

Quick Start Guide

Digital Order Wire Voice Module

Introduction

Trio DataCom's Digital Order Wire Voice Module (EDOVM) provides for the transmission of analogue voice over an all digital Trio E Series data radio network. It may also be used on Trio D Series systems.

The EDOVM module converts analog voice to a digital data stream, and back to voice again at the receiving end. The entire unit is built into a plastic lightweight housing small enough to slip into a pocket, or clip onto a belt.

A combination of digital signal processing and a dedicated packetisation algorithm, together with the sending of voice data only upon activation of the PTT button, result in minimised data bandwidth for optimum transmission of the digitised voice signals.

The EDOVM features an adjustable volume control and operates in half duplex mode with an audio quality that is equivalent to that obtained from two way mobile radio type communication systems.

The Trio EDOVM uses a compact industry standard handheld speaker-microphone with a Press-To-Talk (PTT) switch that plugs into the housing.



Applications

The EDOVM is intended to provide occasional voice communications between two locations in an all digital data radio communication network. Like other order wire products, it is primarily intended to be used during system commissioning of new data radio networks and in the maintenance of existing networks.

In many cases it is possible, by virtue of Trio's unique Multistream™ technology, to multiplex the digital voice stream together with the user data on the same radio channel. Performance of the EDOVM as well as any effects on the effective throughput of the primary user application data will depend on the characteristics of the user data which is being transmitted on the channel as well as the configuration of the data radio system.

The EDOVM may be used on simple Point-To-Point (PTP) systems or in the most complex Point-To-Multi-Point (PTMP) networks, providing speech capability from one location to another via links and repeaters.

Full Duplex Point-To-Point Link

The simplest application is to add the EDOVM to a full duplex PTP link. In most cases it should be possible to achieve satisfactory voice communication without any significant effect on the primary user data throughput. For half duplex PTP links please refer to the comments for Point-To-Multi-Point (PTMP) systems below.

Point-To-Multi-Point Systems

In the case of a PTMP system comprising a base station and two or more remote units, it is also possible to achieve satisfactory voice communication in either direction. However, there are some factors that require consideration. The main points for consideration can be summarised in the following list :

Full Duplex Base Station & Half Duplex Remote Units

EDOVM transmitting from base station

- While a remote unit is responding to a poll from the base station, it will not be possible to receive EDOVM speech signals transmitted from the base station.

EDOVM transmitting from remote unit

- While EDOVM is transmitting from a remote unit, it will not be possible for that remote unit to receive polling data from the base / master station.
- While EDOVM is transmitting from a remote unit, it will not be possible for any other remote to respond to polling data from the base station.

Note: Trio's C/DSMA collision avoidance feature, the poll response can be buffered inside the Trio remote data radio modem and may then be sent once the EDOVM speech signal is complete. If Trio's C/DSMA collision avoidance is not enabled then the remote response to the poll from the base station will interfere with the EDOVM speech signal from the other remote unit.

Full Duplex Repeater Station & Half Duplex Control Unit and Remote Units

EDOVM transmitting from remote unit

- While EDOVM is transmitting from a remote unit, it will not be possible for the control unit to transmit any polling data unless using Trio's C/DSAMA Collision Avoidance Feature
- While EDOVM is transmitting from a remote unit, it will not be possible for any other remote to respond to polling data from the control unit unless using Trio's C/DSAMA Collision Avoidance Feature

EDOVM transmitting from control unit

- While EDOVM is transmitting from the control unit, it will not be possible for any remote to respond to polling data from the control unit unless using Trio's C/DSAMA Collision Avoidance Feature

Note: Although intended for use on Trio data radio systems, where error protection is added to the digitised voice data packets, the standard asynchronous 9600 bps RS-232 interface and the packet data transport protocol make it possible to also transmit voice over non radio based data systems.

System Planning

The EDOVM requires an asynchronous serial data channel with a minimum throughput of 9600 bps. Typically, the EDOVM is connected to the second RS-232 data port (Port B) on either the Trio E or D Series products.

Most applications will have a single EDOVM connected to Port B of the base station or control unit (in repeater systems) and then one or more EDOVM units connected temporarily to Port B of any remote units. The EDOVM may also be connected at any repeater station.

Whenever an EDOVM is used in a Trio data radio network, the interface ports used for the EDOVM should be assigned a Stream ID (SID) that is unique and different to the SID assigned to the primary user application data (for further information on SID and Trio's Multistream™ technology please consult Trio data radio equipment user guides).

If the Trio data radio network also features Trio's TVIEW Network Management & Remote Diagnostics then care must be taken to either choose a different SID value to that used for the Diagnostics stream or, the EDOVM speech signals, unless both speech data and the diagnostics stream are required to be routed to the same locations/ ports in the network.

Note: In Trio D Series equipment, Port B is often configured for Network Management / Remote Diagnostics. In most cases this configuration is also suitable for the EDOVM as long as it is acceptable to have the speech signal sent to all locations (ports) in the network to which the Diagnostics stream is sent. In some instances, e.g., where the Diagnostics stream is repeated to all remote locations, this may not be desired although technically it is possible.

