

ELECTROM INSTRUMENTS

A Division of Electrom Corporation

Capture Pro

for Windows 95 to XP

CONTENTS

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**Main Form/
Controls**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Exit	Button	Exits the program.
Customer	Button	Opens the Customer Information Form.
Motor	Button	Opens the Motor Information Form.
Off line Test	Button	Opens the Off line Test Form.
On line Test	Button	Opens the On line Test.
Find Motor	Button	Search for a specific motor.
Customer	Combo Box	Select a CUSTOMER.
Serial #	Radio Button	Orders the data by Serial Number.
Equipment Tag	Radio Button	Orders the data by Equipment Tag.
Project #	Radio Button	Orders the data by Project Number.
Location	Radio Button	Orders the data by Location.
Database Navigator	Database Navigator	Set Position to the desired motor.

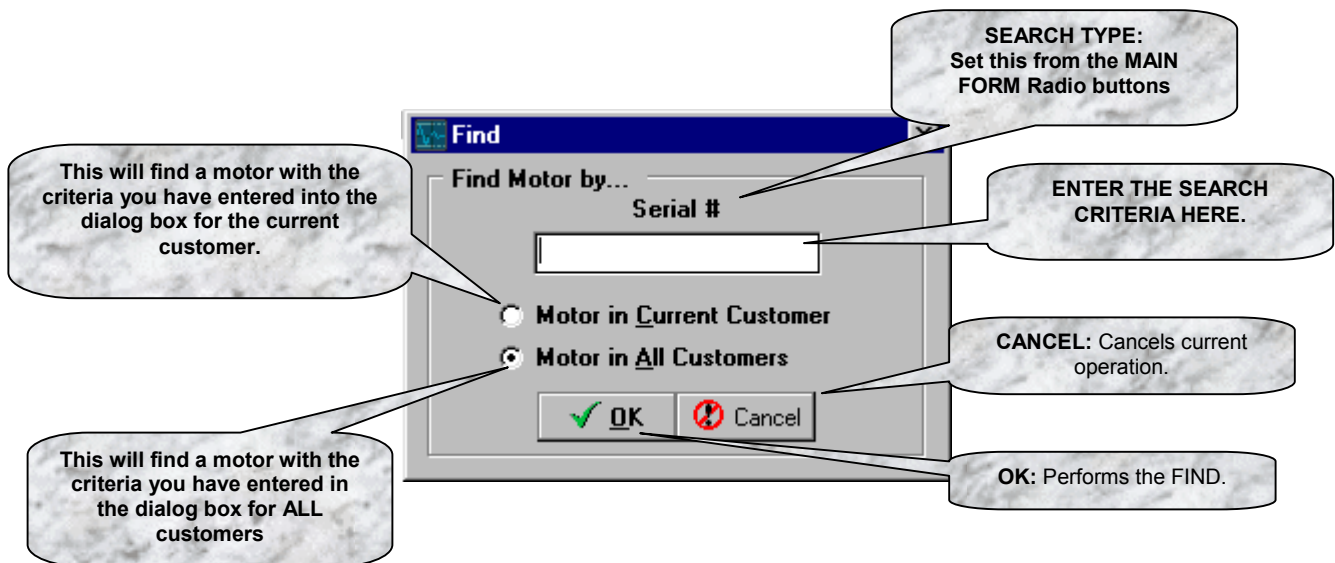


Figure 2 Find Motor – Search the database for a specific Motor.

FIND DIALOG BOX

This dialog is opened by pressing the FIND button on the MAIN FORM, or the FIND MENU CHOICE from the FILES MENU. Enter the search criteria in the EDIT BOX, then check either the Current Customer, or the ALL Customers RADIO BUTTON . Now press OK to start the search. If ALL Customers was selected, the search will look for any motor that fits the criteria. It always returns the FIRST one found.

**Printer Setup
MAIN FORM**

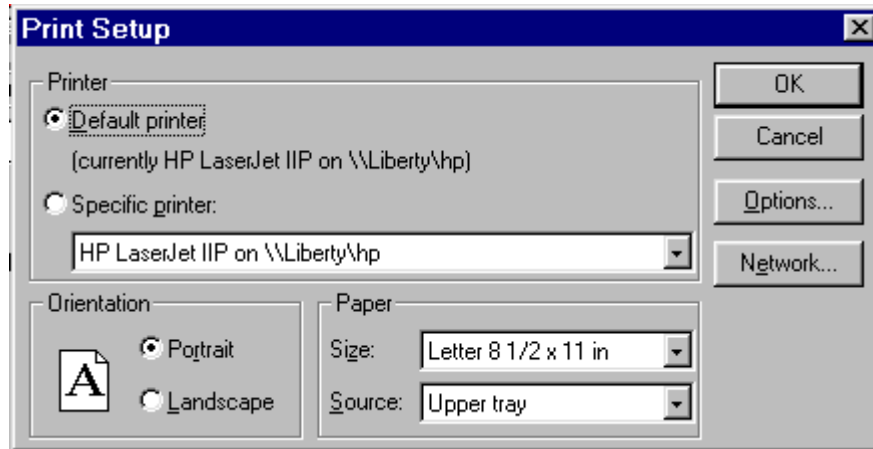


Figure 3 Printer Setup Dialog.

This dialog is opened by selecting the PRINTER SETUP menu choice form the MAIN FORM FILE menu. This is a standard printer setup for Windows.

**Printer Setup
Control
MAIN FORM**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Ctrl+Alt+S	Menu Hot Key	Opens a printer setup dialog box.

New Customer

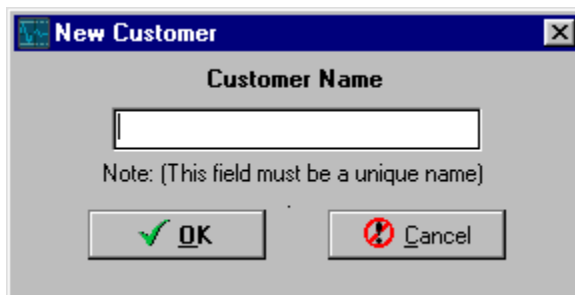


Figure 4 New Customer Dialog.

This dialog is opened by selecting the CUSTOMER button, or the NEW CUSTOMER menu choice from the MAIN FORM FILE menu

**New Customer
Control
MAIN FORM**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
CUSTOMER	EDIT BOX	Enter a customer name, and click OK or press CANCEL to abort entering a NEW CUSTOMER.

This is the first step in creating a NEW CUSTOMER. The second part involves the Customer Information form.

New Motor

The image shows a 'New Motor' dialog box with the following fields and values:

Customer Name	Serial	Equipment Tag	Project No	Location	Manufacturer	Operating Volts	RPM
Samples	SERIAL #	TAG	PROJECT	LOCATION			

Figure 5 New Motor Dialog

Enter the NEW MOTOR information in the appropriate boxes. When done, press OK to enter the data, or CANCEL to abort entering a NEW MOTOR. This is the first part of creating a new motor from the MAIN FORM. The second part is the Motor Information Form.

Database Version Information

Database Name	Last Version Update	Table Version Number
ACOFFTST	02/18/1998 14:40:24	1.16
ACONTST	02/17/1998 16:27:10	1.16
COUNTRY	12/19/1997 12:19:58	1.16
CUSTOMER	02/16/1998 09:20:48	1.16
DCOFFTST	02/02/1998 11:34:00	1.16
DCONTST	02/16/1998 09:39:14	1.16
FINDWAVE	12/19/1997 12:34:16	1.16
MOTORS	02/18/1998 14:40:24	1.16
USER	02/18/1998 16:32:06	1.16

24,584,764 bytes memory available and the largest free block is 16,711,680 bytes.
 177,356,800 Bytes free of 1,011,236,864 Bytes capacity 17.54 % free disk space.

Figure 6 Database Version Information Form

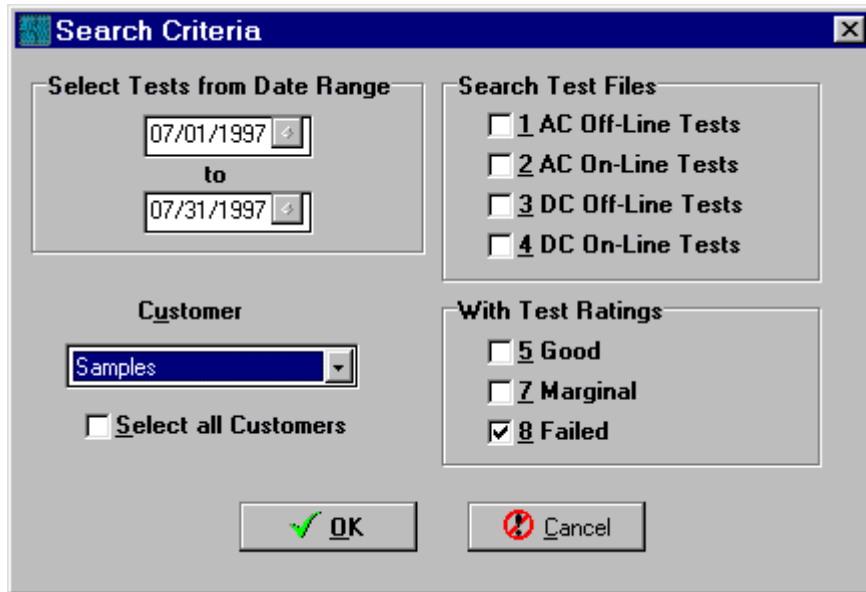
This form displays some system and database information. The files listed are the database names. Last version update tells when the last update was done on the file structure, and Table Version Number tells the current version of the database tables.

Database Version Information

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	File Menu	Ctrl + V

<u>Label</u>	<u>Function</u>
Database Name:	This is the name of the database.
Last Version Update:	This is the version number of the database table.

Search Criteria



Search Criteria Controls

Figure 7 Search Criteria Dialog.

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Customer	Combo Box	Select a customer
Select all Customers	Check Box	Select ALL customers
AC Off-Line Tests	Check Box	Include AC Off Line Tests
AC On-Line Tests	Check Box	Include AC On-Line Tests
DC Off-Line Tests	Check Box	Include DC Off-Line Tests
DC On-Line Tests	Check Box	Include DC On-Line Tests
Good	Check Box	Include Motors with a Good Technician Rating
Marginal	Check Box	Include Motors with a Marginal Technician Rating
Failed	Check Box	Include Motors with a Failed Technician Rating
OK	Button	Close this form and continue
Cancel	Button	Cancel all actions and close this form.

The partial dialog box below, shows the possible FIND types, a database navigator bar, and the OK button. The FIND types are only changed from the MAIN FORM radio buttons. here.

**ALL Customers
Motor Search**

**DATABASE
NAVIGATOR**

Serial #	Equipment Tag	Project #	Location
1001	AC - Balanced	001	Factory
1002	AC - Shorted Turns	002	Factory
1003	AC - Flash-Over	003	Factory
1004	AC - Grounded	004	Factory
1005	AC - Rotor Fault	005	Factory
2001	DC - Balanced	006	Factory
2002	DC - Shorted Turns	007	Factory

Customer Name	City	State	Zip
Samples	Loveland	CO	80537-0745

Figure 8 All Customers Motor Search.

