## BASIC USE CASE

RVON is a way of getting audio across long distance, without the need for dedicated infrastructure. RVON encodes the audio to allow it to be sent over the Internet.  To use RVON, a matrix card is required, as well as a device on the other end, capable of sending and receiving RVON audio. This is shown in Figure 1.



*Figure 1. RVON in its simplest form*

With the exception of one single keypanel, the KP-3016A, **all** keypanels in the KP-Series family are capable of running RVON. The firmware for RVON may be downloaded for free from the RTS website.

## USING THE RVON-I/O

For analog products that need to be connected remotely, there is a converter called RVON-I/O. Using the RVON-I/O, it is possible to connect analog products as well as legacy products, as shown in Figure 2.
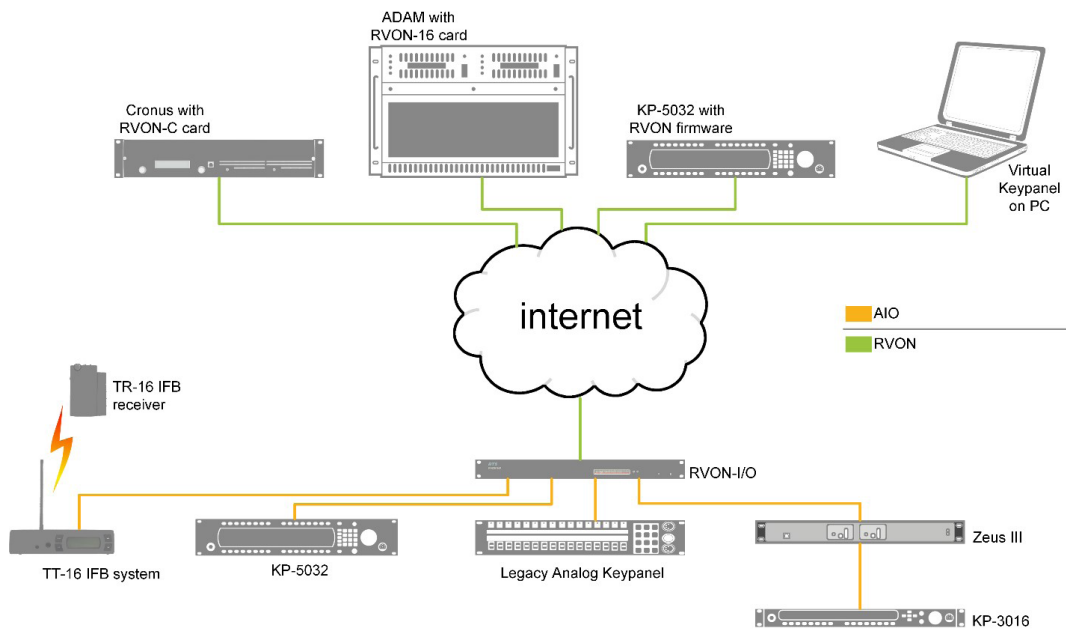


*Figure 2. Using the RVON-I/O box for remoting analog devices*

Figure 2 shows RVON being used to connect an IFB, a KP-Series keypanel connected via AIO, a legacy keypanel (KP-96/7) and a Zeus III with an analog keypanel. There is also a software product, the Virtual Keypanel or VKP, running on a PC, which gives it the ability to transmit and receive RVON audio. Note the Cronus, ADAM, and ADAM-M all have the ability to use RVON, whereas Zeus III does not.

# RVON IN TRUNKING APPLICATION

One of the most commonly used applications for RVON is Trunking. An example is shown in Figure 3. Three intercoms are interconnected over RVON. The Trunkmaster issues commands to the controllers in each of the matrices to close crosspoints, meaning set up paths for audio. It is very important to understand the Trunkmaster does not actually switch any audio.
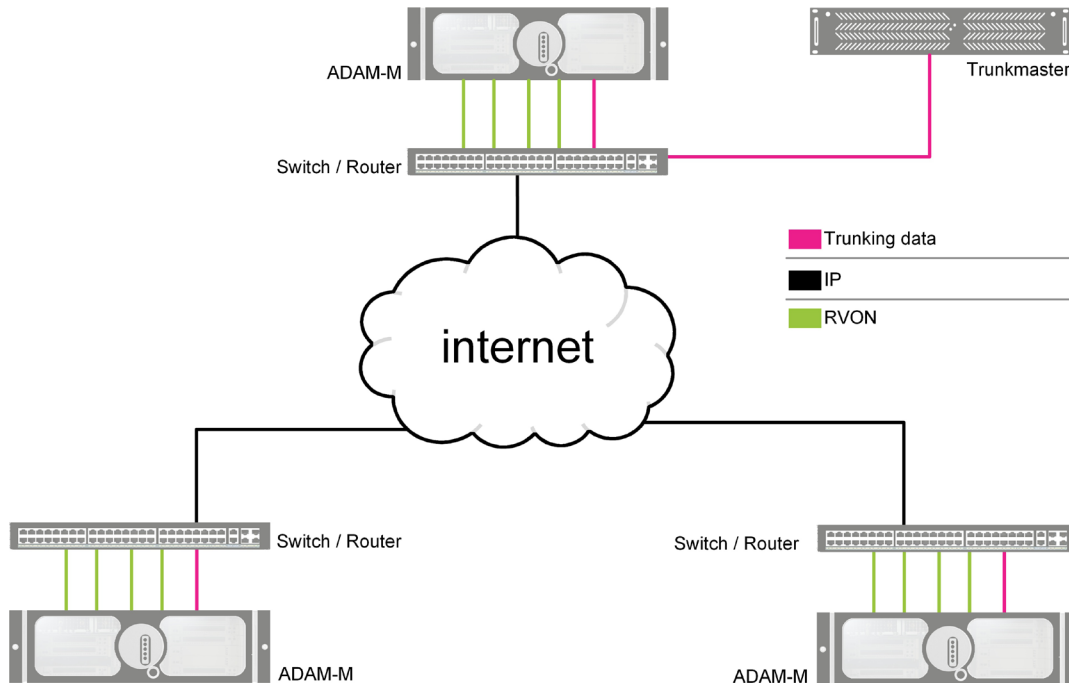


