

Double Inversion & Rolling Double Inversion Scramblers



Shown: VS-110-KW1

VS-110 Rolling Double Inversion Scrambler

Midian's VS-110 series is a rolling double inversion voice scrambler that is compatible with Icom's UT-110. The VS-110 matches the Icom UT-110 group and code numbers. The VS-110's codes can also be programmed for fixed double inversion voice scrambling (aka split-band voice scrambling) that is compatible with Midian's VS-1100 and VPU-6, Icom's UT-109/UT-112 and AIR/Inysa's XPTO.

- In rolling double inversion mode (Icom UT-110 mode) the unit can be programmed to match the 1020 codes of the UT-110 (4 groups with 255 codes per group).
- In fixed double inversion mode the unit can be programmed to match any of the 32 double inversion codes used by Midian's VS-1100 and VPU-6, Icom's UT-109/UT-112 and Inysa's XPTO.
- Programmable for up to 16 different codes (some versions may only support up to 4 codes)
- Plug-in modules available for Icom, Kenwood, Motorola and Vertex.
- Requires Midian's KL-4 programmer



Shown: VS-1100-KW2

VS-1100 Double Inversion Scrambler

Midian's VS-1100 series is a double inversion voice scrambler (aka split-band scrambler) that is compatible with Midian's VPU-6, Icom's UT-109/UT-112 and AIR/Inysa's XPTO.

- The VS-1100 can be programmed to match any of the 32 double inversion codes used by Midian's VPU-6, Icom's UT-109/UT-112 and AIR/Inysa's XPTO
- Programmable for up to 16 different codes (some versions may only support up to 4 codes)
- Plug-in modules available for Icom, Kenwood, Motorola and Vertex.
- Requires Midian's KL-4 programmer

Common Questions About Encryption

Do I need digital voice encryption? Most likely not! Digital voice encryption tends to be very costly and the benefits do not outweigh this high cost. Most users only need their conversations secured for a tactical amount of time (i.e. days or weeks). Once this time period has passed the information is no longer important. Examples of this would be a military commander directing troop movements during a battle, police SWAT or Narcotics operations, a taxi company picking up a fare, etc. Once the troops have moved, the SWAT operation is over or the fare is picked up the information transmitted is no longer important to an eavesdropper, therefore most systems only need a tactical level of voice security such as Midian's TVS-2 or VS-1200. Digital voice encryption is typically only needed to secure conversations for a strategic time period (i.e. years).

Is voice inversion scrambling secure? Voice inversion scramblers will protect conversations from a casual listener. Many radio manufacturers are building voice inversion scramblers into the firmware of the radio and they tend to use the same or very similar inversion frequencies. If you buy a radio with the built in inversion scrambler, someone with a radio with a built in inversion scrambler could eavesdrop on your conversation if on the same channel. Adding a Midian voice inversion scrambler, such as the VPU-12A or VS-1000, on an inversion frequency different from what the radio manufacturers have built in can provide additional privacy.

Is it difficult to install a voice scrambler? Midian supports plug in modules for many popular radio manufacturers and models including Motorola, Kenwood, Vertex, Icom, Tait and Hytera. Midian also offers voice scramblers in a speaker microphone configuration. Many plug-in installations can be done in just a matter of minutes. For radios not supported with a plug in module, Midian offers many application notes which are instructions on how to wire in a wired module.

Which kinds of systems can scramblers be used in? Midian has installed voice scramblers in simplex radio systems, as well as repeater systems, trunking systems and voted systems. Scramblers can also be used with signaling such as CTCSS, DCS, DTMF and MDC-1200. On the transmit side the scrambler scrambles the audio prior to the signaling being encoded and on the receive side the scrambler descrambles the audio after the signaling has been decoded and filtered out.

Do the number of security codes matter? Only up to a point. Midian's TVS-2 offers 4.29 billion user programmable codes plus 10,000 Midian controlled system ID's for a total of 42.9 trillion codes. Midian's VS-1200 offers approximately 4 billion user programmable codes from 6.2×10^{23} total codes. To put this in perspective, it would take more than 30 years to test one billion codes at a rate of one code per minute. Some manufacturers claim to offer more codes alluding to higher security, but that is just marketing hype. It is no more practical to try and break a scrambler with a billion codes than a scrambler with a trillion codes.