**ALL Customers
Motor Search**

Form

Main Screen

Program Control

Find -> Check ALL

Hot Key

Customers -> OK

Customer Information

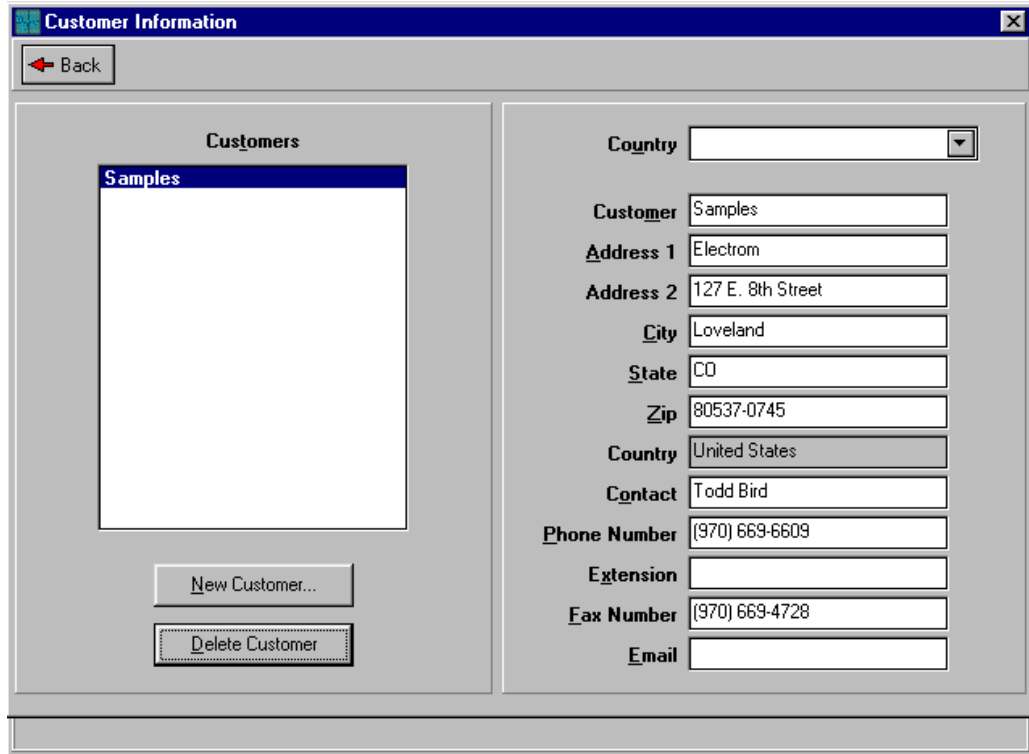


Figure 9 Customer Information.

CUSTOMER Control MAIN FORM

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	Edit Menu	Ctrl + I

This form is used to enter all the Customers Information. This information will be used in a number of places in the program screens and reports.

CUSTOMER Controls CUSTOMER FORM

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Customers	List Box	Click on a Customer to view info.
New Customer	Button	Create a NEW Customer.
Delete Customer	Button	Delete the current customer.
Back	Button	This will Exit this screen.

NOTE: Right Click to use popup menus, or use the Hot Keys associated with the popup menus.

C A P T U R E P R O

**CUSTOMER
Popup Menu
Hot Keys**

<u>Control</u>	<u>Control Type</u>	<u>Action</u>
Ctrl+X	Hot Key	Same as the BACK button.
Ctrl+N	Hot Key	Same as the NEW CUSTOMER button.
Ctrl+D	Hot Key	Same as the DELETE CUSTOMER button.

Motor Information

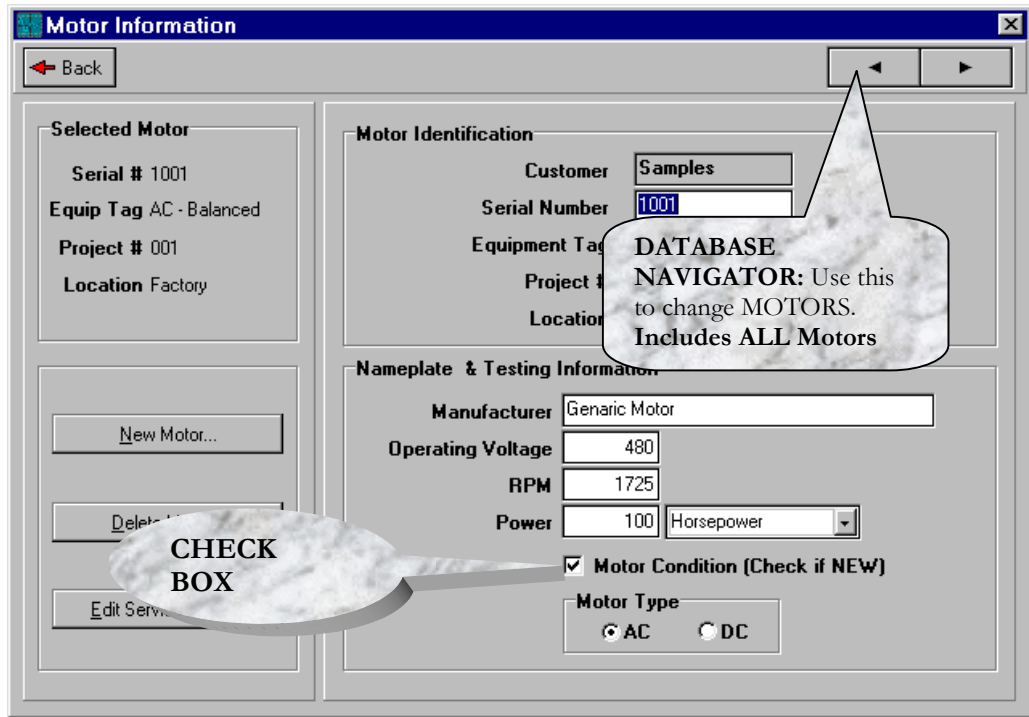


Figure 10 MOTOR INFORMATION:

Edit the motor information, or create another new motor.

Motor Information Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Power	Edit Box	Numeric rating for the MOTOR.
Power	Combo Box	Select HORSEPOWER, KW, and KVA.
AC	Radio Button	Select AC type motor.
DC	Radio Button	Select DC type motor.
Motor Condition	Check Box	Check this if testing a NEW MOTOR.
New Motor	Button	Creates an entry for a NEW MOTOR.
Delete Motor	Button	Delete the CURRENT MOTOR
Edit Service Notes	Button	Open SERVICE NOTES form.
Back	Button	Return to the MAIN form.
Database Navigator	Database Navigator	Change the to a different motor.

**Modify AC-Test
Results
Off-Line Test Data**

Off Line AC Motor Testing

Back

Motor
Serial # 1001
Equip Tag AC - Balanced
Project # 001
Location Factory

Test Start Date 08/15/1997
Test Start Time 04:01:17

New Test Record

Edit Service Notes...

Technician's Motor Evaluation
Good

HIPOT Tripout
 SURGE Test Flashover

Phase Resistance (From Ohmmeter)

Phase A Ohms 14.5500
Phase B Ohms 14.5500
Phase C Ohms 14.5500

Phase Resistance / MegOhm / Step Voltage / Hipot / Surge Comparison

TIG Setup & Capture
Capture Only

Figure 11 MODIFY AC OFF LINE TEST RESULTS

**Modify AC Test Results
On Line Test Data**

Figure 12 MODIFY AC ON LINE TEST RESULTS

Modify AC-Test Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Off line	Radio Button	Selects the Off line test results.
On line	Radio Button	Selects the On line test results.
Test Dates	List Box	Test dates and times for this motor.
Delete Test	Button	Delete the selected test.
Back	Button	Exit's from current screen.
Technician's Motor Evaluation	Combo Box	Technician's evaluation of the motor
Ctrl+X	Hot Key	Exits this screen.

**Modify AC TEST
Pop up Menu**

Modify DC Test Results

Modify DC Test Results
Off-Line Testing Data

← Back

<div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Motor Serial # 2001 Equip Tag DC - Balanced Project # 006 Location Factory </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Type of Test <input checked="" type="radio"/> 1 Offline <input type="radio"/> 2 Online <input type="radio"/> 3 Offline Surge Voltages </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Date & Time 06/14/1997 11:08:19 </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px; text-align: center;"> Delete Test </div>	<div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Winding Resistance Armature <input type="text" value="0.97"/> Series Field <input type="text" value="60.24"/> Temperature <input type="text" value="85"/> Shunt Field <input type="text" value="1.55"/> Inter Poles <input type="text" value="2.67"/> </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Megohm & P.I. 1 Min Armature Peak Voltage <input type="text" value="920"/> 1 Min Series Field Peak Voltage <input type="text" value="920"/> 1 Min Armature μAmps Leakage <input type="text" value="0"/> 1 Min Series Field μAmps Leakage <input type="text" value="0"/> Corrected Megohm to <input type="text" value="15776"/> Corrected Megohm to <input type="text" value="15776"/> 10 Min Armature Peak Voltage <input type="text" value="0"/> 10 Min Series Field Peak Voltage <input type="text" value="0"/> 10 Min Armature μAmps Leakage <input type="text" value="0"/> 10 Min Series Field μAmps Leakage <input type="text" value="0"/> Armature P.I. Result <input type="text" value="0"/> Series Field P.I. Result <input type="text" value="0"/> </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Hipot Test Armature Volts Reached <input type="text" value="2360"/> Series Field Volts Reached <input type="text" value="2360"/> Armature μAmps Leakage <input type="text" value="6"/> Series Field μAmps Leakage <input type="text" value="33"/> Shunt Field Volts Reached <input type="text" value="2360"/> Inter Poles Volts Reached <input type="text" value="2360"/> Shunt Field μAmps Leakage <input type="text" value="73"/> Inter Poles μAmps Leakage <input type="text" value="6"/> </div> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> Technician's Motor Evaluation <input type="text" value="Marginal"/> </div>
---	---

Figure 13 MODIFY OFF LINE DC TEST RESULTS.

12

**MODIFY ON LINE
DC TEST DATA**

Modify DC Test Results

Back

On-Line Testing Data

Motor
Serial # 2001
Equip Tag DC - Balanced
Project # 006
Location Factory

Type of Test
 1 Offline 2 Online
 3 Offline Surge Voltages

Date & Time
06/14/1997 11:08:19

Operating DC Voltage
Operating DC Current
Speed (RPM)

Delete Test

Technician's Motor Evaluation

Figure 14 MODIFY ON LINE DC TEST RESULTS.

**MODIFY OFF LINE
DC TEST DATA**

Figure 15 MODIFY OFF LINE DC TEST RESULTS

**MODIFY DC TEST
RESULTS
CONTROLS**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Test Dates	List Box	Select the test date to modify.
OFF LINE	Radio Button	Select OFF LINE test data.
On line	Radio Button	Select ON LINE test data.
Delete Test	Button	Delete this test date / time.
Back	Button	Close this form.
Technician's Evaluation	Combo Box	Select a general evaluation of this motor.

Preferences and Calibration

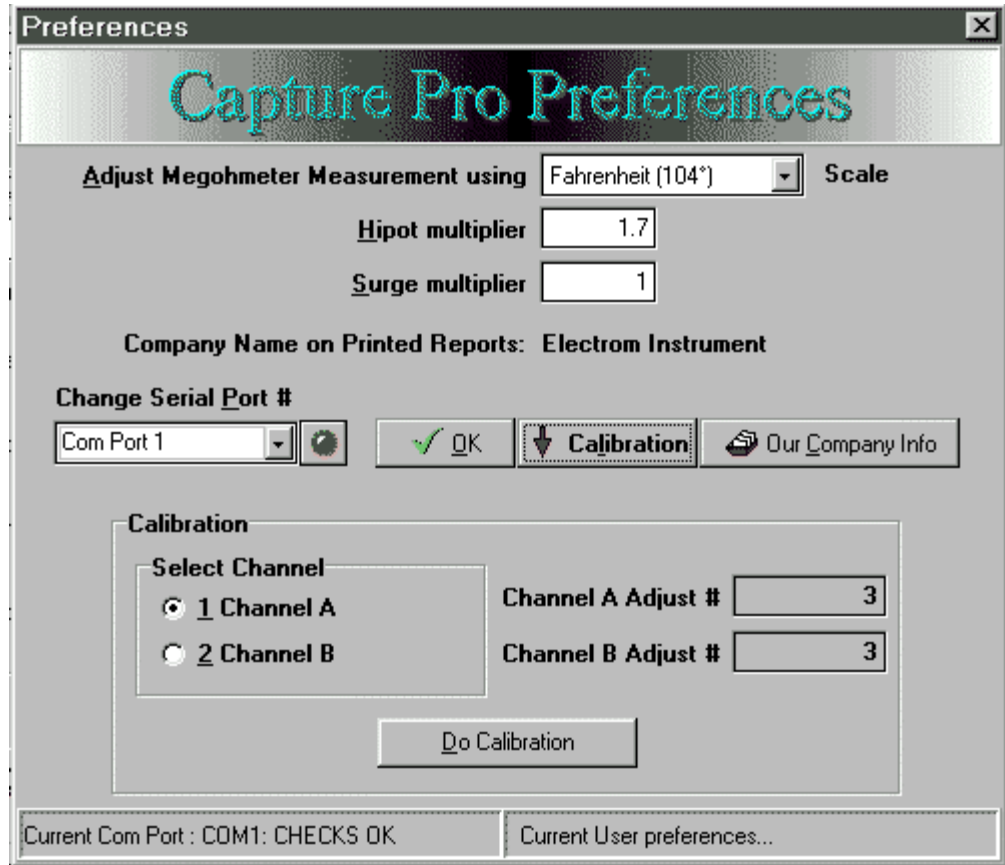


Figure 16 PREFERENCES and CALIBRATION.

