INOGENI

INOGENI TOGGLE ROOMS XT

User guide

Version 1.5

May 29, 2025

VERSION HISTORY

Version	Date	Description
1.0	October 11, 2024	First release. Preliminary version.
1.1	November 18, 2024	- Added precisions to API.
1.2	December 10, 2024	- Adding precision to RESTAPI. - Adding web interface section.
1.3	March 12, 2025	- Adding precisions to Maestro application.
1.4	April 11, 2025	- Adding precisions to Maestro application.
1.5	May 29, 2025	- Adding precisions on the LINKSTATUS command.

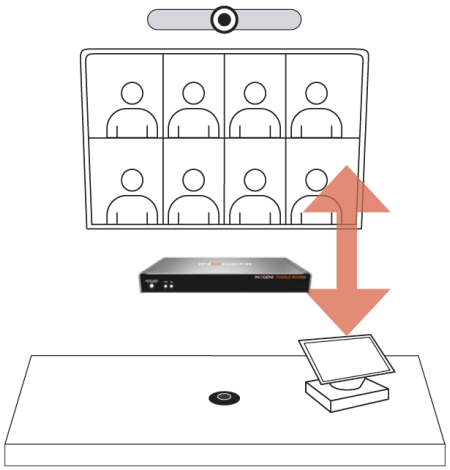
CONTENTS

TYPICAL APPLICATIONS

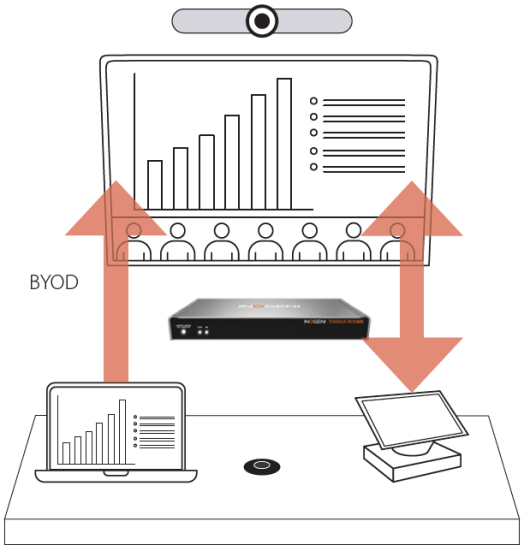
Here is a typical connection diagram used for the TOGGLE ROOMS device in a videoconferencing setup.

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.

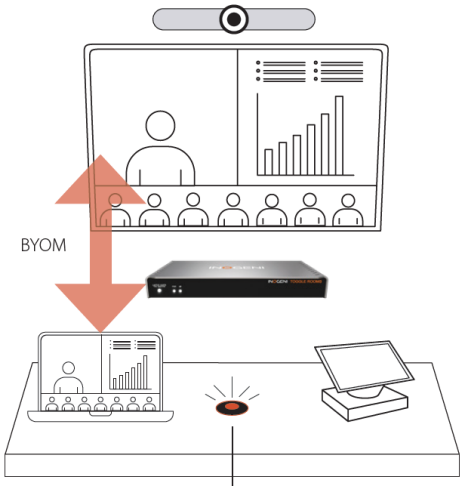


The Room PC is the system that is currently selected to the main USB and HDMI peripherals. However, if the user would like to send HDMI content from the laptop's USB-C or HDMI connection to the Room PC, it is possible to do so with the HDMI SHARE output connection.



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.

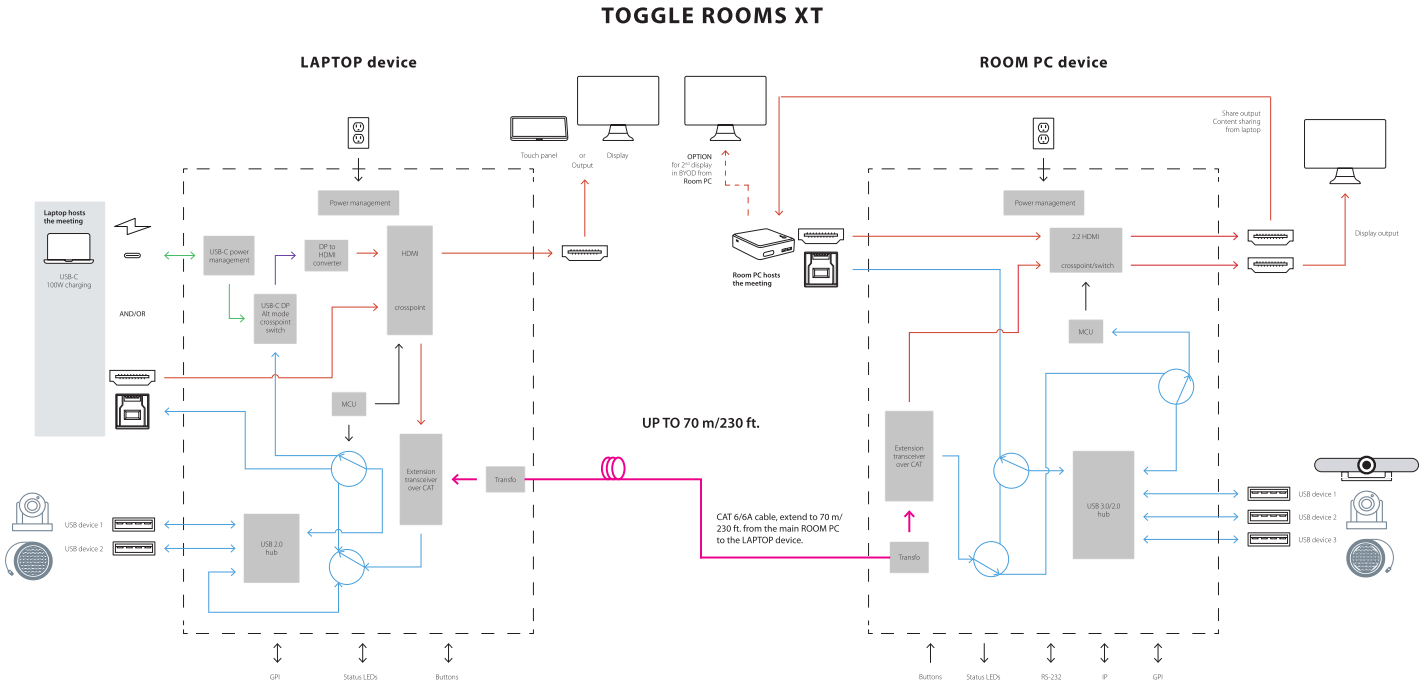


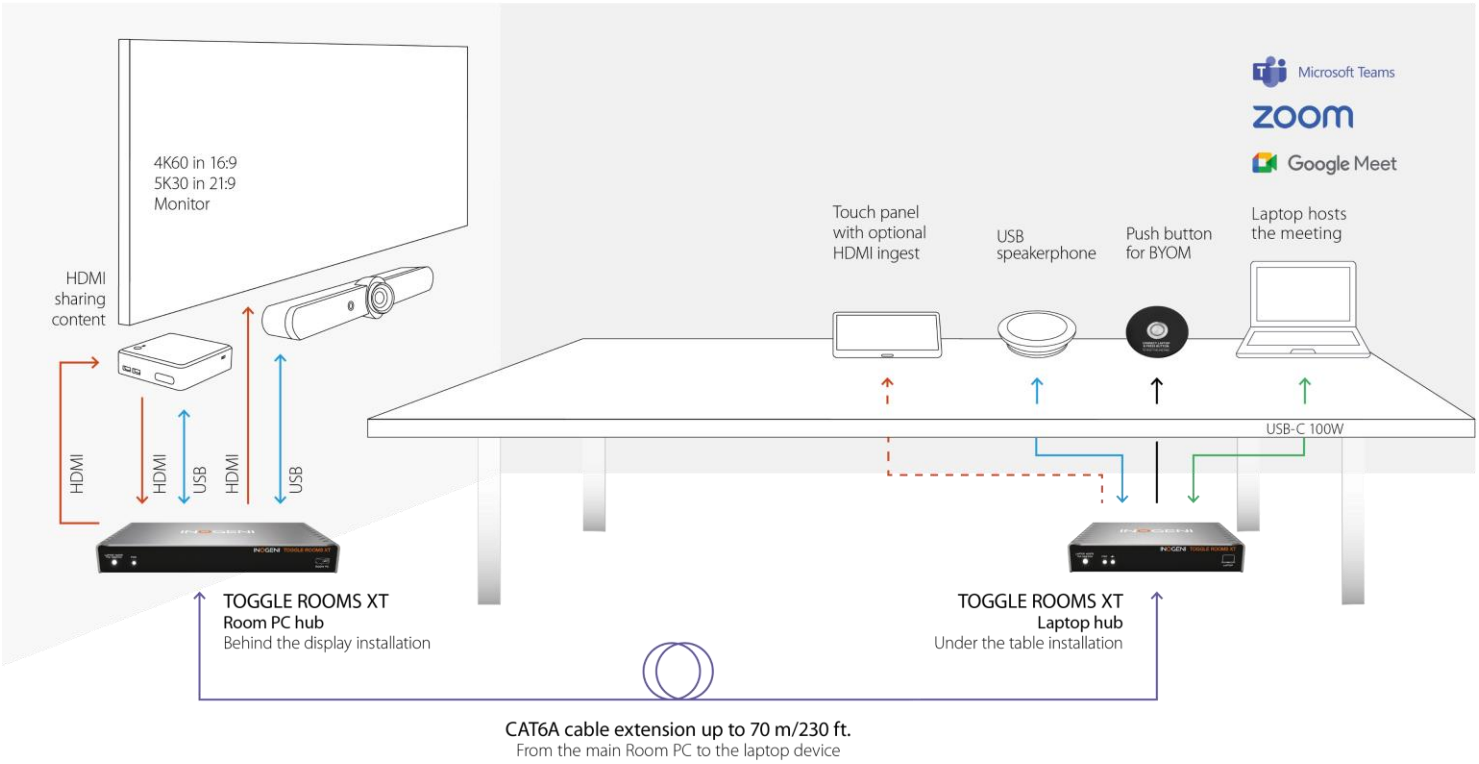
Figure 1: Basic block diagram when RoomPC and content sharing mode is activated.

