OPTOLINX OWNERS MANUAL

INNOVATIVE PRODUCTS FOR A MODERN PLANET

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INTRODUCTION

This manual describes the operation of the OptoLinx PC - Universal Radio Interface. The OptoLinx adapts a wide variety of Radios, Scanners, Decoders, Frequency Counters, and other devices for connection to an RS-232C personal computer serial port in a star network configuration.

Both full and half duplex devices can be connected simultaneously using software to switch between them. Switching between full and half duplex can be done either through software or manually using a dip switch setting on the rear panel.

An Audio input with circuitry acting as a Data Slicer is included for future use to permit software decoding of FSK or AFSK modulated carriers.

Unique to the OptoLinx is the FFC-7 connector and cable used for connection to the AR8000 hand held scanner.

Optoelectronics, Inc. does not specify or recommend any particular software for use with the OptoLinx. Anyone wishing to develop software to support any device to be connected to the OptoLinx is free to do so but please be advised that Optoelectronics can not provide any technical support.

CONNECTORS

The OptoLinx has two connections located on the rear panel, and seven connections located on the front panel. The functions of each of the interfaces are briefly described on the next two pages. A more detailed discussion is given in the OPERATION section.

POWER
DC power is supplied to the OptoLinx through the POWER connector, a standard 2.1mm coaxial DC power jack located on the rear panel.

RS-232C
The RS-232C connector, located on the rear panel, is a DB-9S (9-pin female) connector used to connect the OptoLinx to a personal computer serial port. The connector pinout is such that a "straight - through" cable is required for connection (i.e., connection does not require a null modem adapter).

SERIAL DATA

There are three identical serial data connectors, labeled A, B, and C, located on the front panel. These 3.5mm stereo phone jacks are used to connect up to three Optoelectronics or other CI-5 compatible devices to the OptoLinx. The "TIP" carries TTL transmit data from the OptoLinx, the "RING" carries TTL receive data to the OptoLinx, and the "SHIELD" provides the return for both. This pinout convention is such that a standard stereo audio patch cable can be used to connect the OptoLinx to other Optoelectronics devices equipped with serial ports. The connections are listed below

PIN	SIGNAL
TIP	TTL TXD (or CI-V) from OptoLinx
RING	TTL RXD to OptoLinx
SHIELD	GROUND

APPLICATIONS

TTL Serial Ports

Optoelectronics products are equipped with a TTL asynchronous serial interface which allows the unit to be connected to a personal computer for the purpose of remote control and / or automatic data logging. This three wire interface has different voltage levels and data polarity than the standard RS-232C interface. The OptoLinx can connect to as many as four different Optoelectronics devices equipped with serial ports.

Connection to the M1 Handi - Counter

To connect an Optoelectronics M1 to a personal computer equipped with an RS-232C serial port, perform the following steps:

1. Connect the male end of the supplied RS-232C cable to the RS-232C connector located on the rear panel of the OptoLinx.

2. Connect the female end of the RS-232C cable to the RS-232C connector on your personal computer. Consult your personal computer manual if necessary.

3. Connect one end of the supplied 3.5mm mono cable to one of the three serial data connectors (labeled A, B, or C) located on the front panel of the OptoLinx.

4. Connect the other end of the 3.5mm mono cable to the data port of the M1.

5. Connect the cable plug of the supplied AC adapter to the POWER jack on the rear panel of the OptoLinx.

6. Plug the AC adapter into a working 120V AC outlet.

7. Set the Configuration DIP switches located on the rear panel of the OptoLinx for local & Full Duplex.

8. OptoLog datalogging software is required for use with the M1 frequency counter.

Connection to the Scout

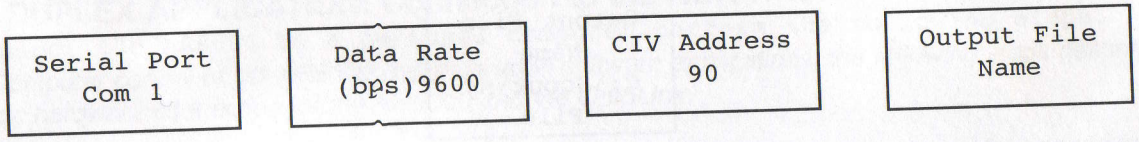
To connect the Optoelectronics Scout frequency recorder to a personal computer equipped with an RS-232C serial port, perform the following steps:

- *The Scout Frequency Recorder needs to be preset in CI-V mode, and in Normal mode (filter off / capture off)when downloading to the PC. The OptoLinx needs to be set in HALF DUPLEX MODE.*
- *Follow steps 1-2 on the M1 instructions.*
- *Connect the 2.5mm cable to the CI-V port on top of the Scout, and other end to the 2.5mm Scout Input of the OptoLinx.*

1. Insert the supplied Scout utility software disk. At the DOS prompt change to your 3.5 disk drive. (*This manual will reference the A: drive as the 3.5 drive*)

2. Type Scout at the A: prompt, this brings you to the introduction screen, Press any key to continue.

3. You have now entered the Main Menu, the diagram on page 7 displays four configuration windows.



3A. Serial port will indicate which COM port you're using.
3B. Data rate is preset to 9600 baud.
3C. CIV address is preset to 90.
3D. Output File Name will be the file you create.

4. Go to selection <3>, select Output File Name, this brings you to the Select Output File Name screen, type in your file name.

Note: Its a good idea to create a sub directory name.

Example: c:\ SCOUT \ MY FILE.TXT

SUB DIRECTORY FILE NAME *OUTPUT FILE NAME*

And Press Enter

Note: When creating a sub directory and file name, you can name it anything
you want. The file names shown are examples only.

5. You have now returned to the Main Menu , the Output Data Filename box

FFC Cable Hookup for AR8000

PIN	SIGNAL
1	Squelch
2	Audio
3	Ground
4	Ground
5	TTL TXD from OptoLinx
6	TTL RXD to OptoLinx
7	N.C.

The AOR AR8000 is connected to the OptoLinx using the 12" long FFC (flat flexible cable) cable (supplied). Note the white plastic backing on one end of the cable, When plugged into the radio correctly (holding the AR8000, antenna up)the white plastic stiffener is down. To plug correctly into the OptoLinx, twist the FFC cable 180 degrees so that it plugs in with the blue backing tape down.

Connection to ICOM CI-V Receivers

To connect the ICOM R7000, R7100, R8500, R9000, and R10 receivers to a computer for the purpose of computer control, perform the following steps:

1. The OptoLinx needs to be configured in Half Duplex Mode. Set the configuration DIP switches on the rear panel of the OptoLinx to Half Duplex Mode.

2. Connect the male end of the supplied RS-232C cable to the RS-232C connector located on the rear panel of the OptoLinx.

3. Connect the female end of the RS-232C cable to the RS-232C connector on your personal computer. Consult your personal computer manual if necessary.

4. Connect the cable plug of the supplied AC adapter to the POWER jack on the rear panel of the OptoLinx.

5. Connect one end of the supplied mono cable to the Remote jack on the rear panel of your ICOM receiver, or the CI-5 jack on the side of the IC-R10.

6. Connect the other end of the supplied mono cable to either A, B, or C connections located on the front panel of the OptoLinx.

7.You will need to construct a cable to use for the squelch status line. Follow the steps below to construct the cable.

It is recommended that you have some basic electronic knowledge and soldering skills before constructing cables.

7A.Items needed: 1. 3.5mm Stereo Cable
2. 3.5mm Mono adapter

8.Cut off one end of the Stereo cable, strip back cable about a 1/2 inch.

9.Using an Ohm meter, determine which one of the wires is the Ring. Clip the other wire off, as you will not need it.

10.All that remains is one wire and ground (bare wire). Connect the Ground (bare)wire to the ground portion of the mono jack, and connect the other wire to the tip portion of the mono jack.

11.Now with the cable constructed, put the stereo end of the cable into the AUX input located on the front panel of the OptoLinx. Connect the Mono end of the cable to the Recorder Remote Jack located on the back panel of the ICOM receiver.