Additionally, there may be insufficient user ports at the base / control station where the Diagnostics Host (server) uses Port B to interface to the network. In such a case Trio's 95MSR Mux / Stream Router may be used to share Port B between the Diagnostics and EDOVM data streams.

Configuration

Apart from Volume control, which can be adjusted to suit individual user preferences or different ambient noise environments by removing the small cover and using a small flat blade screwdriver to turn the single turn potentiometer located inside, there are no user configurable features of the EDOVM product itself.

The data radio modem equipment to which it is connected requires the following configuration :

Data Port (usually port B)

Character Layer = 9600bps, No Parity, 8 Data Bits, 1 Stop Bit

Protocol = SLIP

Handshaking = OFF

System Parameters

C/DSMA Collision Avoidance = ON (recommended for half duplex systems)

SID = any value but normal default is 0 if also using Network Management & Diagnostics on the same port

Installation guide

The EDOVM package includes the following parts :

- EDOVM unit
- Speaker Microphone with cable
- RJ45 to RJ45 standard patch cable (1m)
- RJ45 to DB9 adaptor (for use on Trio E Series or D Series radio modem data ports)
- Mating Power plug
- User Guide

There are three connectors on the EDOVM case. These are for :

- Power Supply
- Speaker / mic
- Data Port (Radio Modem)

Power Supply

The power supply connector is an industry standard Phoenix 2 pin type socket with matching (supplied) screw termination plug.

Note: This connector is identical to the Power Supply connector on the Trio E Series products and also shares the same pin assignment. Reverse polarity and over voltage protection is provided via an internal 'transorb' fitted to the circuit board. Over current protection is provided via an internal thermal (resetting) fuse.

Caution: The EDOVM does not contain an internal replaceable fuse. To avoid possible permanent damage an external fuse should be installed in series with the power supply.

Pin Assignment - Power Supply Connector

Pin	Assignment
1	12V
2	GND

Use the supplied connector to terminate a suitable power supply cable taking care to ensure correct polarity.

Speaker / Mic

The Speaker / mic connector comprises one 3.5mm and one 2.5mm audio sockets which correspond to a mating plug on end of the Speaker / mic cable.

The Speaker / mic is simply plugged into the EDOVM. The connector is polarised in such a way that incorrect connection is not possible. Ensure that the plug is pushed in fully. The Speaker / mic unit may be hand held or attached to the user's clothing via the integrated clip.

Data Port (radio modem interface)

The supplied RJ45 to RJ45 cable, together with the RJ45 to DB9 adaptor is designed to be connected directly between the EDOVM and the DB9 data port of Trio's E Series or D Series data radio equipment. The Data Port connector is an industry standard RJ45 type socket with the following pin assignments.

Pin	Assignment	Function
1	Receive RS-232	Input
2	Transmit RS-232	Output
3	Auxiliary Pin	Output
4	N.C.	N.A.
5	N.C.	N.A.
6	12 Vdc	DC +ve Input (not used)
7	GND	Ground DC -ve Input
8	N.C.	N.A.

The EDOVM should be used in a clean and dry location, protected from moisture, excessive dust, corrosive fumes, extremes of temperature and direct sunlight.

Maintenance

This product does not contain any user serviceable components and should be returned to the supplier for maintenance and repair. The supplied speaker microphone should be kept clean and care should be taken to keep the cord from being damaged.

Appendix A

Specifications

Housing	High strength plastic enclosure with belt clip
Size	110mm x 70mm 25mm
Power supply	13.8 Vdc (10 to 16Vdc)
Power consumption	<2 W (150mA) max / 0.55 W (40mA) typical
Temperature	0 to 50°C
Humidity	0 to 95% relative (non condensing)
Data protocol	SLIP
CODEC	CELP 2000 bps plus packetisation overhead
Data interface	RS232 DTE - RJ45 (std. cable supplied)
Data protocol	Asynchronous N81 @ 9600 bps
Audio interface	2.5mm/3.5mm unbalanced
Audio device	Hand-held speaker microphone with PTT switch
Audio mode	Half duplex (PTT Controlled)

Support Options

Website Information

The Trio DataCom website support page contains links to e-mail and telephone support, tech notes, manuals, software updates.

Please go to www.trio.com.au/support.htm.

E-mail Technical Support

E-mail your questions to support@trio.com.au.

When e-mailing questions to our support staff, make sure you tell us the exact model number (and serial number if possible) of the Trio equipment you are working with. Include as much detail as possible about the situation, and any tests that you have done which may help us to better understand the issue. If possible, please include your telephone contact information should we wish to further clarify any issues.

Telephone Technical Support

Telephone support is available at our head office telephone number Aus: (+61) 3 9775 0505 during Eastern Australian business hours (9am-5pm).

Contacting the Service Department

The Service department may be contacted by e-mail to service@trio.com.au, or by telephone during Eastern Australian business hours.



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