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

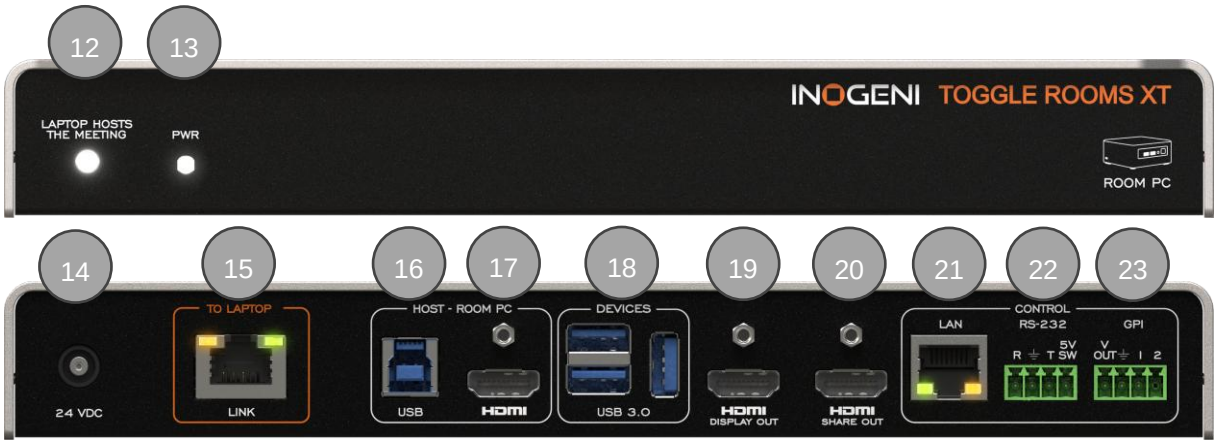


DEVICE INTERFACES

Here are the devices interfaces.

LAPTOP HUB

ROOMPC HUB



		Items
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.

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

LEDS BEHAVIOR

Here are the LEDs behavior:

LAPTOP HOSTS THE MEETING	
OFF	Laptop not selected.
SOLID	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: - **1x** pulse: the “Laptop USB-C” host is selected. - **2x** pulses: the “Laptop USB-B + HDMI” host is selected.
BLINK	Error condition. 1. When the user tries to switch to laptop if this one is not present or if USB or HDMI connections are missing. 2. When the user tries to switch host if button is locked through our API.
PWR	
OFF	Device not powered.
SOLID	Device powered.
Charging	
OFF	Laptop is not charging.
SOLID	Laptop is charging.
Link Orange LED	
OFF	No HDBaseT connection detected.
SOLID	HDBaseT connection detected.
Link Green LED	
OFF	No video signal over HDBaseT connection.
SOLID	Video signal with HDCP content.
BLINK	Video signal with no HDCP content.

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

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

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

MANUAL WITH FALLBACK

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

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.

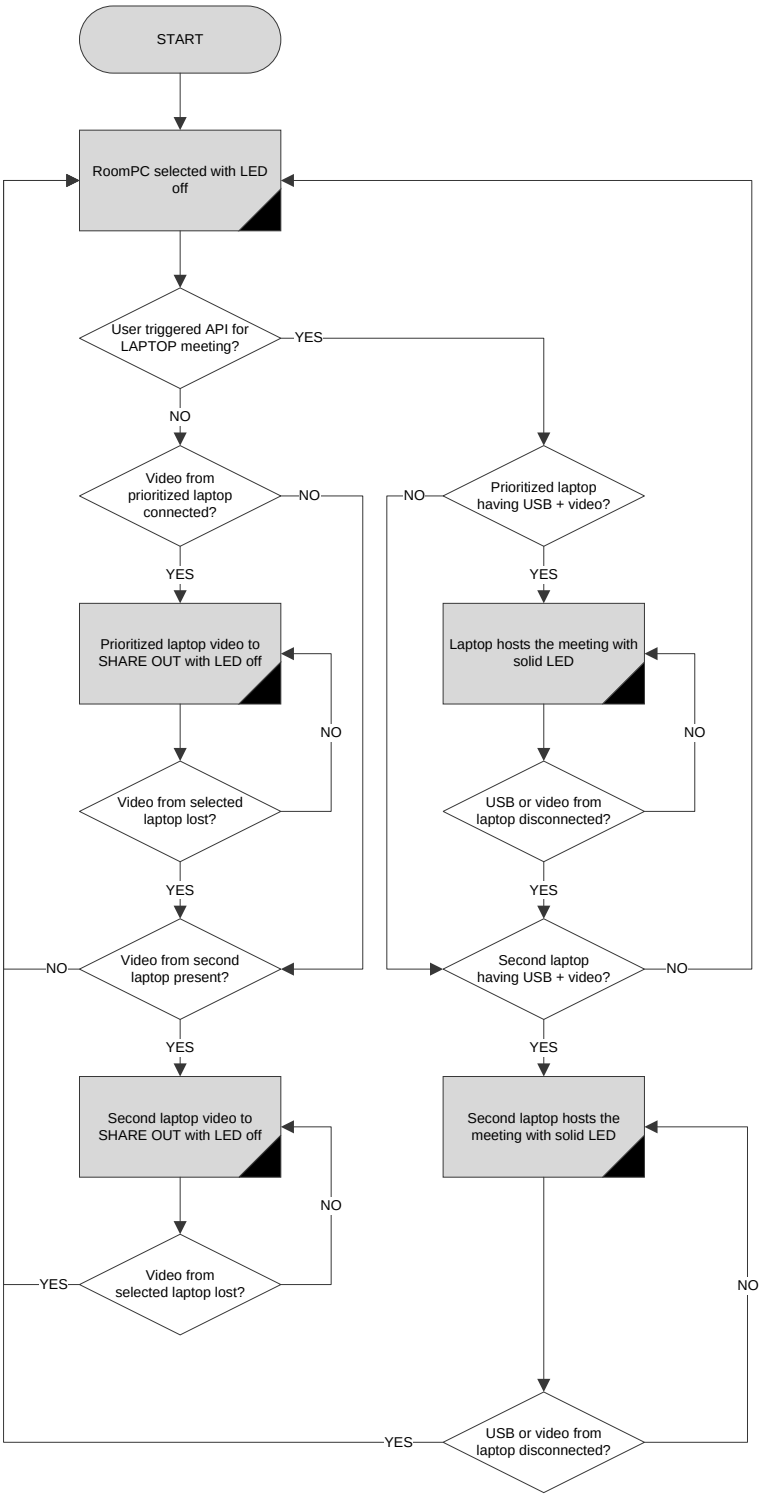
Applicable only on the USB host switching mode.

HDMI FOLLOWS USB

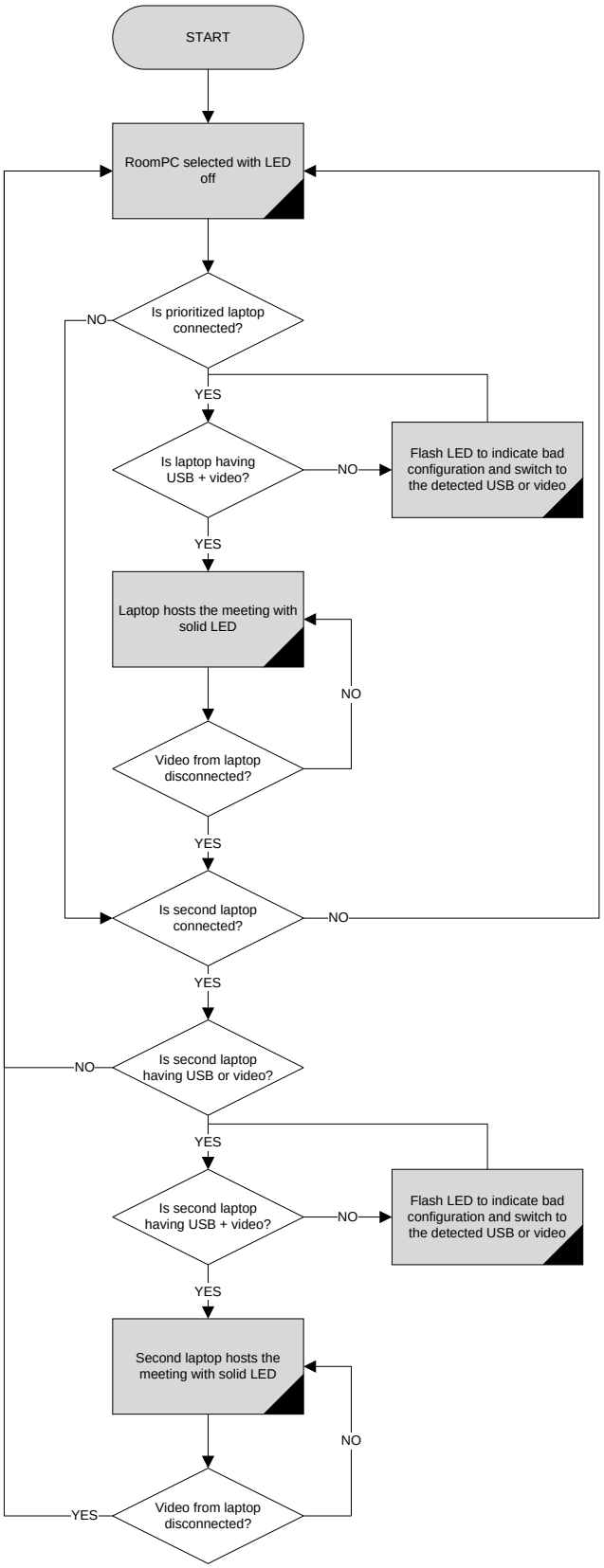
In this mode, the HDMI source selection depends on the USB host selected. If the USB host switching mode is set to "Automatic", the selected HDMI display source will be the one associated to the last detected USB host.