Preferences and Calibration Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
RED LED	Button	Shows RS232 port status bits.
Temp Scale Combo	Combo Box	Select the temperature correction factor.
Channel A	Radio Button	Select channel A for calibration.
Channel B	Radio Button	Select channel B for calibration.
Do Calibration	Button	Calibrate the selected channel.
Com Port	Combo Box	Com port for TIG communication.
Our Company Info	Button	Open the Company Information Form.
Calibration	Button	Expand the form to show calibration.
OK	Button	Close this form.

Off Line AC Motor Testing

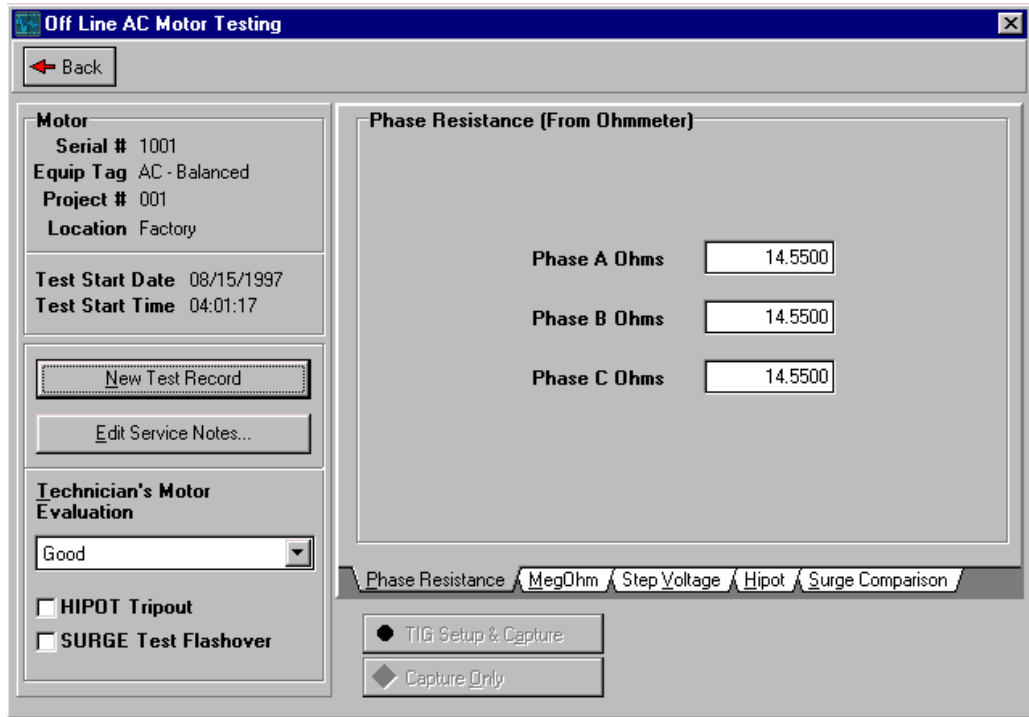


Figure 17 OFFLINE AC MOTOR TESTING – Phase Resistance.

MEGOHIM TEST;
 Recommended time for test is 1 minute.
 To insure that the entire winding has charged to the predetermined test voltage for the Megohm test allow the test to be on for a period of no less than 1 minute.

PI TEST;
 Recommended time for test is 10 minutes.
 To insure that the entire winding has charged to the predetermined test voltage for the PI test allow the test to be on for a period of no less than 10 minutes.

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Motor Eval.	Combo Box	Selectable evaluation of the current motor
Edit Service Notes	Button	Edit the SERVICE NOTES for the current motor
New Test Record	Button	Create a new TEST DATE for the current motor.
Back	Button	Exit's current form
TIG Setup Capture	Button	Use the WALK THROUGH test procedures.
Capture Only	Button	Bypass the WALK THROUGH. and CAPTURE.
Winding Temp	Radio Button	Do a temperature data capture using the TIG
F°	Combo Box	Degrees Fahrenheit or Celsius
1 Minute Megohm	Radio Button	Do a 1 minute megohm test.
10 minute P.I.	Check Box	Include a 10 minute pi test.
High	Radio Button	Set up for High Current readings
Low	Radio Button	Set up for Low Current readings

C A P T U R E P R O

Surge Leads 1 2	Radio Button	Select Leads 1 to 2 for testing
Surge Leads 2 3	Radio Button	Select Leads 2 to 3 for testing
Surge Leads 3 1	Radio Button	Select Leads 3 to 1 for testing
View Captured Waves	Button	View the wave forms captured.
Cancel Test	Button	Cancel all further test action.
Cancel Timer	Button	Cancel the timer, and capture data.

**Other AC OFFLINE
SCREENS**

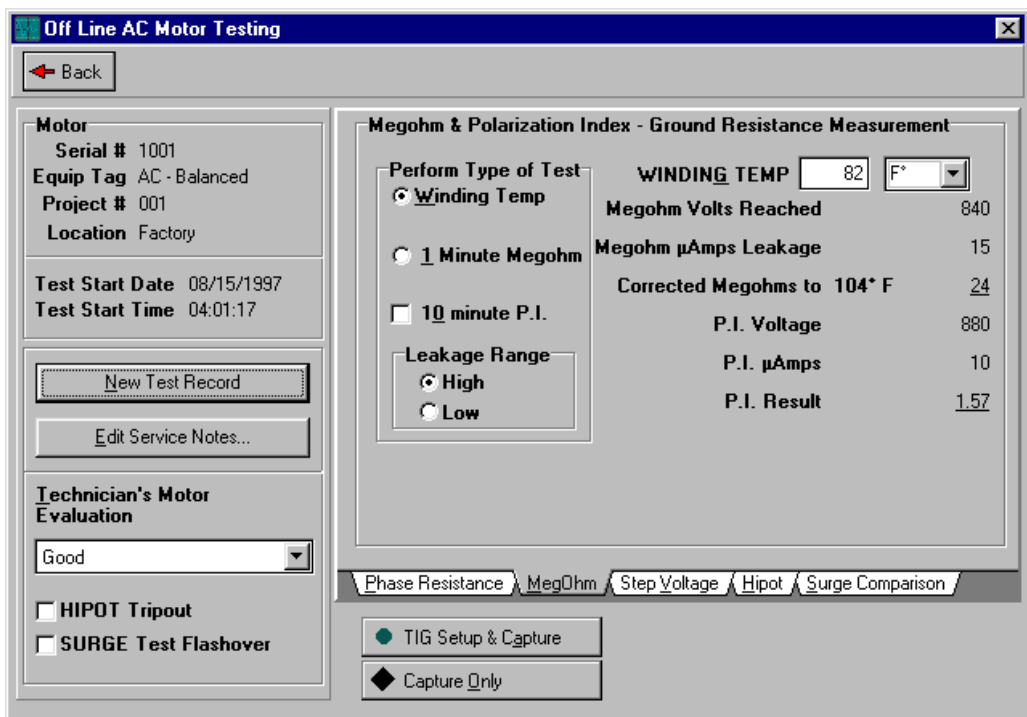


Figure 18 OFF LINE AC MOTOR TESTING – Megohm

Off Line AC Motor Testing
✕

← Back

Motor

Serial # 1001
 Equip Tag AC - Balanced
 Project # 001
 Location Factory

Test Start Date 08/15/1997
 Test Start Time 04:01:17

New Test Record

Edit Service Notes...

Technician's Motor Evaluation

Good ▼

HIPOT Tripout
 SURGE Test Flashover

Step Voltage Test

Step 1

Recommended Voltage	1113
Voltage Reached	1120
μAmps	3

Step 2

Recommended Voltage	2227
Voltage Reached	2240
μAmps	36

Step 3

Recommended Voltage	3340
Voltage Reached	3320
μAmps	70

Phase Resistance
MegOhm
Step Voltage
Hipot
Surge Comparison

● TIG Setup & Capture

◆ Capture Only

Figure 19 Off Line AC Motor Testing – Step Voltage

Off Line AC Motor Testing

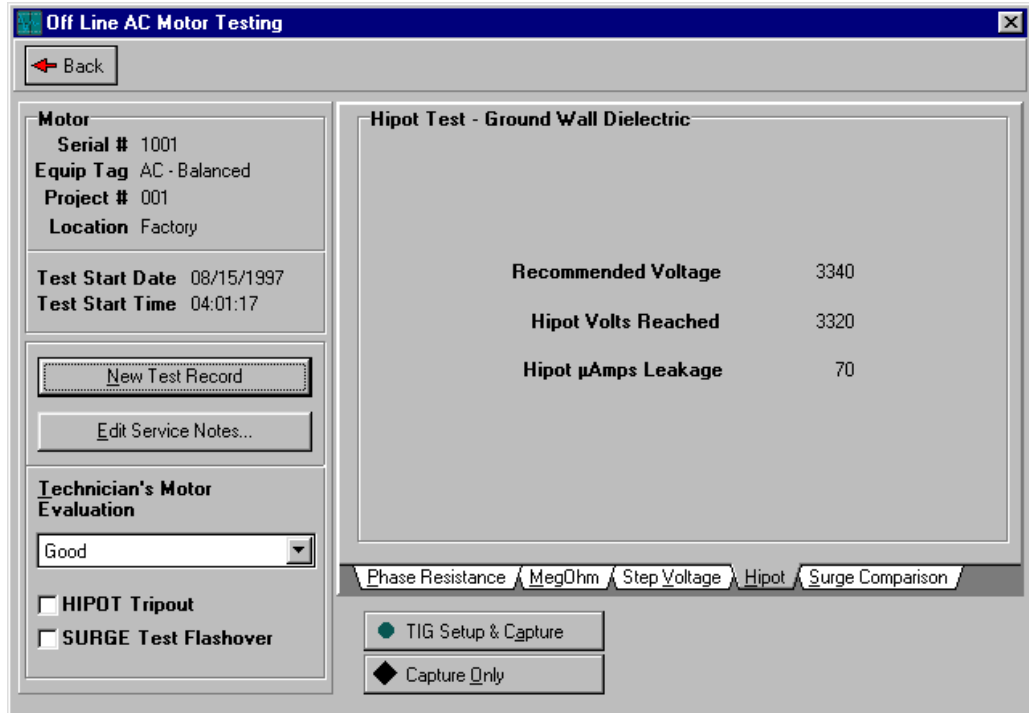


Figure 20 OFF LINE AC MOTOR TESTING – HIPOT

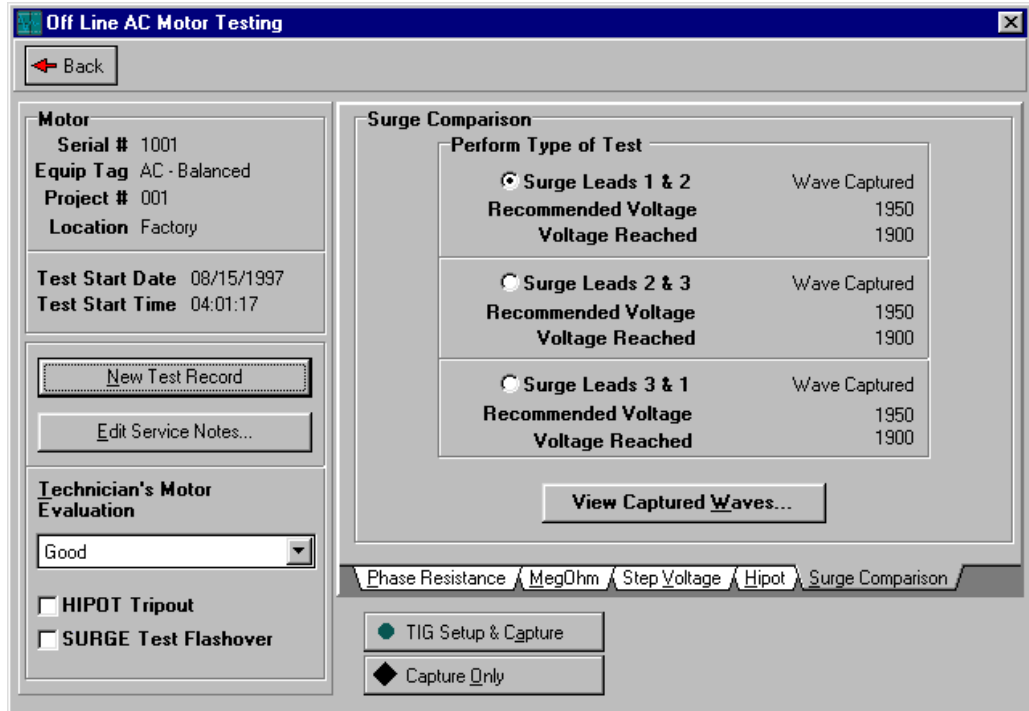


Figure 21 OFF LINE AC MOTOR TESTING – Surge Comparison

C A P T U R E P R O

**Off Line AC Motor
Testing
Controls**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	TIG Setup
Capture	Button	Capture Only
Technician's Evaluation	Combo Box	Selectable Motor Evaluation
Edit Service Notes	Button	Edit the Service Notes
New Test Record	Button	Create a NEW TEST record in the database.
Phase A Sample 1	Radio Button	Selects SAMPLE A to be tested
Phase A Sample 2	Radio Button	Selects SAMPLE B to be tested
Phase A	Radio Button	Selects PHASE A to be tested
Phase B	Radio Button	Selects PHASE B to be tested
Phase C	Radio Button	Selects PHASE C to be tested
View Captured Waves	Button	Go to WAVEFORM screen

