This document describes the procedures required to interface with SEL communications processors utilizing the ZIVercom software Version 1.90 and up (older versions can be used but require Patch 20 and up to incorporate the SEL2030 module). The procedures listed below are specific to the SEL 2030, but can also be applied to the SEL 2020.

To ensure proper operation the subsequent steps must be followed correctly for a remote connection (via modem) or a local connection (directly through a port of a SEL communications processor):

- ZIVercom (PC) communication settings
- ZIVercom (PC) SEL2030 module settings
- SEL 2030 communication settings
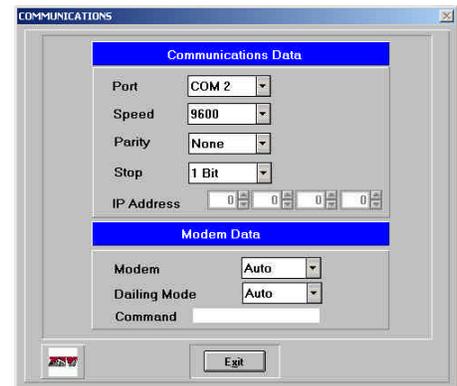- ZIV relay communication settings

Additionally, an appendix includes information on:

- Communications cable selection
- RS232 port pinouts
- Modem settings

Remote Connection

ZIVercom Communications Settings:

- The Windows™ based ZIVercom communications software must have the identical communications settings as the SEL 2030 port (master port) that is connected to the modem. To adjust the communications settings, select the **Communications** option from the **Configuration** menu.

- The **Port** setting should indicate the PC serial port that is connected the to the modem. The **Speed**, **Parity** and **Stop Bit** settings should match the settings of the SEL 2030 master port.

- Typically, the fields under **Modem Data** can be left in the **Auto** setting.

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ZIVercom SEL2030 Settings:

- The ZIVercom communications software is equipped with a module that will establish a transparent connection with the appropriate selected port, as well as issue the **termination string** and **quit** commands when the session has ended.

- To distinguish between a direct modem connection and a connection via a 2030, the **SEL2030** menu *needs to be opened and exited in order to set a switch in the ZIVercom software to interface with the 2030*. The user needs to select the **SEL2030** option *each time* a connection via an SEL 2030 is made. The settings will not need to be adjusted after they have been set the first time using the **Add** button.

- There are seven important settings in this menu

  - **Password Level 1:** Enter the Level 1 password for your device.

  - **Password Level 2:** Enter the Level 2 password for your device.

  - **Slave Port:** Select the port that the ZIV relay is connected to.

  - **Speed:** Select the speed of the slave port to match the speed of the ZIV serial port.
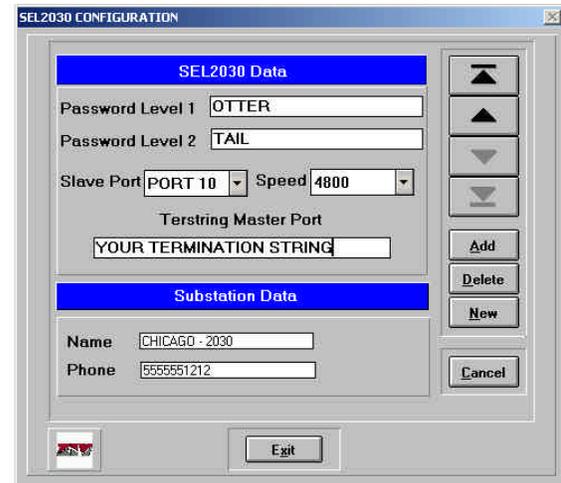
  - **Terstring Master Port:** Enter the text string that terminates the transparent connection to the slave port

  - **Name:** Enter the name of the substation / connection for database purposes.

  - **Phone:** Enter the phone number of the substation to be dialed.

SEL 2030 Communication Settings:

An SEL 2030 can communicate with up to 16 different IEDs using EIA-232 serial communication. A PC communicates to the 2030 via HyperTerminal (or similar terminal emulator program) to perform programming of each port.