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	
Description	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.
Link technology	HDBaseT 3.0
Link range	Up to 40 m when using 4K60 Up to 70 m when using 1080p60
Link medium	CAT6A U/FTP

Laptop hub	
USB-C connector (host #1)	Supports USB-C DisplayPort Alternate Mode • DisplayPort up to 3840x2160p60 / 4096x2160p60 • USB 2.0 (480 Mbps) • Charges up to 100W • USB-C cable locking option
USB connector (host #2)	USB 2.0 Type-B
HDMI input connector (host #2)	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
HDMI output connector	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
USB devices connectors	USB 2.0 Type-A ports for peripherals
LINK connector	HDBaseT 3.0 interface
GPI	4-POS terminal block connector 2x Contact-closure control GPI: • Controlled by open-drain IO (short to ground) or driven IO • Supported voltage range: 0 to 12V max • Voltage threshold is 2.3V VOUT: • Able to power up the LED on the button of our INO-Button accessory • Logic-low level: 0 @ 0.5V • Logic-high level: 4.5 @ 5V
Power connector	24VDC/160W

Room PC hub	
LINK connector	HDBaseT 3.0 interface
USB connector (host #3)	USB 3.0 Type-B / 5 Gbps
HDMI input connector (host #3)	Up to 3840x2160p60 / 4096x2160p60 Cable locking option
HDMI display output	Up to 3840x2160p60 / 4096x2160p60 HDMI with cable locking option
HDMI share output	Up to 3840x2160p60 / 4096x2160p60 HDMI with cable locking option
USB devices	3x USB 3.0 Type-A ports. 1.8A shared between downstream ports
GPI	4-POS terminal block connector 2x Contact-closure control GPI: • Controlled by open-drain IO (short to ground) or driven IO • Supported voltage range: 0 to 12V max • Voltage threshold is 2.3V VOUT: • Able to power up the LED on the button of our INO-Button accessory • Logic-low level: 0 @ 0.5V • Logic-high level: 4.5 @ 5V
IP interface	10/100Mbps Supports DHCP or static addressing IP control available through RESTAPI and Telnet connections
RS-232 interface	4-pos terminal block connector Baud rates: 9600 [default], 19200, 38400 and 115200 Data bits: 8

	Stop bits: 1 Parity: None Flow control: None
Power connector	24VDC/36W

HDMI video	
HDCP compliance	Compliant with HDCP2.3, HDCP2.2 and HDCP1.4
HDMI compliance	Compliant with HDMI2.0b, HDMI1.4 and DVI1.0
Sampling frequency	600MHz
Video scaling	Crosspoint switch supports video downscaling from 4K to 1080p.
Chroma subsampling	YUV/RGB 4:4:4, 4:2:2
CEC	Ability to send CEC commands to connected HDMI display sink.

HDMI audio	
Audio	Audio passthrough from input to output
Formats	LPCM, Dolby Digital, DTS up to 192kHz

Control	
Control options	Front button – For laptop selection RS232 GPI LAN USB

Compatibility	
Operating system	NO driver installation necessary Windows 7 and above (32/64-bit) macOS 10.10 and above Linux (kernel v2.6.38 and above)

Physical details	
Room PC hub - Dimensions (W x L x H)	25.10 cm x 11.57 cm x 3.26 cm 9.88” x 4.56” x 1.28”
Room PC hub - Power supply	36W (85-264VAC 50/60Hz to 24V/1.5A DC)
Room PC hub - Weight	760 g (1.68 lbs)
Laptop hub - Dimensions (W x L x H)	18.4 cm x 11.57 cm x 3.26 cm 7.24” x 4.56” x 1.28”
Laptop hub - Power supply	160W (85-264VAC 50/60Hz to 24V/6.67A DC)
Laptop hub - Weight	580 g (1.28 lbs)
Package contents	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
Operating temperature	0°C to 45°C 32°F to 113°F
Storage temperature	-40°C to 105°C -40°F to 221°F
Relative humidity	0% to 90% non-condensing
Mounting options	Ability to mount under the table or on a wall

Information	
UPC code - US & CAN	051497418717
UPC code - International market EU/UK/AU/BIS/	051497418724
Origin	Canada
Warranty	5 years

Certifications	
Device	FCC, CE, UKCA, RoHS, IEC62368, RCM, SoV
Power supply	FCC, CE, UKCA, RoHS, IEC62368, RCM, CCC, CB, EAC, VI, UL
TAA-compliance	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.

Pin 1: Receive
Pin 2: GND
Pin 3: Transmit
Pin 4: 5V supply (for INOGENI Remote)

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. By default, no authentication is required to perform action using the REST API. Authentication can be enabled through the embedded webpage or the REST API itself.

Command URL / Description	Body arguments	Return body

HTTP POST
https://<IP>/api/v1/
changePassword
 	
Change the password to <newPassword>.
	{
	"oldPassword": "<oldPassword>",
	"newPassword": "<newPassword>"
	}
		{
		"message": <String>
		}

HTTP GET
https://<IP>/api/v1/
accessToken
 	
Return the bearer token.
		{
		"token": <String>
		"message": <String>
		}

HTTP POST
https://<IP>/api/v1/
accessToken
 	
Generate random access token and activate bearer token authentication for REST API.
		{
		"token": <String>
		"message": <String>
		}

HTTP DELETE
https://<IP>/api/v1/
accessToken
 	
Delete and deactivate bearer token.
		{
		"message": <String>
		}

HTTP GET
https://<IP>/api/v1/
accessTokenEn?
enable=<number>
 	
Activate (1) or Deactivate (0) access token for REST APIss
		{
		"message": <String>
		}

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
AUTOHDMICECPWR - autoHdmiCecPwr	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> }
BAUDRATE - baudrate	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> }
BTNLOCK - btnLock	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> }
CECPASSTHROUGHEN - cecPassthroughEn	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> }
CECTOGGLEMUTE - cecToggleMute	Toggle mute control.	**TX**		ACK**<CR><LF>**		{ "message": <String> }
CECVOLDOWN - cecVolDown	Decrease display volume.	**TX**		ACK**<CR><LF>**		{ "message": <String> }
CECVOLUP - cecVolUp	Increase display volume.	**TX**		ACK**<CR><LF>**		{ "message": <String> }
DISPLAYSRC - displaySrc	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>
						}

DISPLAYSWMODE
-
displaySwMode
	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>
						}

EDID
-
edid
	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>
						}

EDIDHDMIOUT
-
edidHdmiOut
	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>
						}

EDIDUSR
-
edidUsr
	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
		RX	<src>	EDIDUSR=<edidUsr>**<CR><LF>**
				ACK**<CR><LF>**
					src=<src>	{
						"edidUsr": <edidUsr>,
						"message": <String>
						}

GPICFG
-
gpiCfg
	Get/Set the GPI configuration.
	
	NOTE:
	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>
						}

HDCPCTL
-
hdcpCtl
	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>
						}

HELP **-** **help**	Return commands list with description.	**RX**		List of all the supported commands.		List of all the supported commands.

HOSTBUTTON
-
hostButton
	This function gives the same functionality as the front button or the INO – BUTTON KIT action.	**TX**		ACK**<CR><LF>**		{
						"message": <String>
						}

HOSTMEETING
-
hostMeeting
	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				

HOSTNAME
-
hostname
	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
	
	<hostname> option:
	String defined hostname to be shown on the network and USB HID interface. This string must not have space characters.
		TX <hostname>	ACK**<CR><LF>**	hostname=<hostname>	{
					"message": <String>
					}

		RX	HOSTNAME=<src>**<CR><LF>**
			ACK**<CR><LF>**
					{
					"hostname": <host>,
					"message": <String>
					}

HTTPEN
-
httpEn
	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>
					}

LAPTOPSRC
-
laptopSrc
	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>
					}

LINKSTATUS
-
link
	Get HDBaseT link status
	
	<status> indicates the link status.
	0 => No link
	1 => Active link
	If no active link is detected, next values should be ignored.
	
	<len> indicates the estimated length in meters.
	
	<q> indicates the quality factor.
	
	HDBTMAXERR, **HDBTMSE** and **HDBTMSEWINDOW** fields will report the associated measurement to a specific channel **<chX>** of the HDBaseT connection.
	
	The HDBTMAXERR will report the current errors measured over the link.
	
	For an appropriate measurement of the signal quality, we recommend getting the HDBTMSE and HDBTMSEWINDOW values to calculate the signal to noise ratio associated to a specific channel using the following formula:
		TX	HDBTLINK=<status>**<CR><LF>**
			HDBTCABLEL=<len>**<CR><LF>**
			HDBTCABLEQ=<q>**<CR><LF>**
			HDBTMAXERR=<cha>, <chb>
			<chc>, <chd>**<CR><LF>**
			HDBTMSE=<cha>, <chb>
			<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
	MSE (dB) $= 10 \cdot \log_{10}\left(\frac{\text{HDBTMSE+1}}{2^{14} \cdot \text{HDBTMSEWINDOW}[i]}\right)$ If MSE > -9 dB, the current link is bad. **<ret>** indicates the retransmission rate over the link. 0 => No retransmission				

NETWORK - network	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.
	
	<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
		TX	<mode> <ip> <netmask> <gateway>	ACK**<CR><LF>**	mode=<mode>
					ip=<ip>
					netmask=<netmask>
					gateway=<gateway>
						{
						"message": <String>
						}

		RX		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>
						}

OPMODE - opMode	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.
	
	<opMode> options:
	0 => RoomPC with BYOD/content sharing [default]
	1 => BYOM
	2 => Custom
		TX	<opMode>	ACK**<CR><LF>**	opMode=<opMode>	{
						"message": <String>
						}

		RX		OPMODE=<src>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"opMode": <opMode>,
						"message": <String>
						}

PRIORDISPLAYSRC - priorDisplaySrc	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”.
		TX	<src>	ACK**<CR><LF>**	priorDisplaySrc=<src>	{
						"message": <String>
						}

API command (RS232 - RESTAPI)	Description		RS232 payload	RS232 return	RESTAPI payload	RESTAPI return

	<src> options:
	0 => RoomPC
	1 => Laptop USB-C
	2 => Laptop HDMI
	3 => Last detected source [default]
		RX		PRIORDISPLAYSRC=<src>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"priorDisplaySrc": <host>,
						"message": <String>
						}

PRIORHOSTMEETING
-
priorHostMeeting
	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” and “BYOM”.
	
	<host> options:
	1 => Laptop USB-C
	2 => Laptop USB-B/HDMI
	3 => Last detected laptop [default]
		TX	<host>	ACK**<CR><LF>**	host=<host>	{
						"message": <String>
						}

		RX		PRIORHOSTMEETING=<host>**<CR><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>
						}

API command (RS232 - RESTAPI)	Description		RS232 payload	RS232 return	RESTAPI payload	RESTAPI return

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>
						}

SHARESRC
-
shareSrc
	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>
						}

SHARESWMODE
-
shareSwMode
	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>
						}

STATUS **-** **status**	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.