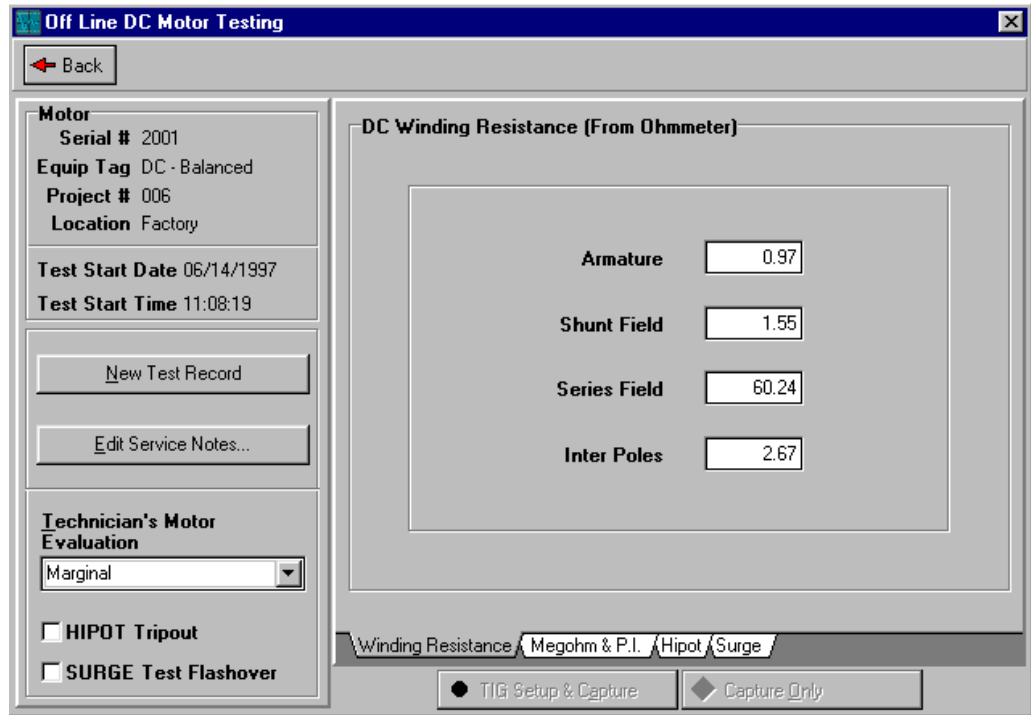


Figure 22 Off Line DC Motor Testing – Winding Resistance

Off Line DC Motor Testing Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
TIG Setup Capture	Button	Use the WALK THROUGH test procedures.
Capture Only	Button	Bypass the WALK THROUGH and CAPTURE.
Winding Temp	Radio Button	Do a temperature data capture using the TIG
F°	Combo Box	Degrees Fahrenheit or Celsius
1 Minute Armature	Radio Button	Do a 1-minute megohm test
1 Minute Series Field	Radio Button	Do a 1-minute megohm test
10 Minute Armature	Check Box	Do a 10-minute megohm test
10 Minute Series Field	Check Box	Do a 10-minute megohm test
Armature	Radio Button	Do a Surge test
Shunt Field	Radio Button	Do a Surge test
Series Field	Radio Button	Do a Surge test
Inter Poles	Radio Button	Do a Surge test
High	Radio Button	Set up for High Current readings
Low	Radio Button	Set up for Low Current readings
View Captured Waves	Button	View the waveforms captured.

CAPTURE PRO

Sample 2	Radio Button	Select sample 1 for testing
Sample 1	Radio Button	Select sample 2 for testing
Motor Eval	Combo Box	Selectable evaluation of the current motor
Edit Service Notes	Button	Edit the SERVICE NOTES for the current motor
New Test Record	Button	Create a new TEST DATE for the current motor.
Back	Button	Exit's current form
Technician Eval	Combo Box	Selectable evaluation of the current motor
Cancel Test	Button	Cancel all further test action.
Cancel Timer	Button	Cancel the timer, and capture data.

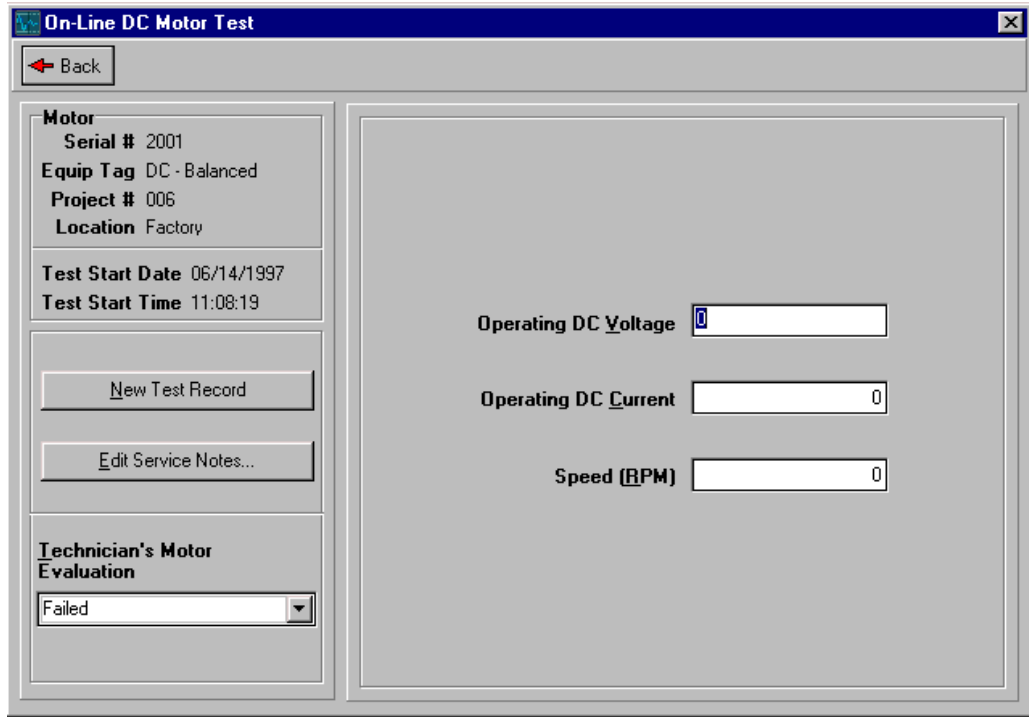


Figure 23 ON LINE DC MOTOR TEST

ON LINE DC TEST CONTROLS

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit's current form
Technician's Motor Evaluation	Combo Box	Evaluation of the motor
Edit Service Notes	Button	Edit the SERVICE NOTES
New Test Record	Button	Create a new TEST DATE

Combo Box

The following is an example of a COMBO BOX



Figure 24 COMBO BOX

Data Base

A database is the file that contains all the information to be stored. Various databases are included with Capture Pro to contain user information, test data, and motor information. It is safe to think of a database as a file cabinet full of reports, and information.

**Data Base
Navigator Control**

The **Database Navigator** allows the user to move through the database by using VCR style buttons.



Figure 25 DATABASE NAVIGATOR CONTROL

**DC OFFLINE
REPORT SCREENS**

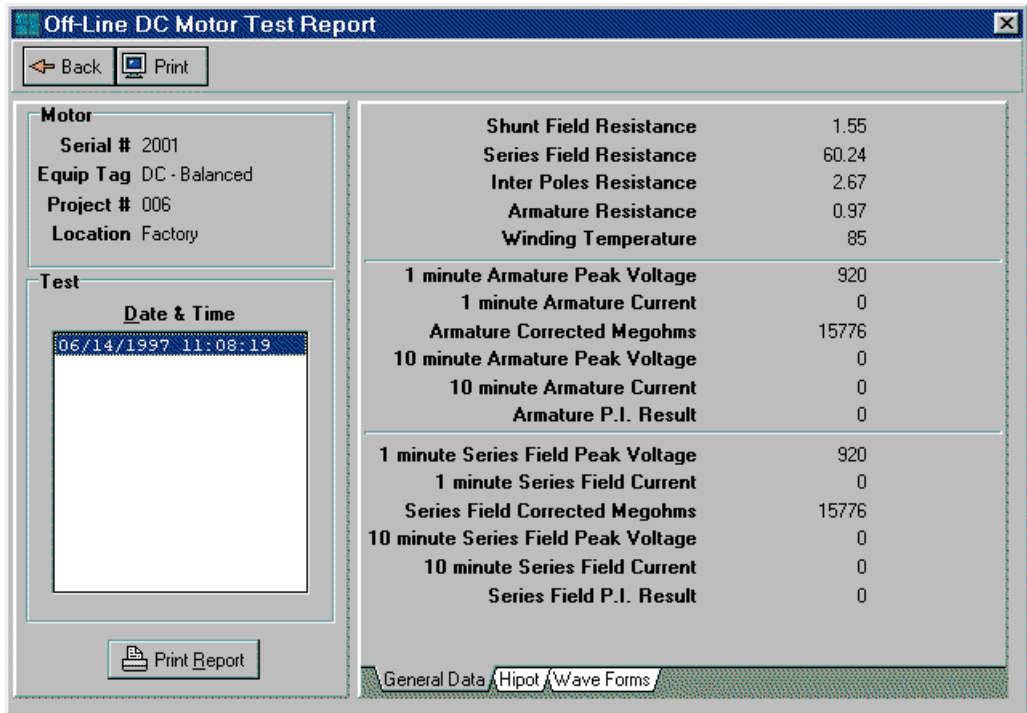


Figure 26 OFF LINE DC MOTOR TEST REPORT – HIPOT

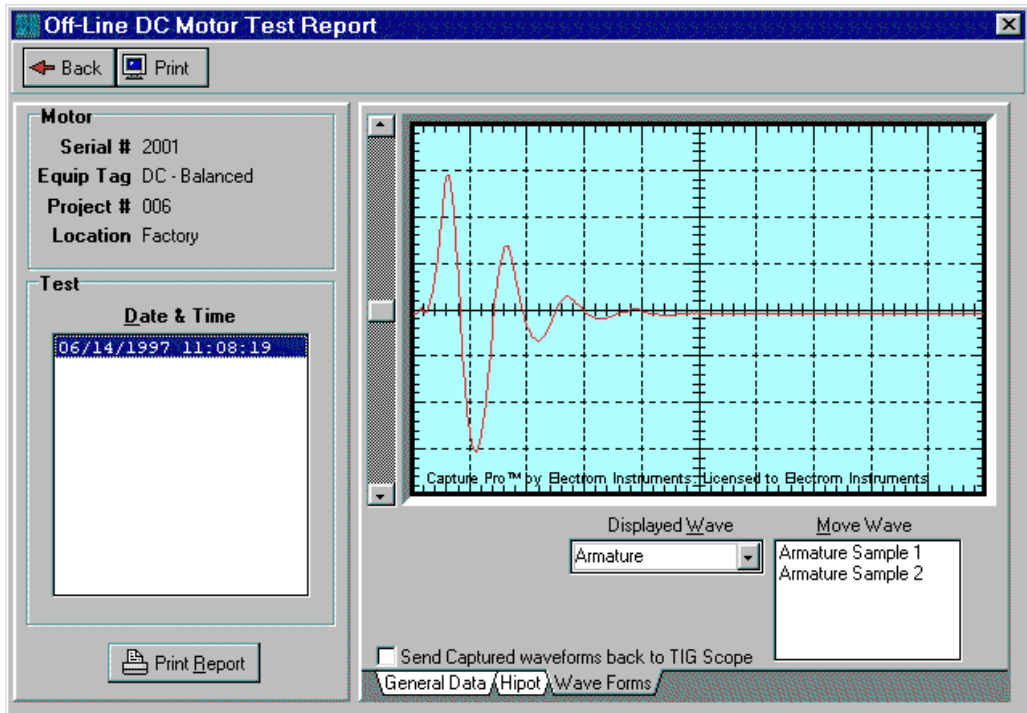


Figure 27 OFF LINE DC MOTOR TEST REPORT – Waveforms data

CAPTURE PRO

Form refers to an open window.