Please refer to the SEL 2030 manual for procedures and ASCII commands to configure and activate ports for communication.

The SEL 2030 rear port configuration options are listed below. The Slave Port settings should correspond to the communications settings of the ZIV relay as well as the **Slave Port** settings in the **SEL2030** module of the ZIVercom software. The items in **bold** indicate the proper settings used for this example.

Slave Port:

```
PORT:          3 (arbitrary)
DEVICE  =      O
MODEM   =      N
AUTO_BAUD=     N
PROTOCOL=      A
PORTID  =      " User Defined "
BAUD    =      4800 (arbitrary)
DATABIT =      8   STOPBIT = 1   PARITY  = N
RTS_CTS =      N   XON_XOFF= N
TIMEOUT =      User Defined
```

Master Port:

```
PORT:          10 (arbitrary)
DEVICE  =      M
PROTOCOL=      S
FAST_OP =      N
PORTID  =      " User Defined "
MODEM   =      Y
MSTR    =      " User Defined "
CD_CTS  =      N
BAUD    =      9600 (arbitrary)
DATABIT =      8   STOPBIT = 1   PARITY  = N
XON_XOFF=      N
TIMEOUT =      User Defined ECHO   = Y
AUTO_HELP=     N
TERTIME1=      User Defined
TERSTRING=     " User Defined " (SEL default is "\004")
TERTIME2=      OFF
```
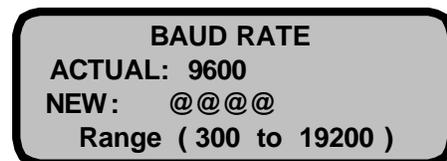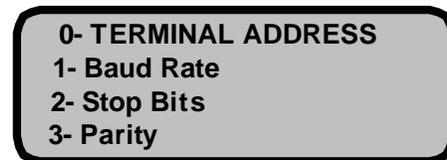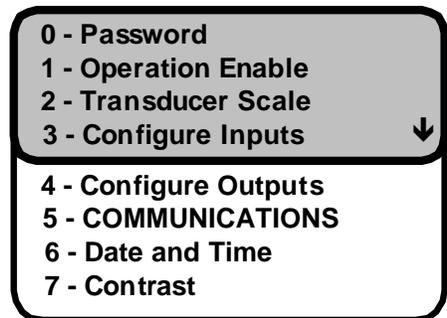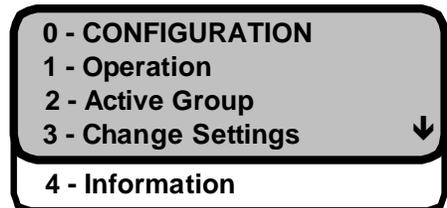
Note: The setting TERSTRING refers to the termination string that is required to end the transparent mode of communications and is used in the SEL2030 module in the ZIVercom software.
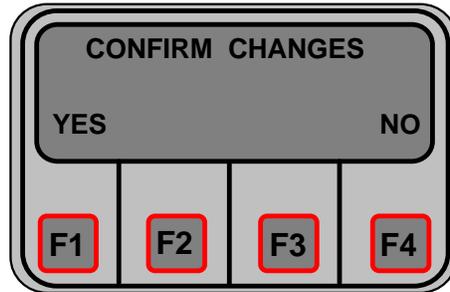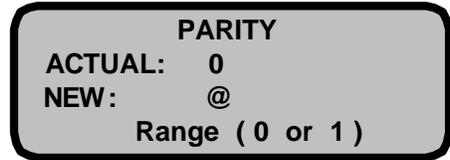
ZIV Relay Communication Settings:

The rear communications port settings of the ZIV relay must match the communications settings of the SEL 2030 slave port.   The front port of a ZIV relay can also be used, but the speed is not adjustable. The default communication settings are 4800:1:Even. The parity settings of the front port can be adjusted in the **Communications** menu (example note shown).

- Press any key on the keypad to display the main menu.