TELNETEN
-
telnetEn
	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>
						}

USBDEVEN
-
usbDevEn
	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.
		TX	<host> <devices>	ACK**<CR><LF>**	host=<host>
					devices=<devices>
						{
						"message": <String>
						}

API command (RS232 - RESTAPI)	Description		RS232 payload	RS232 return	RESTAPI payload	RESTAPI return

	
	<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
		RX	<host>	DEVICES=<devices>**<CR><LF>**
				ACK**<CR><LF>**
					host=<host>	{
						"devices": <devices>,
						"message": <String>
						}

USBHOST - usbHost	Get/Set USB host to use.
	
	<host> options:
	0 => RoomPC
	1 => Laptop USB-C
	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.
		TX	<host>	ACK**<CR><LF>**	usbHost=<host>	{
						"message": <String>
						}

		RX		USBHOST=<host>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"usbHost": <host>,
						"message": <String>
						}

USBHOSTSWMODE - usbHostSwMode	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>	{
						"message": <String>
						}

		RX		USBHOSTSWMODE=<host>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"usbHostSwMode": <swMode>,
						"message": <String>
						}

VERSION - version	Return firmware version.	**RX**		MAJOR=<Integer>**<CR><LF>**
				MINOR=<Integer>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"major": <Integer>,
						"minor": <Integer>
						}

VOUT - vout	Get/Set the VOUT level.
	
	NOTE:
	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>	{
						"message": <String>
						}

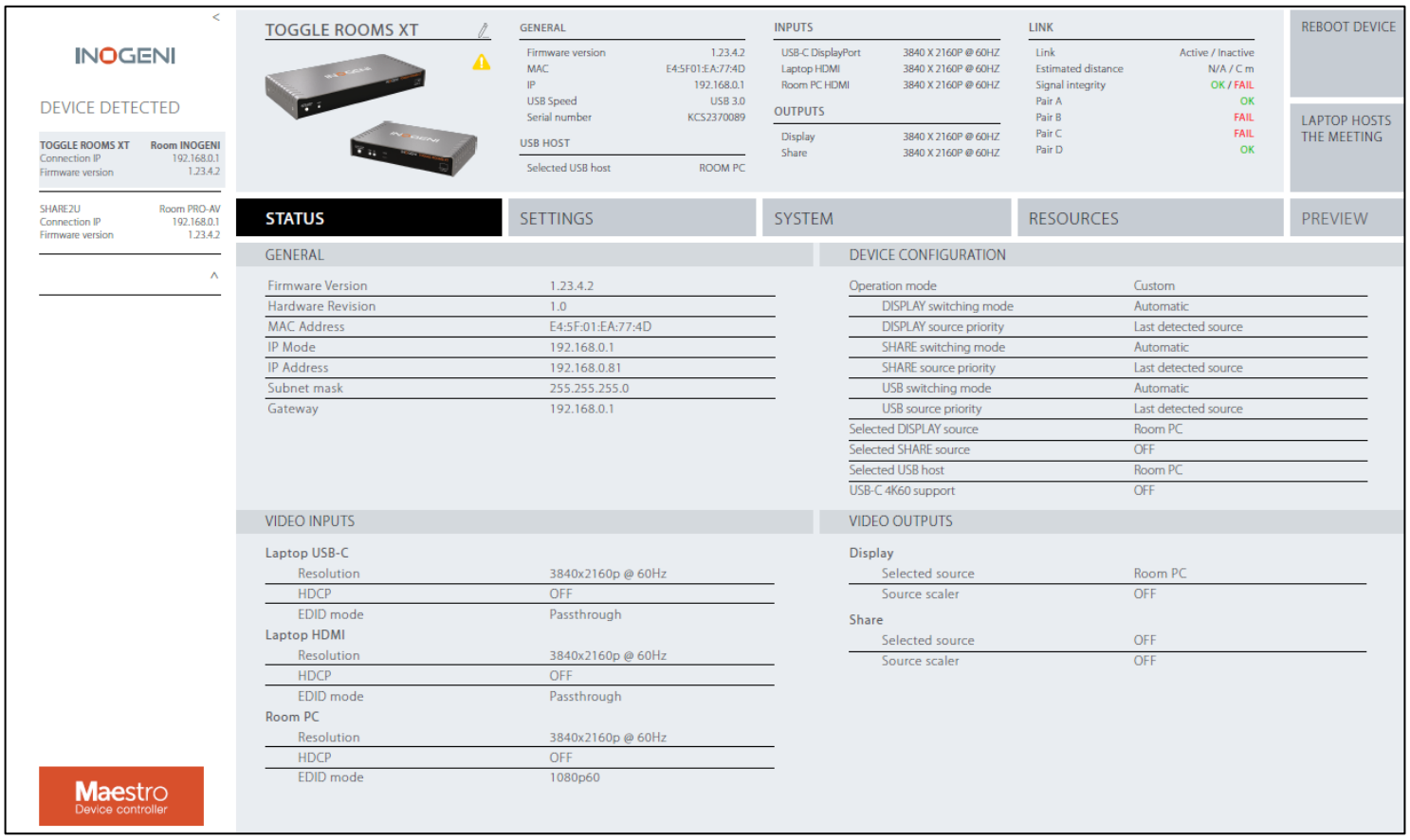
		RX		VOUT=<vout>**<CR><LF>**
				ACK**<CR><LF>**
						{
						"vout": <vout>,
						"message": <String>
						}

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.

Be sure to use INOGENI Maestro v2.0.0 or later.



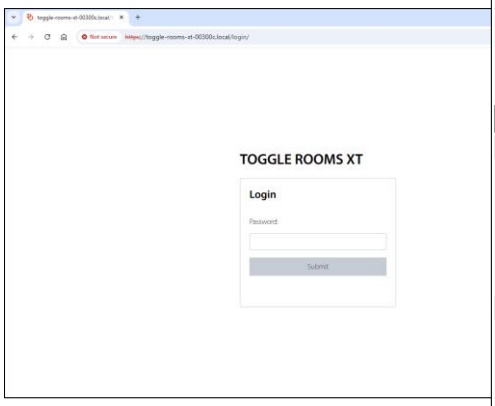
WEB INTERFACE ACCESS

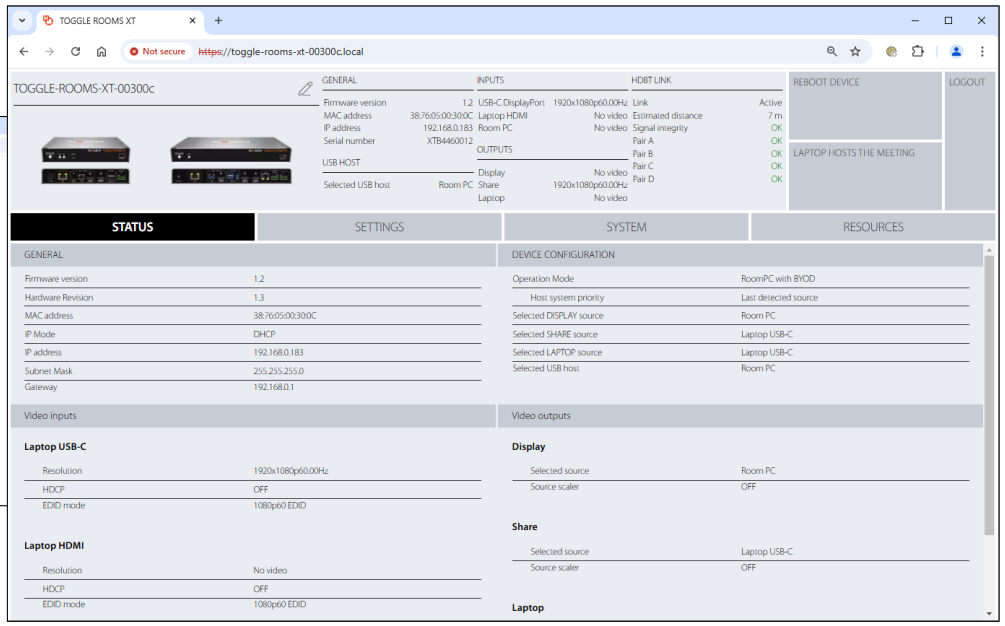
A web interface is available for the device. This one is accessible through your network.

Since the device supports the mDNS networking protocol, you can access the web interface of the device using the link-local networking URL below the device next to the MAC address under the RoomPC hub. This URL will end with the **.local** suffix like shown in this example:

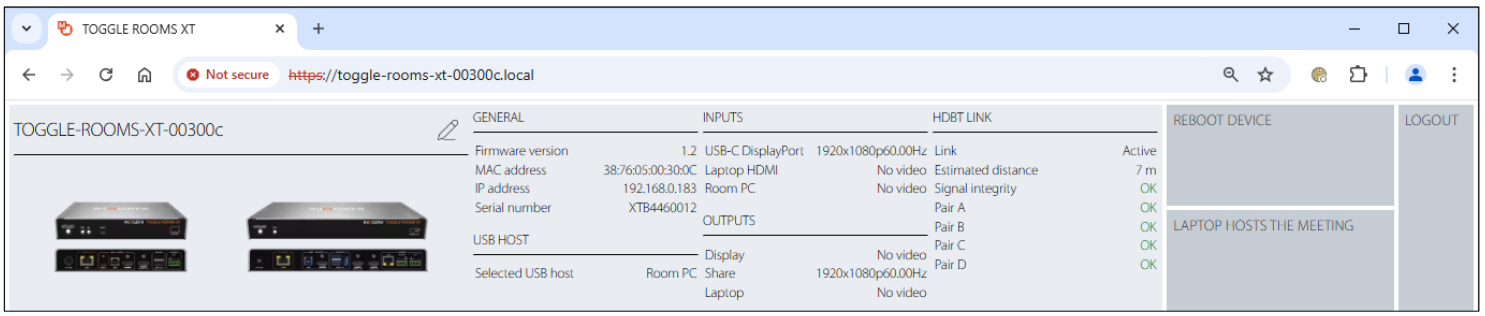
38:76:05:00:80:00
toggle-rooms-xt-008000.local

You can access the device using any browser and enter the URL with the **.local** suffix or the IP address of the unit if you have this information. You will be prompted with a login dialog. At first connection, the device will ask you to configure a new password.





