

ELECTRO-AV MONITORING SYSTEM

INSTRUCTION 90662

October 1998

Electro-AV Recorder

1.0 Introduction

The Stevens Electro-AV Recorder is a 10" wide strip chart recorder designed primarily for water level gaging applications. It utilizes an AC synchronous chart drive motor, together with solid state electronics to control pen position by use of a stepper motor. It accepts a serial RS-232 encoded signal, which is interpreted to produce proper pen movement. The signal represents an absolute level indication. Battery backup memory within the circuitry maintains the reference value during power down conditions, allowing for proper registration when power is restored. An integral 5-digit display is also included in the system. Power is derived from standard 110 VAC line.

1.1 Unpacking

Remove all shipping tie-downs, packing pieces, etc. Several parts and accessories may be individually wrapped. Check the Sales Order to insure that all items are accounted for before disposing of the packing materials.

1.2 Equipment and tools required

The following equipment and tools are usually required for proper installation of the Electro-AV Recorder:

Necessary mounting hardware and tools (screw drivers, screws, drill, combination pliers, etc.) as required.

Electrical wiring tools.

1.3 Mounting

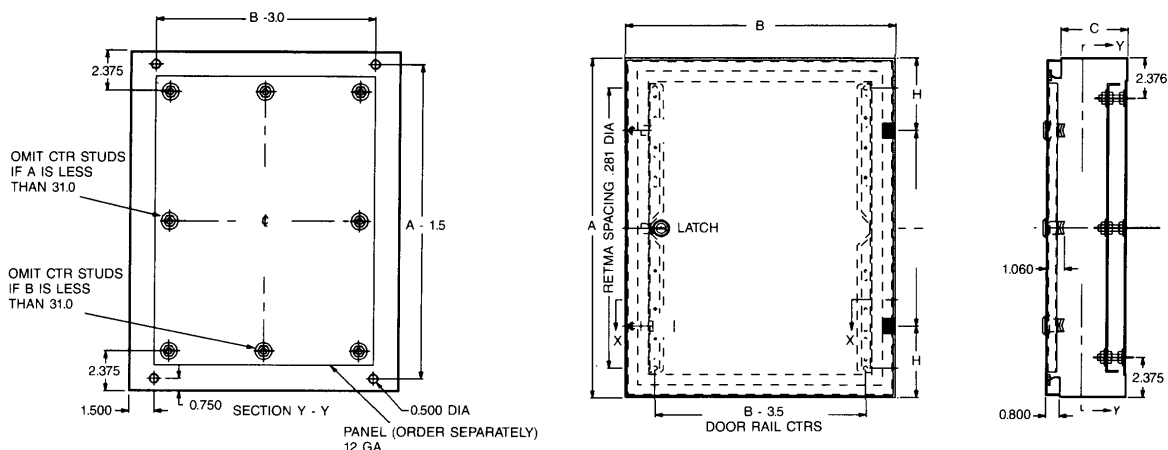
The surface on which the recorder is to be mounted should be reasonably flat. The instrument is supplied for wall or panel mounting. For panel mounting cut a hole in the panel as specified in Figure 1. Use the "L" brackets included with the recorder. For wall mounting, use the included set of screws and nuts.

1.4 Wiring

Note: This system requires connection to 115 VAC 60 Hz line power. Such wiring should be done by a licensed electrician or otherwise certified personnel.

When the recorder is in position, open the cover. Install the grey and black cable bushings in the left-hand side of the case, through the appropriate cable routing holes. Route the 3 conductor 110 VAC power cable through the gray bushing on the left-hand side of the instrument. Use the wiring diagram in Figure 2 for reference. Connect the wires to the appropriate terminals.

Figure 1 Electro-AV Outline Drawing (Panel cutout 20 1/4" x 20 1/4")



A = 20" B = 20" C = 6"

90662

Electro-AV Recorder

place by sliding it in the direction of the "lock" arrow.

