	Set specific EDID modes to be reported to video source.  <src> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI  <edid> options: 0 => Passthrough 1 => User EDID 2 => 3840x2160p60 3 => 3840x2160p50 4 => 3840x2160p30 5 => 3840x2160p25 6 => 1920x1080p60 7 => 1920x1080p50 8 => 1280x720p60 9 => 1280x720p50 10 => 5120x2160p30 11 => 5120x2160p25	TX <src> <edid>	ACK<CR><LF>	src=<src> edid=<edid>	{ "message": <String> }
		RX	EDID=<edid><CR><LF> ACK<CR><LF>	src=<src>	{ "edid": <edid>, "message": <String> }
<b>EDIDHDMIOUT</b> <b>-</b> <b>edidHdmiOut</b>	Get/Set the EDID from the sink and report it to the associated source. This will put the EDID mode of the associated source to "User EDID".  <sink> options: 0 => Display 1 => SHARE OUT 2 => Laptop OUT  <src> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI  <edidHdmiOut> => formatted 256 bytes array	TX <sink> <src>	ACK<CR><LF>	src=<sink> src=<src>	{ "message": <String> }
		RX <sink>	EDIDUSR=<edidUsr><CR><LF> ACK<CR><LF>	sink=<sink>	{ "edidHdmiOut": <edidHdmiOut>, "message": <String> }
<b>EDIDUSR</b> <b>-</b> <b>edidUsr</b>	Set specific EDID modes to be reported to video source.  <src> options:	TX <src> <256 bytes array>	ACK<CR><LF>	src=<src> edidUsr=<256 bytes array>	{ "message": <String> }