- Select option 0 – **Configuration** to enter the Configuration menu.

```
0 - CONFIGURATION
1 - Operation
2 - Active Group
3 - Change Settings      ↓
4 - Information
```

- Select option 5 – **Communications** to enter the Communications menu.

```
0 - Password
1 - Operation Enable
2 - Transducer Scale
3 - Configure Inputs     ↓
4 - Configure Outputs
5 - COMMUNICATIONS
6 - Date and Time
7 - Contrast
```

- Option 0 – **Terminal Address** is only used when a relay is incorporated into an integrated system. This setting can be ignored for other applications.

```
0- TERMINAL ADDRESS
1- Baud Rate
2- Stop Bits
3- Parity
```

- Selecting option 1 – **Baud Rate** will open the Baud Rate setting screen. Ensure that this setting corresponds to the same speed of the SEL 2030 slave port.

```
    BAUD RATE
ACTUAL:  9600
NEW:    @@@@
  Range ( 300 to 19200 )
```

- Selecting option 2 – **Stop Bits** will open the Stop Bits setting screen. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

```
    STOP BITS
ACTUAL:    1
NEW:       @
      Range ( 1 or 2 )
```

- Selecting option 3 – **Parity** will open the Parity setting screen. **0** represents **NO Parity** and **1** represents **Even Parity**. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

```
        PARITY
ACTUAL:    0
NEW:       @
      Range ( 0 or 1 )
```

- Press the **ESC** key until the **Confirm Changes** prompt appears. Press **F1** to accept the changes or **F4** to cancel the changes.

```
   CONFIRM  CHANGES

YES                      NO

 F1     F2     F3     F4
```

- Press the **ESC** key until the default screen appears. The relay is now configured for remote communications via the rear port.
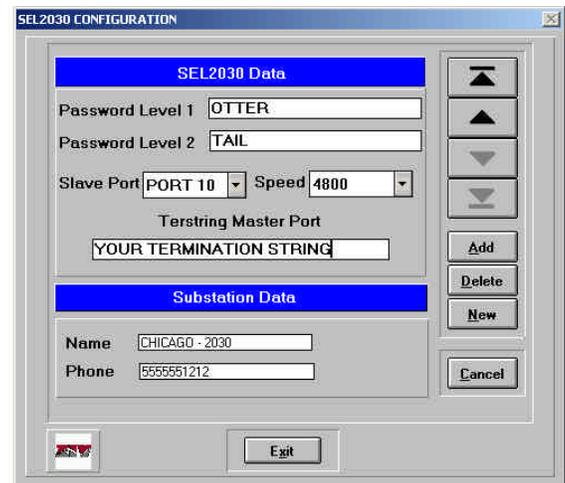
Connection:

Once all of the settings have been completed, a remote connection via the 2030 can be made.

Step 1: Initiate the ZIVercom program

Step 2: Log on using your username and password

Step 3: Select the **SEL2030** option from the **Configuration Menu** to prepare the software to interface with the 2030. Ensure that the settings are correct and click the **Exit** button.
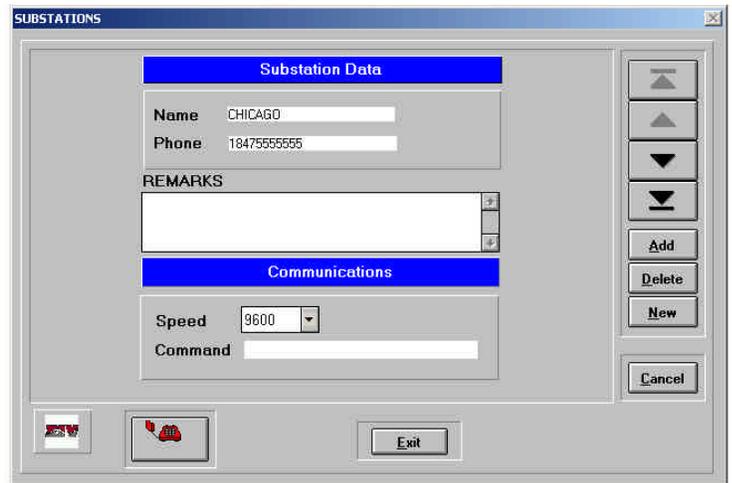
Step 4: Select **Remote** from the **Connection** menu

Step 5: Verify and adjust (if necessary) the **Name**, **Phone** number and the **Speed** of the substation to connect to.