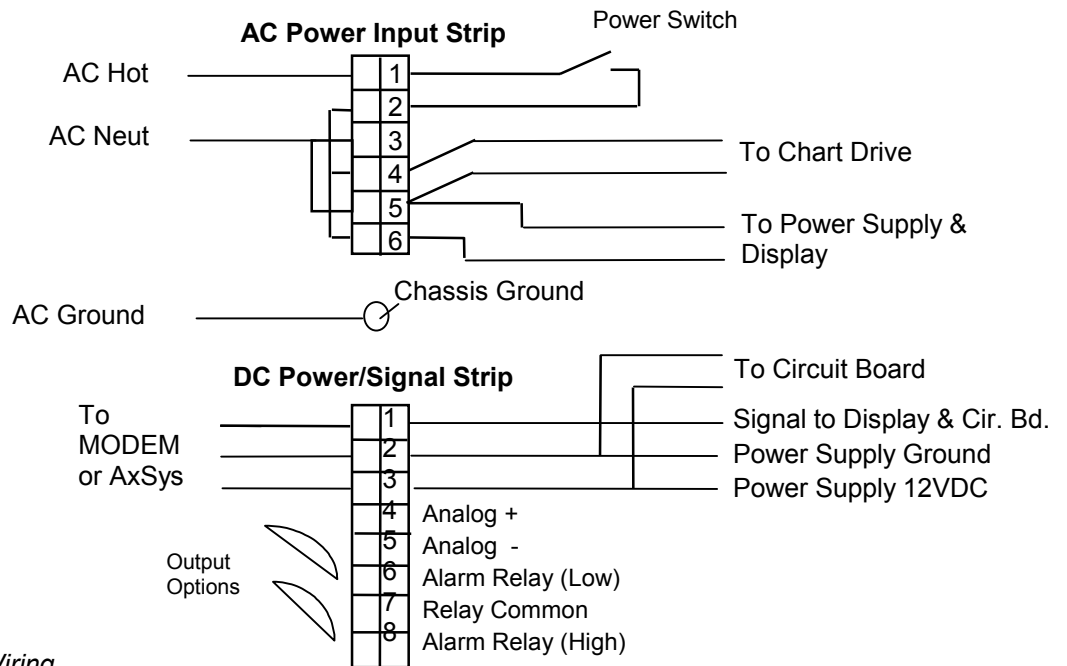


Figure 2. Electro-AV Wiring

Route the signal/12 VDC power cable through the black bushing(s) on the left-hand side of the instrument. Use the wiring diagram in Figure 2 for reference. Connect the wires to the appropriate terminals. You may also wish to

reference the system diagram in Figure 4, and SYSTEM DIAGRAM on Page 9.

1.5 Final Check-out

Re-install the cover over the terminal strip. Do not apply power until performing a complete system checkout and calibration. This is described in section 1.10.

After checkout and calibration, secure the cover on the recorder.

1.6 Installing the Chart

Disable the pen carriage drive by using the pen drive toggle switch (see Figure 5). To install or replace a chart roll, lift the pen from the chart drive cylinder (bottom cylinder) by simply tilting it back. Pull the friction roller assembly away from the chart cylinder. Lock it in

Remove the two thumb screw from the sides of the writing plate and lift the plate out. Remove the take-up cylinder from the recorder. Remove the supply cylinder (middle cylinder) from the recorder, and remove the large knurled nut from the end. Observe that the core of the new chart is flush at one end and protrudes at the other. Slip the chart onto the supply cylinder, flush end toward the flange, and tighten the knurled nut firmly in place. Place the supply cylinder in its bearings, with the flange to the left so the chart comes off of the top of the cylinder. Replace the take-up cylinder.

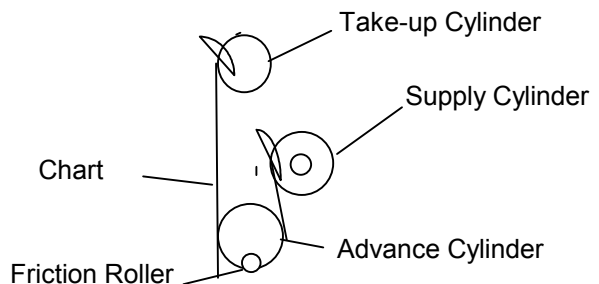


Figure 3. Chart Routing

Pass the chart behind the drive cylinder (bottom drum) and out between the cylinder and the friction rollers. Pull the chart upward about 1 1/2 inches beyond the take-up cylinder with the right edge square to the flange. Reinstall the writing plate.