API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
	0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI  <edidUsr> => formatted 256 bytes array Get/Set the GPI configuration.	RX <src>	EDIDUSR=<edidUsr><CR><LF> ACK<CR><LF>	src=<src>	{ "edidUsr": <edidUsr>, "message": <String> }
<b>GPICFG</b> - <b>gpiCfg</b>	<b>NOTE:</b> In pulse mode, a short to GND on this pin will trigger the function. The function will be executed on GPI falling edge. GPI rising edge has no effect.  In level mode, the function will be executed on short to GND and open states.  <gpi> options: 1 => GPI1 2 => GPI2  <mode> options: 0 => Pulse mode [default] 1 => Level mode  <function> options: 0 => Disabled. 1 => BYOM mode control [default GPI1] SHORT = LAPTOP OPEN = ROOMPC 2 => USB host control [default GPI2] SHORT = LAPTOP OPEN = ROOMPC 3 => Display video source control SHORT = LAPTOP USB-C/HDMI OPEN = ROOMPC 4 => Share output video source control SHORT = LAPTOP USB-C OPEN = LAPTOP HDMI	TX <gpi> <mode> <function>	ACK<CR><LF>	gpi=<gpi> mode=<mode> function=<function>	{ "message": <String> }
		RX <src>	MODE=<mode><CR><LF> FUNCTION=<function><CR><LF> > ACK<CR><LF>	gpi=<gpi>	{ "mode": <mode>, "function": <function>, "message": <String> }
<b>HDCPCTL</b> - <b>hdcpCtl</b>	Get/Set the HDCP setting.  <src> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI  <hdcp> options: 0 => Disabled 1 => HDCP v1.4 2 => HDCP v2.2 3 => Auto	TX <src> <hdcp>	ACK<CR><LF>	src=<src> hdcp=<hdcp>	{ "message": <String> }
		RX <src>	HDCP=<hdcp><CR><LF> ACK<CR><LF>	src=<src>	{ "hdcp": <hdcp>, "message": <String> }
<b>HELP</b> - <b>help</b>	Return commands list with description.	RX	List of all the supported commands.		List of all the supported commands.
<b>HOSTBUTTON</b> - <b>hostButton</b>	This function gives the same functionality as the front button or the INO – BUTTON KIT action.	TX	ACK<CR><LF>		{ "message": <String> }
<b>HOSTMEETING</b> - <b>hostMeeting</b>	This function allows the device to switch USB and HDMI connections to the provided host connection. This is a momentary control. As soon as there are events over USB and HDMI signals, the preconfigured modes will take over. This control is similar to the actual front button	TX <host>	ACK<CR><LF>	host=<host>	{ "host": <host>, "message": <String> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
	and also when user is using the INO – BUTTON KIT.  <host> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop USB-B/HDMI				
<b>HOSTNAME</b> - <b>hostname</b>	Get/Set the hostname of the device. This command will change the device name when probed over the network and the name of the USB HID interface	TX <hostname>	ACK<CR><LF>	hostname=<hostname>	{ "message": <String> }
	<hostname> option: String defined hostname to be shown on the network and USB HID interface. This string must not have space characters.	RX	HOSTNAME=<src><CR><LF> ACK<CR><LF>		{ "hostname": <host>, "message": <String> }
<b>HTTPEN</b> - <b>httpEn</b>	Get/Set HTTP control setting.  <enable> options: 0 => OFF 1 => ON	TX <enable>	ACK<CR><LF>	enable=<enable>	{ "message": <String> }
		RX	ENABLE=<enable><CR><LF> ACK<CR><LF>		{ "enable": <enable>, "message": <String> }
<b>LAPTOPSRC</b> - <b>laptopSrc</b>	Get/Set the video source routed to LAPTOP HDMI output.  <src> options: 1 => Laptop USB-C 2 => Laptop HDMI 3 => OFF	TX <src>	ACK<CR><LF>	laptopSrc=<src>	{ "message": <String> }
		RX	LAPTOPSRC=<src><CR><LF> ACK<CR><LF>		{ "laptopSrc": <src>, "message": <String> }
<b>LINKSTATUS</b> - <b>link</b>	Get HDBaseT link status  <status> indicates the link status. <len> indicates the estimated length. <q> indicates the quality factor. <chX> indicate de measurement of the associated pair A, B, C or D. <ret> indicates the retransmission rate over the link.	TX	HDBTLINK=<status><CR><LF> HDBTCABLEL=<len><CR><LF> HDBTCABLEQ=<q><CR><LF> HDBTMSE=<cha>, <chb> <chc>, <chd><CR><LF> <chc>, <chd><CR><LF> HDBTMSEWINDOW=<cha>, <chb> <chc>, <chd><CR><LF> HDBTRETRANRATE=<ret> ACK<CR><LF>		{ "Link": { "HdbtLink": <status>, "HdbtCableLength": <len>, "HdbtCableQuality": <q>, "HdbtMaxError": [ <cha>, <chb>, <chc>, <chd> ], "HdbtMse": [ <cha>, <chb>, <chc>, <chd> ], "HdbtMseWindow": [ <cha>, <chb>, <chc>, <chd> ], "HdbtRetransmissionRate": <ret> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
<b>NETWORK</b> - <b>network</b>	Get/Set network settings.  <mode> options: static => addressing is static dhcp => use DHCP addressing  If mode is static, IP and netmask are required while gateway is optional.	<b>TX</b> <mode> <ip> <netmask> <gateway>	ACK<CR><LF>	mode=<mode> ip=<ip> netmask=<netmask> gateway=<gateway>	{ "message": <String> }
	<ip> option: String defined IP address. Example: 192.168.0.20  <netmask> option: String defined netmask address. Example: 255.255.0.0  <gateway> option: String defined gateway address. Example: 192.168.0.1	<b>RX</b>	MODE=<mode><CR><LF> IP=<ip><CR><LF> NETMASK=<netmask><CR><LF> GATEWAY=<gateway><CR><LF> ACK<CR><LF>	{ "mode": <static, dhcp>, "ip": <ip>, "netmask": <netmask>, "gateway": <gateway>, "message": <String> }	
<b>OPMODE</b> - <b>opMode</b>	Get/Set operation mode.  By default, the device will operate in RoomPC / BYOD mode – RoomPC USB and HDMI peripherals selected, and laptop sends video content only to SHARE output. The user will need to trigger our API or use the GPI interface to connect USB and HDMI to the laptop.  When BYOM mode is set, the device will automatically switch all HDMI and USB peripherals to the laptop as soon as it is detected. The RoomPC is always selected if there is no laptop detected.  When Custom mode is set, the user can set the USB, display and share source switching modes independently.	<b>TX</b> <opMode>	ACK<CR><LF>	opMode=<opMode>	{ "message": <String> }