MODE SETTINGS

The various operating modes of the OptoLinx are selected by a two-position piano-type DIP switch, located on the rear panel. The two switch positions are assigned as follows:

Settings	Switch 1	Switch 2
Local Mode / Half Duplex	Up	Up
Remote Mode / Half Duplex	Down	Up
Local Mode / Full Duplex	Up	Down
Remote Mode/ Full Duplex	Down	Down

Since the OptoLinx can perform many different complex interfacing functions, the two configuration switches interact with one another differently depending upon the modes selected.

MODES

LOCAL MODE:
In Local mode changing between full and half duplex is done manually

REMOTE MODE:
An RS232C interface signal from the computer selects between HALF DUPLEX and FULL DUPLEX modes.

HALF DUPLEX MODE:
In HALF DUPLEX mode, data is transmitted to and received from various devices on a single data line. Therefore, transmission and reception cannot occur simultaneously. In this mode, the TXD signals on the FFC connector are disabled. Half duplex interfaces are sometimes referred to as two-wire interfaces. The CI-V interface standard, used on newer Optoelectronics products, as well as ICOM receivers and transceivers, is an example of a half duplex interface.

FULL DUPLEX MODE:
In FULL DUPLEX mode, separate data lines are provided for transmit and receive data. Therefore, transmission and reception can occur simultaneously. In this mode, the TXD signals on the DIN connector and FFC connector are enabled. Full duplex interfaces are sometimes referred to as three-wire interfaces. Some Optoelectronics products such as the M1 Frequency Counter, as well as the AOR AR8000 receiver are examples of full duplex interfaces.

ELECTRICAL SPECIFICATIONS

Since products manufactured by other companies often provide TTL asynchronous serial interfaces, the electrical specifications of the OptoLinx TTL serial ports are provided to assist users in connecting the OptoLinx to these devices. To avoid possible damage to the OptoLinx, consult the manual of the product in question to determine whether or not the interfaces are compatible. Connector types and pin outs may vary, so use caution. Damage to the OptoLinx due to improper connection to a third party device will void the warranty.

The following electrical parameters are for each of the four TTL serial ports, and are specified relative to Signal Ground (SHIELD).

Transmit Data from OptoLinx (TIP)

LOGIC "0": 0-0.4VDC (0.7 mA max. sink current)
LOGIC "1": 3.5-5.0VDC (0.2 mA max. source current)

Receive Data to OptoLinx (RING)

LOGIC "0": 0-0.7 VDC (0.7 mA max. load current)
LOGIC "1" 2.0-5.0 VDC (0.1 mA max. load current)

PC SERIAL PORT

ABOUT THE PC SERIAL INTERFACE PORT:
A serial interface port (may be referred to as an RS-232C or asynchronous communications port) can connect modems, mice or other peripheral devices to your personal computer. Data is transferred back and forth between the peripheral device and the computer.

Peripheral devices other than modems and mice that employ microprocessors and TTL level logic circuitry are not able to directly connect to the RS-232C port on a PC. They must have their TTL logic levels converted to meet the RS-232C specification. Fortunately this has become much more convenient and less expensive due to dedicated converter ICs that are available now. The OptoLinx uses converter ICs to convert TTL logic levels to RS-232C.

Considerations other than logic level are whether the data flow is half duplex or full duplex and to what use the other data and control lines included in the interface are used with the peripheral device. The OptoLinx is designed to switch between half and full duplex manually using a switch and electronically using one of the control lines in the interface. OptoLinx connectors are designed to provide for flexibility in connecting Radios, Scanners, and similar peripherals.

Older PCs may have DB25 (25 pin connectors) while newer PCs may use DB9 connectors exclusively. The OptoLinx uses a DB9 connector and is supplied with a DB9 Male to DB9 Female cable for connection to a PC. Both types of connectors can be accommodated by using adapters. To help sort out some compatibility issues the table below should be used.

Signal	Name	DB9 pin	DB25 pin
DCD	Data Carrier Detect	1	8
RX	Receive Data	2	3
TX	Transmit Data	3	2
DTR	Data Terminal Ready	4	20
GND	Signal Ground	5	7
DSR	Data Set Ready	6	6
RTS	Request to Send	7	4
CTS	Clear to Send	8	5
RI	Ring Indicator	9	22