Example: THIS IS THE MAIN FORM SHOWN OPEN.

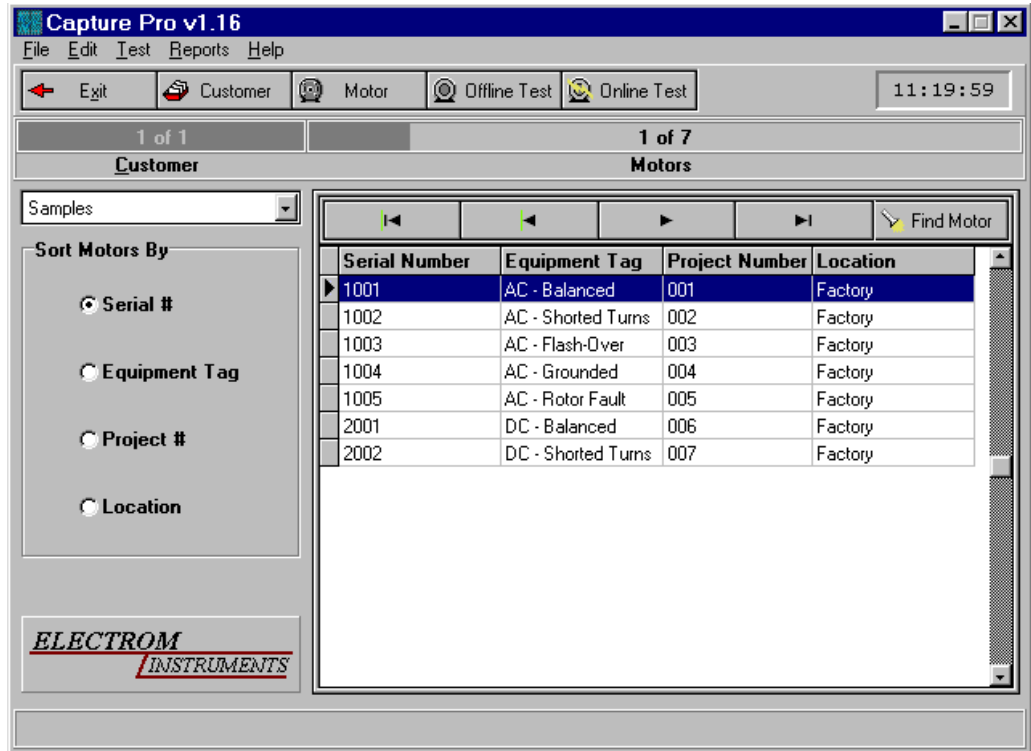


Figure 28 MAIN FORM of Capture Pro.

List Box's

List boxes are used when a selection is needed from a LIST of items. The following list box is used to select a TEST DATE.

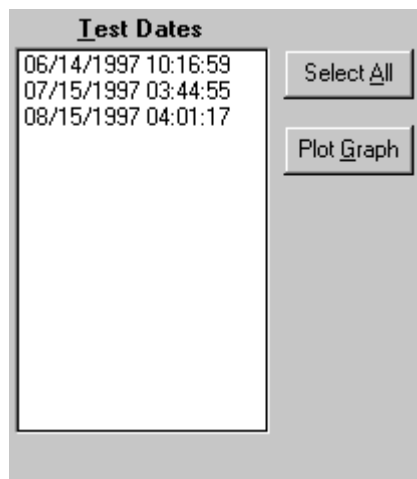
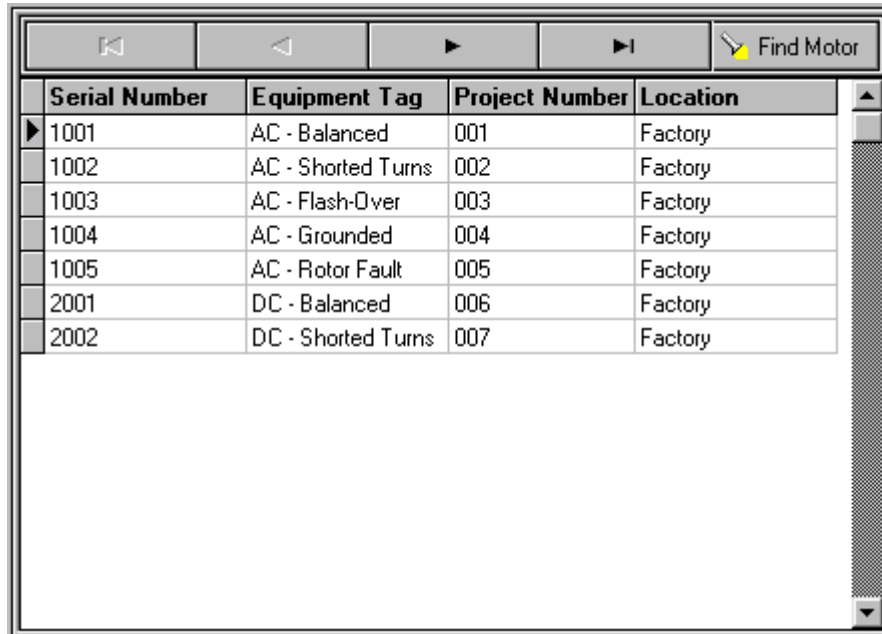


Figure 29 this is an example of a LIST BOX

By selecting an item in the list box, you can then press the PLOT BUTTON to show the output.



Serial Number	Equipment Tag	Project Number	Location
1001	AC - Balanced	001	Factory
1002	AC - Shorted Turns	002	Factory
1003	AC - Flash-Over	003	Factory
1004	AC - Grounded	004	Factory
1005	AC - Rotor Fault	005	Factory
2001	DC - Balanced	006	Factory
2002	DC - Shorted Turns	007	Factory

List Box's

Figure 30 Motor List Box

On the TOP is a DATABASE NAVIGATOR control, and a FIND button.

On the right side is a VERTICAL scroll bar.

Clicking on a row in the LIST BOX selects that motor for reports, or testing. Double clicking will bring up the MOTOR INFORMATION FORM

View wave form

The following is representative of the wave form display

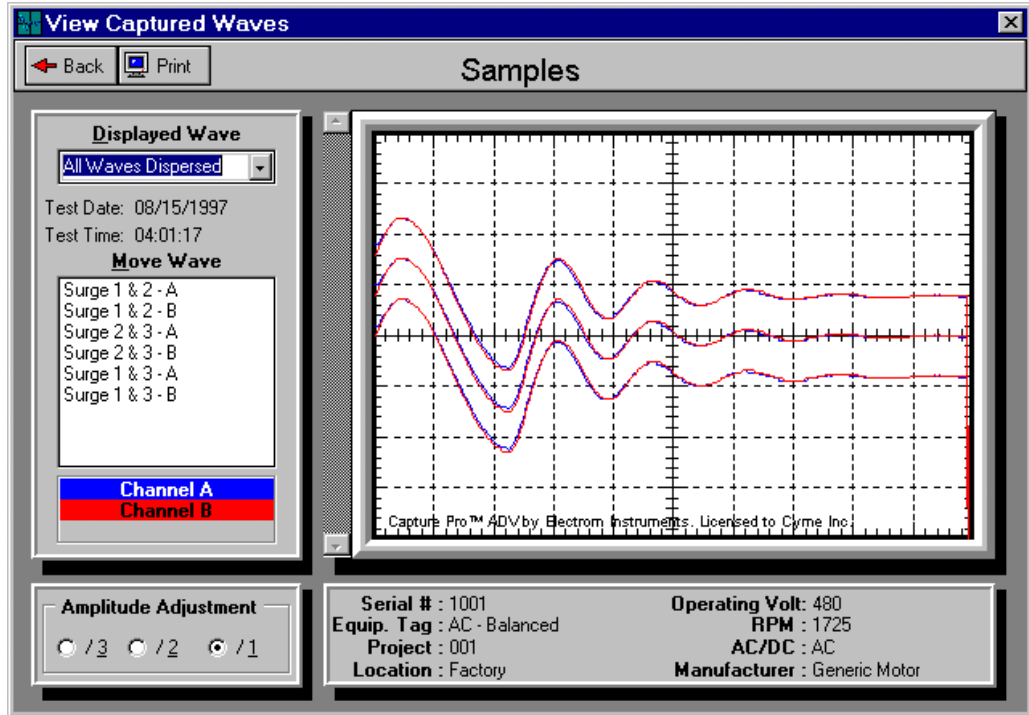


Figure 31 WAVEFORM DISPLAY

Edit Box

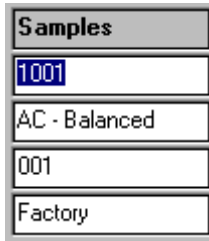


Figure 32 Edit Box Example

This screen shot shows EDIT box's. These type objects allow data entry into the program from the operator. Other than automatic entry of data captured from the TIG, these objects are the primary method of data entry.

Hot Keys

Hot Keys are combinations of Ctrl, ALT, SHIFT, and any other standard key.

