

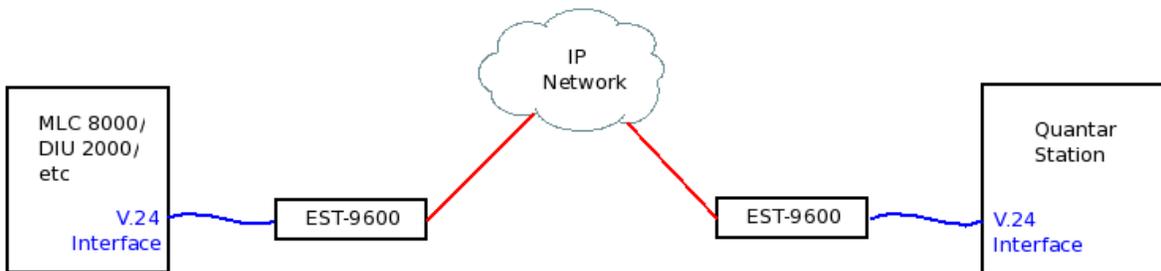
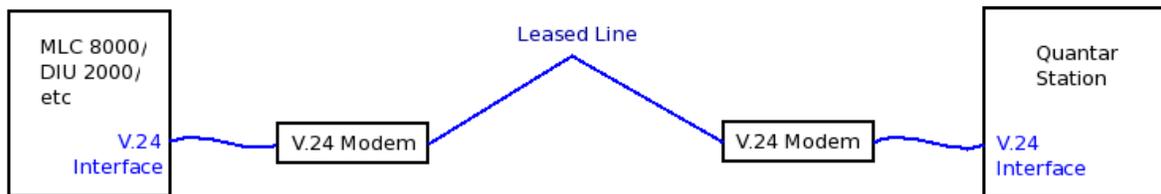


EST-9600 as a V.24 Modem Replacement in Motorola Radio Systems

02/23/2022

Introduction

This application note describes the use of the EST-9600 as a V.24 modem replacement in Motorola radio systems. Some Motorola components may be linked by way of a V.24 interface. Through the use of V.24 modems, these components can then be connected longer distances by way of a leased line service. As telco providers eliminate support for leased line service, radio technicians are looking for alternate solutions for maintaining these long distance V.24 connections.



The information presented here was provided by several clever radio technicians that found our EST-9600 product and worked through the details of using it as a modem replacement. They graciously shared their notes with us so that we could pass them on to others.

EST-9600

The EST-9600 is not really a modem. At its most basic level, it is a synchronous HDLC to UDP/IP converter. When used in pairs, it can tunnel synchronous HDLC serial data over an IP network. This is what makes it a good fit for the Motorola radio components. The Motorola V.24 interface happens to use synchronous HDLC as its transport. The EST-9600 can be directly connected to the Motorola V.24 interface and utilized like a synchronous V.24 modem. The only difference from an operational standpoint is that the EST-9600 will induce more latency than a dedicated leased-line link. It is also

subject to the jitter and congestion of a packet network, so care must be taken to ensure the network is adequately provisioned.

To get started with the EST-9600, please refer to our EST-9600 Quick Setup Guide. This generic guide will walk through the setup of the two EST-9600 units, establishing the HDLC tunnel. Beyond the generic configuration, the HDLC port on the EST-9600 should be configured as shown below.

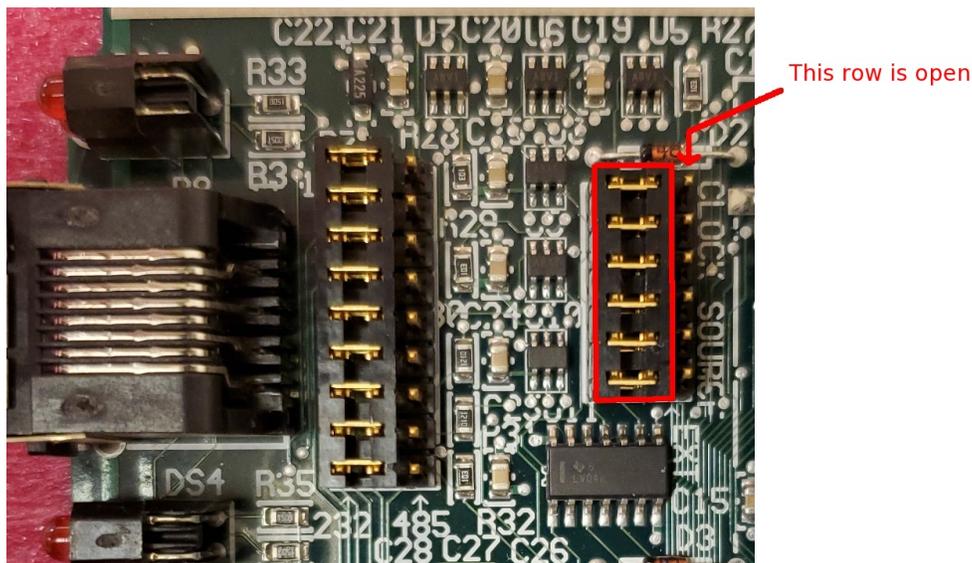
The screenshot shows the configuration page for the EST-9600 unit, titled "EST-9600 - noname" with a timestamp of "01-01-2000 19:14:20". On the left is a "MENU" with links for Administration, HDLC Tunnel, Ethernet, HDLC, Tools, Status, Activate Changes, and Store Configuration. The main area is titled "HDLC Port Values" and contains the following settings:

- Sync Mode Clock Source: external internal
- Internal Clock Rate (bps): 9600 (dropdown menu)
- Encoding: nrz nrzi
- Max Transmit Unit (bytes): 1500 (text input field)

At the bottom of the configuration area are "Submit" and "Cancel" buttons.

Please note, the “**internal**” clock source means the EST-9600 is providing clock to the attached device. In this case, a 9600 bps clock. When it comes time to configure the Motorola devices, make sure to set them for an “**external**” clock source.

In addition to setting the clock source to “internal,” it is also necessary to position a jumper block inside the EST-9600 for “internal” operation. “Internal” is the default position. However, if in doubt, please double-check the position.



Motorola Quantar

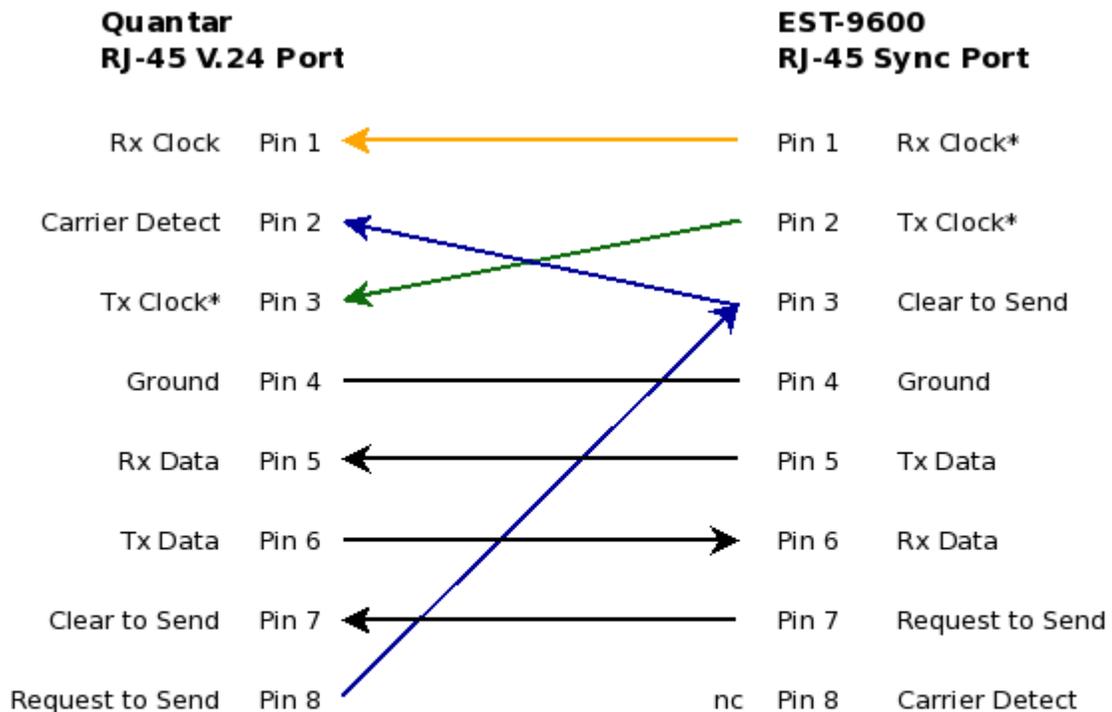
This device has been confirmed to work with the EST-9600. The V.24 interface is an add-on feature of the Wireline Interface Board. Please refer to the Quantar Station Function Manual – Connecting V.24 Board, for more information.