Electro-AV Recorder

Pass the chart over the writing plate and around the front of the take-up cylinder. Install the half-round paper clamp from the bottom, pressing downward. Take the slack out of the chart by winding the take-up cylinder upward, using the white knurled flange (see Figure 5). Unlock the friction roller

assembly and allow it to hold the paper in place.

So the paper will run true, reach over the top of the take-up cylinder and hold

the supply cylinder with your fingers, and turn the white knurled flange of the take-up cylinder until the paper slips for 1/2 turn. To take the slack out of the chart, turn the take-up cylinder's flange upward.

1.7 Removing the Chart

Disable the pen carriage drive by using the pen drive toggle switch (see Figure 5). Lift the pen from the chart drive cylinder (bottom cylinder) by simply tilting it back. Manually advance the chart by turning the large, white knurled disk on the left end of the take-up cylinder. Do this until the graphic record is just beyond the edge of the writing plate. Using the edge of the writing plate as a guide, cut the chart with a knife. Lift the take-up cylinder out of the instrument and slip off the chart. This may require a firm twisting motion if the chart is tightly wound. Pull or shake the chart clamp out of the chart roll. Re-attach the remaining chart, or install a new chart as described in section 1.6, above. The A-10 (English) charts have a diagonal blue line marked at the end of the chart fastened to the core. When this line appears during use, the remaining days of supply can be calculated. On the A-10 chart, count the number of small divisions (0.1 in) between the left margin and the blue line. At a chart speed of 2.4 inches per day, the number of days of chart remaining is equal to the number of divisions counted.

1.8 Positioning the Pen

This procedure is covered in Section 1.10, Check-out and Calibration.

1.9 The Pen

The pen is a replaceable cartridge pen, which should be replaced periodically, as the chart line begins to dim. Simply slide the pen out of its holder and replace it with a new unit.

