Quick – Start Programming Guide

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INTRODUCTION

CAUTION

The equipment covered by this publication must be selected for a specific application and it must be operated by qualified persons who are thoroughly trained and who understand any hazards that may be involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

This document is intended to be used as a guide for programming the protection functions of a ZIV type **BCD** relay with the provided *ZIVercom*® communications software. Standard requirements to operate this program are:

- An IBM PC AT or compatible computer using an Intel 80386 processor or higher. A minimum of 8 MB or RAM is required (16 MB recommended). Either an accessible CD-ROM or 3.5" 1.44 MB floppy disk drive, and at least 20 MB of available hard disk space are required for software installation and storage. The computer must utilize Windows 3.x or higher for its operating system. Serial port COM 1 or COM 2 must be available.

- A DB-9 (9 pin) serial communications cable with a null modem adapter (pins 2 and 3 crossed).

ZIVercom® is a powerful, user friendly software package intended to aid the user with setting changes, data collection and oscillography (optional). Settings can be made off line and downloaded locally or remotely, or can be made while being physically connected to the relay.

To ease the process, the user should be familiar with the keypad and menu structure of the LCD interface screen. Please refer to Chapter 7 of the **8BCD** Manual or Chapter 8 of the **7BCD** manual.

USING *ZIVercom*® COMMUNICATION SOFTWARE

Installing *ZIVercom*® on the Computer Hard Drive

NOTICE

If you have been provided with 3.5" floppy disks, we recommend that you back these up at this time. Refer to your Microsoft Windows manual if you are unfamiliar with this procedure. Store the original disks in a safe place and use the backup copy henceforth.

Insert Disk 1 in to the appropriate drive of the computer. Your version of windows will determine how to access and execute the file named **setup.exe**.

If you are using the CD-ROM version of the software, the **setup.exe** file is located in the following directory **d:\setup\Disk 1\setup.exe**. If d: is not your CD-ROM drive, please substitute with the appropriate drive letter.

Running *ZIVercom*®

NOTICE

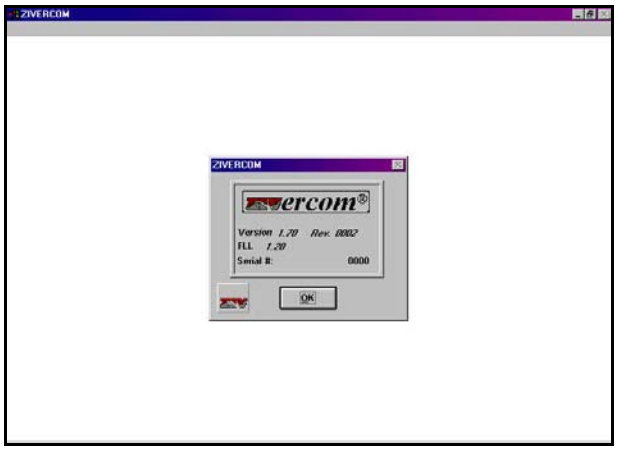
There are two ways to load setting from the ZIVercom® software to the BCD terminal units. Settings files can be created off-line and downloaded remotely or locally. Settings can also be edited while the relay is connected to a PC. The instruction set described next applies to adjusting relay settings while being connected to a PC. Instructions for off-line settings adjustments are located in the Appendix on page 23.

Step 1

With the PC off, connect the DB-9 communication cable with null modem adapter between the serial port of the computer and the local communication port of the relay located on the front panel. (Note: it may be possible to connect the communication cable with the PC powered up, please consult you PC manufacturer). Be sure the proper auxiliary voltage has been connected to the terminal units power supply (see external connection diagram(s) at the end of the appropriate instruction manual).

Step 2

Turn on computer and initiate the *ZIVercom*® software program by double-clicking on the *ZIVercom*® icon. The *ZIVercom*® application screen will appear, as depicted below.



Note that this screen indicates the software version and serial number.

Step 3

Click **OK**. The identification screen will appear, as depicted below.

Enter the appropriate “User” name and “Password”. The default is “ZIVERCOM” and “ziv” respectively.

Step 4

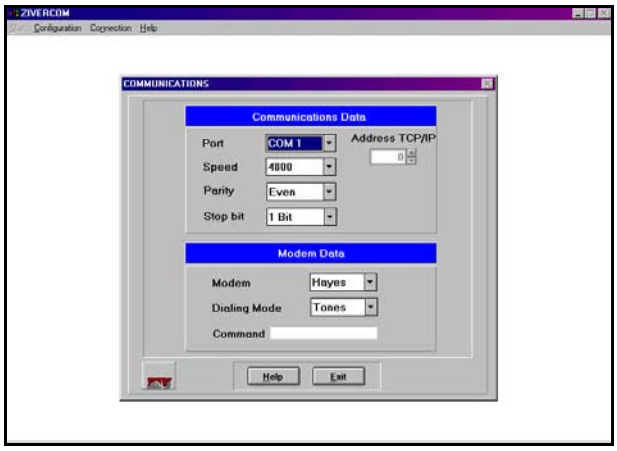
Click **OK**. The main menu screen will appear, as depicted below.

Step 5

Highlight and select **Configuration** on the menu bar. A pull-down menu screen will appear, as depicted below, listing configuration options.

Step 6

Highlight and select **Communications.** The **COMMUNICATIONS** dialog box will appear, as depicted below, listing communications and modem data options.



Enter the following settings for the local communication port:

- Port: COM 1 or COM 2, as appropriate.
- Speed: 4800 bps.
- Parity: Even.
- Stop bit: 1 Bit.

Also enter the appropriate modem data to allow remote communication with the **BCD** terminal unit.

Step 7

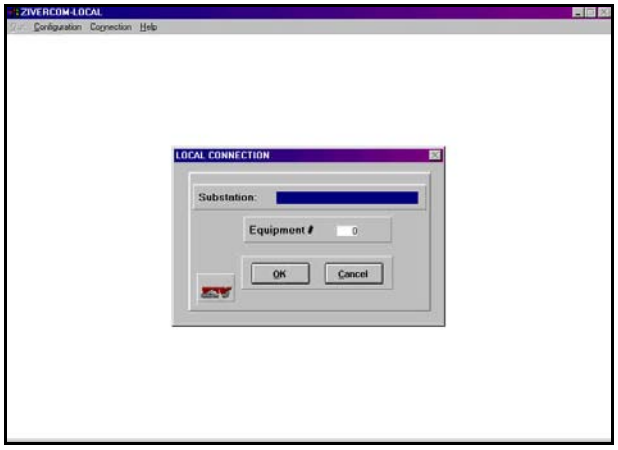
Clicking **Exit** on this, or any other, dialog box will close the dialog box and revert back to the previous screen, typically the main menu screen (as depicted below) or the default information screen.

Step 8

Highlight and select **Connection** on the menu bar. A pull-down menu will appear, as depicted below, listing various connection options.

Step 9

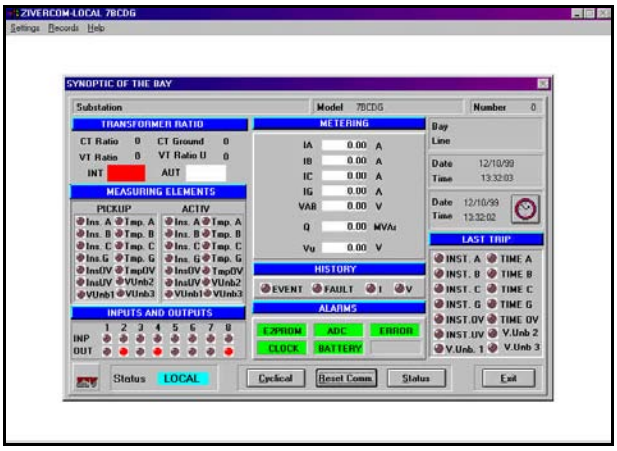
Highlight and select **Local**. A dialog box will appear, as shown below, for specifying substation and equipment number information.



This dialog box is utilized when the **BCD** is connected in a system with multiple relays for addressing purposes. For connecting to a single relay locally, clicking **OK** without any additional input is acceptable.

Step 10

The software will perform a "handshake" function with the **BCD** terminal to determine the correct model number and gather settings actively being used in the relay. The default information screen will appear to alert you that the software is communicating correctly with the terminal unit.



Real-time information is polled from the unit and is displayed on the default information screen. (Note: in this representation, the analog inputs are not connected to currents or voltage, therefore all metering data will read zero.) Verify that the "**Status**" indicator in the lower left-hand corner displays **LOCAL**.

Clicking the **Cyclical** button will continuously update screen information. Press any key to exit this function. Clicking the **Status** button will perform a one-time status update of screen information.

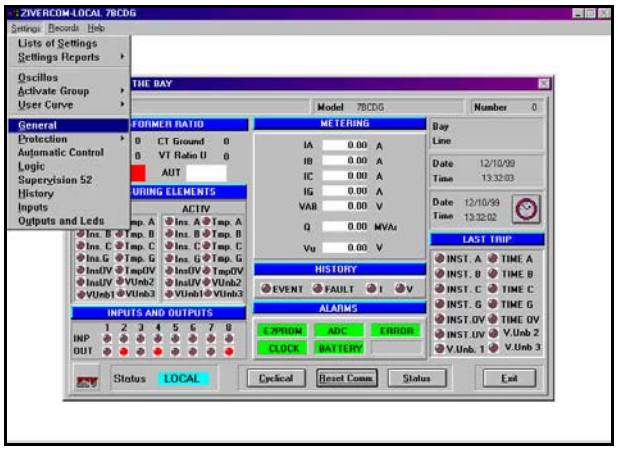
Creating a Default Settings Record

NOTICE

Before creating a new settings file, it is recommended that a default settings record be created, reflecting the settings of the device as shipped. The user can adopt the same techniques used to create a default settings file in the following steps to create specific settings files in the future.

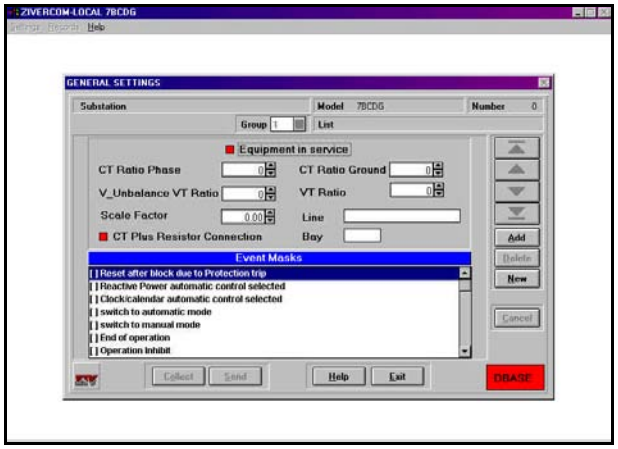
Step 11

Highlight and select **Settings** from the main menu bar. A pull-down menu will appear, as depicted below, listing setting options.