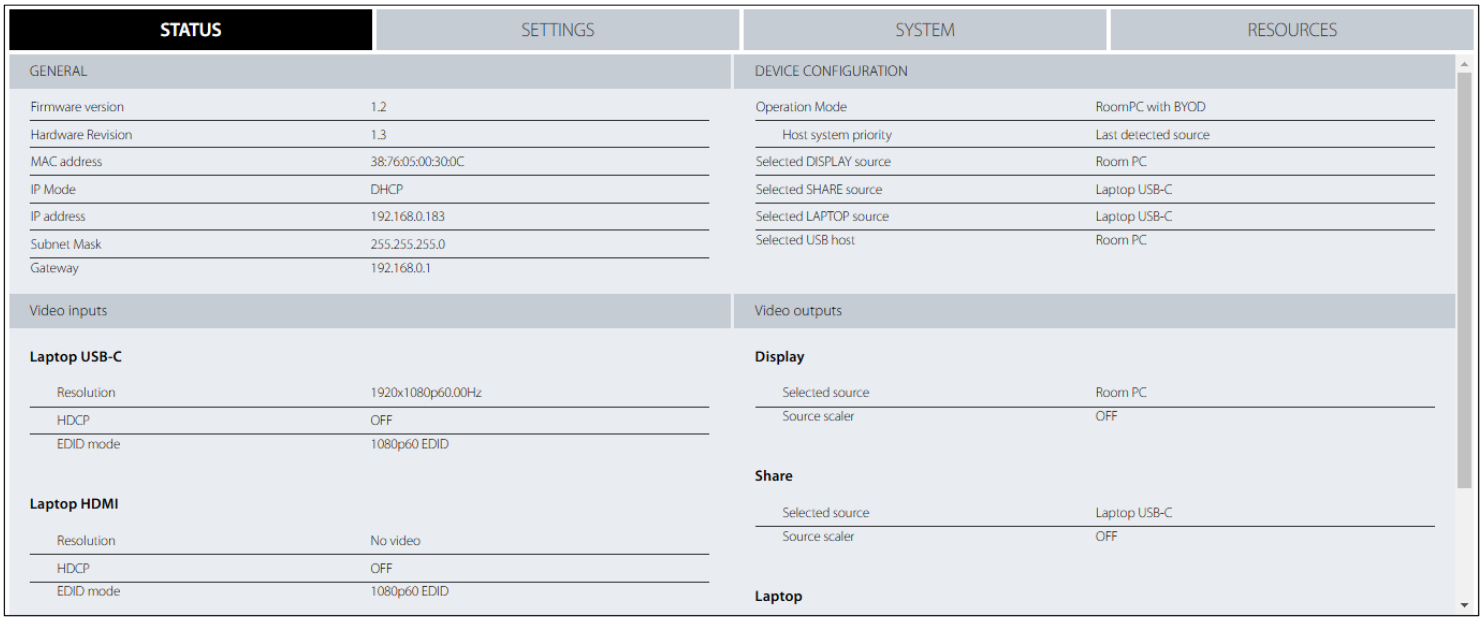
When you enter the web interface, you will get access to the general information of the device. This information is always available when you navigate through the tabs.



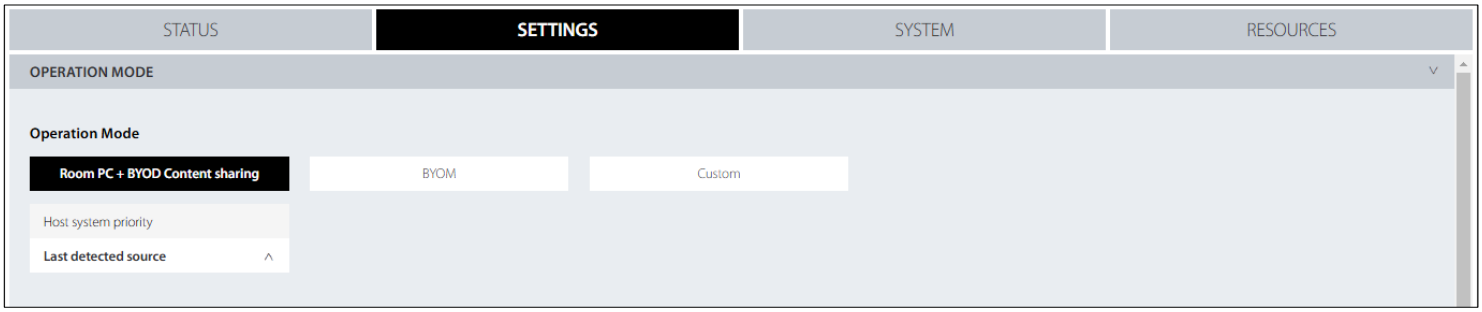
- General section with firmware version, MAC address, IP address and serial number of the unit.
- USB host selected
- Status of video inputs and outputs
- HDBaseT / Link information like estimated distance and signal integrity over the CAT cable pairs.
- Buttons to reboot the unit, initiate a “laptop hosts the meeting” trigger and the logout action.

STATUS TAB

This section contains all the firmware information, video sources detections/resolutions along with the actual configuration of the unit.



SETTINGS TAB



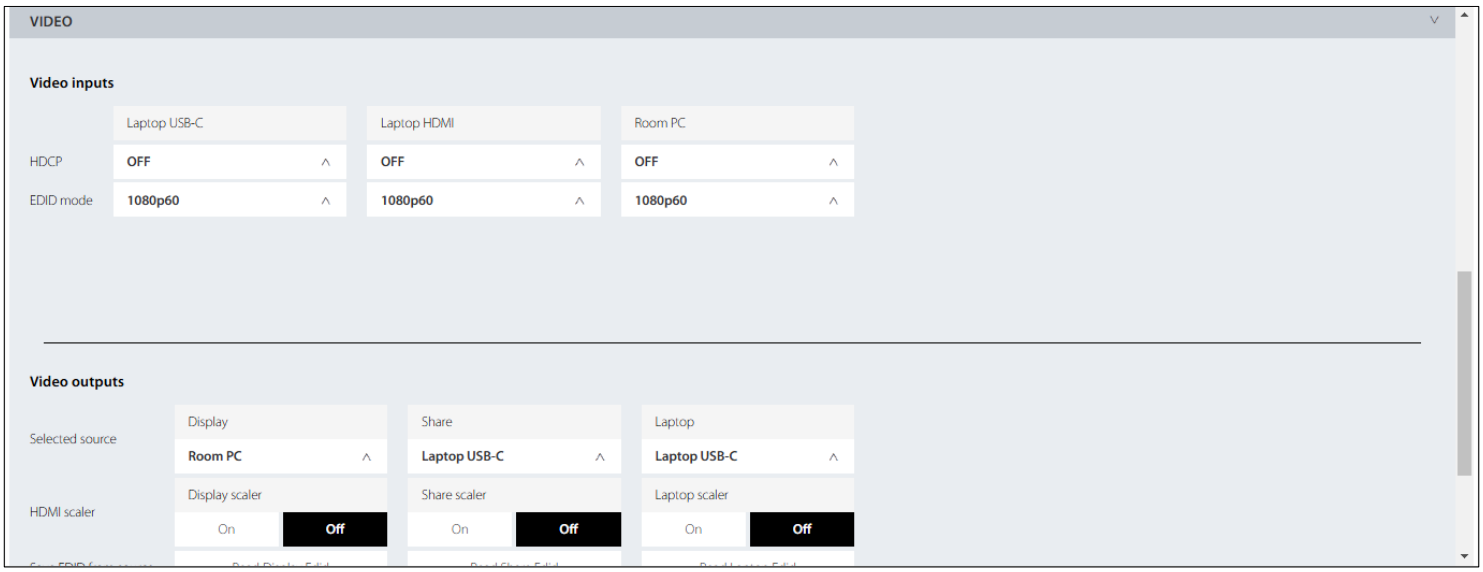
OPERATION MODE

- Change the operation mode of the unit.
    - RoomPC + BYOD Content sharing
        - In this mode, as soon as a laptop is connected to the device, video will be routed to HDMI SHARE OUT for content sharing. USB devices are not switched to the laptop in order to avoid disrupting video call on RoomPC. A user trigger (front button, INO – BUTTON KIT our API call) needs to be done to initiate BYOM session.
    - BYOM
        - In this mode, switching between RoomPC and BYOM is automatic upon host detection.
    - Custom mode
        - In this mode, USB, HDMI display and HDMI share switching modes can be independently controlled.

USB

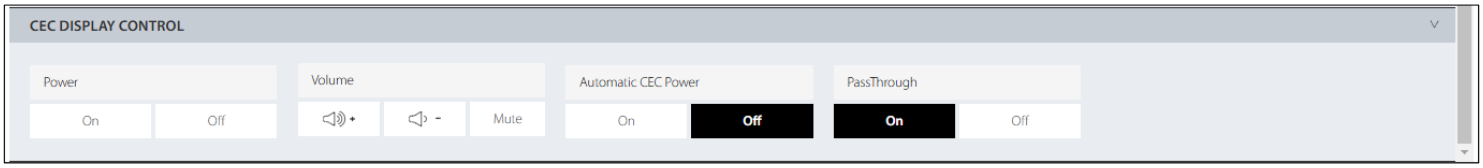
- USB configuration
  - User can select the USB host.
  - USB devices power control
    - This control allows you to turn ON/OFF USB power on each port depending on the host selected.
      - This can be useful when unit is connected to a Room PC system which have BYOM support.