Electro-AV Recorder

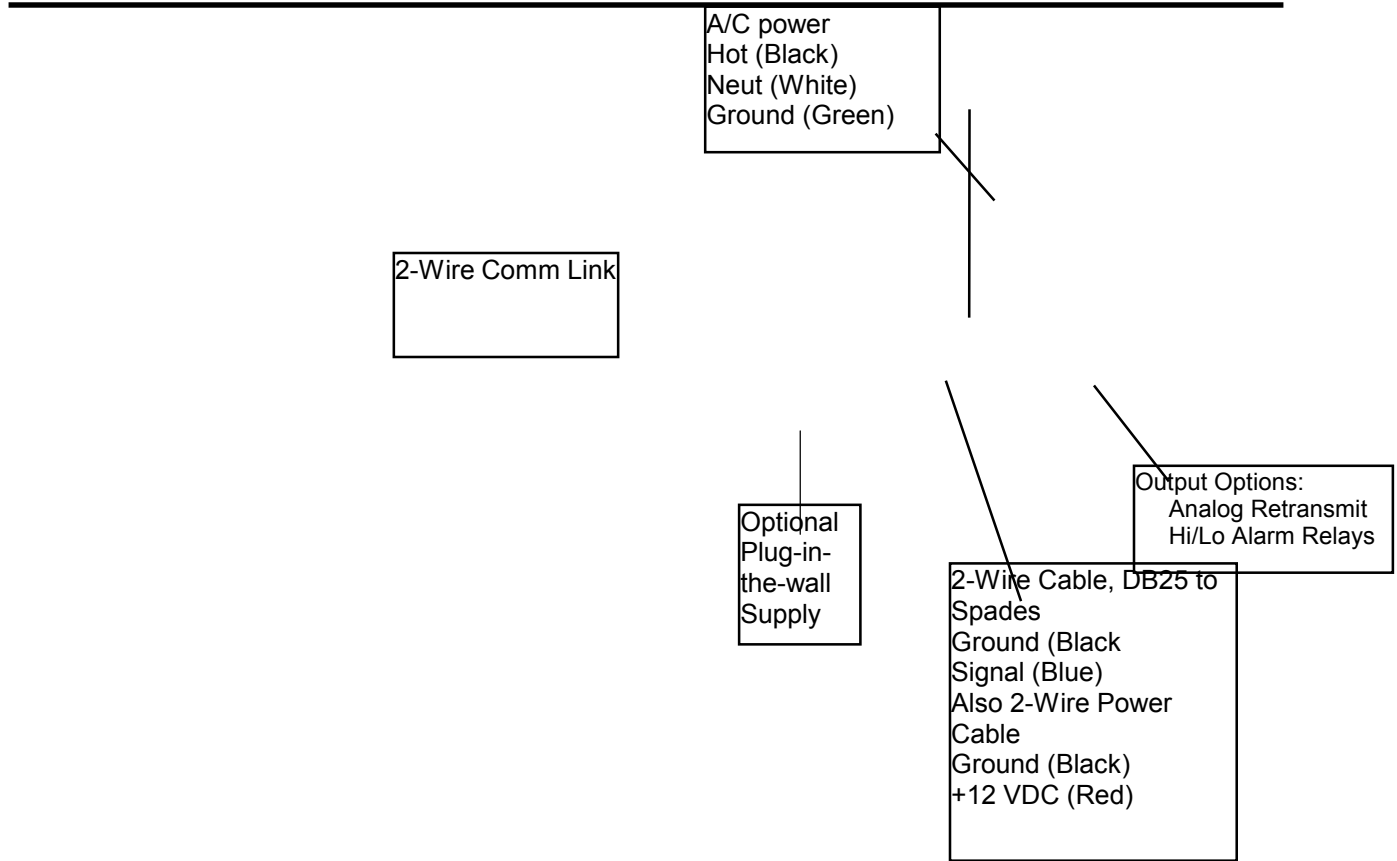


Figure 4. System Diagram

Electro-AV Recorder

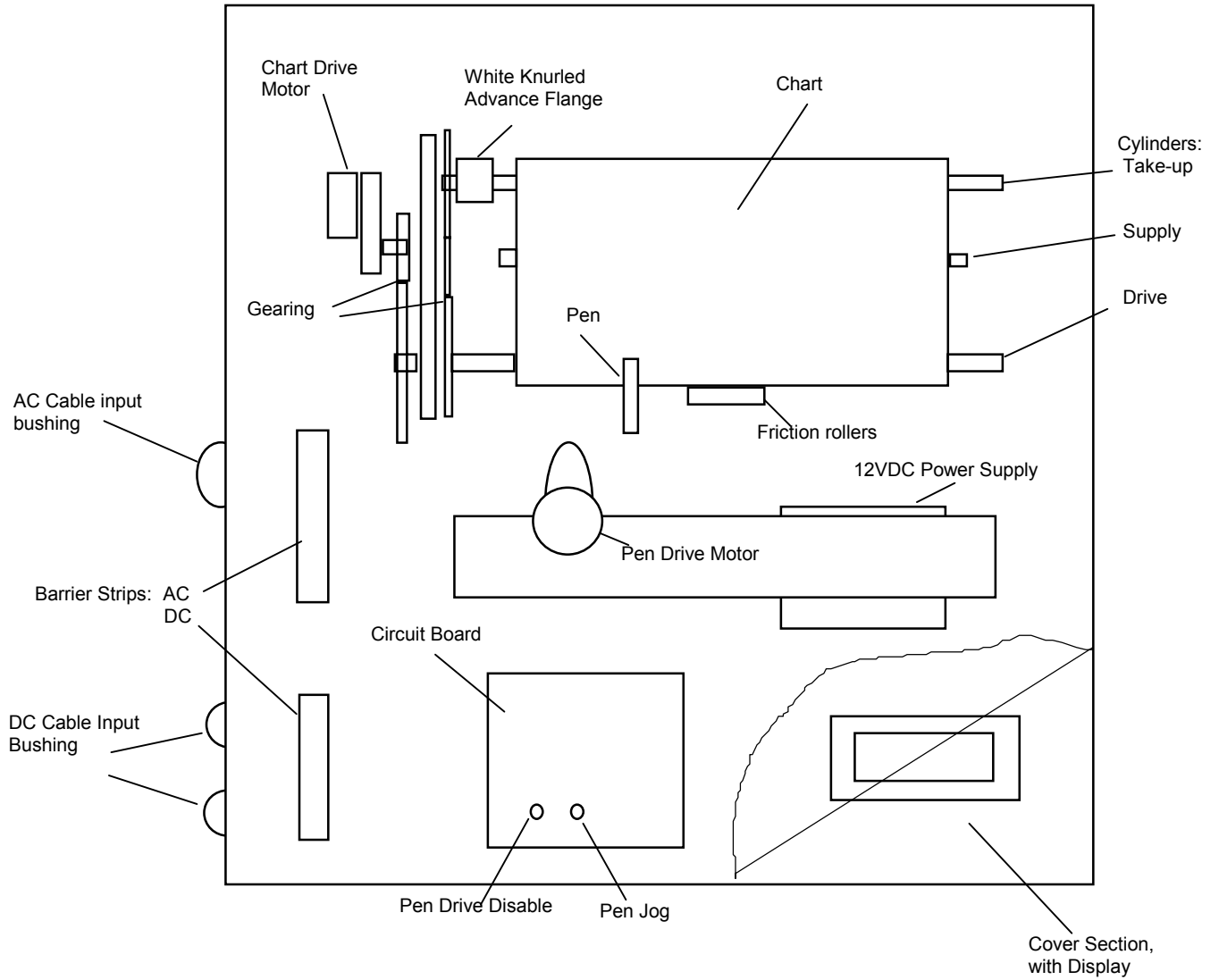


Figure 5. Electro-AV, Major Components

Electro-AV Recorder

1.10 Check-out and Calibration

A. The system should be connected as shown in the attached system diagram (Figure 4). Power should not be applied to components at either the gage site or the receive site until all connections are

complete at that site. The interconnect between site and control room need not be complete for power-up check.

B. All components are pre-programmed for operation. The system should “plug and play”. The following set-up conditions apply:

Axsys setup:

Set last character of Channel ID to “/”
 System Set-up, enter submenu by pressing “>”
 Set Log Mode to Cont. Display
 Set Auto-Telemetry to: DLT
 Set Baud Rate to 300

1256 (9096) Display	dEC P bAud bITS StOP PARIT bEGIn	3 (Decimal point for xxx.xx readout) 300 7 1 (stop bits) Odd (parity is reverse of AXSYS, which is Even) 47 (This is the start character of the telemetry sequence from the AXSYS, an ASCII 47, equivalent to the character “/”)	
	End	120 (This is the end character of the telemetry sequence from the AXSYS, an ASCII 120, equivalent to a lower case “x”)	
MODEMS	One modem is set for ORIGINATE, and one is set for ANSWER. The ORIGINATE modem should be used together with the Electro-AV and the ANSWER modem at the gage site. The modem at the gage site receives power from the AXSYS through the RS-232 cable. The modem used the Electro-AV receives power from that unit.		

C. A power supply is provided for power at the gage site. This supply is sufficient to power both the AxSys and the Modem. For operation of a remote display only (1256 or 9096) without the Electro-AV chart recorder, a separate supply is needed for the ORIGINATE Modem.

AxSys “Reading” display and in the Electro-AV display and pen

movement. If this is incorrect, check the AxSys set-up menu to verify input sensor parameters (see AxSys manual).