	<opMode> options: 0 => RoomPC with BYOD/content sharing [default] 1 => BYOM 2 => Custom	<b>RX</b>	OPMODE=<src><CR><LF> ACK<CR><LF>	{ "opMode": <opMode>, "message": <String> }	
<b>PRIORDISPLAYSRC</b> - <b>priorDisplaySrc</b>	Get/Set display source priority. Only applicable when operation mode is set to "Custom" and display source switching mode is set to "automatic" or "manual with fallback".	<b>TX</b> <src>	ACK<CR><LF>	priorDisplaySrc=<src>	{ "message": <String> }
	<src> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI 3 => Last detected source [default]	<b>RX</b>	PRIORDISPLAYSRC=<src><CR><LF> ACK<CR><LF>	{ "priorDisplaySrc": <host>, "message": <String> }	
<b>PRIORHOSTMEETING</b> - <b>priorHostMeeting</b>	Get/Set host system priority. The function will select which computer to use as the prioritized source, including USB and video associated to the same computer. Only applicable when operation mode is set to "RoomPC / BYOD content sharing"	<b>TX</b> <host>	ACK<CR><LF>	host=<host>	{ "message": <String> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
	and "BYOM".  <host> options: 1 => Laptop USB-C 2 => Laptop USB-B/HDMI 3 => Last detected laptop [default]	RX	PRIORHOSTMEETING=<host><CR><LF><LF> ACK<CR><LF>		{ "priorHostMeeting": <host>, "message": <String> }
PRIORLAPTOPSRC - priorLaptopSrc	Get/Set laptop source priority.  <src> options: 1 => Laptop USB-C 2 => Laptop HDMI 3 => Last detected laptop [default]	TX <src>	ACK<CR><LF>	priorLaptopSrc=<src>	{ "message": <String> }
		RX	PRIORLAPTOPSRC=<src><CR><LF> ACK<CR><LF>		{ "priorLaptopSrc": <src>, "message": <String> }
PRIORSHARESRC - priorShareSrc	Get/Set share source priority. Only applicable when operation mode is set to "Custom" and share source switching mode is set to "automatic" or "manual with fallback".  <src> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI 3 => Last detected source [default]	TX <src>	ACK<CR><LF>	priorShareSrc=<src>	{ "message": <String> }
		RX	PRIORSHARESRC=<src><CR><LF> ACK<CR><LF>		{ "priorShareSrc": <host>, "message": <String> }
PRIORUSBHOST - priorUsbHost	Get/Set USB priority. Only applicable when operation mode is set to "Custom" and USB host switching mode is set to "automatic" or "manual with fallback".  <host> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop USB-B 3 => Last detected host [default]	TX <host>	ACK<CR><LF>	priorUsbHost=<host>	{ "message": <String> }
		RX	PRIORUSBHOST=<host><CR><LF> ACK<CR><LF>		{ "priorUsbHost": <host>, "message": <String> }
REBOOT - reboot	Reboot the device.	TX	ACK<CR><LF>		{ "message": <String> }
RSTR - rstr	Restore default settings (including password and REST API token).	TX	ACK<CR><LF>		{ "message": <String> }
SCALER - scaler	Get/Set the scaler options over the HDMI video outputs.  <output> options: 0 => Display output 1 => Share output  <enable> options: 0 => OFF 1 => ON	TX <output> <enable>	ACK<CR><LF>	output=<output> enable=<enable>	{ "message": <String> }
		RX <output>	ENABLE=<enable><CR><LF> ACK<CR><LF>	output=<output>	{ "enable": <enable>, "message": <String> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
<b>SHARESRC</b> - <b>shareSrc</b>	Get/Set which HDMI source to be routed to share output.  <src> options: 0 => RoomPC [Not supported in automatic mode] 1 => Laptop USB-C 2 => Laptop HDMI 3 => OFF	TX <src>	ACK<CR><LF>	shareSrc=<src>	{ "message": <String> }
		RX	SHARESRC=<src><CR><LF> ACK<CR><LF>		{ "shareSrc": <src>, "message": <String> }
<b>SHARESWMODE</b> - <b>shareSwMode</b>	Get/Set HDMI share source switching mode. The operation mode must be set to "Custom" to use this.  <swMode> options: 0 => Automatic mode [default] 1 => Manual mode 2 => Manual mode with fallback 3 => HDMI follows USB mode	TX <swMode>	ACK<CR><LF>	shareSwMode=<swMode>	{ "message": <String> }
		RX	SHARESWMODE=<host><CR><LF> ACK<CR><LF>		{ "shareSwMode": <swMode>, "message": <String> }
<b>STATUS</b> - <b>status</b>	Return laptop and RoomPC information, display and share output timings.	RX	List of all the status of the device.		List of all the status of the device.
<b>TELNETEN</b> - <b>telnetEn</b>	Get/Set telnet control setting.  <enable> options: 0 => OFF 1 => ON	TX <enable>	ACK<CR><LF>	enable=<enable>	{ "message": <String> }
		RX	ENABLE=<enable><CR><LF> ACK<CR><LF>		{ "enable": <enable>, "message": <String> }
<b>USBDEVEN</b> - <b>usbDevEn</b>	Get/Set the power on USB devices ports according to specific hosts.  <host> options: 0 => RoomPC 1 => Laptop USB-C 2 => Laptop HDMI 3 => When no host detected  <devices> options: Bitmask to enabled ports.    <devices>    USB1    USB2    USB3 0            OFF     OFF     OFF 1            ON      OFF     OFF 2            OFF     ON      OFF 3            ON      ON      OFF 4            OFF     OFF     ON 5            ON      OFF     ON 6            OFF     ON      ON 7            ON      ON      ON	TX <host> <devices>	ACK<CR><LF>	host=<host> devices=<devices>	{ "message": <String> }
		RX <host>	DEVICES=<devices><CR><LF> ACK<CR><LF>	host=<host>	{ "devices": <devices>, "message": <String> }
<b>USBHOST</b> - <b>usbHost</b>	Get/Set USB host to use.  <host> options: 0 => RoomPC 1 => Laptop USB-C	TX <host>	ACK<CR><LF>	usbHost=<host>	{ "message": <String> }

