



**Q: What does the RTK-AM1™ do?**

**A:** The **RTK-AM1™** is designed to bring several signal types to/from a conference room table over a single category cable. It includes a 4x1 video switch, USB-A and USB-C ports with host capabilities at each end.

**Q: I only see three HDMI inputs. Where is the fourth?**

**A:** The fourth input on the **RTK-AM1-TX™** is actually the USB-C connector, which supports not only USB data, but also USB DisplayPort Alternate Mode (DP Alt Mode) video when connected to a Full Function USB-C device port.

**Q: What is a Full Function USB-C port?**

**A:** A full function USB-C port is one that supports traditional USB data, power delivery for charging, and DP Alt Mode video.

**Q: How can I tell if my device has a Full Function USB-C port?**

**A:** Not all USB-C ports are full function ports. If it's a Windows device it will typically have a lightning bolt symbol (⚡) at the connector signifying that is Thunderbolt capable and therefore a full function USB-C port. MacBooks don't normally have printed symbols at the connector, but typically MacBooks 2018 and newer include full function USB-C ports. Check the specifications to be certain.

## Ethernet

**Q: How do the Ethernet ports work on the RTK-AM1™?**

**A:** There are three Ethernet ports on the RX and four ports on the TX. When in VLAN mode (DIP switch selectable) the "Mics Out" port on the RX is tied to the three Mic ports on the TX. The two "Ethernet Switch" ports on the RX are tied to the "Ethernet" port on the TX. This is designed for codecs that require Ethernet microphones to be on their Link Local Network and touch panels to be on the LAN side of the network.

When not in VLAN mode all four Ethernet ports on the TX are tied to all three Ethernet Switch ports on the RX.

**Q: What kind of PoE is provided?**

**A:** The **RTK-AM1-TX™** includes 4 Ethernet ports that provide PoE/PoE+ power. 2 PoE+ ports support 48VDC PoE+ devices up to 30W per IEEE 802.3at. The remaining ports support 48VDC PoE devices up to 15.4W per IEEE 802.3af (Total 76.2W maximum).

The ports are intended to power IP microphones, touch panels, and table cameras.

## USB

### **Q: What kind of device charging is available at the RTK-AM1-TX™ USB-C port?**

**A:** The **RTK-AM1-TX™** USB-C port can support Power Delivery (PD) up to 60W to the connected device.

### **Q: How does USB data work between the TX and RX?**

**A:** Both the TX and RX include one USB-C and two USB-A ports.

- If the host is connected to the TX it will see all four USB-A ports and the USB-C port on the RX as device ports.
- If the host is connected to the RX it will see all four USB-A device ports only. The USB-C port on the TX cannot support devices (only hosts) so it is not used when the host is on the RX side.

USB devices local to the host side support USB 3.0 speeds, while USB devices on the extended side support USB 2.0 speeds.

### **Q: Can there be more than one host connected to the RTK-AM1™ system?**

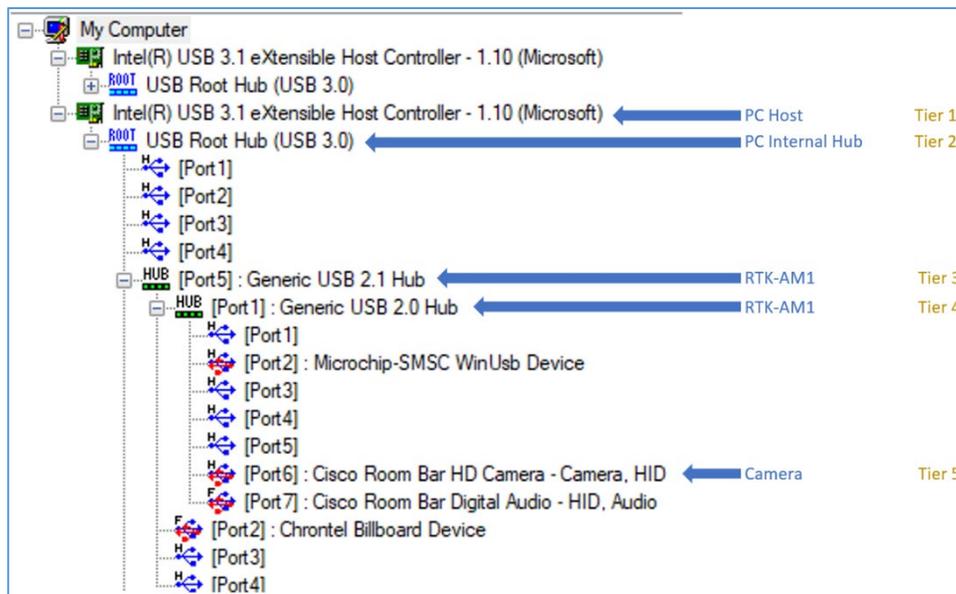
**A:** No, only one host may be connected at a time. During installation choose which USB direction makes the most sense for your application. A host device can be connected to the USB-C on either the **RTK-AM1-TX™** or **RTK-AM1-RX™**.