D. Once the system is wired properly and power is applied, a change in the input device to the AxSys should produce a corresponding response on the display of the Electro-AV, as well as moving its pen. The display on the

F. If all operation appears correct, it is now appropriate to position the pen. Place the Pen Drive toggle switch in the “Disable” position. Set the AXSYS to the appropriate water level gage height. Use the Pen Jog push-button to position the pen at the appropriate location on the chart. Each time you push and hold the button, it will reverse directions. It will make ten incremental moves, and then jump to a larger increment size for the next 10. Every time the button is released and pressed again, the process will repeat, and the direction will reverse. Once the pen is in the proper position, and the proper gage height has been set into the AXSYS, the toggle switch can be moved to re-enable the pen drive. The Electro-AV will then take the next signal from the AXSYS as the reference for the current pen position, and the system will be synchronized to that datum.

Electro-AV (1256 or 9096) should indicate the same as “Reading” on the AxSys Display. Set the AxSys to a reading other than zero to see if the corresponding reading appears on the 1256 display. If not, check the system wiring.

E. To check for proper registration, exert a change on the input device to the AxSys (e.g., turn encoder pulley, raise or lower submersible pressure device) and observe the proper amount of change in the

Electro-AV Recorder

G. Secure the cover in the closed position. The system is now ready for normal operation.

2.1 General

The Electro-AV System is designed for many years of operation with a minimal amount of maintenance. Design parameters are such that torque loads, bearing stress and other mechanical wear concerns are much lower than what the system is capable of handling. Therefore, such long-term wear is extremely minimal.