API command (RS232 - RESTAPI)	Description	RS232 payload	RS232 return	RESTAPI payload	RESTAPI return
	2 => Laptop USB-B 3 => OFF 4 => RoomPC with HID connection*.  * In this mode, the HID interface of the device will be detected over the RoomPC connection. However, remote USB devices connected on the laptop hub will not be seen.	RX	USBHOST=<host><CR><LF> ACK<CR><LF>		<pre>{   "usbHost": &lt;host&gt;,   "message": &lt;String&gt; }</pre>
<b>USBHOSTSWMODE</b> - <b>usbHostSwMode</b>	Get/Set USB host switching mode. The operation mode must be set to "Custom" to use this.  <swMode> options: 0 => Automatic mode [default] 1 => Manual mode 2 => Manual mode with fallback 3 => USB follows HDMI mode	TX <swMode>	ACK<CR><LF>	usbHostSwMode=<swMode>	<pre>{   "message": &lt;String&gt; }</pre>
		RX	USBHOSTSWMODE=<host><CR><LF> ACK<CR><LF>		<pre>{   "usbHostSwMode": &lt;swMode&gt;,   "message": &lt;String&gt; }</pre>
<b>VERSION</b> - <b>version</b>	Return firmware version.	RX	MAJOR=<Integer><CR><LF> MINOR=<Integer><CR><LF> ACK<CR><LF>		<pre>{   "major": &lt;Integer&gt;,   "minor": &lt;Integer&gt; }</pre>
<b>VOUT</b> - <b>vout</b>	Get/Set the VOUT level.  <b>NOTE:</b> By default, the firmware will drive this output to power up a led when enabling the BYOM mode. If the user wants to override this behavior, it is possible by changing the <vout> option.  <vout> options: 0 => Controlled by firmware. 1 => Logic-low. 2 => Logic-high.	TX <vout>	ACK<CR><LF>	vout=<vout>	<pre>{   "message": &lt;String&gt; }</pre>
		RX	VOUT=<vout><CR><LF> ACK<CR><LF>		<pre>{   "vout": &lt;vout&gt;,   "message": &lt;String&gt; }</pre>

# INOGENI MAESTRO APPLICATION

You can use our [INOGENI Maestro](#) application to monitor firmware information and upgrade your unit.