VIDEO



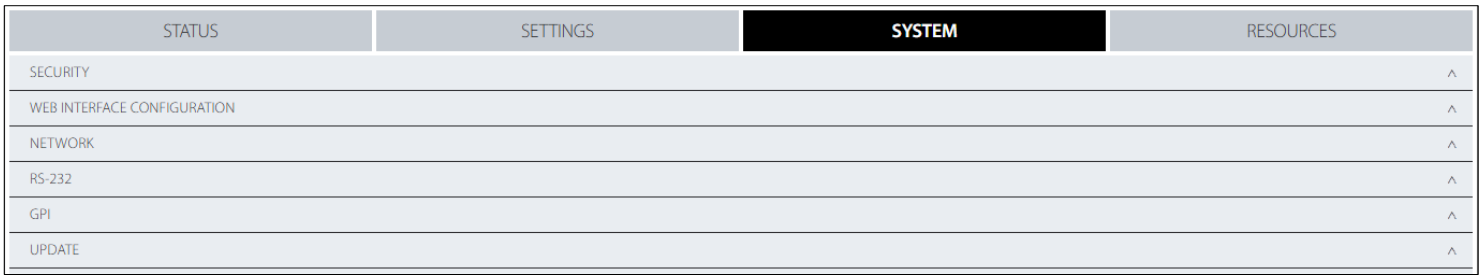
- Video inputs
  - HDCP
    - Can be turned ON/OFF and appropriate HDCP version can be set.
  - EDID mode
    - Can report EDID information based on actual display, using preset EDIDs or using a user EDID that can be uploaded to the device.
- Video outputs
  - User can select video source to be shown on specified output.

CEC DISPLAY CONTROL



- Power
    - Can turn ON/OFF connected display.
- Volume
    - Can send volume UP/DOWN commands.
    - Can send toggle mute command.
- Automatic CEC power
    - Device can automatically send power ON/OFF commands to display when selected video sources is detected or not.

SYSTEM TAB



SECURITY

- Login info
    - Ability to change the current password of the device.
- Telnet connection
    - Allows the device to be connected to a telnet client.

WEB INTERFACE CONFIGURATION

- Ability to turn on or off the HTTP server.
- Allows the authentication token.
- API access token can be accessed, generated or deleted using those buttons.

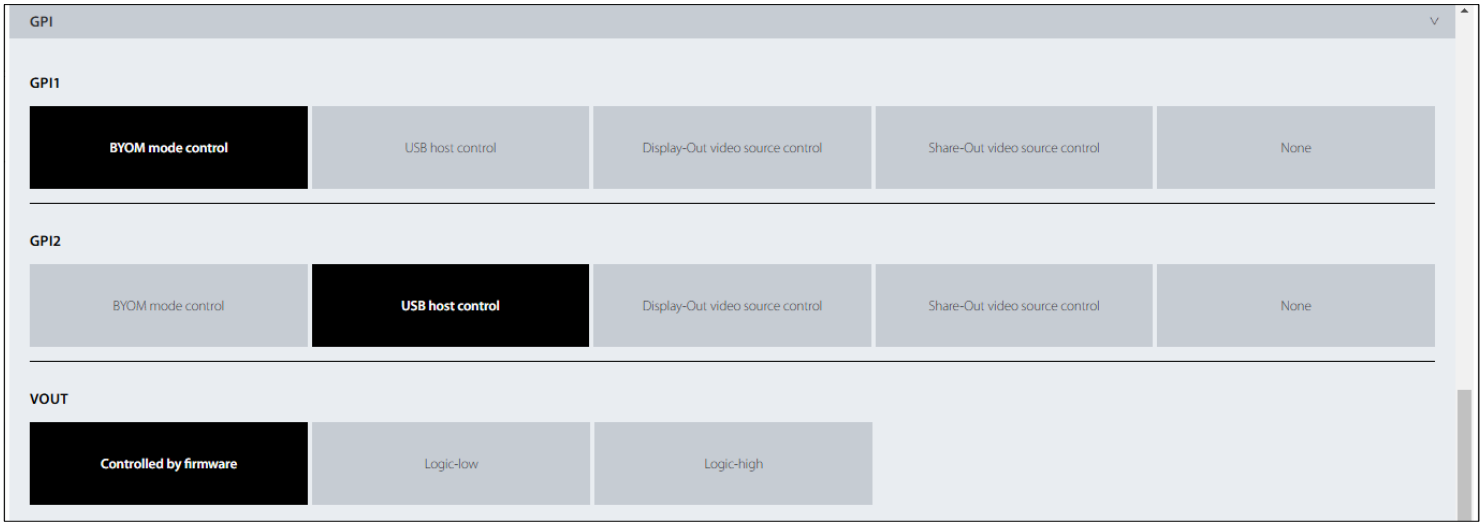
NETWORK

- IP mode
  - Device can be configured using DHCP or static IP address.
  - If static IP addressing is selected, you can set IP address, subnet mask and gateway.

RS232

- Baud rate
  - The baud rate of the RS232 port can be set here.

GPI

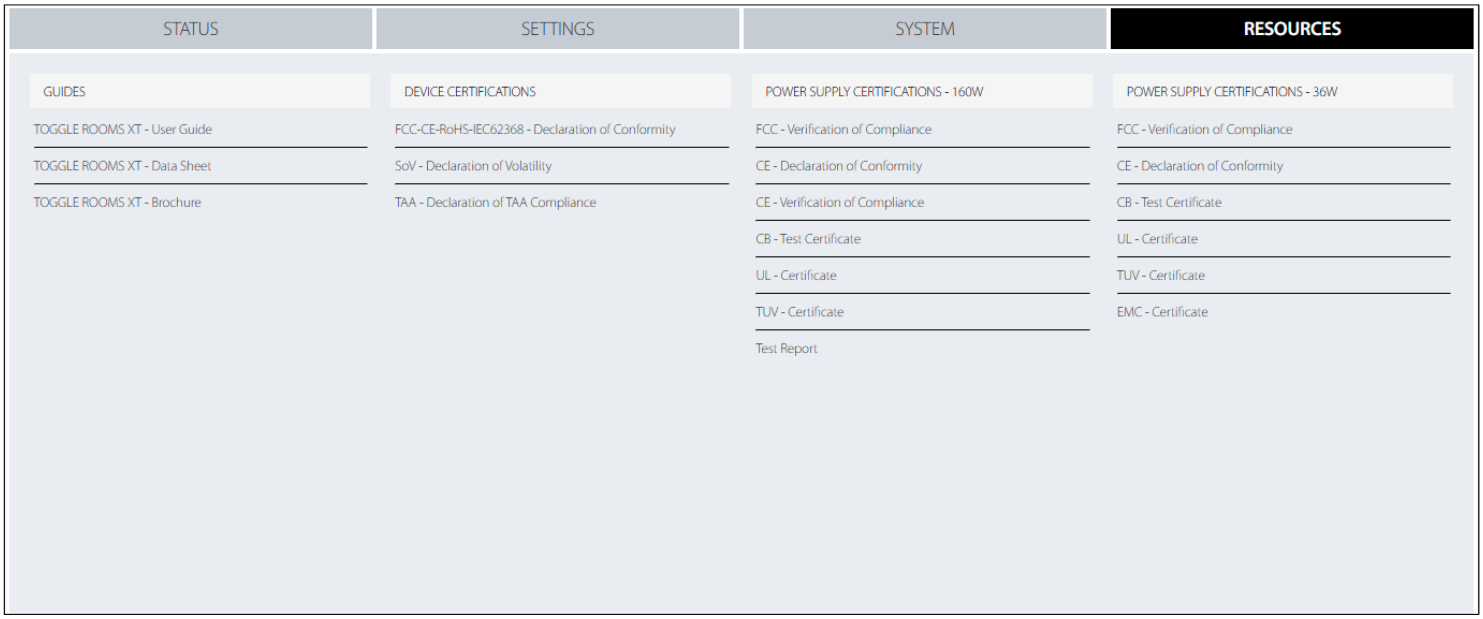


- GPI functions are set here.
- The VOUT pin can also be configured.

UPDATE

- You can force a specific firmware package (ZIP file) after clicking on the Browse button. Click on “Upload” button to proceed to the update.
- If you need to do a factory reset of the product, you can click on the “Reset” button.

RESOURCES TAB

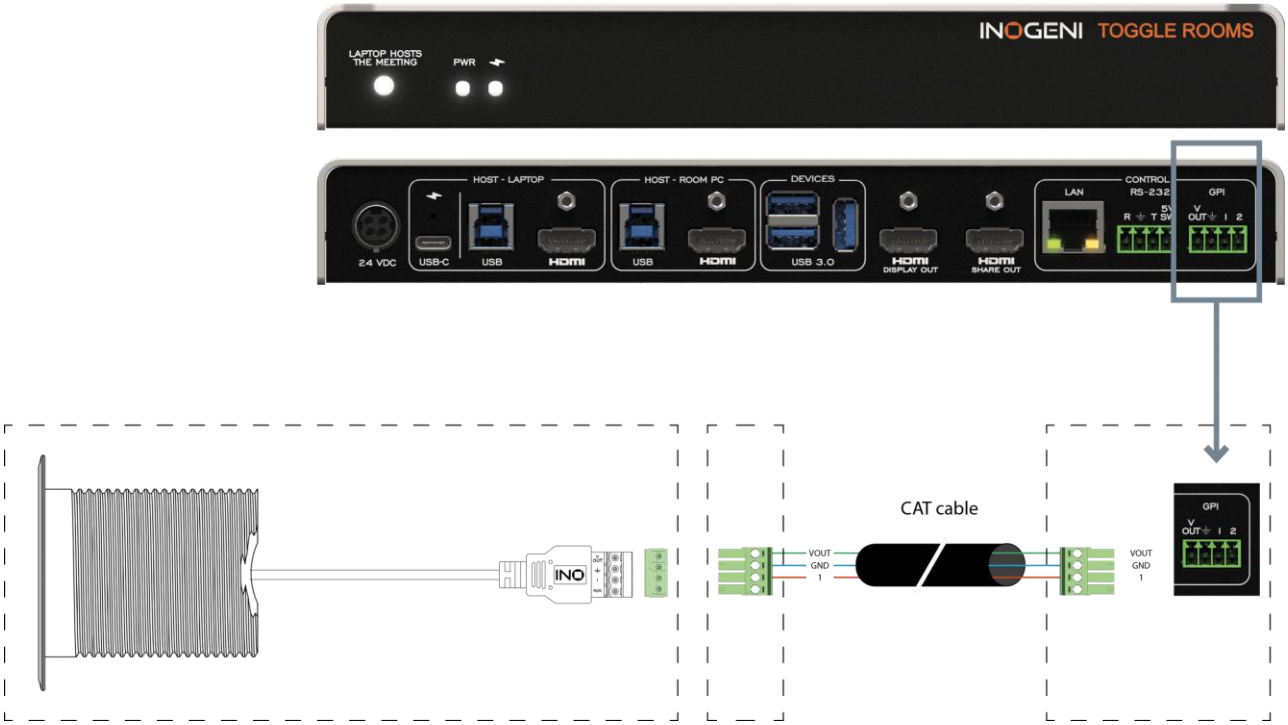


In this section, you will have access to the latest documentation.

