# OptoLinx Owners Manual

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Connectors</td>
<td>2-3</td>
</tr>
<tr>
<td>Applications</td>
<td>4-12</td>
</tr>
<tr>
<td>Connecting with the M1</td>
<td>5-6</td>
</tr>
<tr>
<td>Connecting with the Scout</td>
<td>6-8</td>
</tr>
<tr>
<td>Connecting with the AOR AR8000</td>
<td>9-10</td>
</tr>
<tr>
<td>Connecting with the ICOM Receivers</td>
<td>11-12</td>
</tr>
<tr>
<td>Modes / Mode Settings</td>
<td>13-14</td>
</tr>
<tr>
<td>Electrical Specifications</td>
<td>15</td>
</tr>
<tr>
<td>PC Serial Port</td>
<td>16-17</td>
</tr>
<tr>
<td>Product Warranty</td>
<td>19</td>
</tr>
<tr>
<td>OptoLinx Compatible Products</td>
<td>20</td>
</tr>
<tr>
<td>Schematic</td>
<td>21</td>
</tr>
</tbody>
</table>
The Optolink devices can not provide any technical support.

Optolink devices are free to do, but please be advised that
anyone wishing to develop software to support any
software, Inc., does not specialize or recommend any particular software
unique to the Optolink is the PC-7 connection and cable used for communication.

An audio input with circuitry acting as a data selector is included for future
rear panel.

Both full and half duplex devices can be connected simultaneously using soft-
computer serial port in a star network configuration.

Frequency counters, and other devices, for communication to an RS-232C personal
interface. The Optolink adapter is a wide variety of radios, scanners, decoders,
This manual describes the operation of the Optolink PC - Universal Radio

INTRODUCTION
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).
<table>
<thead>
<tr>
<th>SIGNAL</th>
<th>GROUND</th>
<th>TTL RXD to Optolinx</th>
<th>TTL RXD (or TXD) from Optolinx</th>
<th>TTL TXD (or TXD) from Optolinx</th>
<th>TIP</th>
<th>RING</th>
<th>SHIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Included below are Optolinx devices equipped with serial ports. The connections are audio, such that a standard stereo jack can be used to connect the Optolinx to other devices. The RING carries TTL receive data to the Optolinx, and the SHIELD provides the Optolinx. The TIP carries TTL transmit data from the Optolinx, the RING to these Optolinx devices or other CI-5 compatible devices to connect up. The 3.5mm stereo phone jacks are used to locate on the front panel. These 3.5mm stereo phone jacks are used to connect up.

Serial DATA

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

5. Connect the cable plug of the supplied AC adapter to the power jack on the rear panel of the printer.

4. Connect the other end of the cable plug of the supplied AC adapter to the data port of the ML-Handi printer.

3. Connect one end of the supplied 3.5mm mono cable to the ML-Handi printer. (Consult your personal computer manual if necessary.)

2. Connect the female end of the RS-232C cable to the RS-232C connector located on the front panel of the printer.

1. Connect the male end of the supplied RS-232C cable to the RS-232C connector of your personal computer.

To connect an optional footswitch ML to a personal computer equipped with an
connection to the ML-Handi - Counter

Optotrax Owners Manual
OptoLinx Owners Manual

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

You want. The title names shown are examples only.

Note: When creating a subdirectory and title name, you can name it any-
thing you want. The title names shown are examples only.

And press Enter.

**OUTPUT FILE NAME**

**SUB DIRECTOR FILE NAME**

Example: \C\SCOUT\MY FILE.TXT

Note: It is a good idea to create a sub directory name.

The select output FILE NAME screen, type in your title name.

The select output FILE NAME, this brings you to

4. Go to selection <3>, select Output FILE NAME, this brings you to

3b. Output FILE name will be the title you create.

3c. CIV address is preset to 90.

3d. Data Rate is preset to 9600 baud.

3a. Serial port will indicate which COM port you're using.

<table>
<thead>
<tr>
<th>Output File Name</th>
<th>CIV Address</th>
<th>Data Rate (bps) 9600</th>
<th>Serial Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optionalx Owners Manual
### FFC Cable Hookup for AR8000

<table>
<thead>
<tr>
<th>PIN</th>
<th>SIGNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Squelch</td>
</tr>
<tr>
<td>2</td>
<td>Audio</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>TTL TXD from OptoLinx</td>
</tr>
<tr>
<td>6</td>
<td>TTL RXD to OptoLinx</td>
</tr>
<tr>
<td>7</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

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.
6. Connect the other end of the supplied mono cable to either A, B, or C con-

ected to the front panel of the Optolink.

5. Connect one end of the supplied mono cable to the remote jack on the rear

panel of your ICOM receiver, or the CI-6 jack on the side of the IC-R10.

4. Connect the cable plug on the supplied AC adapter to the POWER Jack on

the rear panel of the Optolink.

3. Consult your personal computer manual if necessary.

2. Connect the male end of the supplied RS-232C cable to the RS-232C con-

ector located on the rear panel of the Optolink.

1. The Optolink needs to be configured in half duplex mode. Set the com-

puter for the purpose of computer control, perform the following steps:

Connection to ICOM C/V Receivers

Optolink Owners Manual
Optolinx Owners Manual

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.

1. 3.5mm Stereo Cable

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. Clip the other wire off, as you will not need it.

9. Using an Ohm meter, determine which one of the wires is the Ring. Clip the wire to the tip portion of the Mono Jack.

10. All that remains is one wire and ground (bare wire). Connect the Ground wire to the ground port of the Mono Jack. Connect the other wire to the ICOM receiver.

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.
The two configurable switches interact with one another differently depending upon the mode selected. Since the options can perform many different complex interacting functions, the various operating modes of the options are selected by a two-position piano-type DIP switch, located on the rear panel. The two switch positions are assigned as follows:

<table>
<thead>
<tr>
<th>Remote Mode / Full Duplex</th>
<th>Local Mode / Full Duplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down</td>
<td>Down</td>
</tr>
<tr>
<td>Up</td>
<td>Up</td>
</tr>
<tr>
<td>Remote Mode / Half Duplex</td>
<td>Local Mode / Half Duplex</td>
</tr>
<tr>
<td>Down</td>
<td>Down</td>
</tr>
<tr>
<td>Up</td>
<td>Up</td>
</tr>
</tbody>
</table>

**Mode Settings**

- **Switch 1**
- **Switch 2**
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.
OIICC "1": 0-5,0 VDC (0.1 mA max. load current)
OIICC "0": 0-0.7 VDC (0.7 mA max. load current)

Receive data to Optolinx (RING)

OIICC "1": 3.5-5.0VDC (0.2 mA max. source current)
OIICC "0": 0-4.8VDC (0.7 mA max. sink current)

Transmit data from Optolinx (TIP)

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

Electrical Specifications

Optolinx Owners Manual
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.
<table>
<thead>
<tr>
<th>Signal</th>
<th>Name</th>
<th>DB25 Pin</th>
<th>DB9 Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>Ring Indicator</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>CTS</td>
<td>Clear to Send</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>RTS</td>
<td>Request to Send</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>DSR</td>
<td>Data Set Ready</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>Signal Ground</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>DTR</td>
<td>Data Terminal Ready</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td>Transmit Data</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>RX</td>
<td>Receive Data</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DCD</td>
<td>Data Carrier Detect</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>