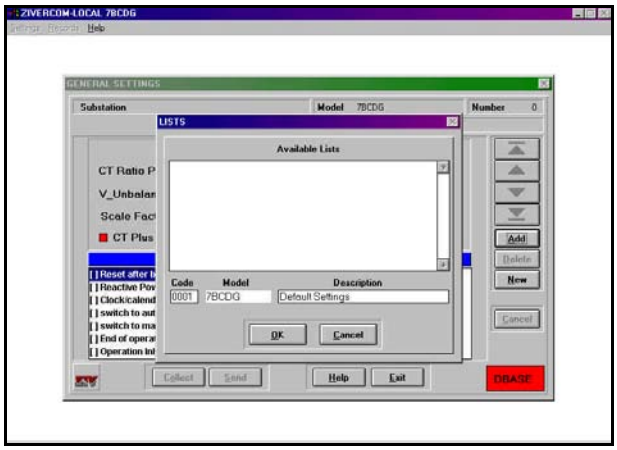
Step 12

Highlight and select **General**. The **GENERAL SETTINGS** dialog box will appear, as depicted below, listing general settings options.



Step 13

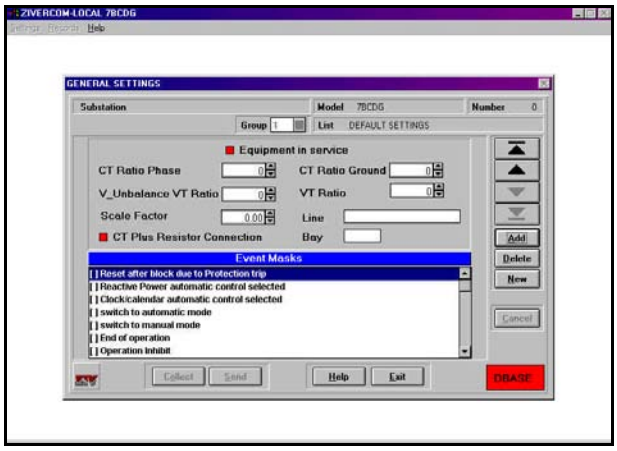
Click **Add**. The **LISTS** dialog box will appear, as depicted below, providing a list of all available settings records. In this instance, there are none.



Enter a code number and description to label the setting file. In this instance, select “0001” and “Default Settings,” respectively.

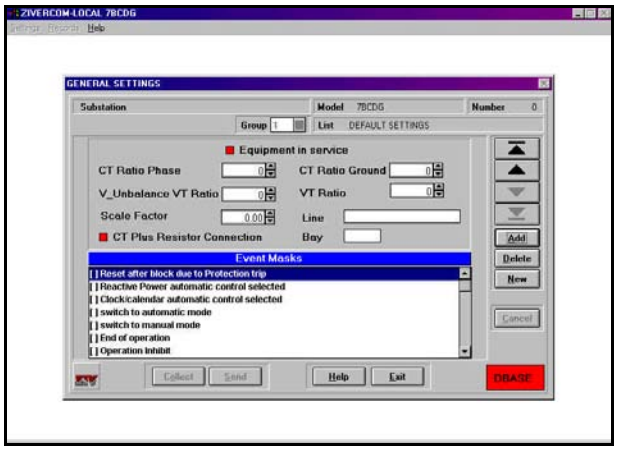
Step 14

Click **OK**. The **GENERAL SETTINGS** dialog box will appear again, as depicted below.



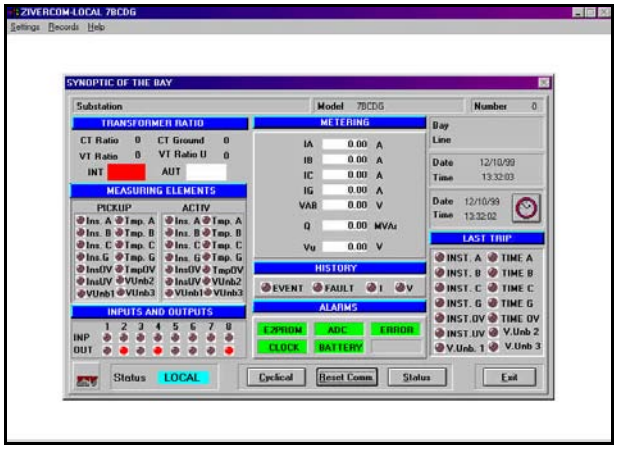
Step 15

Click the up or down arrow key until the **List** field reads "Default Settings," as depicted below. Note that the data source box at the lower right-hand corner changes from **RELAY** to **DBASE**.



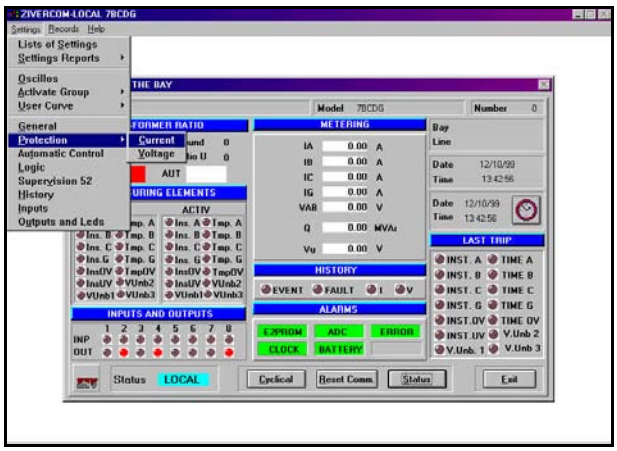
Step 16

Click **Exit**. The default information screen will appear again, as depicted below.



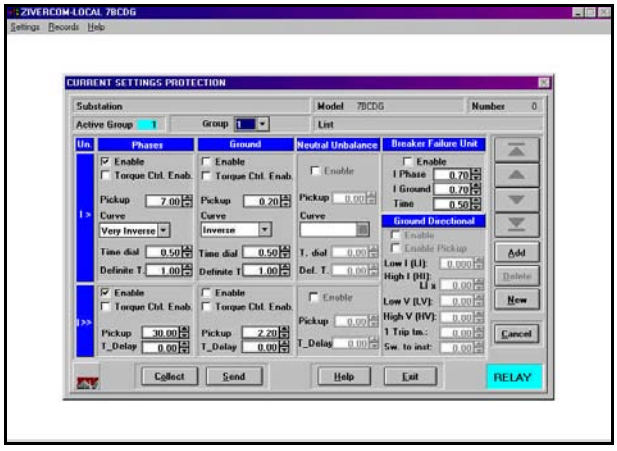
Step 17

Highlight and select **Settings**. A pull-down menu will again appear, as depicted below, listing settings options.



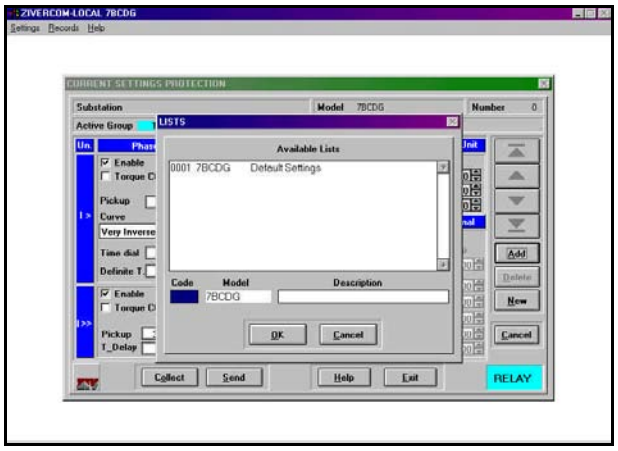
Step 18

Highlight and select **Protection, Current**. The **CURRENT SETTINGS PROTECTION** dialog box will appear, as depicted below, listing current protection settings.



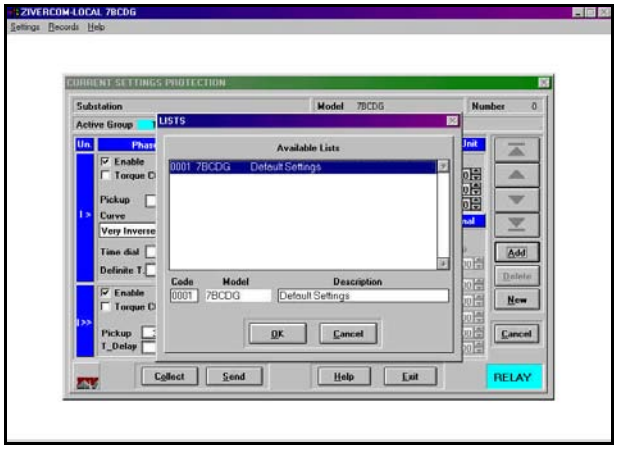
Step 19

Click **Add**. The **LISTS** dialog box will again appear, as depicted below, indicating all available setting records. In this case, the only settings record is "0001 Default Settings."



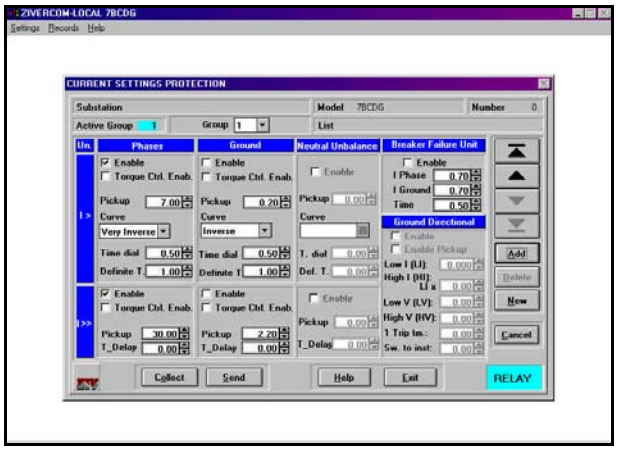
Step 20

Double-click on "0001 Default Settings" to select this settings record, as depicted below.