**NOTE:** You need to use the USB-B to USB-A cable provided with the box for the Maestro application to detect the unit.

**This is a preview of the upcoming Maestro application. More detailed configurations will be added to an updated version of the user guide.**

The screenshot displays the INOGENI Maestro application interface. At the top left, it shows the logo and version 'Version - V1.0.0'. The main area is divided into several sections:

- TOGGLE ROOMS XT:** Shows two device images with a warning icon.
- GENERAL:** Lists device details: Firmware version (1.23.4.2), MAC (E4:5F:01:EA:77:4D), IP (192.168.0.1), USB Speed (USB 3.0), Serial number (KCS2370089), and USB HOST (Selected USB host: ROOM PC).
- INPUTS:** Lists connections: USB-C DisplayPort (3840 X 2160P @ 60HZ), Laptop HDMI (3840 X 2160P @ 60HZ), and Room PC HDMI (3840 X 2160P @ 60HZ).
- OUTPUTS:** Lists connections: Display (3840 X 2160P @ 60HZ) and Share (3840 X 2160P @ 60HZ).
- LINK:** Shows Link status (Active / Inactive), Estimated distance (N/A / C m), Signal integrity (OK / FAIL), and Pair A, B, C, D (OK / FAIL).
- REBOOT DEVICE:** A button to restart the device.
- LAPTOP HOSTS THE MEETING:** A button to manage meeting settings.
- STATUS, SETTINGS, SYSTEM, RESOURCES, PREVIEW:** Navigation tabs.
- GENERAL (Detailed):** Lists Firmware Version (1.23.4.2), Hardware Revision (1.0), MAC Address (E4:5F:01:EA:77:4D), IP Mode (192.168.0.1), IP Address (192.168.0.81), Subnet mask (255.255.255.0), and Gateway (192.168.0.1).
- VIDEO INPUTS:** Lists settings for Laptop USB-C, Laptop HDMI, and Room PC, including Resolution (3840x2160p @ 60Hz), HDCP (OFF), and EDID mode (Passthrough).
- DEVICE CONFIGURATION:** Lists settings for Operation mode (Custom), DISPLAY switching mode (Automatic), DISPLAY source priority (Last detected source), SHARE switching mode (Automatic), SHARE source priority (Last detected source), USB switching mode (Automatic), USB source priority (Last detected source), Selected DISPLAY source (Room PC), Selected SHARE source (OFF), Selected USB host (Room PC), and USB-C 4K60 support (OFF).
- VIDEO OUTPUTS:** Lists settings for Display (Selected source: Room PC, Source scaler: OFF) and Share (Selected source: OFF, Source scaler: OFF).

At the bottom left, there is a red 'Maestro Device controller' logo.

## WEB INTERFACE

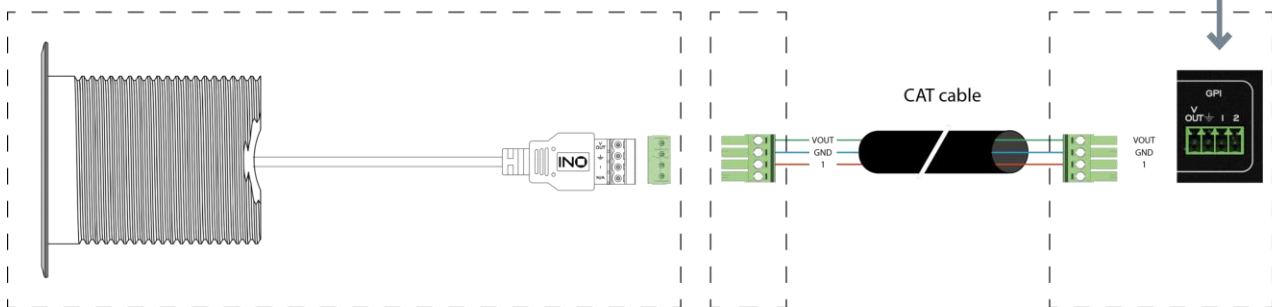
A web interface will be available at launch. This section will be populated soon.

# INOGENI INO – BUTTON KIT

You can use our INOGENI INO – BUTTON KIT to trigger the BYOM mode of the TOGGLE ROOMS.



Here is the connectivity diagram of the INO – BUTTON KIT to the TOGGLE ROOMS.



Here is also the timing diagram of the GPI and VOUT interfaces. When the GPI1 interface is shorted to GND, the VOUT signal will act like this depending on the laptop selected. Each cycle is 250ms.