Example:

Ctrl+P this indicates the user must press CONTROL and P at the same time

T-Handle Lead Selector

Old Lead Selector Knob



Figure 33 T-Handle Lead Selector

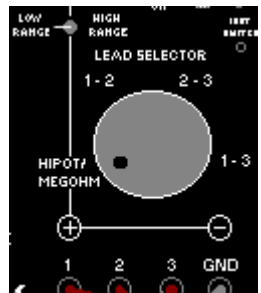


Figure 34 Old Style Lead Selector

AC ON LINE
SCREENS

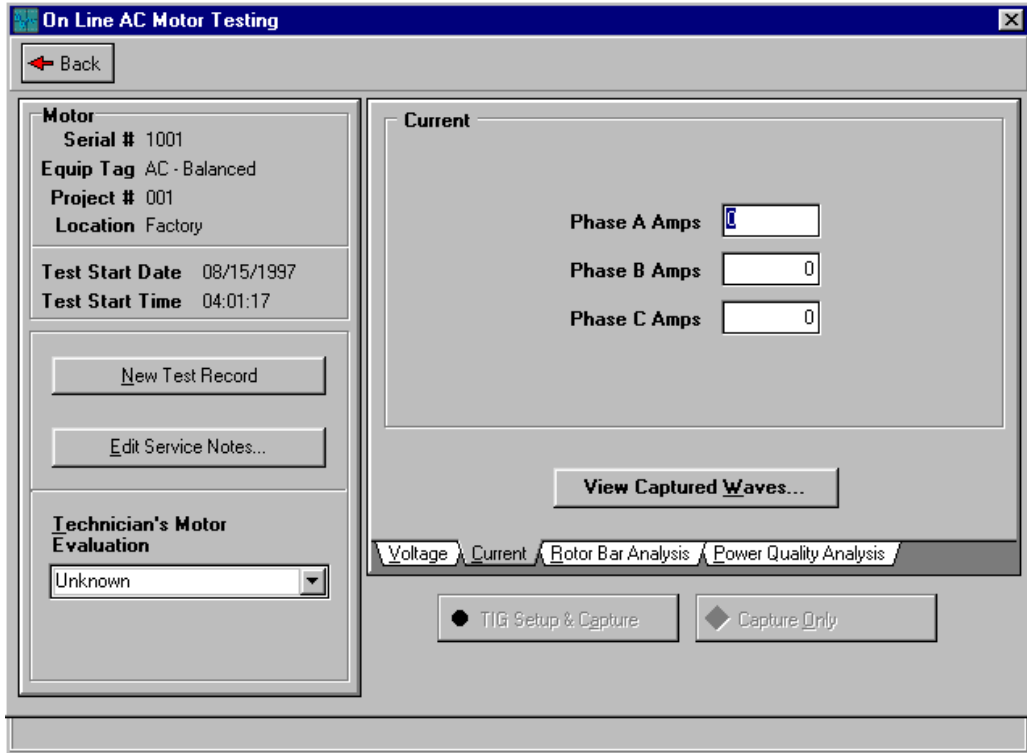


Figure 35 On Line AC Motor Testing - Current

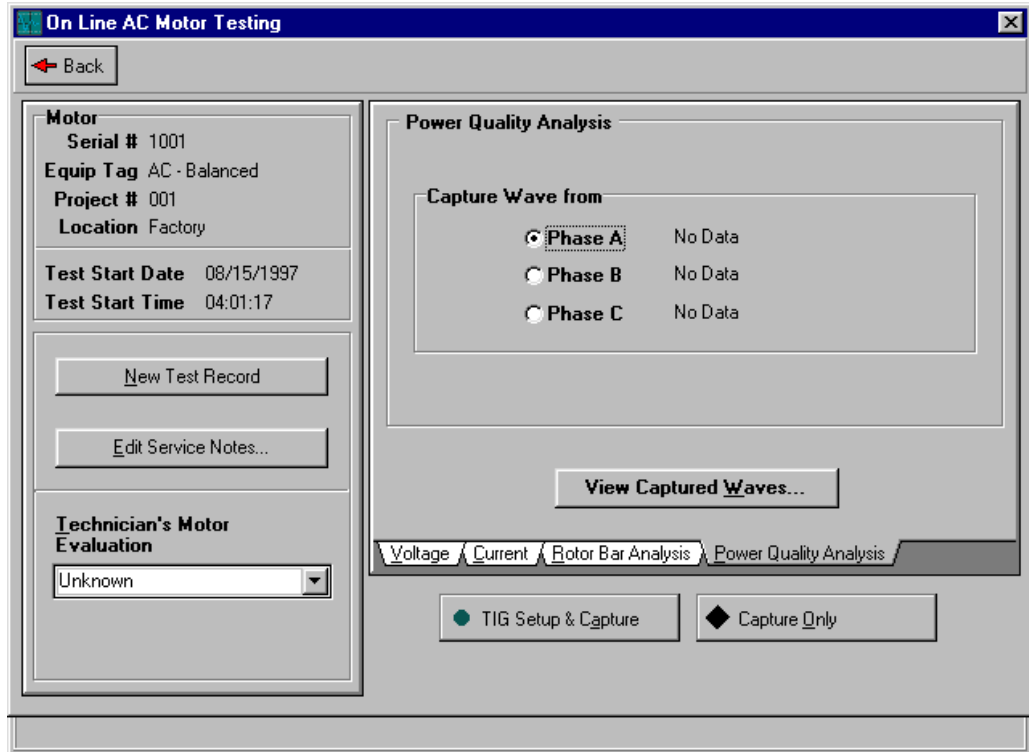


Figure 36 On Line AC Motor Testing – Power Quality Analysis

Selecting

This can also be called a SINGLE CLICK, or in some cases a DOUBLE CLICK.

Move the mouse pointer over the object desired and press the LEFT MOUSE BUTTON, either once, or twice.

Objects

Objects are BUTTONS, LINES of a LIST BOX, MENU CHOICES, etc...

Button



Figure 37 Button example

Buttons are similar to real world buttons. Pressing a button results in some sort of action being taken.

Check Boxes



Figure 38 Check Box Example

Check Boxes are toggled ON or OFF by either clicking them, or using the space bar to select them.

Radio Buttons

Radio Buttons, like CHECK BOXES, are selected by CLICKING on them. They operate in groups, and only one can be selected per group at one time.



Figure 39 Radio Button example

AC Motor Trending

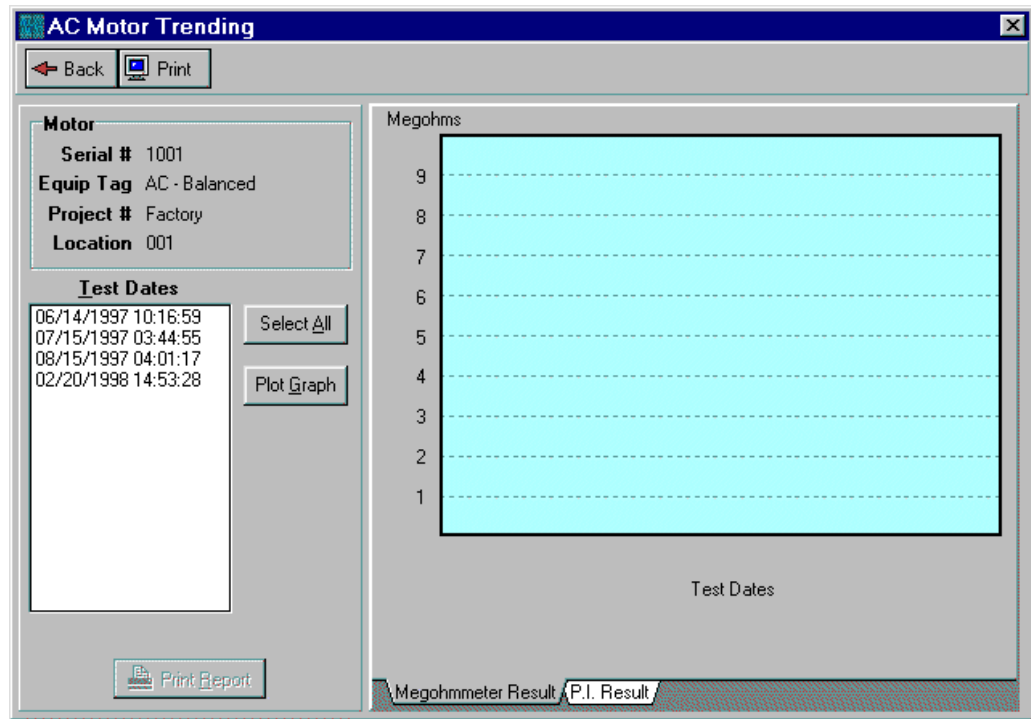


Figure 40 AC Motor Trending – Megohmmeter results

**AC Motor Trending
Hot Keys
Main Form**

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	Reports (menu bar)	SHIFT + F3

**AC Motor Trending
Controls**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit's current form
Print	Button	Prints current screen
Test Dates	List Box	Shows a list of all test dates for current motor.
Select All	Button	Selects all test dates in list box
Plot Graph	Button	Plots Graph for all test dates selected
Print Report	Button	Prints a Trending Report

**Menu Hot Keys
AC Motor Trending**

Ctrl+X	Menu Hot Key	Exit's from Current Form
Alt+M	Menu Hot Key	Focuses on Megohm meter Results Tab
Alt+P	Menu Hot Key	Focuses on P.I. Results Tab
Ctrl+P	Menu Hot Key	Prints Current Screen
Ctrl+R	Menu Hot Key	Prints Motor Trending Report

DC Motor Trending

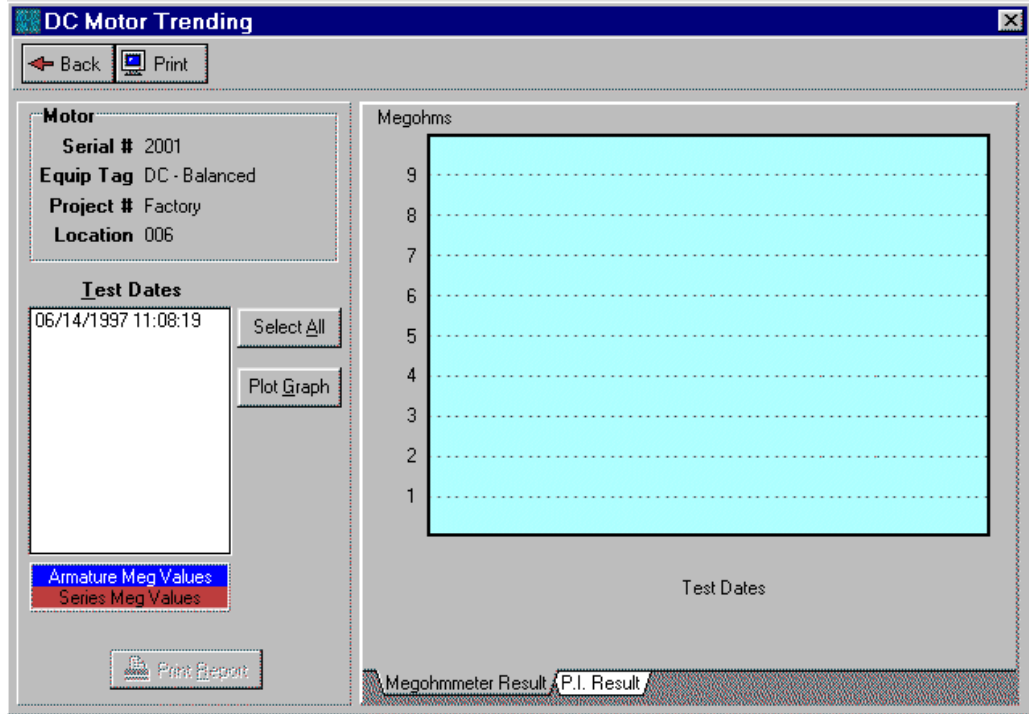


Figure 41 DC Motor Trending – Megohmmeter results

DC Motor Trending

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	Reports Menu (menu bar)	SHIFT + F6
<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit current form.
Print	Button	Prints current screen.
Test list	List Box	List of current test for this motor.
Select All	Button	This will select ALL test dates.
Plot Graph	Button	Plot the test results on the graph.
Print Report	Button	This will print the Trending Report.