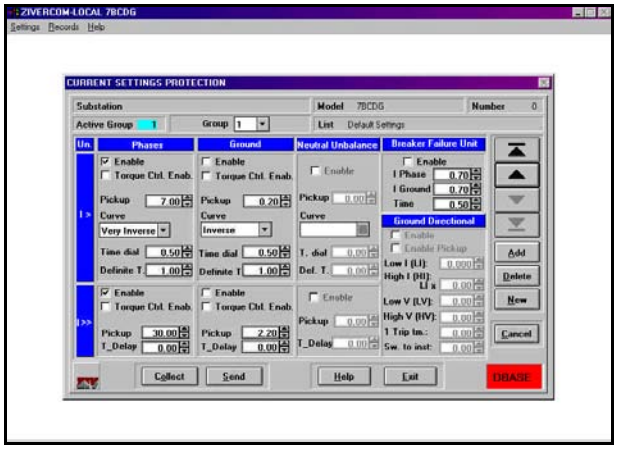
Step 21

Click **OK**. The **CURRENT SETTINGS PROTECTION** dialog box will again appear, as depicted below.



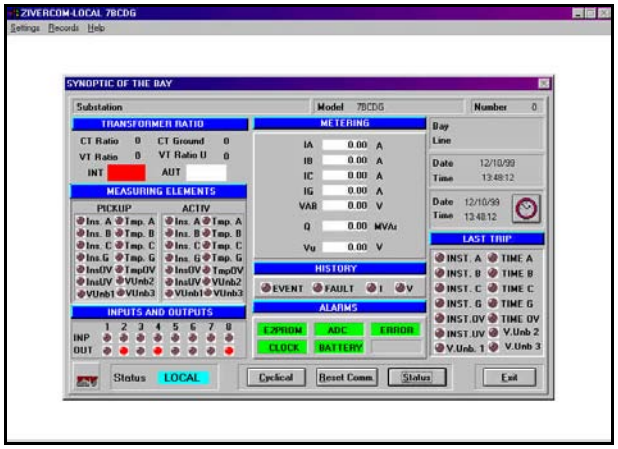
Step 22

Click the up or down arrow key until the **List** field reads "Default Settings", as depicted below. Note that the data source box at the lower right-hand corner changes from **RELAY** to **DBASE**.



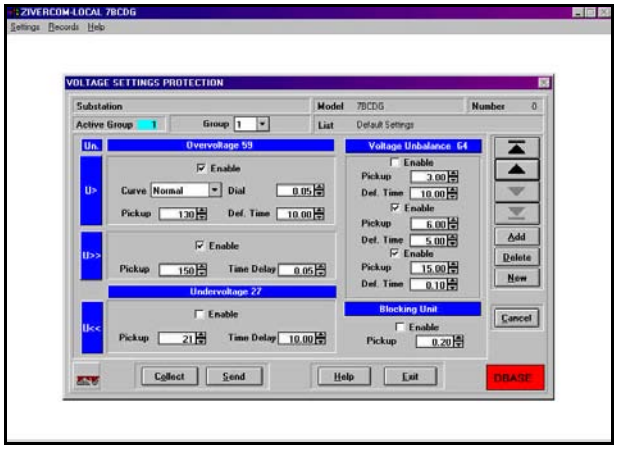
Step 23

Click **Exit**. The default information screen will again appear, as depicted below.



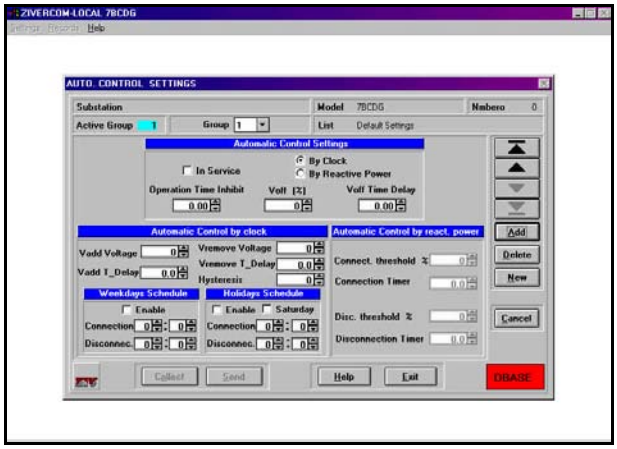
Step 24

Repeat steps 17 through 23 for **Protection, Voltage** settings, as depicted below.



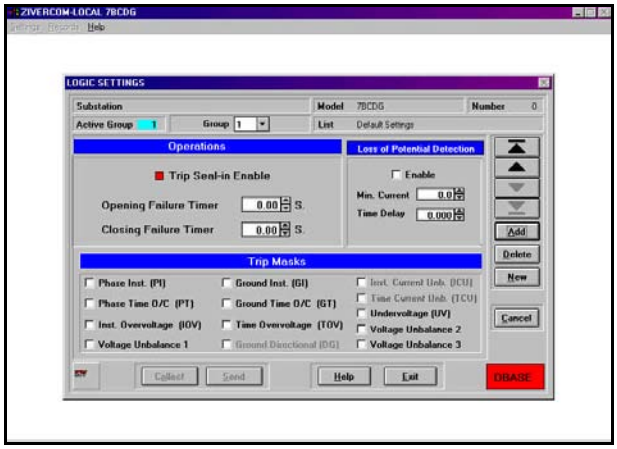
Step 25

Repeat steps 17 through 23 for **Automatic Control** settings, as depicted below.



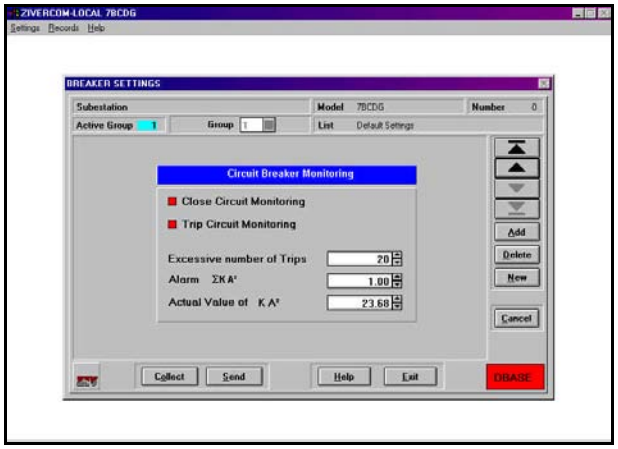
Step 26

Repeat steps 17 through 23 for **Logic** settings, as depicted below.



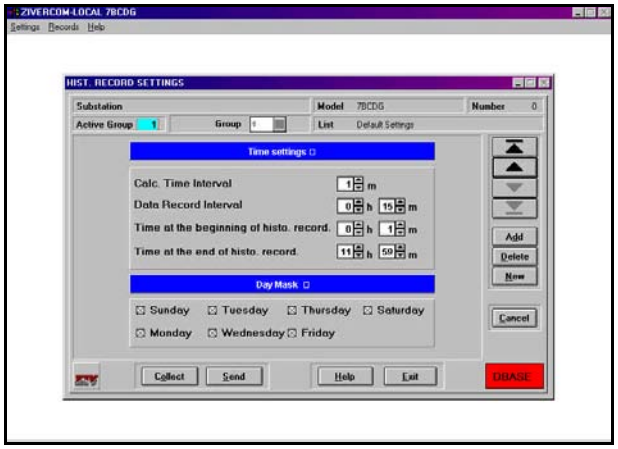
Step 27

Repeat steps 17 through 23 for **Supervision 52** (**Breaker**) settings, as depicted below.



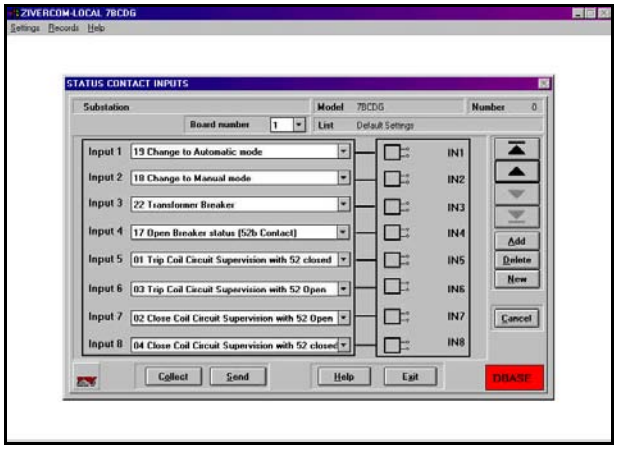
Step 28

Repeat steps 17 through 23 for **History** (**Historical Records**) settings, as depicted below.



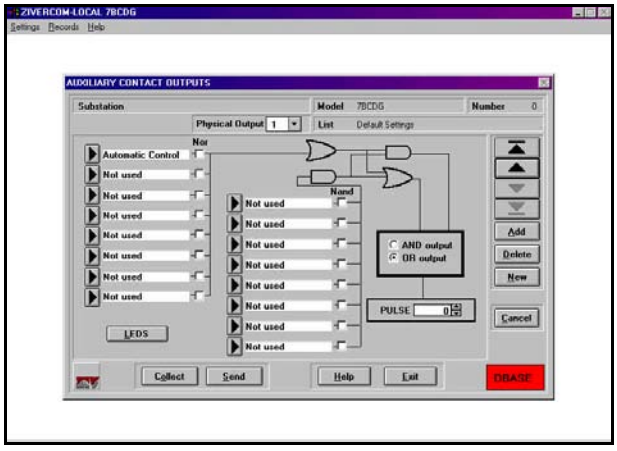
Step 29

Repeat steps 17 through 23 for **Inputs** settings, as depicted below.



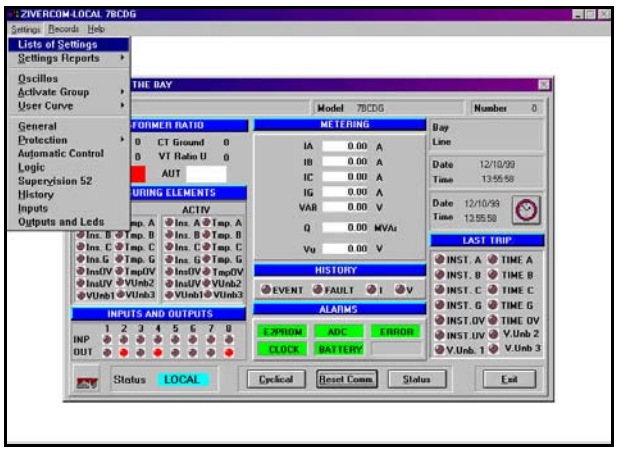
Step 30

Repeat steps 17 through 23 for **Outputs and Leds** settings, as depicted below. (Note: the user needs to click the **LEDS** button to access the **LED** settings options.)



Step 31

Highlight and select **Settings**. A pull-down menu will again appear, as depicted below, listing setting options.