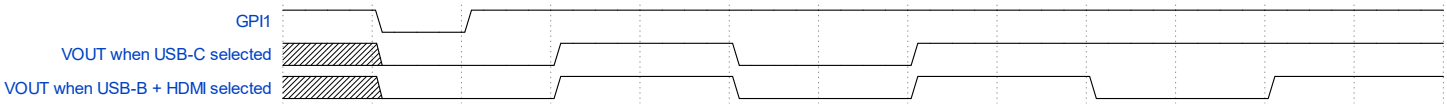
- User guide
- Datasheet
- Brochure
- Device certifications
- Power supply certifications

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

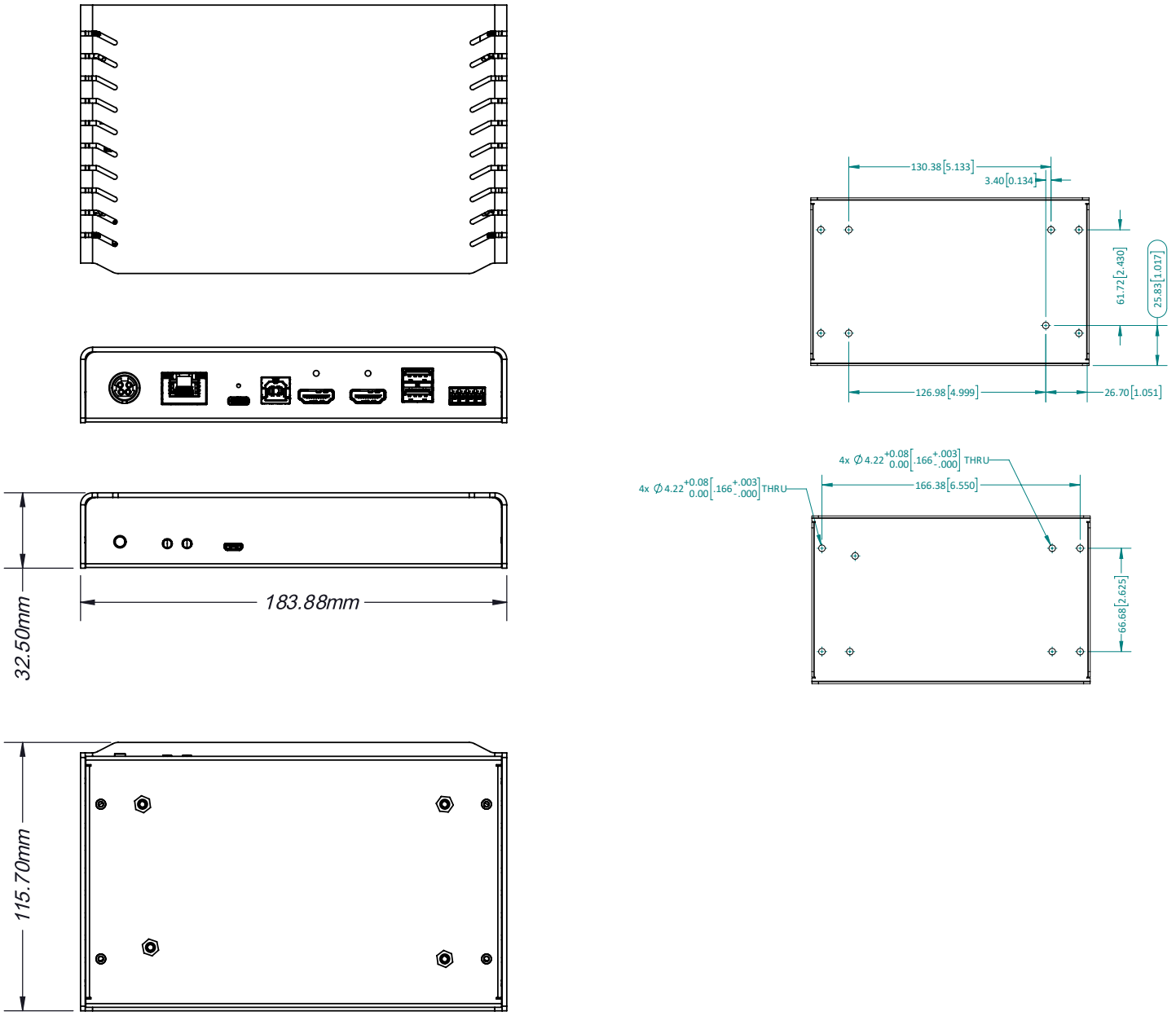
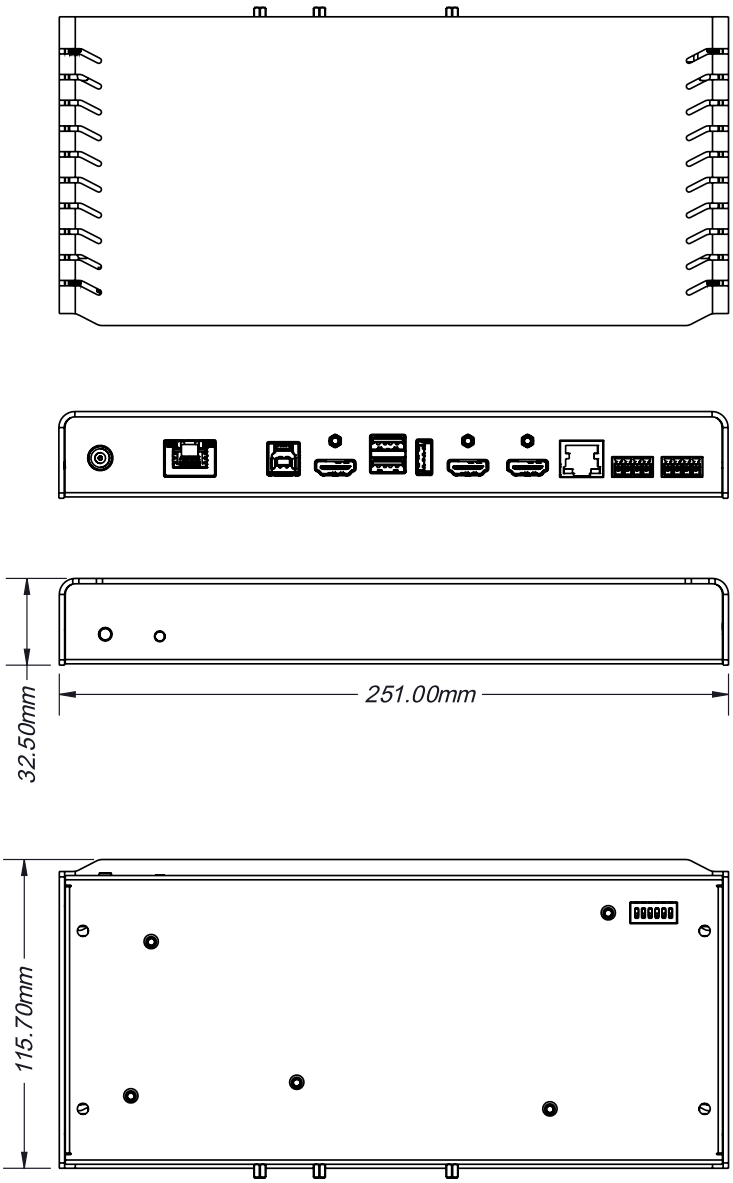
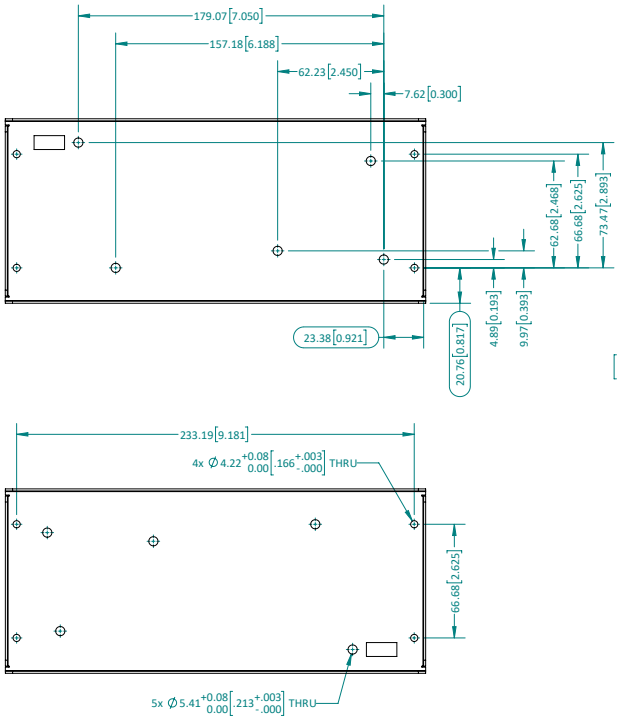


Figure 2: Bottom plate dimensions and holes positions of laptop hub


32.50mm
251.00mm
115.70mm


179.07[7.050]
157.18[6.188]
62.23[2.450]
7.62[0.300]
62.68[2.468]
66.68[2.625]
73.47[2.893]
23.38[0.921]
20.76[0.817]
4.89[0.193]
9.97[0.393]