### **Q: Is there any support for USB auto host switching?**

**A:** Yes, starting with firmware v6.0 there is a USB auto host switching mode enabled by **RTK-AM1-RX™** DIP Switch 2. It is designed for when a dedicated room PC is needed at the RX location for hosting soft codec applications. With the PC connected to the USB-C port on the **RTK-AM1-RX™**, any USB-C peripherals on the TX or RX USB-A ports will be given to the room PC. If a guest laptop is connected to the USB-C port on the TX, the peripherals will automatically shift to the guest PC. When the guest PC is removed, the peripherals are given back to the room PC.

### **Q: How many USB tiers does the RTK-AM1™ use?**

**A:** A linked **RTK-AM1™** kit will use up two tiers (hubs) in the USB hierarchy. Be aware that many computers will use up two tiers internally, and the attached 3<sup>rd</sup> party device will use another tier. Seven total tiers is the maximum allowed per the USB specification, so take care to design your systems appropriately. Software programs such as UsbTreeView (freeware by Uwe Sieber) can be a useful tool in verifying tier structure. Below is a typical example of a USB camera connected through the **RTK-AM1™** into a host PC:



## HDMI

### Q: What resolutions does the video section support?

**A:** The video section supports up to 4K60 4:4:4 resolution on all four video inputs (3 x HDMI and 1 DP Alt Mode). HDMI audio and HDCP up to v2.2 (if present) are also supported.

## Control

### Q: How does the Input Select 6-pin connector work on the RTK-AM1-TX™?

**A:** These are inputs designed to be used with a third-party control system or contact closure switch. The inputs are active low and include an internal pull-up. The connector has two modes of operation depending on the state of DIP switch 5 on the RTK-AMX-TX.

With DIP switch 5 OFF, only pin 1 and one of the ground pins are used. A momentary short of pin 1 will select the next available connected source. It will automatically skip over inputs without a source connection.

With DIP switch 5 ON, this connector operates as a discrete input selection. A momentary short between one of the numbered pins and ground will select the indicated video input.

### Q: Can the RTK-AM1™ be controlled from a 3<sup>rd</sup> party RS-232 control system?

**A:** Yes, there is a 3<sup>rd</sup> party RS-232 port on the Receiver that can receive commands for switching inputs and resetting the PoE ports. Please refer to the SCT Programming Guide which can be downloaded from the Tech Tips Support page at [www.soundcontrol.net](http://www.soundcontrol.net).

### Q: How does Auto-Switching work?

**A:** There are two auto-switching modes: Last Source Detect Mode and Priority Mode. In Last Source Detect Mode the video switches to the last active device attached to the Transmitter. In Priority Mode the video switches to the last active device attached, however when all other devices are removed the video falls back to the priority port (defined by TX DIP switch 4).

## Operation

### Q: What do the LEDs indicate?

**A:** The LEDs on both the **RTK-AM1-TX™** and **RTK-AM1-RX™** provide a good way to tell if the system is wired correctly and operating normally. Refer to the chart below for details.

Module	LED LABEL	STATUS	INDICATES
RTK-AM1-RX	Power	Solid Green	Good Power
	Status	Blinking Green	Good Link Firmware
	FW*	Blinking Green	Good MCU Firmware
		Blinking Red (slow)	DIP switch 8 is on but no valid configuration file is loaded
		Blinking Red (fast)	Fan error - Fan has stopped or failed
	Link	Solid Green	Linked to RTK-AM1-TX
In 1 - In 4	Solid Green	Video source selected	
RTK-AM1-TX	Power	Solid Green	Good Power
	Status	Blinking Green	Good Link Firmware
	FW*	Blinking Green	Good MCU Firmware
		Blinking Red	Cooling Fan Failure
	Link	Solid Green	Linked to RTK-AM1-RX
	In 1 - In 4	Solid Green	Video source selected

\*FW blink pattern changes when performing firmware update or writing the log file. Refer to the “RTK-AM1 Firmware/Log Guide” under the Support page at [www.soundcontrol.net](http://www.soundcontrol.net) for details.

### Q: What do the DIP switches do?

**A:** The following chart shows the functions of the 8 position DIP switches:

#### RTK-AM1-RX DIP Switch

Switch	Function	OFF	ON
1	Cisco Mode	Disabled	Enabled
2	USB Auto Host Switching	Disabled	Enabled
3	Cisco Expert Mode	Disabled	Enabled (Overrides DIP switch 1)
4	Reserved	-	-
5	Reserved	-	-
6	Codec Connector ID - (Applies when DIP 1 is on)	DIP 6 Off and DIP 7 Off - Auto detect the Connector ID.	
7		DIP 6 On and DIP 7 Off - Force Connector ID=2 DIP 6 Off and DIP 7 On - Force Connector ID=3 DIP 6 On and DIP 7 On - Force Connector ID=4	
8	Use microSD Configuration File	Disabled*	Enable

\*Default settings are used when Configuration File is disabled (See details below).