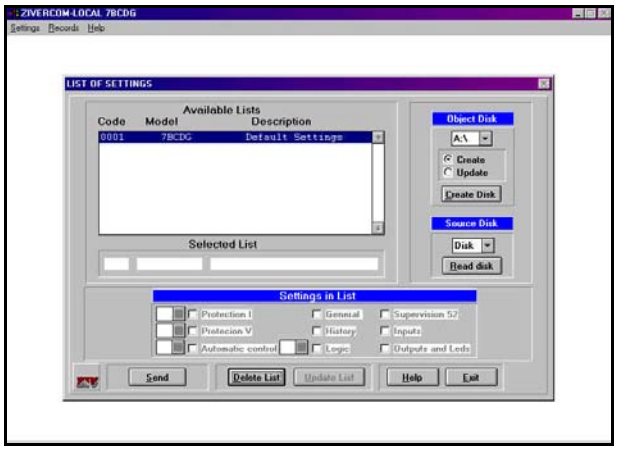


NOTICE

*Model variations of the **BCD** may dictate different **Settings** menu items. In any case, repeat steps 17 through 23 until all settings have been backed up as default settings.*

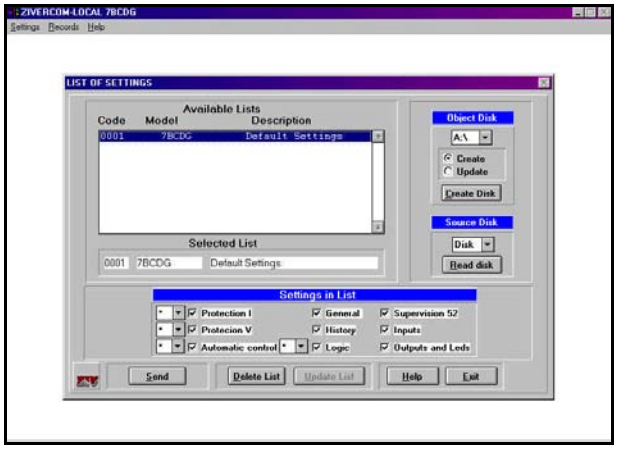
Step 32

To confirm that all settings have been saved in the settings record, highlight and select **List of Settings**. The **LIST OF SETTINGS** dialog box will appear, as shown below, indicating all available settings records. In this case, only the settings record is "0001 Default Settings."



Step 33

Double-click on "0001 Default Settings" to select it.

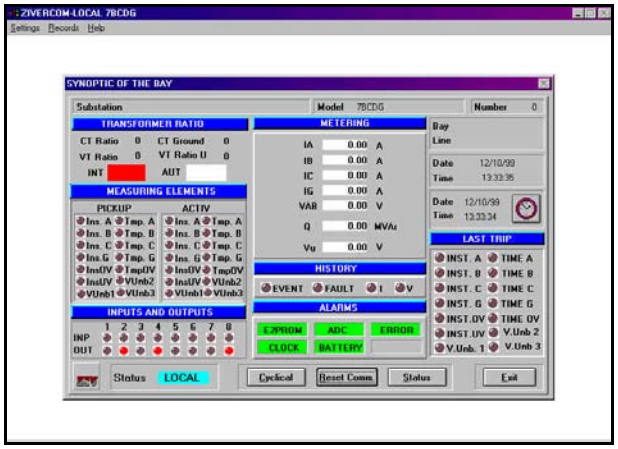


There should be a check mark on all available **Settings in List** field boxes, indicating that these settings are included in the settings record.

To create a back-up copy of the settings record, insert a diskette into the appropriate floppy drive on the PC and click **Create Disk**.

Step 34

Click **Exit**. The default information screen will again appear, as depicted below.

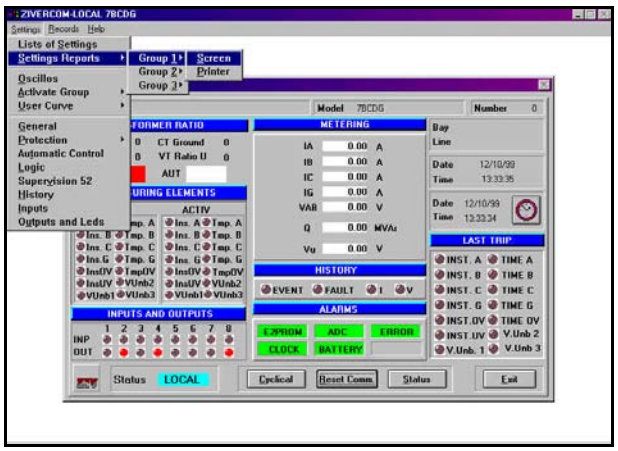


Displaying or Printing a Settings Record

ZIVercom® provides two settings record viewing options. To display a settings record on screen, proceed to Step 35. To print a settings record, proceed to Step 39.

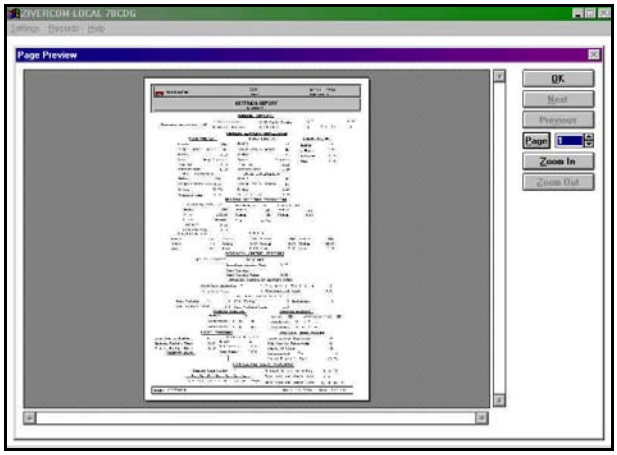
Step 35

Highlight and select **Settings**. A pull-down menu will again appear, as depicted below, listing setting options.



Step 36

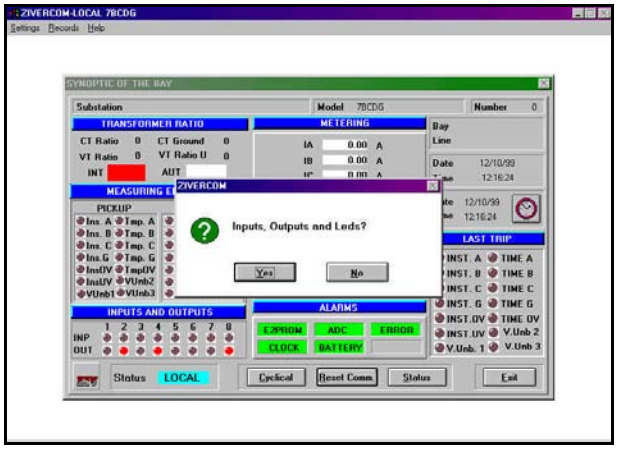
Highlight and select **Settings Reporting, Group 1, Screen**. A report screen will appear, as depicted below, which includes general settings, current protection settings, voltage protection settings automatic control settings, logic setting, breaker monitor settings and historical data settings.



Click **Zoom In** and use the scroll bars to maneuver through the report screen.

Step 37

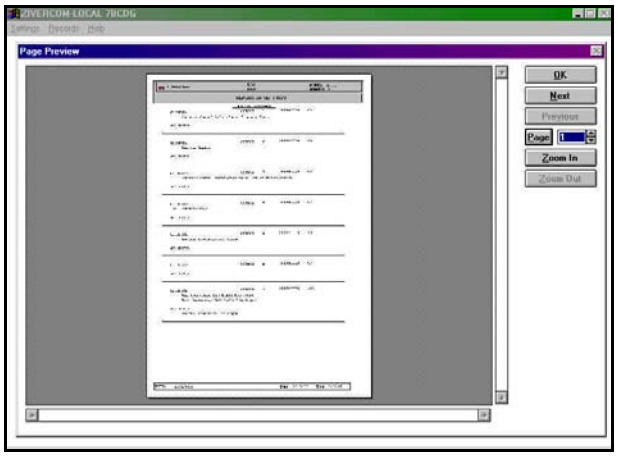
Click **OK** and the "Inputs, Outputs, and Leds?" dialog box appears, as depicted below.



If report screens for these setting are ***not*** desired, click **No.** Proceed to Step 44.

Step 38

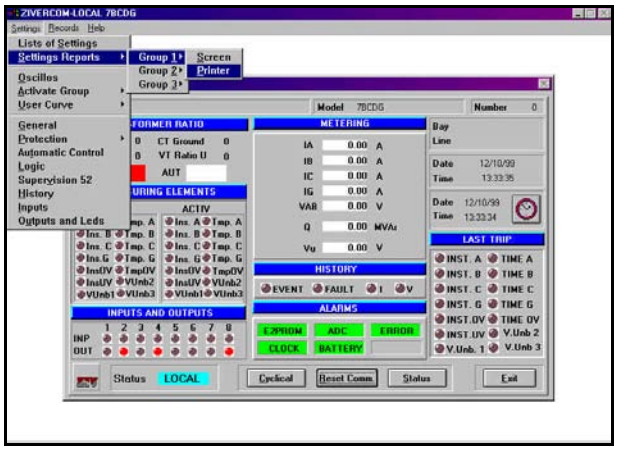
If report screens for these settings are desired, click **Yes**. Screens displaying input settings, output settings and LED settings will appear, as depicted below.



Click **Zoom In** and use the scroll bars to maneuver through the multi-page report screens. Proceed to step 44.

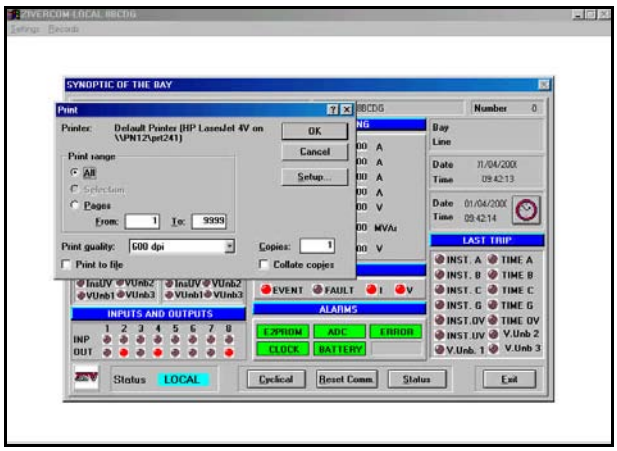
Step 39

Highlight and select **Settings**. A pull-down menu will again appear, as depicted below, listing setting options.