There are no periodic maintenance concerns other than keeping the system clean. In areas of high dust or blowing sand, the system components should be checked for build-up of such particles as might interfere with the system mechanics. Dust and dirt should be removed by a forced stream of compressed air. If a plant source of compressed air is not available, use of aerosol cans of such air can be used. These are particularly good for getting into close areas around small gears and bearings.

DO NOT USE OIL. All bearings are such that they do not require oiling. Oil will only tend to accumulate more dust and dirt.

Maintenance

2.2 Troubleshooting

The following steps should be checked in the event a system is not functioning properly:

A. System totally unresponsive

- . Power not applied to system
- . Circuit breaker open

B. Electro-AV not responding correctly

- . Wrong direction (use jog function to take pen through reversal) edge

- . No response (check wiring)

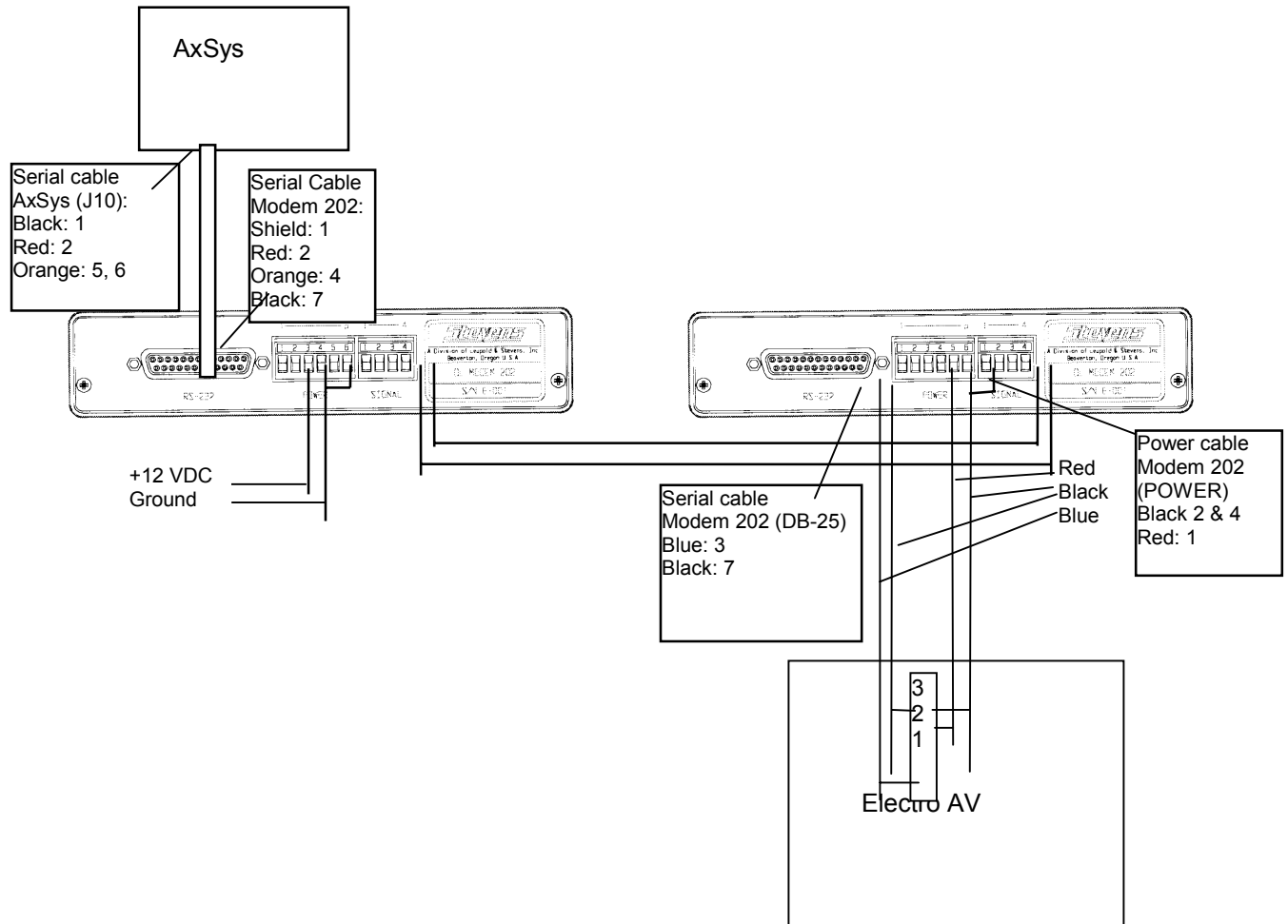
C. Scaling not correct

- . Check input parameters and scale settings for AXSYS
- . Check pen direction

Please also refer to troubleshooting guides for individual components contained in their instructions.