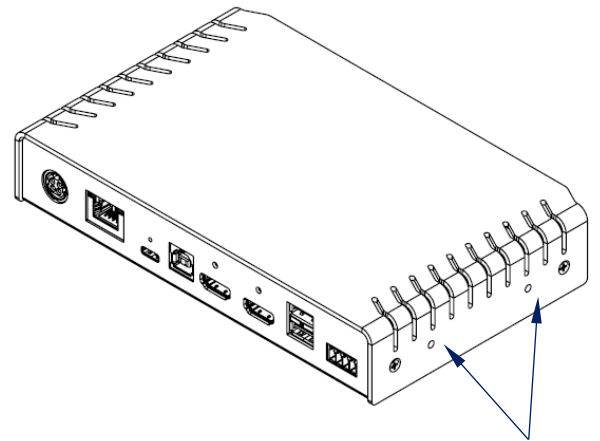
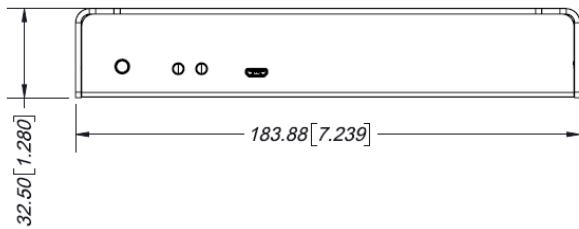
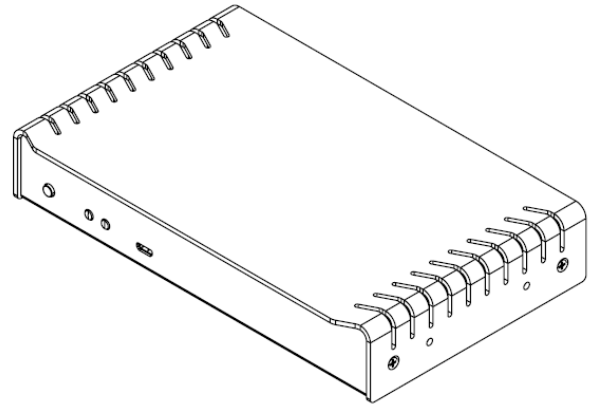




# MECHANICAL SPECIFICATION

You can find the mechanical specification of the device. All dimensions are in **mm [in]**.