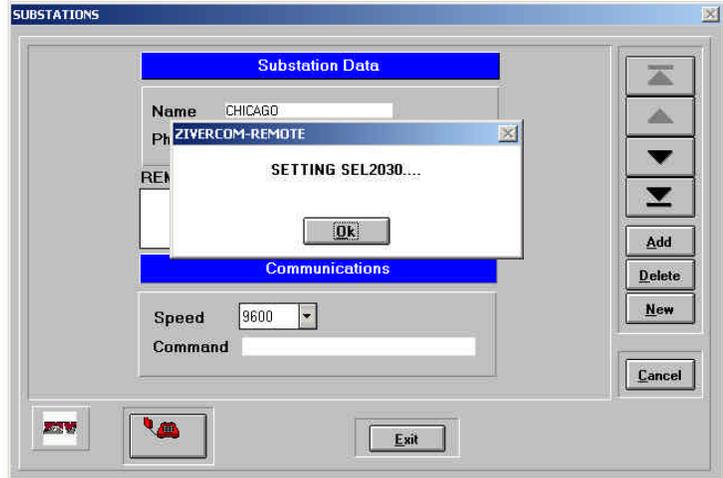Step 6: Click the **Telephone** Icon to initiate the call.

Step 7: The CONNECTING screen will appear. The **Initializing modem** message will appear and indicates that ZIVercom is temporarily adjusting the settings of the modem to work correctly with the application. The **Waiting to Connect** message will then appear indicating that the local modem is attempting to establish communications with the remote modem.
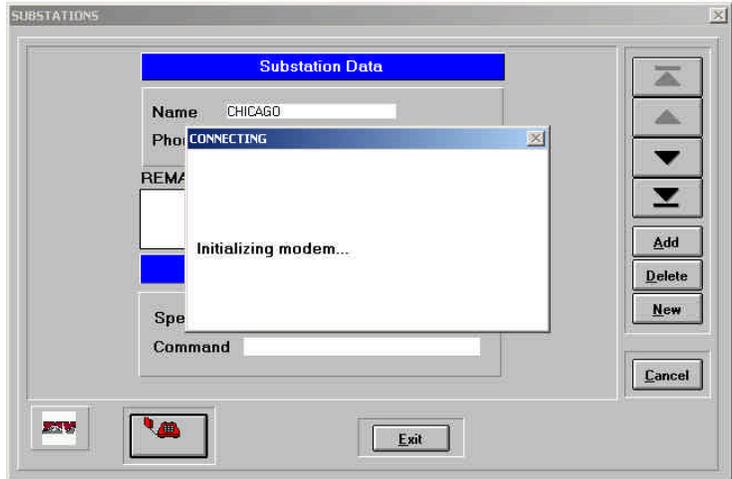
Step 8: The **SETTING SEL2030** prompt will appear after the ZIVercom recognizes the SEL2030 prompt and is ready to send the configuration information.

After clicking OK, the ZIVercom will establish Level 2 access with the 2030 and will prepare the slave port for transparent communication to enable the ZIVercom to communicate with the ZIV relay.

If the program skips step 8, ensure that you have completed step 3 above.