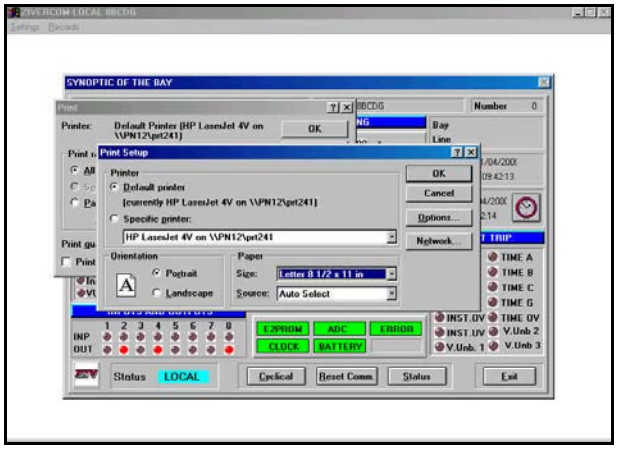
Step 40

Highlight and select **Settings Reporting, Group 1, Printer**. The **Print** dialog box will appear, as depicted below, listing print parameters.



Step 41

Click **Setup**. A dialog box will appear, as depicted below, listing print setup parameters.

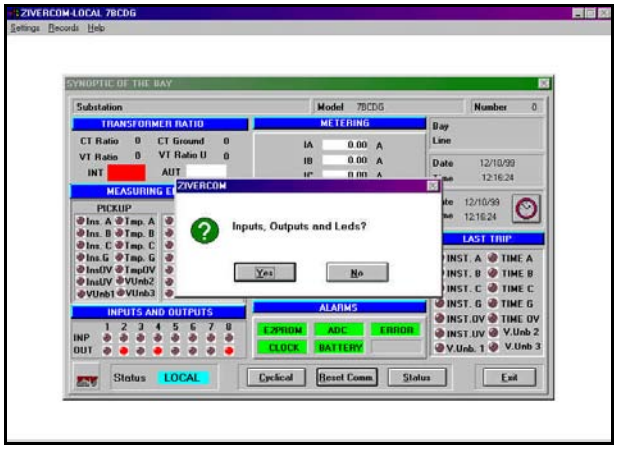


Step 42

Ensure that the paper size selected is “Letter 8½ x 11 in” and click **OK**. A report will be generated that will include general settings, current protection settings, voltage protection settings automatic control settings, logic setting, breaker monitor settings, and historical data settings.

Step 43

The “Inputs, Outputs, and Leds?” dialog box will appear, as depicted below.

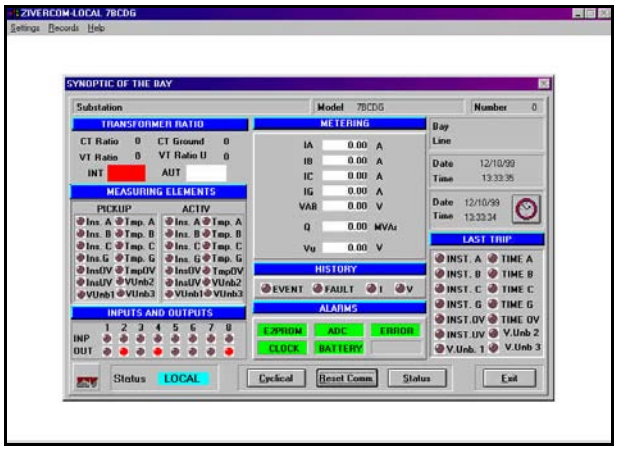


If a report for these settings is ***not*** desired, click **No.** Proceed to Step 44.

If a report on these settings is desired, click **Yes**. Repeat Steps 41 and 42. A report will be generated that includes input settings, outputs settings, and LED settings.

Step 44

Click **Exit**. The default information screen will again appear, as depicted below.



Creating a New Settings Record

NOTICE

Before creating any new settings records, it is recommended that a default settings file be created, reflecting the settings of the device as shipped from the manufacturer. Refer to the procedure outlined in Steps 11 through 35.

The procedure for creating a new settings record is similar to that outlined in Steps 11 through 35. A different Code number and Description will need to be entered for each new settings file.

The protection terminal may need reprogramming and/or wiring connection revision to conform to the new settings record.

In steps 45 through 55, a new record will be created with the following settings:

General Settings

CT Ratio (Phase): 1 V_Unbalance VT Ratio: 1 Scale Factor: 0 CT + Resistor Conn: NO	CT Ratio (Ground): 1 VT Ratio: 1

Current Protection Settings

Phase Overcurrent Unit (50)	Phase Instantaneous Unit (51)
Enable: YES Torque Ctrl. Enable: NO Pickup: 2 A Curve: INVERSE Time Dial: 0.5	Enable: YES Torque Ctrl. Enable: NO Pickup: 4 A Time Delay: 0 s

Ground Overcurrent Unit (50N)	Ground Instantaneous Unit (51N)
Enable: YES Torque Ctrl. Enable: NO Pickup: 0.2 A Curve: INVERSE Time Dial: 0.5	Enable: YES Torque Ctrl. Enable: NO Pickup: 1.5 A Time Delay: 0 s

Breaker Failure Unit
Enable: YES Phase Overcurrent Pickup: 0.7 A Ground Overcurrent Pickup: 0.7 A Time Delay: 0.5 s

Voltage Protection Settings

Overvoltage Unit (59)	Undervoltage Unit (27)
Time Element Enable: YES Curve: NORMAL Time Dial: 0.05 Pickup: 125 V Instantaneous Enable: YES Pickup: 140 V Time Delay: 5 s	Enable: YES Pickup: 21 V Time Delay: 10 s

Voltage Unbalance Unit (64)	Blocking Unit
Enable Element #1: YES Pickup: 3.00 A Definite Time Delay: 10 s Enable Element #2: YES Pickup: 6.00 A Definite Time Delay: 5 s Enable Element #3: YES Pickup: 15.00 A Definite Time Delay: 0.1 s	Enable: YES Pickup: 0.5 A

Automatic Control Settings

Automatic Control	By Clock
Enable: YES Mode: By Clock Operation Time Inh.: 5.00 V off (%): 90 V off Time Delay: 1.00	V add: 100 V add Time Delay: 7 V remove: 125 V remove Time Delay: 7

Weekdays Schedule	Weekends Schedule
Enable: YES Connect: 06 h 30 m Disconnect: 18 h 30 m	Enable: YES Saturday: YES Connect: 08 h 30 m Disconnect: 14 h 30 m

Logic Settings

Operations	Loss of Potential
Trip Sealing: Disabled Open Failure Time: 1.00 s Close Failure Timer: 1.00 s	Enable: YES Min. Current: 1.00 Time Delay: 2.000

Trip Masks: Disabled for every unit

Breaker Supervision Settings

Circuit Supervision	Number of operations
Close Circuit Monitoring: Disabled Trip Circuit Monitoring: Disabled	Excessive No. Of Trips: 20 Alarm Σ kA^2: 10,000 Actual Value Σ kA^2: 0.00

Historical Records Settings

Calculation Time Interval: 1 m
Data Record Interval: 15 m
Beginning Time: 0h 00m
End Time: 24h 00m
Day Mask: Enable Mon to Fri, Disable Sat and Sun

Inputs Settings

DI No.	Assigned Signal
1	19 Change to Automatic Mode
2	18 Change to Manual Mode
3	22 Transformer Breaker
4	17 Open Breaker Status (52b contact)
5	
6	
7	
8	21 External Closing Command

Output Settings

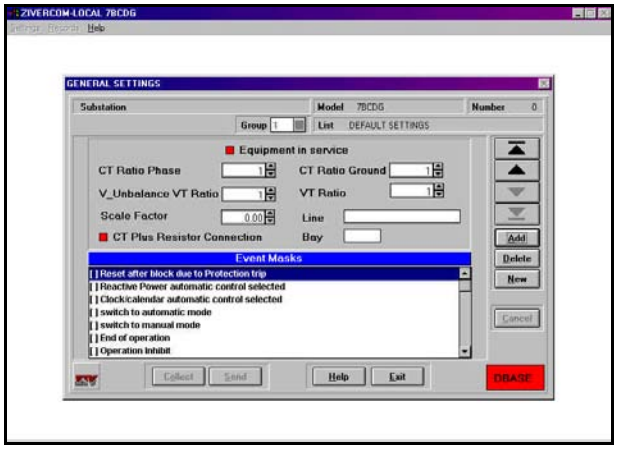
DO No.	Assigned Signal
1	Breaker Failure Output
2	Level 1 Voltage Unbalance Trip Output
3	Level 2 Voltage Unbalance Trip Output
4	Level 3 Voltage Unbalance Trip Output
5	Automatic Mode
...	

Leds Settings

Led No.	Assigned Signal
1	Internal Protection Trip Output
2	Capacitor Bank Connected
3	Circuit Switcher Blocked
4	Automatic Mode
...	

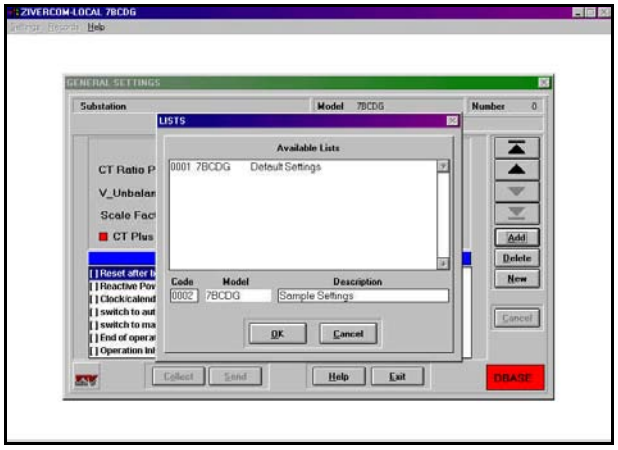
Step 45

Enter the appropriate listed **General Settings** from page 14, as depicted below.



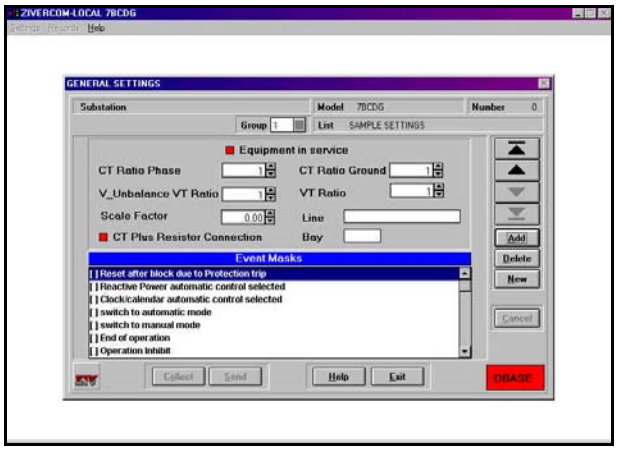
Step 46

Click **Add** in the **GENERAL SETTINGS** dialog box. Enter an appropriate code number and description for the record, in this case “0002” and “Sample Settings,” respectively, as depicted below.