## LAPTOP HUB



M2.5 screw holes for brackets

Figure 2: Top plate dimensions of laptop hub

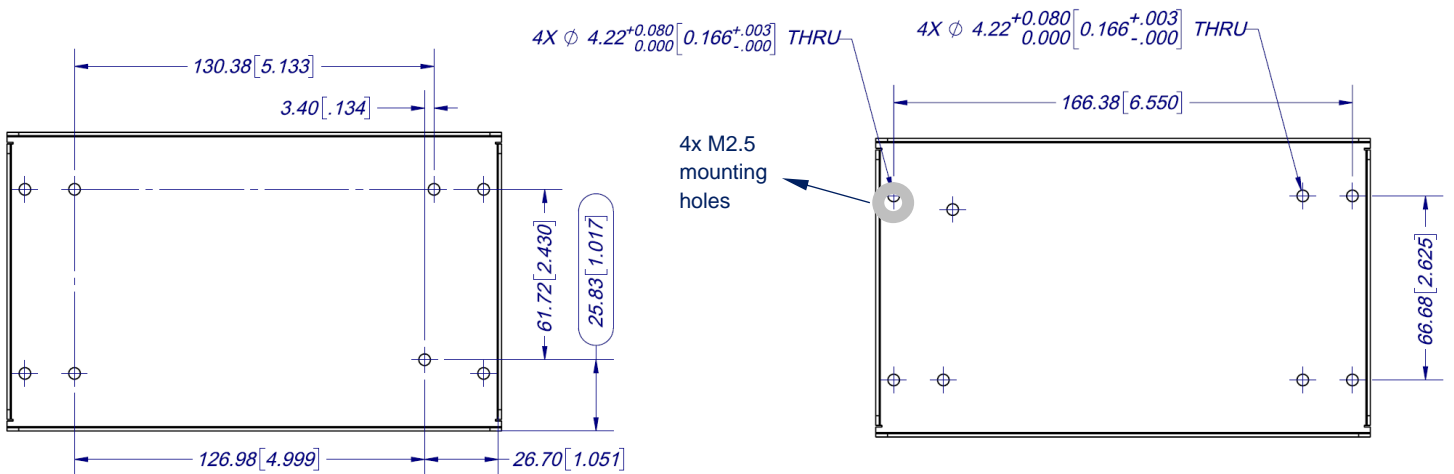


Figure 3: Bottom plate dimensions and holes positions of laptop hub

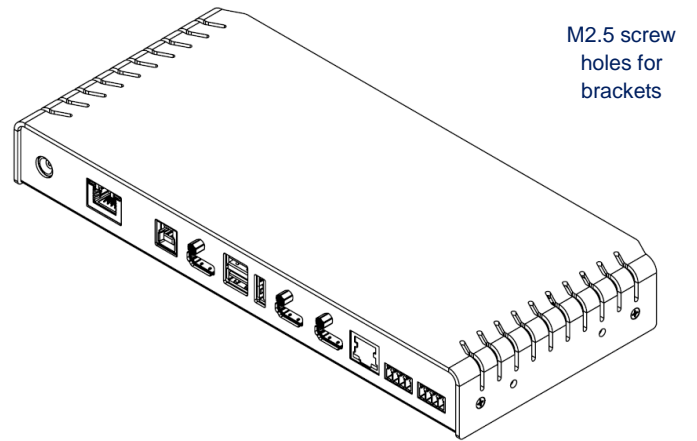
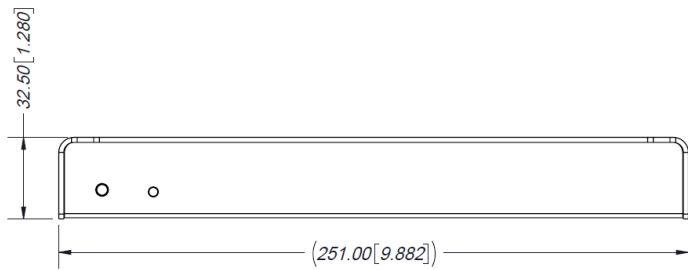
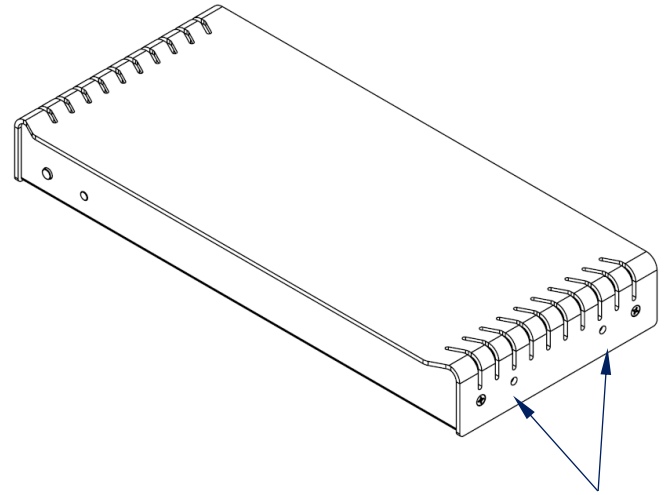
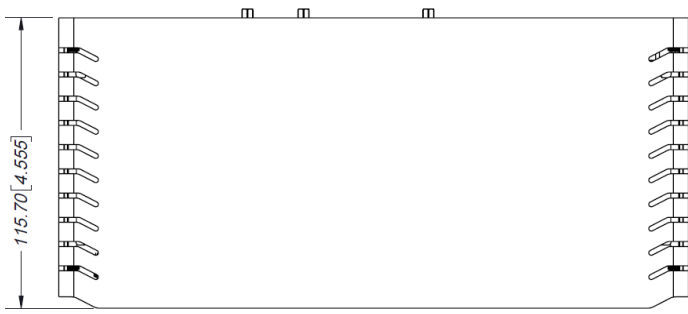


Figure 4: Top plate dimensions of RoomPC hub

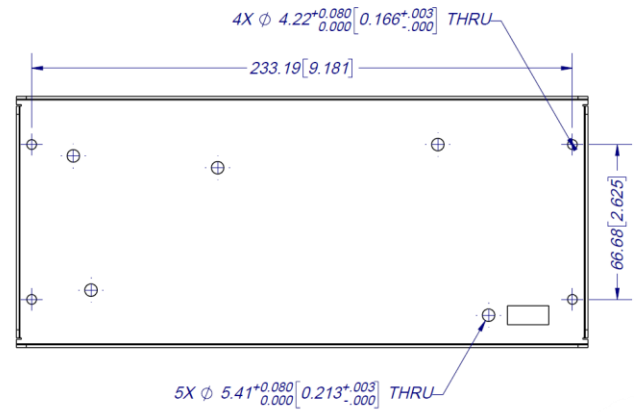
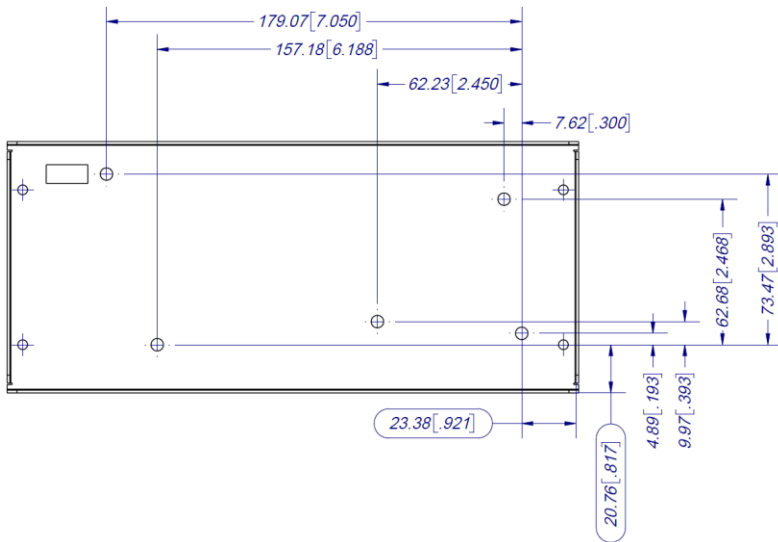