Step 9: After the transparent communications channel has been established, the ZIVercom will prompt the user to click **OK** to establish the remote relay communication.
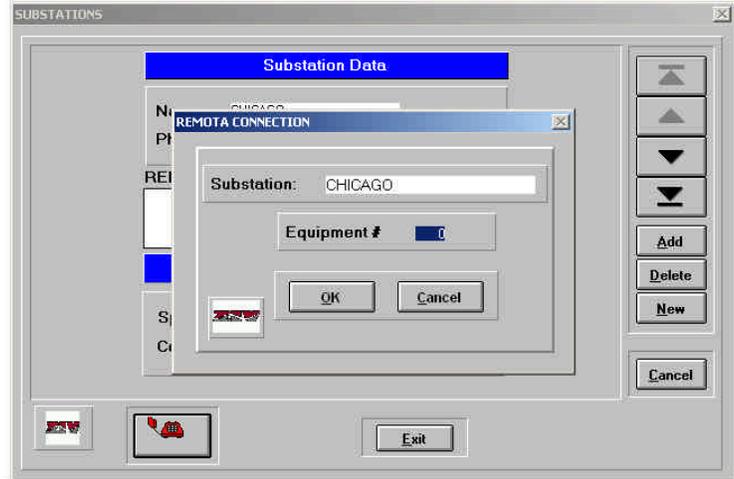
Step 10: The RELAY STATUS screen will appear. You may now use the ZIVercom program to:

- Review and edit settings
- Collect event records
- Collect oscillographs
- Collect fault reports
- Etc.
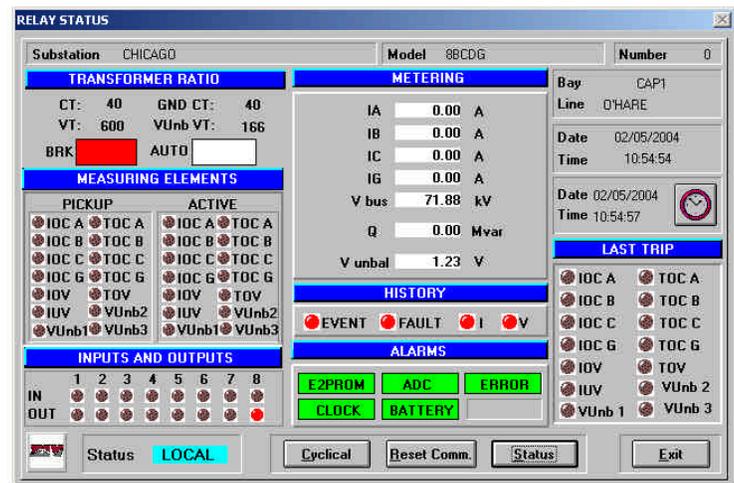
To terminate the connection, **Exit** out of the RELAY STATUS screen and click the **Cancel** button on the REMOTE CONNECTION screen.

LOCAL CONNECTION

ZIVercom Communication Settings:

- The Windows™ based ZIVercom communications software must have the identical communications settings as the SEL 2030 port (master port) that is connected to the PC. To adjust the communications settings, select the **Communications** option from the **Configuration** menu.

- The **Port** setting should indicate the PC serial port that is connected the to the modem. The **Speed**, **Parity** and **Stop Bit** settings should match the settings of the SEL 2030 master port.

- Typically, the fields under **Modem Data** can be left in the **Auto** setting.
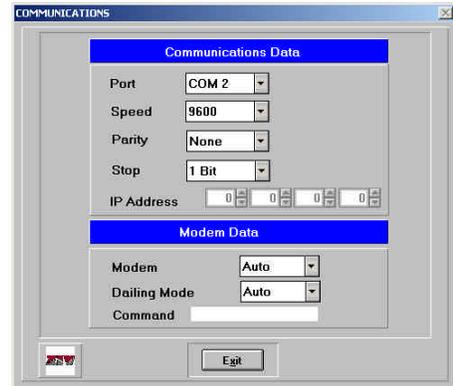
SEL 2030 Communication Settings:

An SEL 2030 can communicate with up to 16 different IEDs using EIA-232 serial communication. A PC communicates to the 2030 via HyperTerminal to perform programming of each port.

Please refer to the SEL 2030 manual for procedures and ASCII commands to configure and activate ports for communication.