233.19[9.181]
4x Ø4.22 +0.08 0.00 [.166 +.003 -.000] THRU
66.68[2.625]
5x Ø5.41 +0.08 0.00 [.213 +.003 -.000] THRU

MOUNTING BRACKET

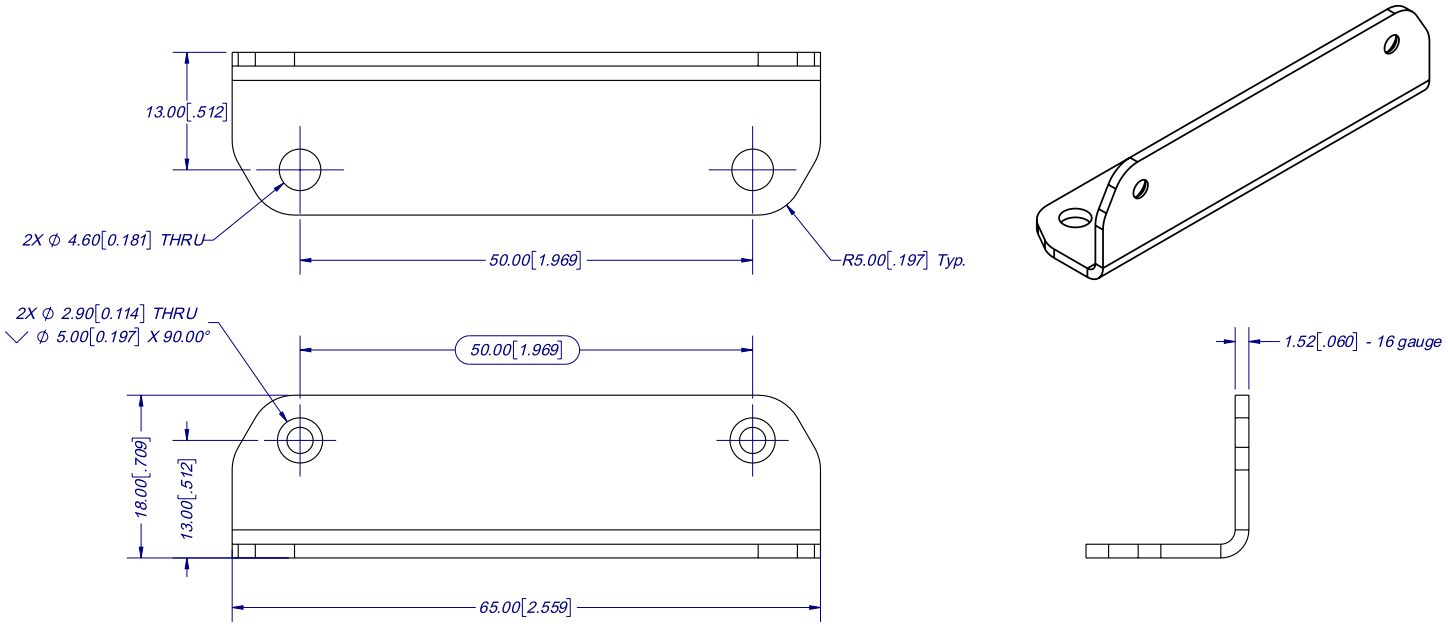


Figure 3: Bracket dimensions

160W POWER SUPPLY BRACKET

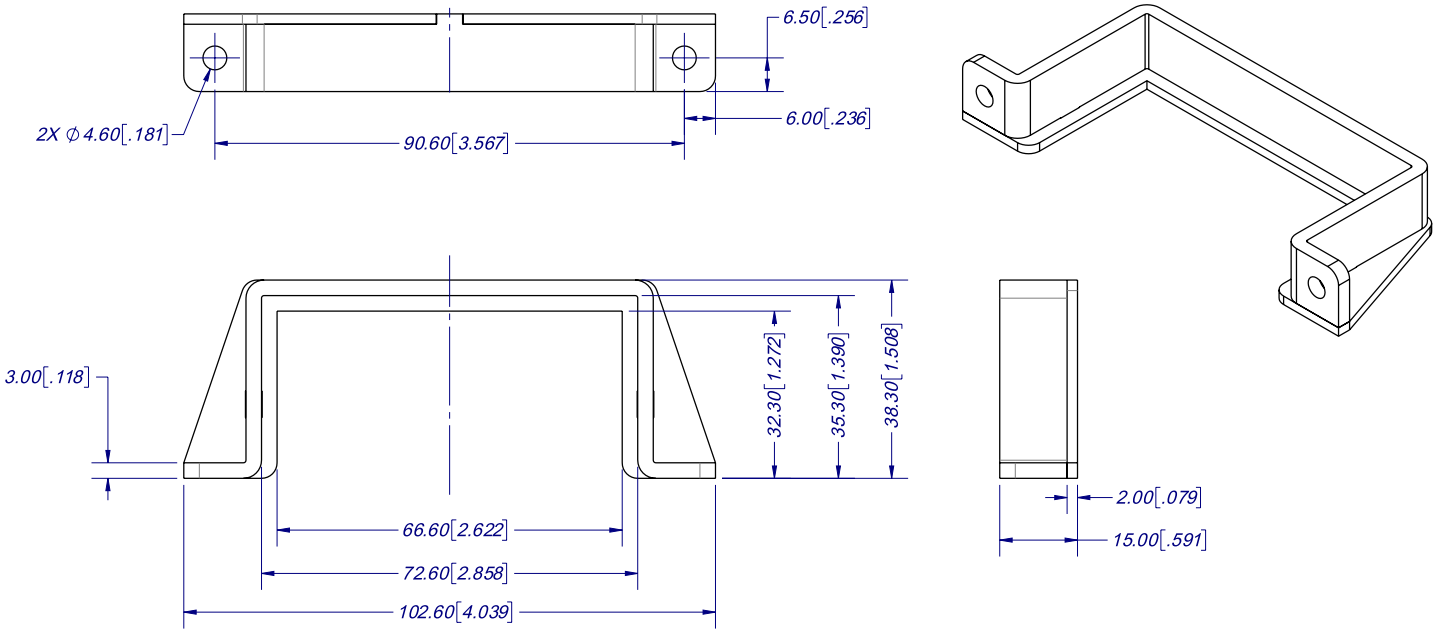


Figure 4: Power supply 160W bracket dimensions

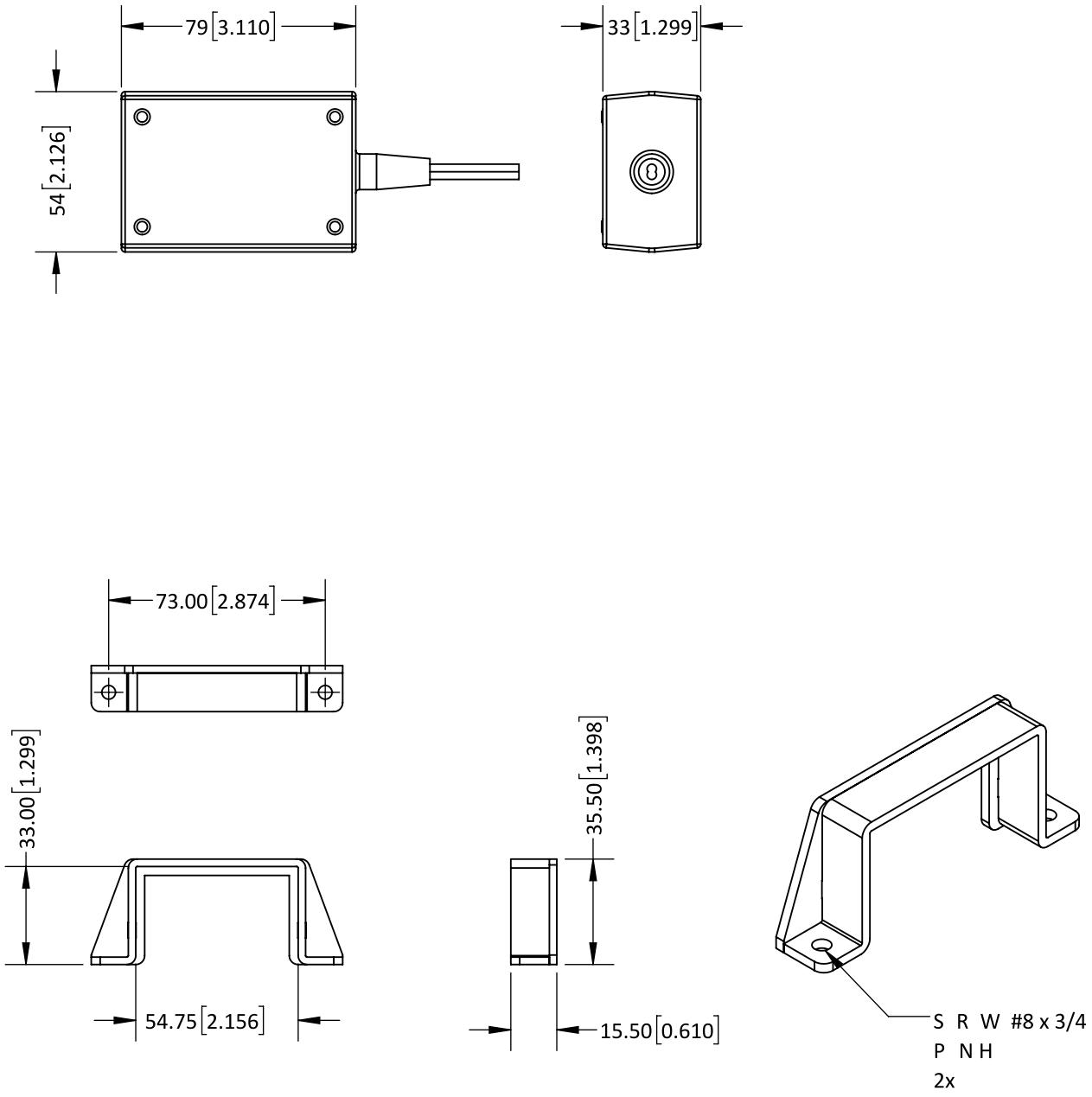


Figure 5: Power supply 36W bracket dimensions

DIP SWITCHES

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

Switch	Position	Description
SW1	OFF	For future use.
	ON	
SW2	OFF	For future use.
	ON	
SW3	OFF	For future use.
	ON	
SW4	OFF	For future use.
	ON	
SW5	OFF	Reserved.
	ON	
SW6	OFF	Disable 5V on RS232 terminal block.
	ON	Enable 5V on RSs232 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
My laptop is not charging using my USB-C cable.	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 https://inogeni.com/product/toggle-rooms/ for the complete list. Make also sure that tour BIOS and your system chipset drivers are up to date.
The device does not automatically switch USB host and HDMI source.	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.
My device is switching HDMI video slowly.	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).
The Maestro software is not able to detect my device.	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.

SUPPORT

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 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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(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 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.

NOM Statement
This device is compliant with the NOM-019 standard.