Configuration Notes

The following configuration tweaks were required in the Wireline Configuration.

- Wireline – 4 Wire Full Duplex
- Astro – V.24 only
- External Transmit Clock – Enabled
- Modem Output Level -14Dbm
- RT/RT - Disabled

Wiring Diagram



*External Transmit Clock enabled (input).

*EST-9600 clocks configured for INTERNAL (outputs).

Note: This pinning is common with the DIU 3000 RJ-45 #1 and the GTR 8000 V.24 port.

Motorola DIU 3000, GTR 8000, etc

The above notes for Quantar Station may equally apply to the DIU 3000 and GTR 8000. We have confirmed through documentation that these devices support the same V.24 interface and features. In the case of the DIU 3000, RJ-45 port #1 may be used for V.24 and supports the same pinning as the Quantar. There is also a DB 25 port on this unit that also supports V.24, but we do not have the details for connecting to this port.

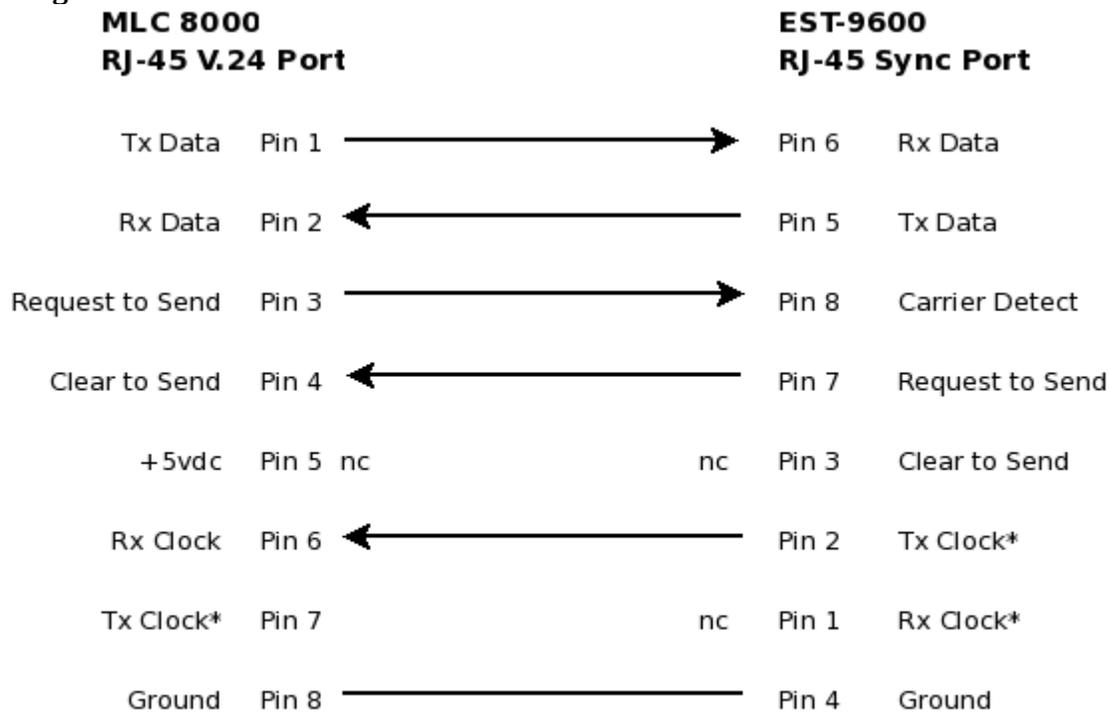
Motorola MLC 8000

This device has been confirmed to work with the EST-9600. The device has an RJ-45 V.24 port, but does not appear to utilize the same pinning as the other Motorola components.

Configuration Notes

- V.24 Link – External Tx Clock

Wiring Diagram



*External Transmit Clock enabled (input).

*EST-9600 clocks configured for INTERNAL (outputs).

This wiring diagram was provided by a confirmed user. However, we question the open Tx Clock pin on the MCL 8000 side of the connection. Since this is confirmed to work, we wonder if there is additional configuration that allows the MLC 8000 to operate both Rx and Tx from the Rx Clock pin.

Share with Us

We are always looking to expand this application note. If you are successful, or even unsuccessful, in deploying the EST-9600 in a similar application, we would love to hear about it. The more technical, the better. Please contact us at support@dcbnet.com.