The SEL 2030 rear port configuration options are listed below. The Slave Port settings should correspond to the communications settings of the ZIV relay as well as the **Slave Port** settings in the **SEL2030** module of the ZIVercom software. The items in **bold** indicate the proper settings used for this example.

Slave Port:

```
PORT:          3 (arbitrary)
DEVICE  =      O
MODEM   =      N
AUTO_BAUD=     N
PROTOCOL=      A
PORTID  =      " User Defined "
BAUD    =      4800
DATABIT =      8   STOPBIT = 1   PARITY  = N
RTS_CTS =      N   XON_XOFF= N
TIMEOUT =      User Defined
```

Master Port:

```
PORT:          10 (arbitrary)
DEVICE  =      M
PROTOCOL=      S
FAST_OP =      N
PORTID  =      " User Defined "
MODEM   =      N
MSTR    =      " User Defined "
CD_CTS  =      N
BAUD    =      9600 (arbitrary)
DATABIT =      8   STOPBIT = 1   PARITY  = N
XON_XOFF=      N
TIMEOUT =      User Defined ECHO   = Y
AUTO_HELP=     N
TERTIME1=      User Defined
TERSTRING=     " User Defined " (SEL default is "\004")
TERTIME2=      OFF
```
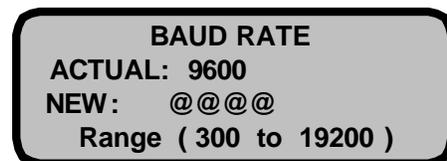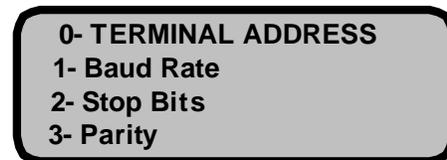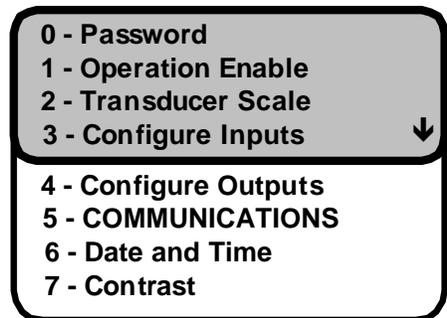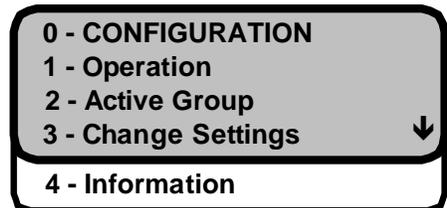
Note: The setting TERSTRING refers to the termination string that is required to end the transparent mode of communications and is used in the SEL2030 module in the ZIVercom software.

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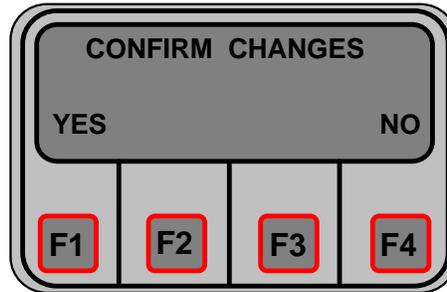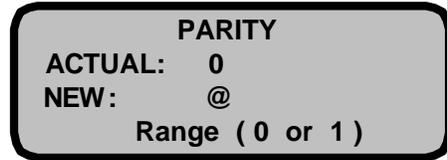
ZIV Relay Communication Settings:

The rear communications port settings of the ZIV relay must match the communications settings of the SEL 2030 slave port.   The front port of a ZIV relay can also be used, but the speed is not adjustable. The default communication settings are 4800:1:Even. The parity settings of the front port can be adjusted in the **Communications** menu (example not shown).

- Press any key on the keypad to display the main menu.