Maintenance

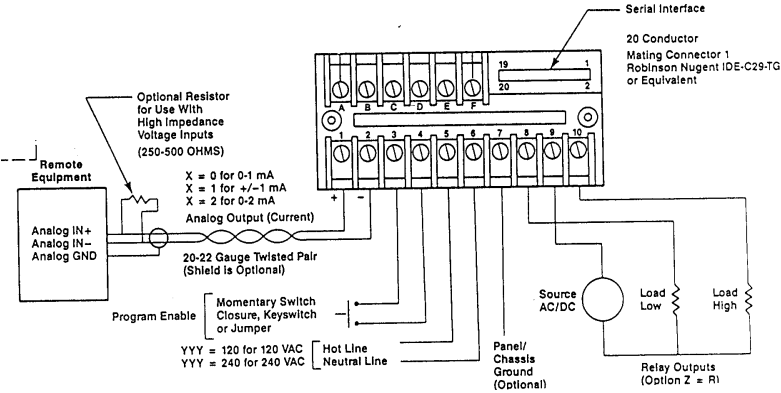
SYSTEM WIRING FOR AXSYS/DLM 202/ELECTRO AV



Set-up for AxSys MPU:

- Set last character of Channel ID to “/”
- System Set-up, enter submenu by pressing “>”
- Set Log Mode to Cont. Display
- Set Auto-Telemetry to: DLT
- Set Baud Rate to 300

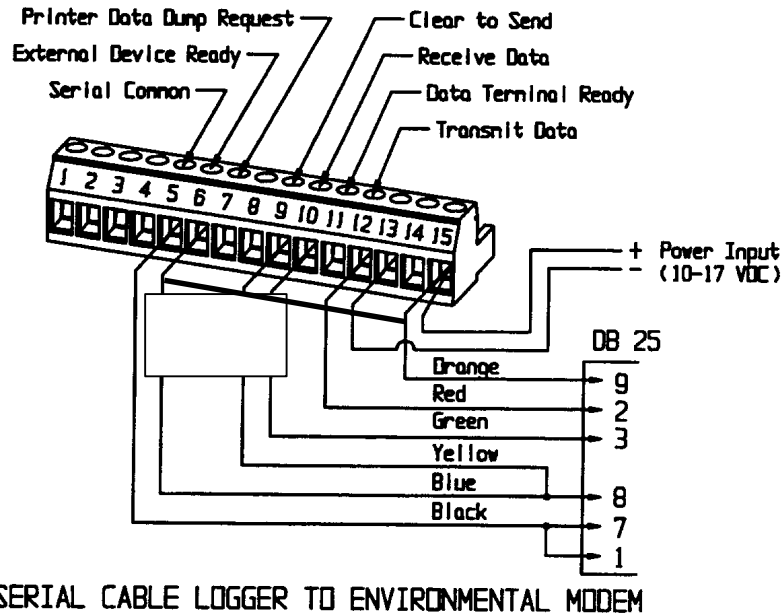
Maintenance



REFERENCE WIRING FOR DIGITAL DISPLAY UNIT

Maintenance

WIRING OF GS-93 FOR USE WITH ELECTRO AV



SERIAL CABLE LOGGER TO ENVIRONMENTAL MODEM

Notes:

1. Disconnect the RECEIVE DATA wire (Position 10) from the orange barrier strip. Communications from the GS-93 to the Electro AV is one way, and there is no need for the GS-93 to receive data. In fact, noise signals that might come in on this line could disrupt the GS-93 transmission cycle.
2. Disconnect the EXTERNAL DEVICE READY wire (Position 6) from the orange barrier strip. Add a jumper connection from Position 6 to Position 15 (+ Power Input). This will enable the continuous transmission of data to the Electro AV without the presence of a carrier, when used with newer Stevens 4-wire Direct Link Modems.