## RTK-AM1-TX DIP Switch

Switch	Function	Off	On
1	Ethernet VLAN Mode	Disable	Enable
2	Video Auto Switching	Disable	Enable
3	Video Auto Switch Mode (Applies when DIP 2 is on)	Last Source Detect Mode	Priority Mode
4	Auto Switch Priority Input (Applies when DIP 2 and DIP 3 are on)	USB-C Input	HDMI Input 1
5	Input Select Mode (6-pin terminal block)	Cycle Mode (Each time pin 1 is pulled low, move to next available connected video port)	Discreet Mode (switch to video input of last pin pulled low)
6	HDCP Follow	HDMI inputs report HDCP capability based on DIP switch 7 setting.	HDCP capability is passed through from RX output device to HDMI inputs
7	HDCP self-declaration (Applies when DIP 6 is off)	All HDMI inputs report no HDCP support	All HDMI inputs report support for HDCP1.4 and HDCP2.2
8	Reserved	-	-

### Q: What are the default settings when the Configuration File is disabled? (RX DIP switch 8 Off)

A: The following settings are used when the **RTK-AM1-RX™** DIP switch 8 is off:

These settings are only applicable when Cisco Codec Communications are Enabled:

Parameter	Default Value
Heartbeat timeout interval	30 seconds
SCT device name reported to codec	SCT RTK-AM1
HDMI 1 input name on Cisco touch panel	SCT-HDMI1
HDMI 2 input name on Cisco touch panel	SCT-HDMI2
HDMI 2 input name on Cisco touch panel	SCT-HDMI3
USB-C input name on Cisco touch panel	SCT-USBC

### Q: Are there any special settings when integrating with a Cisco codec?

A: After logging into the Cisco web interface, navigate to Settings, Video. Then scroll to the input that is connected to the **RTK-AM1-RX™**. Under the settings of that connector verify the following parameters:

*PresentationSelection = Manual*  
*Visibility = IfSignal*

Next, navigate to Settings, SerialPort and verify the following parameters:

*BaudRate = 115200*  
*LoginRequired = Off*

Mode = On  
Outbound Mode = Off

Finally, navigate to Settings, Audio, Input, USBC and set the *Gain* to 0 db.

Be sure to click Save if you make any changes on these pages.

**Q: What is Cisco Expert Mode? (Firmware 4.0 or higher)**

**A:** With Expert Mode off, the **RTK-AM1™** communicates natively with Cisco codecs providing heartbeat, firmware versions, and creating buttons on the Cisco touch panel for selecting sources. These buttons have onscreen labels defined by the Configuration file or the default values. With Expert Mode on it is the responsibility of the installer to create these buttons within the codec via Cisco xCommands. The **RTK-AM1™** will still show/hide the buttons based on active video inputs and still provide heartbeat messages and firmware versions for monitoring.

xCommands are documented in the Cisco API Reference Guide on Cisco's website. The xCommands used to create the buttons in Expert Mode must be formatted correctly to be in compliance with the **RTK-AM1™**.

First, the ConnectorId parameter must match the connector ID of the USB-C port of the Cisco codec. This is where the **RTK-AM1™** will attach to. Here are the connector IDs of common devices:

Cisco Device	USB-C Connector ID	HDMI Connector ID
Codec EQ	4	1, 2, or 3
Room Bar Pro	3	2
Room Bar	2	3
Codec Pro	n/a	1, 2, 3, 4, or 5
Codec Plus	n/a	1, 2, or 3

Next, the SourceIdentifier parameter must be set as defined in the following table:

RTK-AM1 Input Connector	Source Identifier
Input 1 (HDMI)	sct1
Input 2 (HDMI)	sct2
Input 3 (HDMI)	sct3
Input 4 (USB-C)	sct4

The following is an example for a Codec EQ:

```
xCommand UserInterface Presentation ExternalSource Add ConnectorId: 4 Name: "Custom Button Name" SourceIdentifier: sct1 Type: PC
```

Text between the quotes will be the button text on the Cisco touch panel.

**Q: I'm installing in a secure environment. Are there any options to be in compliance?**

**A:** Some secure environments don't allow memory card slots on devices. In the Tech Support Downloads section of [www.soundcontrol.net](http://www.soundcontrol.net) there is a special version of Secure firmware that will completely and **permanently** disable the microSD slot. Note: This is not reversible.