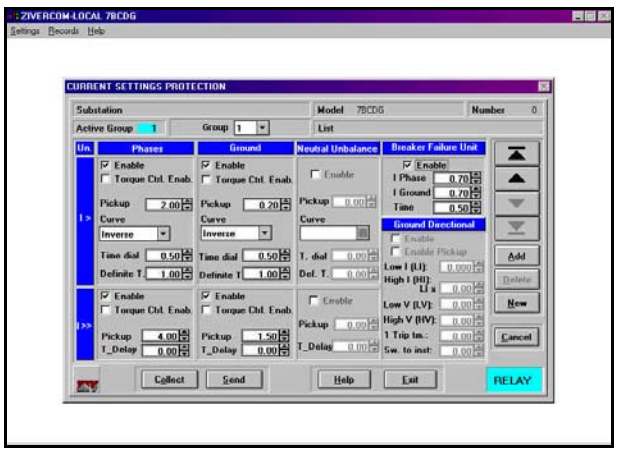
Step 47

Click **OK** to return to the **GENERAL SETTINGS** dialog box. Click the up or down arrow key until the **List** field reads “Sample Settings,” as depicted below.



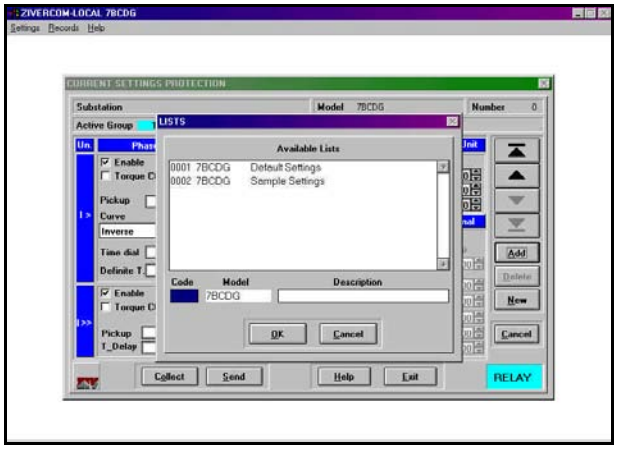
Step 48

Enter the appropriate listed **Current Protection Settings** from page 14, as depicted below.



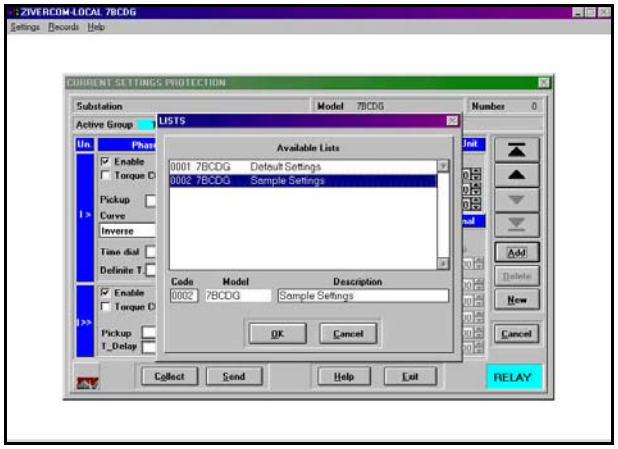
Step 49

Click **Add** in the **CURRENT SETTINGS PROTECTION** dialog box.



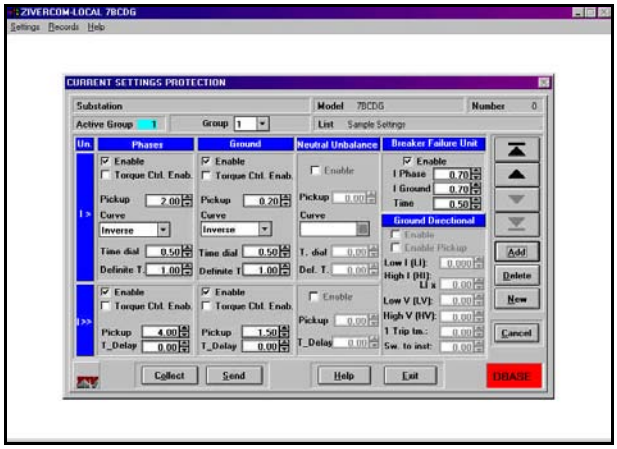
Step 50

Select the **Sample Settings** record by double-clicking the appropriate text field.



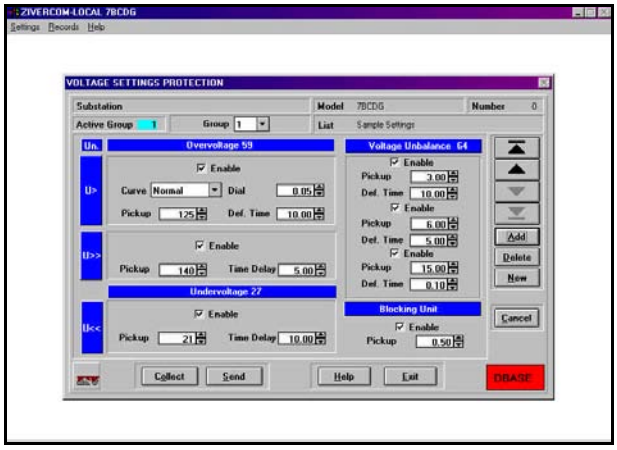
Step 51

Click **OK** to return to the **CURRENT SETTINGS PROTECTION** dialog box. Click the up or down arrow key until the **List** field reads "Sample Settings," as depicted below.



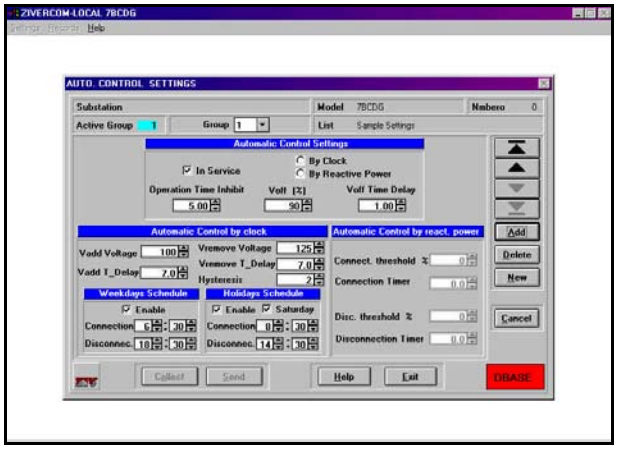
Step 52

Enter the appropriate listed **Voltage Protection Settings** from page 14, as depicted below.



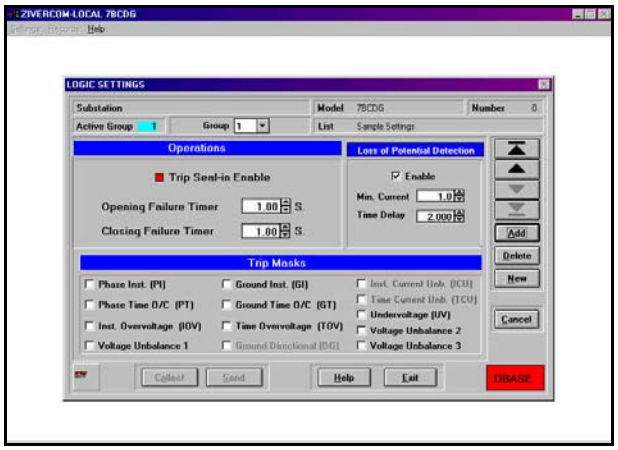
Step 53

Enter the appropriate listed **Automatic Control Settings** from page 14, as depicted below.



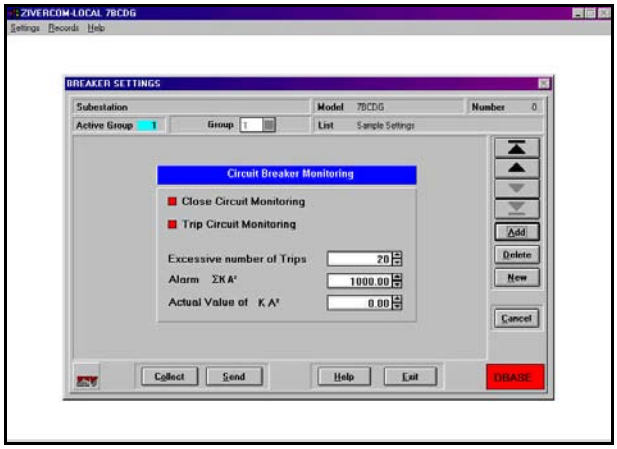
Step 54

Enter the appropriate listed **Logic Settings** from page 14, as depicted below.



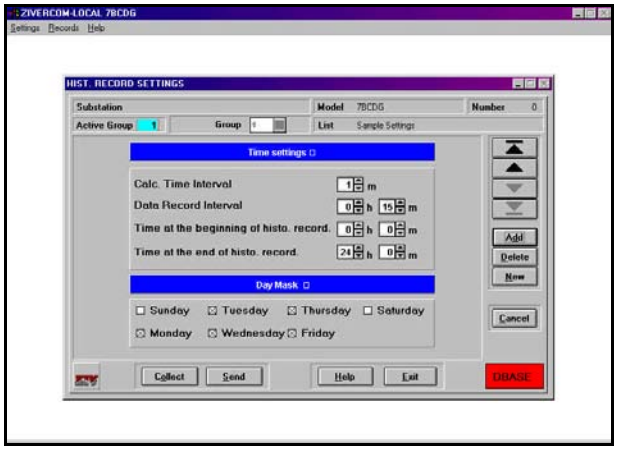
Step 55

Enter the appropriate listed BREAKER SETTINGS from page 14, as depicted below.



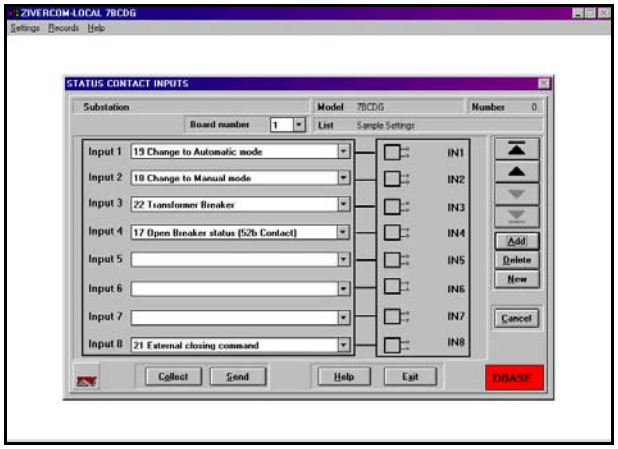
Step 56

Enter the appropriate listed **Historical Records Settings** from page 14, as depicted below.