**Menu Hot Keys
DC Motor Trending**

<u>Program Control</u>	<u>Hot Key</u>
Ctrl+X	This does the same thing as the BACK BUTTON, exits this screen.
Alt+M	Megohm Graph
Alt+P	PI Graph
Ctrl+P	Print Screen
Ctrl+R	Print Report

**Off-Line AC Motor
Test Report**

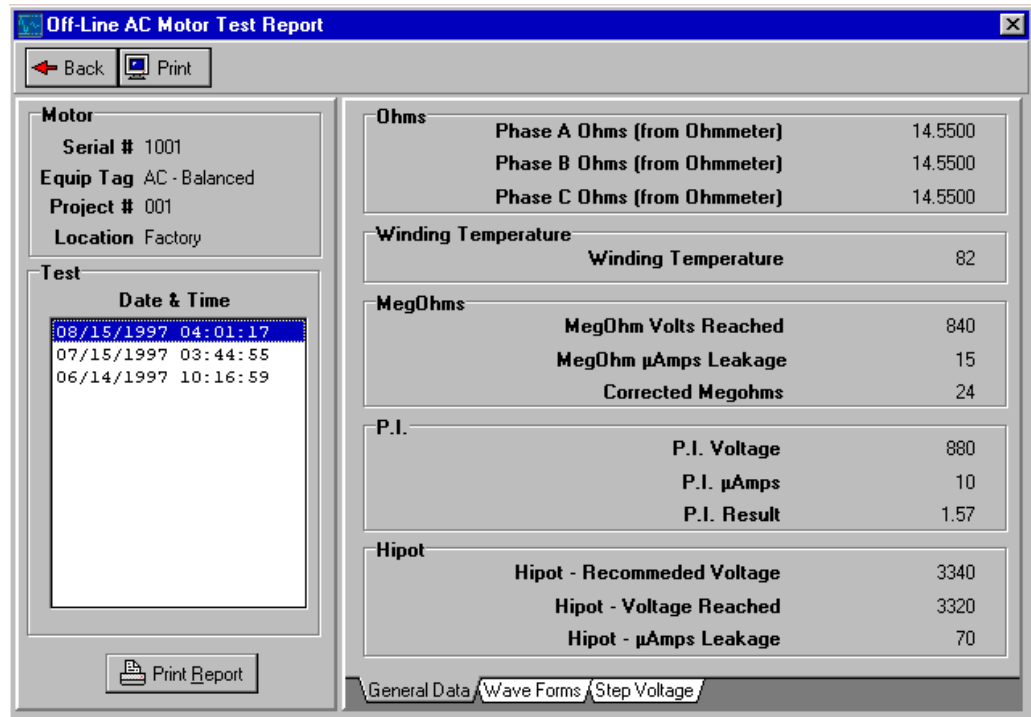


Figure 42 Off Line AC Motor Test Report – General Data

**Off-Line AC Motor
Test Report
Controls**

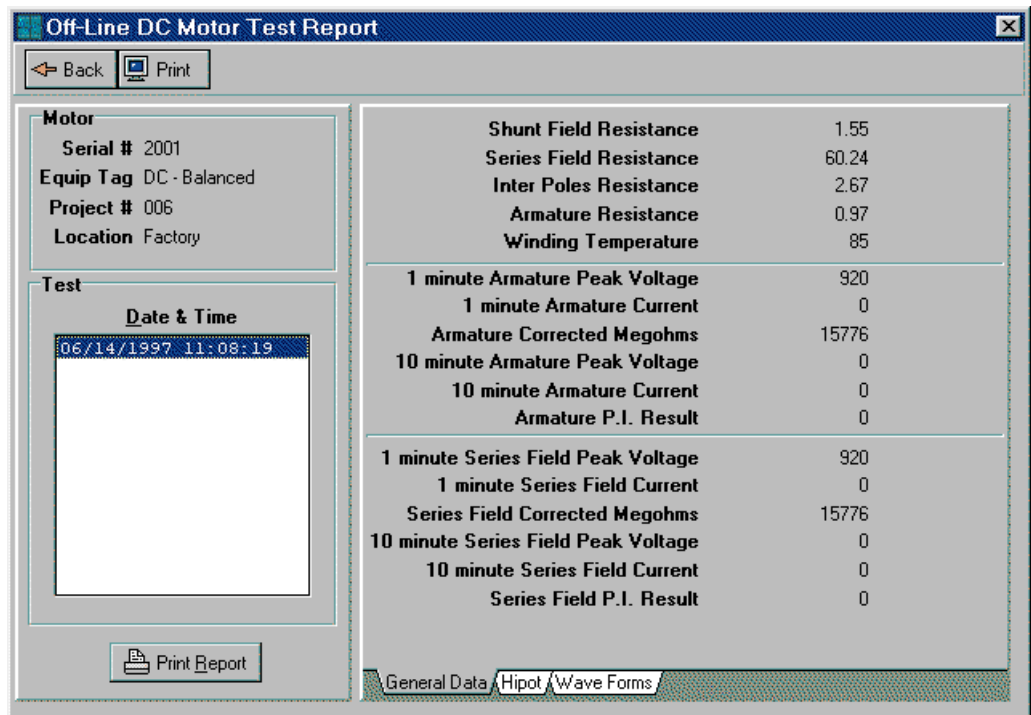
<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Surge Leads	Combo Box	Select a pair of waveforms to view
Move waves	List Box	Select a group of waveforms to move using the scroll bar.

CAPTURE PRO

Send Captured waveforms back to TIG Scope	Check Box	Select this check box, then use the DISPLAYED WAVE combo box to select the waveforms to RECALL to the TIG. Follow the prompt for further information...
Back	Button	Exit's current form
Print	Button	Prints current screen
Date & Time	List Box	Select a test Date & Time
Print Report	Button	Prints an AC OFF LINE report

Figure 43 Off Line DC Motor Test Report – General Data

Off-Line DC Motor Test Report



Off-Line DC Motor Test Report Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit's current form
Print	Button	Prints current screen
Display Wave	Combo Box	Select wave forms to view
Move waves	List Box	Select a group of waveforms to move using the scroll bar.
Send Captured waveforms back to TIG Scope	Check Box	Select this check box, then use the DISPLAYED WAVE combo box to select the wave forms to RECALL to the TIG. Follow the prompt for further information...

C A P T U R E P R O

Date & Time **List Box**

Select a test Date & Time

Print Report **Button**

Prints an AC OFF LINE report

**On-Line AC Motor
Test Report
Controls**

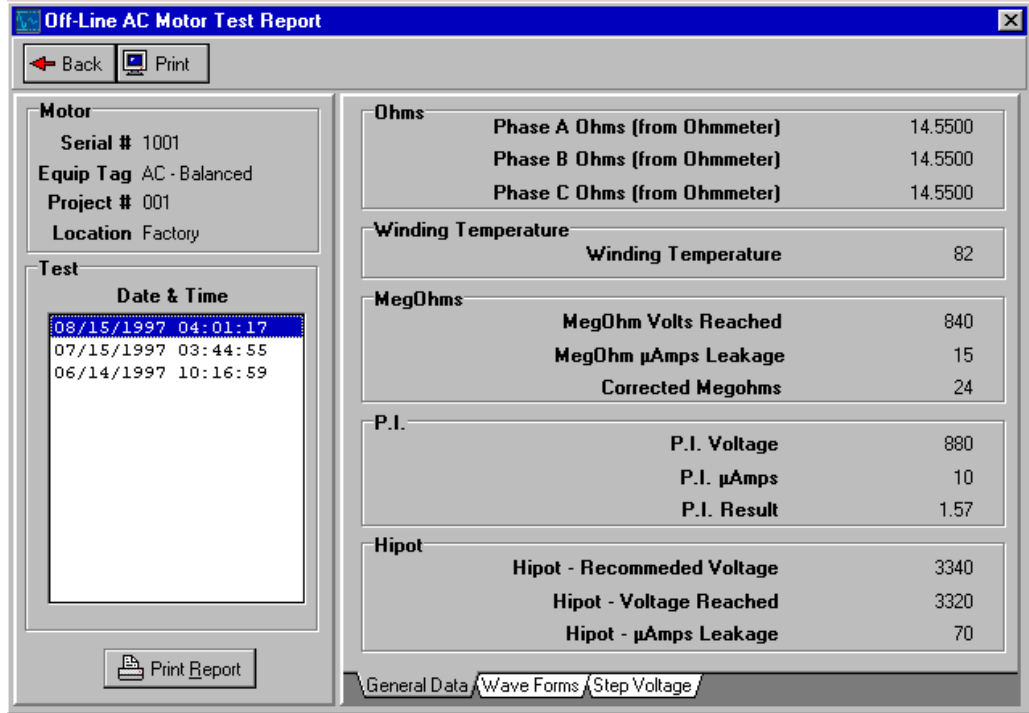


Figure 44 Off Line AC Motor Test Report – General Data

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit's current form
Print	Button	Prints current screen (screen dump)
Date & Time	List Box	Select a test DATE & TIME for viewing.
Move Wave	List Box	Select a waveform to move using the scroll bar
Send Captured waveforms back to TIG Scope	Check Box	Select this check box, then use the DISPLAYED WAVE combo box to select the wave forms to RECALL to the TIG. Follow the prompt for further information...
Date & Time	List Box	Select a test Date & Time
Print Report	Button	This button prints out a report.

**On-Line DC Motor
Test Report**

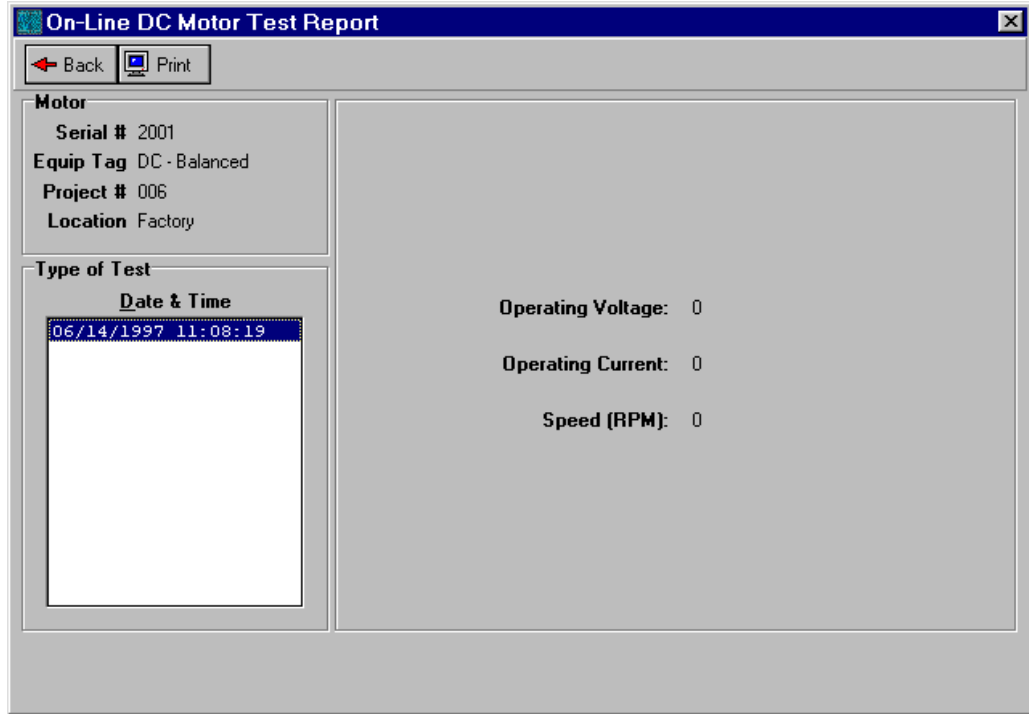


Figure 45 On Line DC Motor Test Report

**On-Line DC Motor
Test Report
Controls**

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Exit's current form
Print	Button	Prints current screen
Date & Time	List Box	Select a test Date & Time

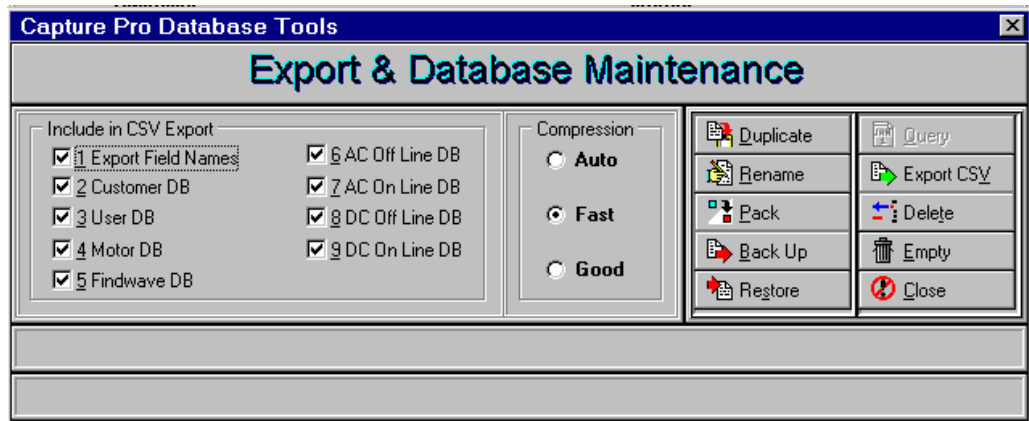


Figure 46 Capture Pro Database Tools

Capture Pro Database Tools

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	File Menu	Ctrl + ALT + E

Capture Pro Database Tools Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
EXPORT Field Names	Check Box	Export header information, which includes the field names.
Customer Database	Data Base	Include database containing all Customer Information.
User DATABASE	Data Base	Include database containing all User Information.
Motor DATABASE	Data Base	Include database containing all Motor Information.
Find wave DATABASE	Data Base	Includes database containing all waveform information.
DC On-Line DATABASE	Data Base	Includes database containing all DC On Line information.
DC Off-Line DATABASE	Data Base	Includes database containing all DC Off Line information.
AC On-Line DATABASE	Data Base	Includes database containing all AC On Line information.
AC Off-Line DATABASE	Data Base	Includes database containing all AC Off Line information.
Maximum slowest)	Radio Button	Maximum compression (Takes the most time to compress).
Minimum (fastest)	Radio Button	Minimum compression (Takes the least time to compress).