- Select option 0 – **Configuration** to enter the Configuration menu.

```
0 - CONFIGURATION
1 - Operation
2 - Active Group
3 - Change Settings        ↓

  4 - Information
```

- Select option 5 – **Communications** to enter the Communications menu.

```
0 - Password
1 - Operation Enable
2 - Transducer Scale
3 - Configure Inputs       ↓

  4 - Configure Outputs
  5 - COMMUNICATIONS
  6 - Date and Time
  7 - Contrast
```

- Option 0 – **Terminal Address** is only used when a relay is incorporated into an integrated system. This setting can be ignored for other applications.

```
  0- TERMINAL ADDRESS
  1- Baud Rate
  2- Stop Bits
  3- Parity
```

- Selecting option 1 – **Baud Rate** will open the Baud Rate setting screen. Ensure that this setting corresponds to the same speed of the SEL 2030 slave port.

```
      BAUD RATE
 ACTUAL: 9600
 NEW:    @@@@
   Range ( 300 to 19200 )
```

- Selecting option 2 – **Stop Bits** will open the Stop Bits setting screen. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

```
      STOP BITS
 ACTUAL:    1
 NEW:       @
       Range ( 1 or 2 )
```

Form CO05 (01-00)

- Selecting option 3 – **Parity** will open the Parity setting screen. **0** represents **NO Parity** and **1** represents **Even Parity**. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

```
        PARITY
ACTUAL:    0
NEW:       @
        Range ( 0 or 1 )
```

- Press the **ESC** key until the **Confirm Changes** prompt appears. Press **F1** to accept the changes or **F4** to cancel the changes.

```
     CONFIRM CHANGES

  YES                    NO

  [F1]   [F2]   [F3]   [F4]
```

- Press the **ESC** key until the default screen appears. The relay is now configured for remote communications via the rear port.

Connection:

Once all of the settings have been completed, a local connection via the 2030 can be made.

Step 1: Connect via Hyper Terminal (or similar terminal emulator program) to the SEL 2030 via the master port. Ensure that the communications properties of the Hyper Terminal connection match the master port of the 2030 (see SEL 2030 manual for detailed instructions).

Step 2: Perform the appropriate steps to establish a transparent connection to the slave port of the 2030 (see SEL 2030 manual for detailed instructions).

Step 3: Suspend the communications between Hyper Terminal and the master port of the 2030 by disconnecting. This will leave the transparent connection open while freeing up the COM port on the PC for the ZIVercom software program.

Step 4: Select **Local** from the **Connection** menu

```
ZIVERCOM
Quit  Configuration  Connection
                     Local
                     Remote
                     Emulation ▸
```

Step 5: The LOCAL CONNECTION screen prompts the user to enter a **Substation** name. This is an optional step, but is recommended as it aids in event and substation data tracking and organization. Click the **OK** button once a substation name has been entered.
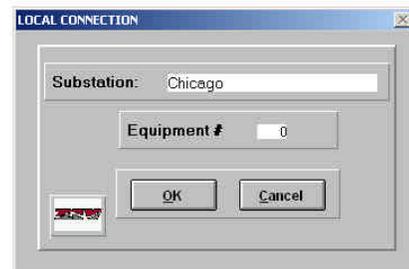
Step 6: The RELAY STATUS screen will appear. You may now use the ZIVercom program to:

- Review and edit settings
- Collect event records
- Collect oscillographs
- Collect fault reports
- Etc.
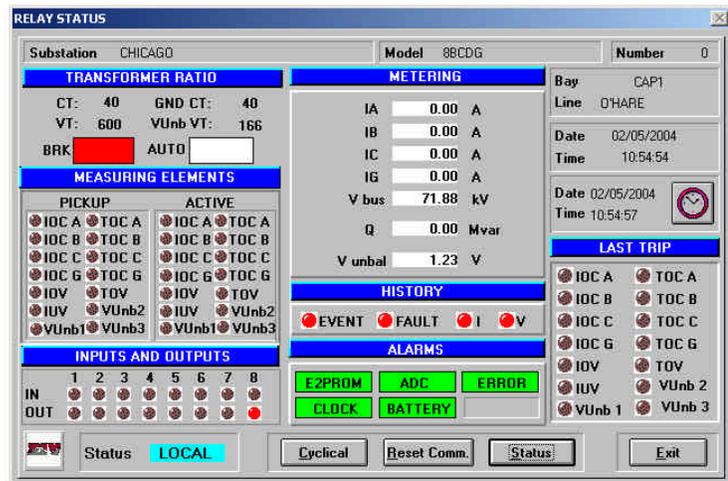
Summary:

Relay communications via the SEL 2030 can be achieved provided that the proper cable selection has been made and that the appropriate communications settings have been applied to the PC, the SEL 2030 and ZIV relay.   For additional assistance, please contact the factory.

APPENDIX:

Communications Cable Selection:

The SEL 2030 instruction manual provides a table of appropriate cables for various types of connections.   For a standard RS-232 connection, a male-to-male DB-9 cable is required between the serial ports of an SEL 2030 and a ZIV relay. The ZIV device requires a null-modem (pins 2 and 3 crossed) type cable for proper connection. Please consult the SEL 2030 manual for specific cable part numbers to meet various requirements

REMOTE CONNECTION

PC – Local Modem   Serial ("Straight") Cable

Remote Modem – SEL Master Port   Serial ("Straight") Cable

SEL Slave Port – ZIV Relay   Null Modem Cable (pins 2 & 3 crossed)

LOCAL CONNECTION

PC – SEL Master Port   Null Modem Cable (pins 2 & 3 crossed)

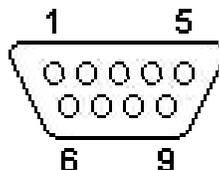SEL Slave Port – ZIV Relay   Null Modem Cable (pins 2 & 3 crossed)

Pinouts:

The ZIV RS232, DB9 communications ports have the following pinout.

PIN 2: TXD

PIN 3: RXD

PIN 5: GND

Modem Settings:

The modem settings should not require adjustment as the ZIVercom software temporarily adjusts the local modem settings to work properly. However, it is important to note that the remote modem must be programmed at the desired connection speed and should match the master port communications parameters of the SEL 2030.

ZIV recommends the following modem settings for US Robotics type modems utilizing a baud rate of 4800 in this example.

LOCAL MODEM

U.S. Robotics 56K FAX EXT Settings...

```
B0  E0  F1  L2  M1  Q0  V0  X1  Y0
SPEED=4800  PARITY=N  WORDLEN=8
DIAL=TONE    OFF LINE  CID=0

&A0  &B0  &C1  &D2  &H0  &I0  &K0
&M0  &N0  &P0  &R1  &S0  &T5  &U0  &Y1

S00=001  S01=000  S02=043  S03=013  S04=010  S05=008  S06=004
S07=060  S08=002  S09=006  S10=014  S11=072  S12=050  S13=000
S15=000  S16=000  S18=000  S19=000  S21=010  S22=017  S23=019
S25=005  S27=001  S28=008  S29=020  S30=000  S31=128  S32=002
S33=000  S34=000  S35=000  S36=014  S38=000  S39=012  S40=000
S41=004  S42=000
LAST DIALLED #:
```

REMOTE MODEM

U.S. Robotics 56K FAX EXT Settings...

```
B0  E1  F1  L2  M1  Q0  V1  X4  Y0
SPEED=4800  PARITY=N  WORDLEN=8
DIAL=TONE    OFF LINE  CID=0

&A0  &B0  &C0  &D0  &H0  &I0  &K0
&M0  &N0  &P0  &R1  &S0  &T5  &U0  &Y1

S00=002  S01=000  S02=043  S03=013  S04=010  S05=008  S06=004
S07=060  S08=002  S09=006  S10=014  S11=072  S12=050  S13=000
S15=000  S16=000  S18=000  S19=000  S21=010  S22=017  S23=019
S25=005  S27=001  S28=008  S29=020  S30=000  S31=128  S32=002
S33=000  S34=000  S35=000  S36=014  S38=000  S39=012  S40=000
 S41=004  S42=000
```