Figure 3. RVON used in Trunking

# RVON FOR REDUCED BITRATE

RVON is not one single codec, it is three. The RVON hardware from RTS supports three codecs, G.711, G.729, and G.723 – all with different technical characteristics and levels of compression, as summarized in Table 1.

| Codec | Bit Rate | Coding Delay | Playout Delay | Bandwidth | Sample Rate |
|-------|----------|--------------|---------------|-----------|-------------|
| G.711 | 64 kbit/s | 0.125 ms | 20-60 ms | 160-224 kbit/s | 8k |
| G.729 | 8 kbit/s | 10 ms | 20-120 ms | 32-112 kbit/s | 8k |
| G.723 | 5.3/6.3 kbit/s | 30 ms | 60-120 ms | 29-45 kbit/s | 8k |

Table 1. RVON has three user-selectable codecs

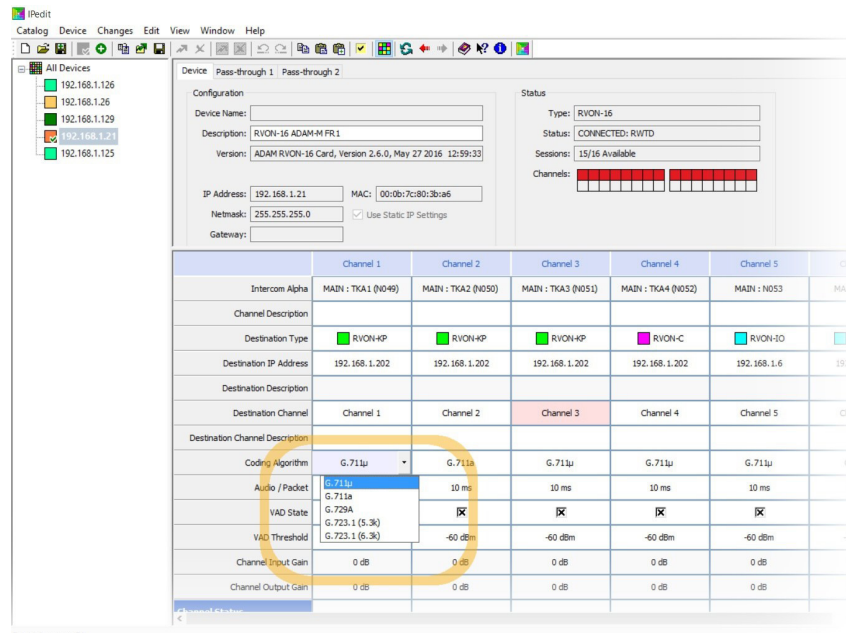The codec can be configured in IP-Edit. An example is shown in Figure 4.



*Figure 4. Codec can be selected in IP-Edit*

# RVON PRODUCTS

RTS has multiple RVON products to support the use of RVON in virtually any application:

- Matrix cards for Cronus, ADAM, and ADAM-M
- Firmware for KP-Series of keypanels (firmware may be downloaded for free)
- Option cards for KP-32, RP-1000, KP 12 CLD, and DKP 16 CLD
- Software for PC (Virtual Keypanel)
- RVON-I/O converter for analog

Finally, a couple of technical points:

- RVON requires fixed IP-addresses to work. The network cannot support Network Address Translation (NAT). In networks that do support NAT, there are still solutions for making RVON work, but they may require additional hardware devices (to create VPN tunnels).

- The RVON firmware for KP-Series keypanels may be downloaded for free. To install it, an RTS supplied software program called Firmware Upload Tool (FWUT) must be used. FWUT is included with the OMNEO Suite, which may also be downloaded from the RTS website.