



May 13, 2007

**INSTRUCTIONS for INSTALLING an ISOLATED
RS485 COMMUNICATIONS LINK (“RS232 EXTENSION CORD”)
for COMTEL DISPLAY SIGNS and other APPLICATIONS**

COMTEL signs are supplied with an RS232 communications interface. A cable with a 3-pin circular connector and a DB9F “D-Sub” connector is also available from the sign manufacturer, in lengths of approximately 2ft. or 25ft. The circular connector connects to the sign and the “D-Sub” connector connects to a PC or Laptop Computer. RS232 communications is specified for distances of up to 50ft. and is generally used for indoor applications only. Upon receiving your sign, it is a VERY GOOD IDEA to connect the sign to your computer, using the RS232 cable provided by COMTEL, to insure proper operation of the Sign and Software, before proceeding with the RS485 installation.

Testing the RS485 Interface:

In general, RS232↔RS485 Converters can be used to extend the communications distance between your PC and the COMTEL sign. Distances of up to 4000ft. are specified for the RS485 link. Before proceeding to make the final connections to your sign, it is once again, a VERY GOOD IDEA to make a local connection to insure that everything is OK. It is much easier to solve problems on the workbench than trouble shoot the system in the final installation.

R. E. Smith has provided all of the items necessary to make this local interface connection before making the permanent connections to your sign. Two IHV24AT converters (with enclosure, cable and power supply) are provided. A short twisted pair of “Cat-5” wire is also provided between the converters for test purposes. The converters have been pre-configured to form the “RS232 Extension Cord.” Connect the terminal strips with the twisted pair of wires to the converters (if not already connected, + to + and - to -, C is not required). Connect a power supply to each converter. Next, connect the 7ft. cable with the DB9F adapter to one of the IHV24AT Converters. Connect the other end of the cable to your PC or Laptop Computer. Then, connect the 2ft. (or 7ft.) cable with the yellow DB9M adapter to the second IHV24AT Converter. Connect the DB9M adapter to the RS232 cable supplied with the COMTEL sign. Next apply power to both converters (the sign and your PC also, if not already powered) and test the operation through the “RS232 Extension Cord” formed by the R. E. Smith, IHV24AT Converters and the other equipment involved.

If everything works the same as with the direct RS232 connection, you are now ready to make your permanent installation over an extended cable distance, using CAT-5 wire or other suitable twisted wire. Shielded wire can be used to improve the reliability and noise immunity of the system. If possible it is best to use a 2ft. RS232 cable at the sign location. Further, the converters must be located in a location that will prevent moisture from condensing on the circuit board.

At this point, if this arrangement does NOT operate the same as with the direct RS232 connection, please recheck your connections and look for the following indications and potential problems:

- 1) The two yellow LED power indicators on both converters should be on.
- 2) The red and green LEDs should be flashing on both converters when data is transferred.
- 3) Please keep in mind that there may be several reasons why the units are not communicating. In general serial communications will NOT operate unless everything is 100% correct.
- 4) If you have NOT tried to test the sign and computer with the direct RS232 connection, please do so at this time. It is better to establish initial success and then add the additional equipment. If you are not operational with the direct RS232 connection, adding the converters will NOT improve the situation. At this point if you are NOT operational you will need to verify that the data rates are the same (typically 9600bps) for the computer and the target device (sign). Also, make sure that the communications specification is the same for both devices (start bit, data bits, parity, stop bits). Check to make sure that you are connected to the correct RS232 serial port on your PC and that handshaking is turned off.
- 5) R. E. Smith has provided a CD with a color-coded terminal emulator (REScomdr...exe) program for use with most Windows operating systems. This program does not require installation; however, the .exe and .ini files should be transferred to a folder on your "desk top" or other location if desired. Do NOT attempt to run this program from the CD. Other information is provided on the CD.
- 6) The jumpers on the IHV24AT have been preset at the factory, for operation in this application, and units should NOT be changed. The converter will operate from data rate of 50bps to 115.2Kbps without adjustment.
- 7) If you are still not operational, give us a call at 513-874-4796. Ask for Ron Smith.

Other helpful hints: When power is applied to the converters the yellow LEDs should be on even if there is no communications between the computer, and the target device (sign). If there is communications between the computer and the target device, all Red and Green LEDs should be on or flashing while the communications is under way (sending a new message to the sign, for example).

Background information: The IHV24AT features a fast automatic transmit-enable circuit for RS232↔RS485 (2-wire, half-duplex) conversion, for data rates up to 115.2Kbps and distances of 4000ft. and further with special driver ICs. The IHV24AT has extensive built-in transient protection for industrial and outdoor applications. The converter will operate from 9-35Vdc, and over a temperature range of -40C to 85C. See data sheet and schematic for additional information. To improve the transient protection capability of the IHV24AT converter, a low impedance path to chassis/earth ground should be provided. To accomplish this, connect a "short" grounding wire to

the standoff marked “ECG” or to the terminal point (ECG) next to the green RS485 connector using, a minimum of 18AWG wire. Call for additional information.

WORK IN PROGRESS, WILL BE UPDATED SOON!

Thanks,

Ronald Smith