Figure 5: Bottom plate dimensions and holes positions of Room PC hub

# MOUNTING BRACKET

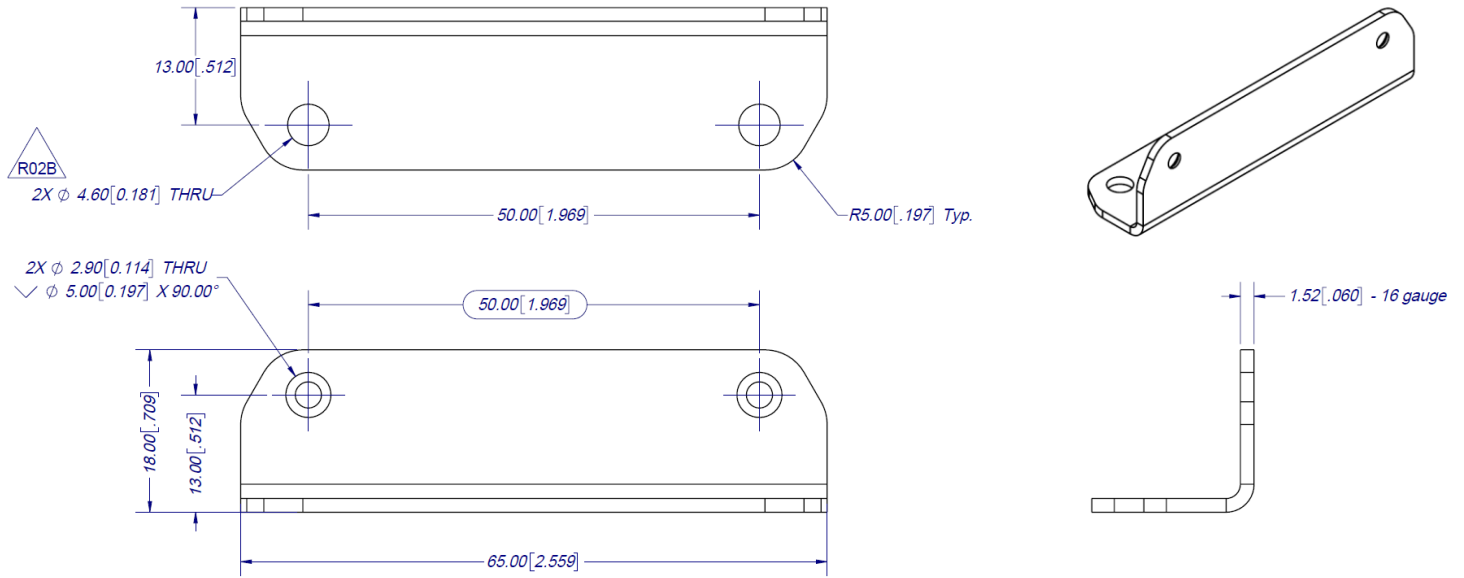


Figure 6: Bracket dimensions

# 160W POWER SUPPLY BRACKET

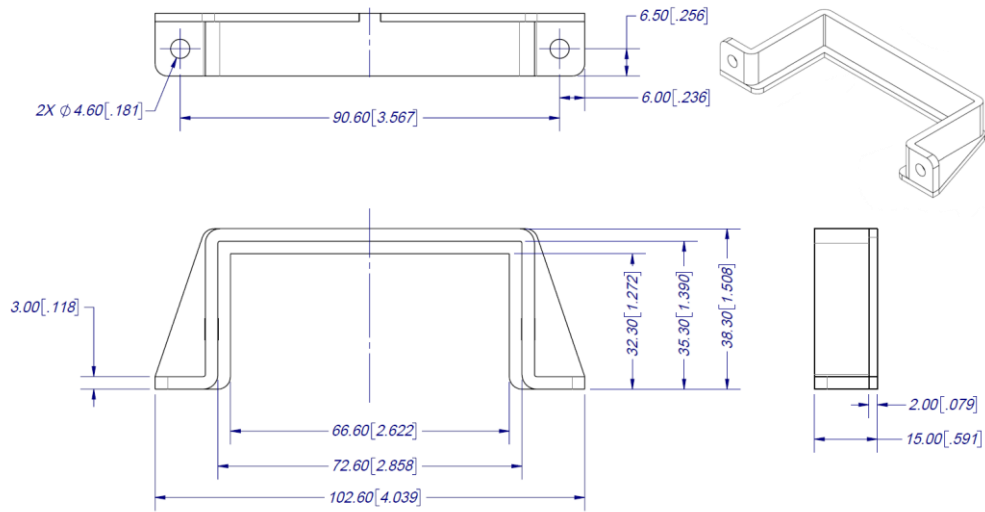


Figure 7: Power supply 160W bracket dimensions

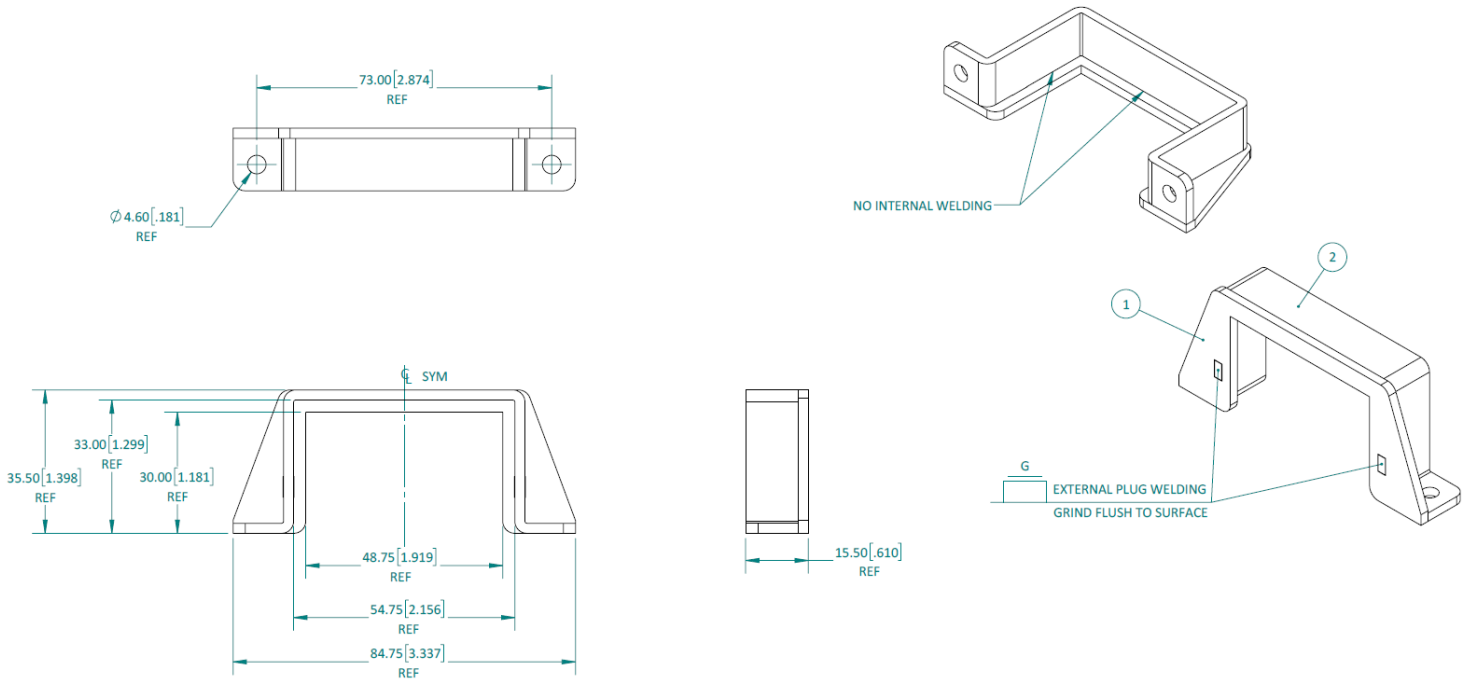


Figure 8: Power supply 36W bracket dimensions

## DIP SWITCHES

Here you can find the behavior of the DIP switches located at the back of the unit.

Switch	Position	Description
<b>SW1</b>	OFF	For future use.
	ON	
<b>SW2</b>	OFF	For future use.
	ON	
<b>SW3</b>	OFF	For future use.
	ON	
<b>SW4</b>	OFF	For future use.
	ON	
<b>SW5</b>	OFF	Reserved.
	ON	
<b>SW6</b>	OFF	Disable 5V on RS232 terminal block.
	ON	Enable 5V on RS232 terminal block. This switch must be set to power up the connected remote.

## TROUBLESHOOTING SECTION

Here is the troubleshooting section for the device.

Problem	Resolution
<b>My laptop is not charging using my USB-C cable.</b>	<p>Check if the cable is rated to support USB-C power delivery. Also check if the cable used is among the ones that we already support. Visit <a href="https://inogeni.com/product/toggle-rooms/">https://inogeni.com/product/toggle-rooms/</a> for the complete list.</p> <p>Make also sure that your BIOS and your system chipset drivers are up to date.</p>
<b>The device does not automatically switch USB host and HDMI source.</b>	<p>By default, the device is operating in “RoomPC with BYOD / content sharing” mode to avoid disruption of a current video meeting. See “Operation mode” API to properly set the operation you need.</p>
<b>My device is switching HDMI video slowly.</b>	<p>If your EDID mode is set to “passthrough”, the device is handshaking the EDID from the connected display to the source. This will take some time. To minimize video switching time, it is recommended to configure the EDID mode of the video sources to a preset EDID (e.g. 1080p60).</p>
<b>The Maestro software is not able to detect my device.</b>	<p>If you are connected to Toggle Rooms through the laptop connections (USB-C or USB-B/HDMI), please make sure the laptop is selected by using the front “LAPTOP HOSTS THE MEETING” button. When laptop is selected, this button will light up. The Maestro software will connect to the device through USB, this is why the device is not detected if the host is not properly selected.</p>

Engineered by video professionals, for video professionals, it is your most compatible USB 3.0 device. INOGENI expertise at your fingertips:

- **Expert Technical Support team** at [support@inogeni.com](mailto:support@inogeni.com) for immediate help or if you have any technical question about our products.
- Extensive **Knowledge Base** to learn from other customers' experiences.

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INOGENI, Inc.  
1045 Avenue Wilfrid-Pelletier  
Suite 101  
Québec, QC, Canada, G1W0C6  
(418) 651-3383

## CERTIFICATIONS



### FCC Radio Frequency Interference Statement Warning

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.

### IC Statement

This Class A digital apparatus complies with Canadian CAN ICES-3(A)/NMB-3(A).



### CE Statement

We, INOGENI Inc., declare under our sole responsibility that the Toggle Rooms, to which this declaration relates, is in conformity with European Standards EN 55032, EN 55035, and RoHS Directive 2011/65/EU + 2015/863/EU.



### UKCA Statement

This device is compliant with the Electromagnetic Compatibility Regulations 2016 No. 1091 as part of the requirements leading to the UKCA marking.



### WEEE Statement

The European Union has established regulations for the collection and recycling of all waste electrical and electronic equipment (WEEE). Implementation of WEEE regulations may vary slightly by individual EU member states. Please check with your local and state government guidelines for safe disposal and recycling or contact your national WEEE recycling agency for more information.



### RCM Statement

This device is compliant with Regulator Compliance Mark (RCM) certification.