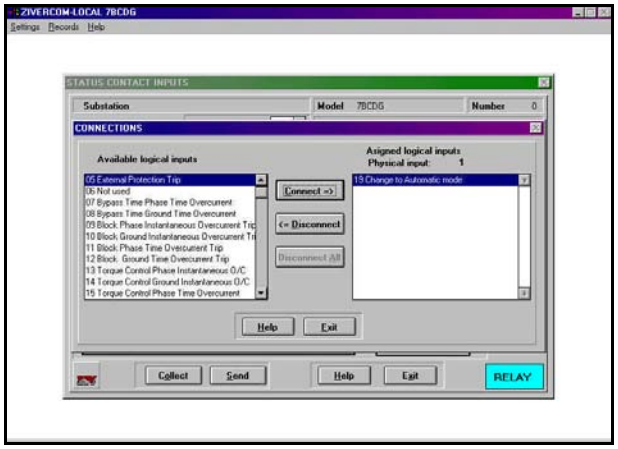


Step 57

Enter the appropriate listed **Inputs Settings** from page 14, as depicted below.



Logical inputs are selected by clicking on the text windows. For example, for Logical Input 2, click **18 Change to Manual mode.** Then click on the highlighted text ***below the text window*** to view all available logical inputs as depicted below.

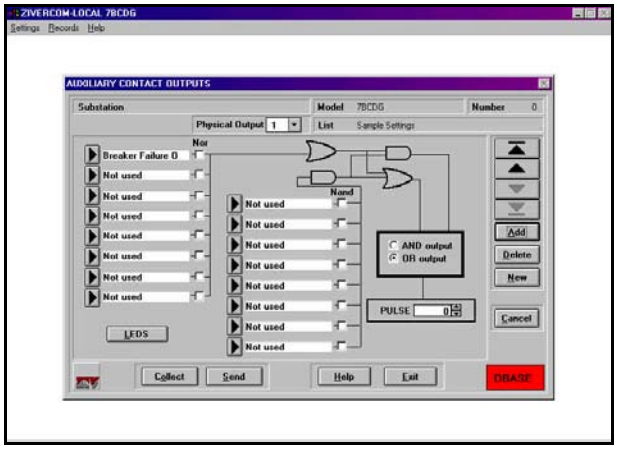


Select the logical input(s) to be associated with a particular physical input by clicking **Connect**.

A particular logical input can be assigned to only one physical input. To *reassign* a logical input to a different physical input, first select that logical input, then click **Disconnect.**

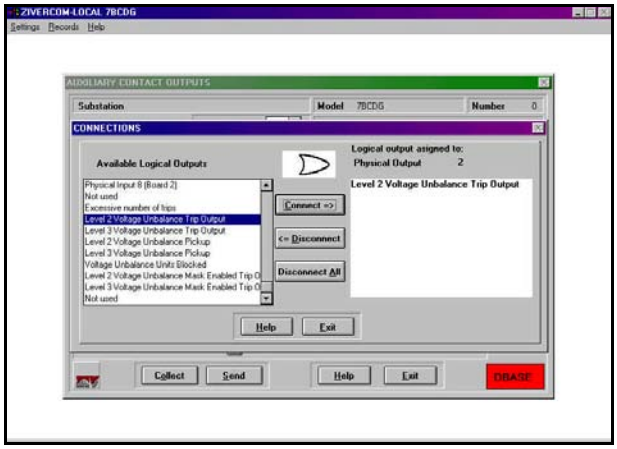
Step 58

Enter the appropriate listed **Outputs Settings** from page 14, as depicted below.



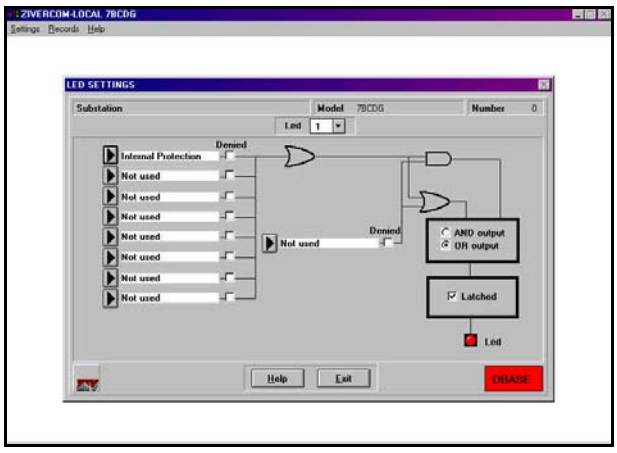
A pull-down menu labled **Physical Outputs**, is used to select which output the user is assigning signals to.

Logical outputs are selected by clicking on the ▶ symbol adjacent to the respective text fields. Performing this action reveals the **CONNECTIONS** dialog box. Use the scroll bars to view the various output connection signals. Select the logical output signal to be associated with a particular physical output and click **Connect**.



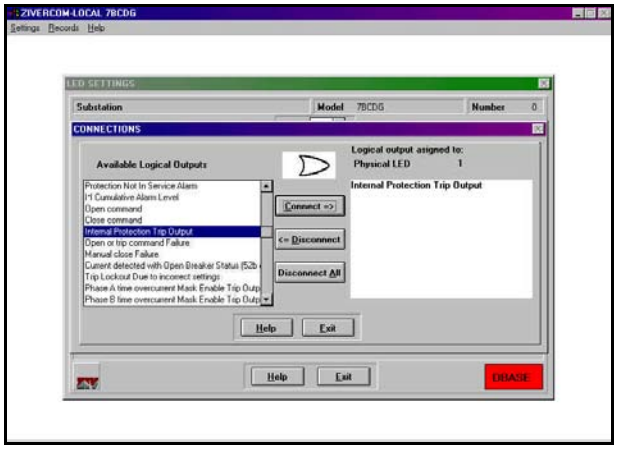
Step 59

Clicking on the **LEDS** button in the lower left-hand corner of the **OUTPUT SETTINGS** dialog box reveals the **LEDS SETTINGS** dialog box.



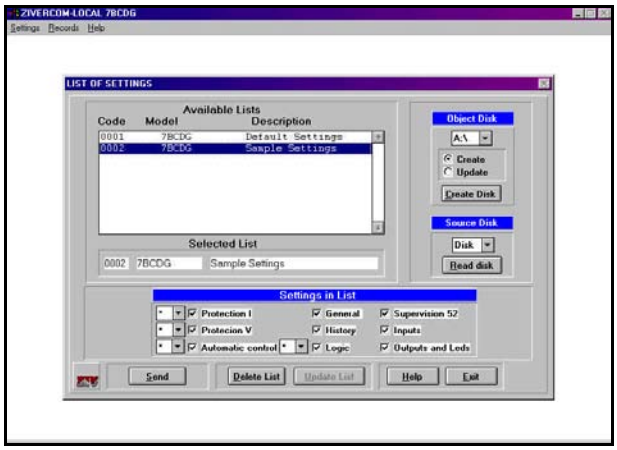
A pull-down menu labled **Led**, is used to select which LED the user is assigning signals to.

Select signals to activate LEDs by clicking on the ▶ symbol adjacent to the respective text fields. In this example, enter the LED settings to reflect the screen depicted below.



Step 60

Verify, in the **List of Settings**, a check mark on all available **Settings in List** field boxes, indicating that these settings are included in the "Sample Settings" record.

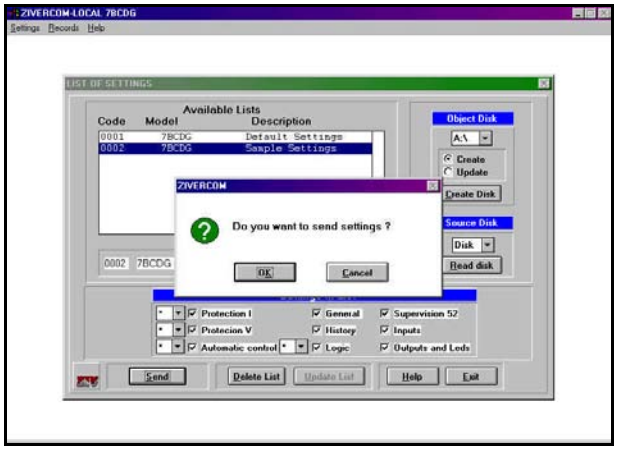


To create a back-up copy of the settings record, insert a diskette into the appropriate floppy drive on the PC and click **Create Disk**.

Downloading a Settings Record

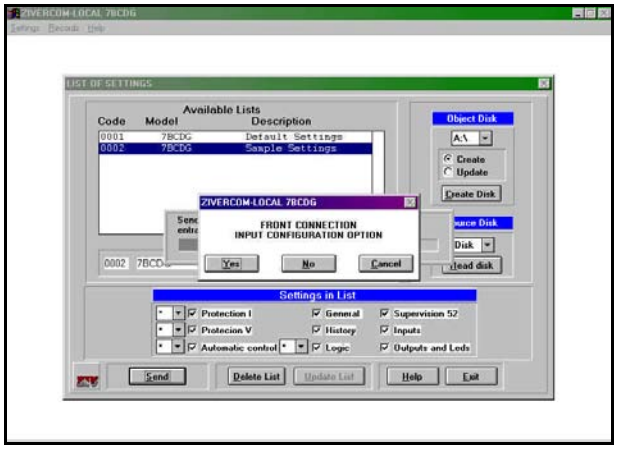
Step 61

To send this "Sample Settings" record to the relay, click **Send**. A confirmation dialog box will appear, as depicted below. Click **Yes**.



Step 62

Shortly thereafter, a second confirmation dialog box will appear. To configure the inputs and outputs of the **BCD** terminal unit, the user must follow steps 63 through 66 below before clicking **Yes**. This is to ensure that input and output settings are not altered accidentally.



Step 63

Press the **ESC** on the keypad of the **BCD** terminal.

Step 64

Select **0. CONFIGURATION** from the main menu of the **BCD** terminal.

Step 65

Enter the required password (the default is 2140).

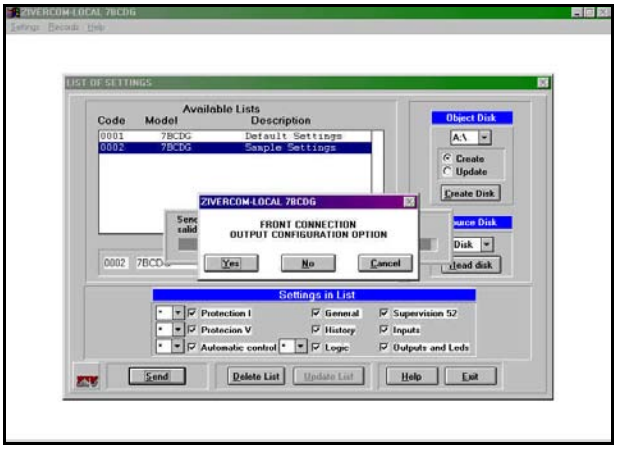
Step 66

Select **2. CONFIGURE INPUTS** from the configuration menu of the **BCD**. The following message will appear on the display of the relay.

```
TO MODIFY
ACCESS THROUGH
LOCAL PORT
```

Click **Yes** on the aforementioned dialog box.

After a brief time delay, another confirmation dialog box will appear, as depicted below, alerting the user to enter a code to change the output settings. Proceed with Step 67 before clicking **Yes**.



Step 67

Select **3. CONFIGURE OUTPUTS** from the configuration menu of the **BCD** terminal. The following message will appear on the display of the terminal.

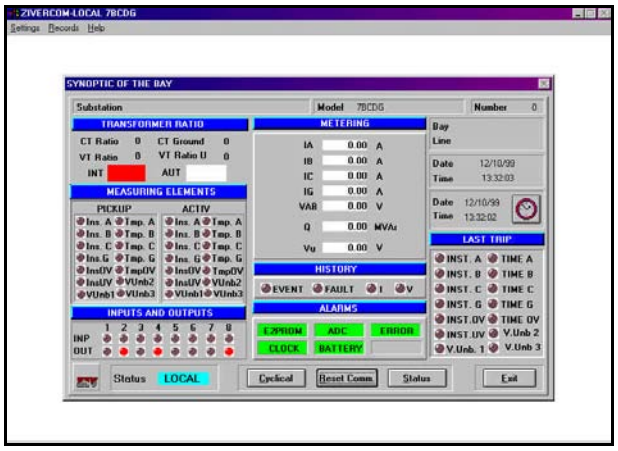
```
TO MODIFY
ACCESS THROUGH
LOCAL PORT
```

Click **Yes** on the aforementioned dialog box.

Quitting *ZIVercom*®

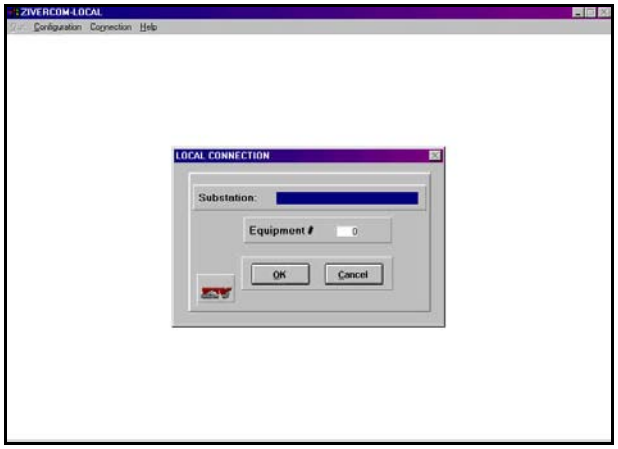
Step 68

Click **Exit**. The default information screen will appear.



Step 69

Click **Exit**. The **LOCAL CONNECTION** dialog box will appear for specifying substation and equipment number.



Step 70

Click **Cancel**. The main menu will appear, as depicted below.

Step 71

Click **Quit**. The identification screen will appear, as depicted below.

Step 72

Click **Quit**. The program will terminate.

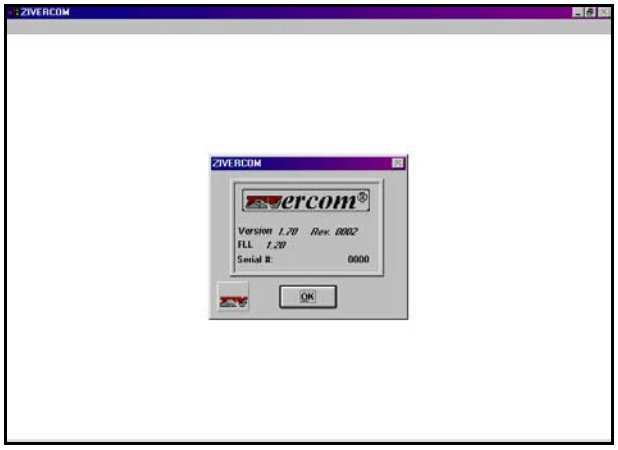
APPENDIX

Creating a Settings Record Offline

The following steps apply only in instances where the protection terminal is ***not*** connected to a PC.

Step A

Load the *ZIVercom*® program by double-clicking on the appropriate icon. The *ZIVercom*® application screen will appear as shown below.



Note: This screen indicates the software version and serial number.

Step B

Click **OK**. The identification screen will appear, as depicted below.

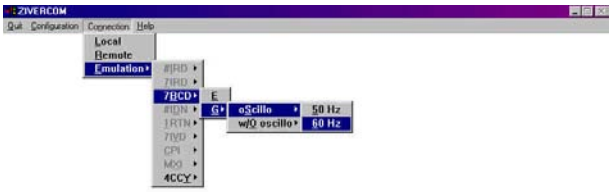
Enter the appropriate "User" name and "Password." The default settings are "ZIVERCOM" and "ziv" respectively.

Step C

Click **OK**. The main menu screen will appear, as depicted below.

Step D

Highlight and select **Connection** on the menu bar. A pull-down menu will appear, as depicted below, listing connection options.



Step E

Highlight and select **Emulation, 7BCD, G, Oscillo, 60 Hz.** A menu screen will appear, as depicted below.

Step F

Follow the procedure for creating a settings record outlined in Steps 11 through 33. In Step 13, enter an appropriate code number and description for the record, such as “0003” and “Emulation Settings” respectively. Make certain that **List** field reads “Emulation Settings” on the appropriate dialog box in steps 15 and 22.

Settings records cannot be displayed or printed in the emulation mode.

Functional Testing

Routine testing of the protection terminal is not necessary since the microprocessor is continuously performing self-diagnostic tests. Functional testing may be desirable, however, to confirm that the device has been correctly connected to the circuit interruption control system, and that the desired protection and control settings have been programmed. Refer to the Chapter titled **Receiving Tests** in the instruction manual for detailed acceptance test procedures.

The following equipment is required to perform functional testing.

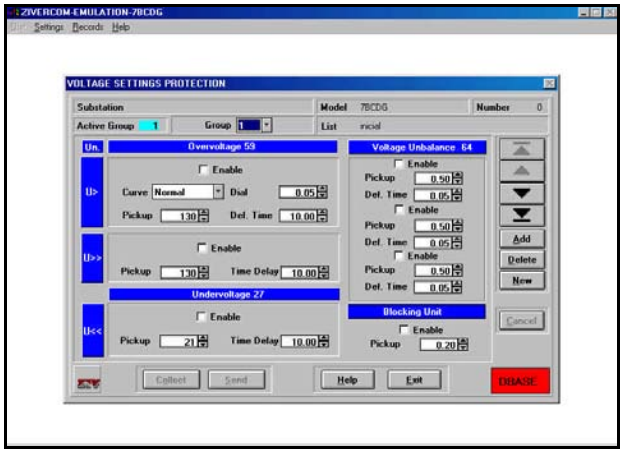
- An appropriate control voltage source
- A 0 – 20 A ac current source
- A 0 – 5 minute timer

If the protection terminal is ***not*** connected to an interruption device, the user should set up a test circuit that simulates operation of the interrupter to confirm protection and automatic control functions. It is possible to test pickup and time delay settings of the protection elements without simulating interrupter operation.

To avoid undesirable protection terminal operations, perform the following:

Step G

Highlight and select **Protection, Voltage** settings, as depicted below.



If the analog voltage inputs are not connected to the terminal, ensure that the **Blocking Unit** function and the **Undervoltage 27** funcion are ***not enabled***. Enabling these functions will block block the **Automatic Control** function. Please refer to Chapter 6 in the instruction manual for more details.

Step H

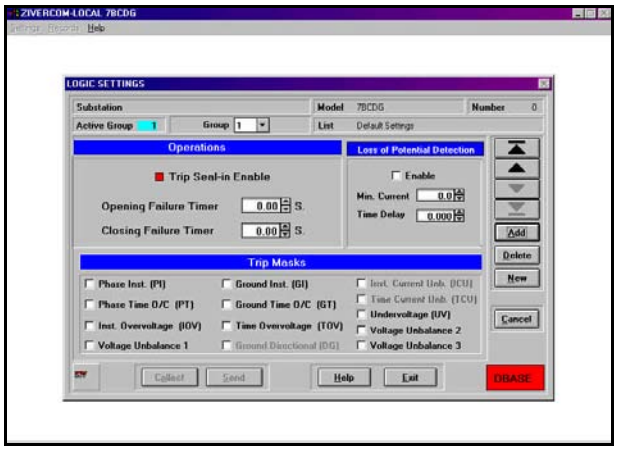
Measure and record the time between trip initiation and change of state of the 52/b contact.

Step I

Measure and record the time between close initiation and change of state of the 52/b contact.

Step J

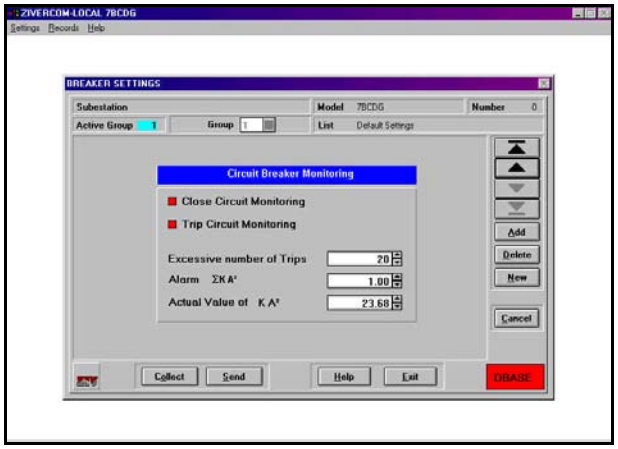
Highlight and select **Supervision 52 (Breaker)** settings, as depicted below.



Verify that the **Close Circuit Monitoring** and the **Trip Circuit Monitoring** settings are appropriate for the installation. Change settings as necessary.

Step K

Highlight and select **Logic** Settings, as depicted below.



Verify that the **Opening Failure Timer** setting is greater than the time between trip initiation and change of state of the 52/b contact, as measured in Step H. Also verify that the **Closing Failure Timer** setting is greater than the time between close initiation and change of state of the 52/b contact, as measured in Step I.

An alarm signal will be generated if the **Opening Failure Timer** setting is less than the time measured in Step H. The **Automatic Control** function will be disabled if the **Closing Failure Timer** setting is less than the time measured in Step I. Change the timer settings as necessary.

Notes:

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