CAPTURE PRO

Normal (medium)	Radio Button	Medium compression (Medium compression time).
Pack	Button	This process will PACK the database and remove any unused space. NOTE: Depending on the sizes of your database this process may take a while!
Rename	Button	Rename a database... NOTE: This should not be done on the main databases as they would then be unusable in Capture Pro.
Duplicate	Button	Duplicate databases. Copies data from an existing database to a New database of the users choice. This function is primarily used to "Back Up" existing data in database format.
Restore	Button	Restore data from a Backup. See BACK UP below.
Back Up	Button	Backup data using a Compression algorithm. This type of backup does not create a new database as does DUPLICATE, but compresses all the selected files in a group format...
Close	Button	Closes the Database Tools dialog box.
Export CSV	Button	Exports Databases to a CSV file... (Comma separated text file) This type of EXPORT is used to make the database information available to other Windows programs.
Empty	Button	Empty a database of ALL its information.
Delete	Button	Delete (erases) a database file and all it's indexes and validation files...
Query	Button	NOT OPERATIONAL AT THIS TIME.

Our Company Information for Reports

Figure 47 Our Company Information for Reports

Our Company Information for Reports Controls

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Country	Lookup combo	Select a country filter.
Edit Country Filter Masks	Button	Opens the Edit form for Country filters
Clear Image	Button	Clear out the User logo. (Bitmap file)
OK	Button	Closes this form

Edit Country Filter Masks

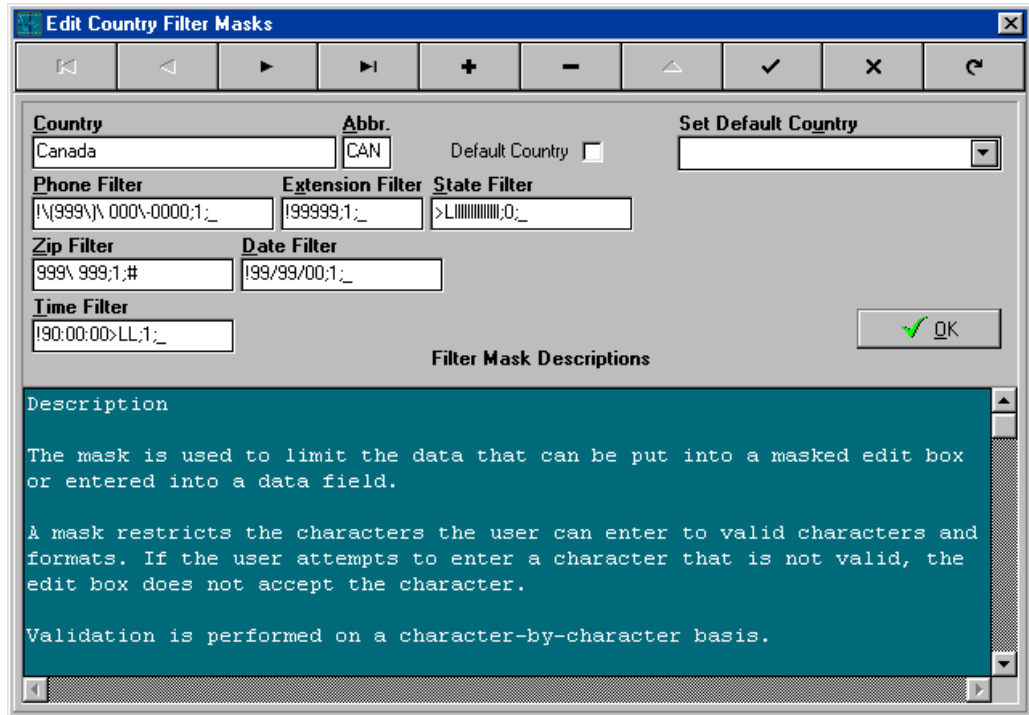


Figure 48 Edit Country Filter Masks

OK Close this form and returns to the previous form.
Vertical Scroll Bar Scroll through the help text on this form.

Hot Key

Hot Key Action

Ctrl+X	This does the same thing as a BACK BUTTON, exits this screen.
Ctrl+1	First entry in the database
Ctrl+2	Prior entry in the database
Ctrl+3	Next entry in the database
Ctrl+4	Last entry in the database
Ctrl+5	Add entry in the database
Ctrl+6	Delete entry in the database
Ctrl+7	Edit entry in the database
Ctrl+8	Post entry in the database
Ctrl+9	Cancel entry to the database
Ctrl+0	Refresh data on screen

**Menu Hot Keys
Edit Country Filter
Masks**

Complete Motor Report Setup

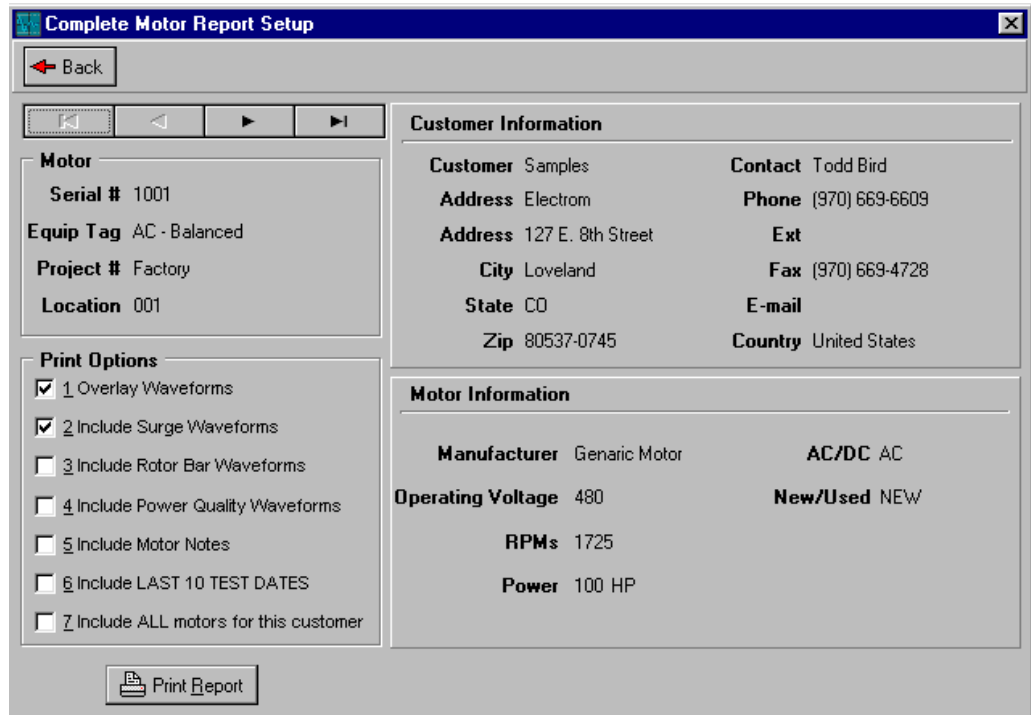


Figure 49 Complete Motor Report Setup

<u>Form</u>	<u>Program Control</u>	<u>Hot Key</u>
Main Screen	Reports Menu	Ctrl + B

Motor & Motor Information This information is generated from MOTOR INFORMATION.
Customer Information This information is generated from CUSTOMER INFORMATION.

Print Options

Overlay waveforms	This will overlay all waveforms to be superimposed on the report.)
Include Surge waveforms	Include the Surge waveforms on the Report
Include Rotor bar waveforms	Include the Rotor Bar waveforms on the Report
Include Power Quality waveforms	Include the Power Quality waveforms on the Report
Include Motor Notes	Include the Motor Notes with the Report.
Include LAST 10 TEST DATES	Include the Last 10 Tests that were performed for this motor on the Report.
Include ALL motors for this customer	Include ALL motor for this customer on the Report
Print Report	Prints Complete Motor Report with the settings that you have selected.
Back	Exit current screen

Menu Hot Keys

<u>Hot Key</u>	<u>Hot Key Action</u>
Ctrl+X	Exit current screen.
Alt+R	Complete Motor report

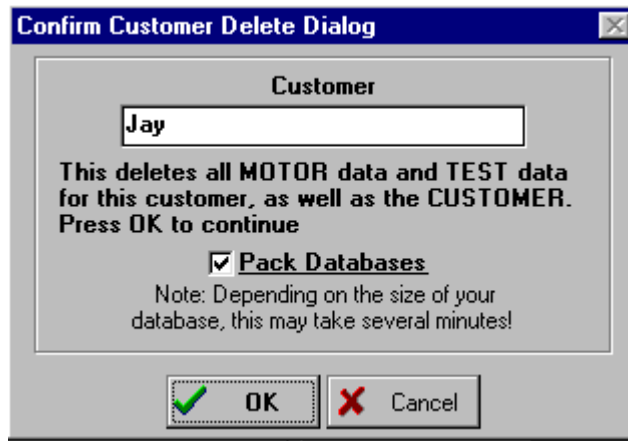


Figure 50 Confirm Customer Delete Dialog

Confirm Customer Delete Dialog

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
OK	Button	This will execute the delete function.
Cancel	Button	This will cancel this operation.
Pack Databases	Check Box	This will remove all unused space from the database, depending on the size of your databases this process could take some time.

Confirm Formula Multiplier Value

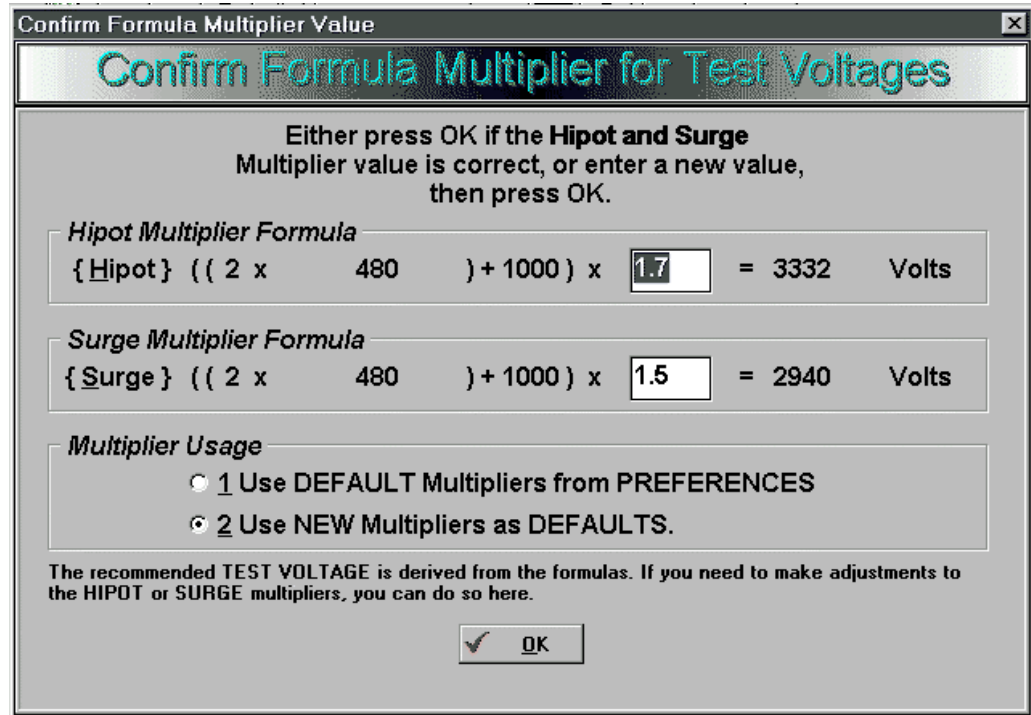


Figure 51 Confirm Formula Multiplier for Test Voltages

The following multipliers will determine what the recommended TEST VOLTAGE will be, for testing.

Hipot Multiplier Formula $((2 \times \text{Operating Voltage}) + 1000) \times \text{Multiplier} = \text{Test Voltage}$

Surge Multiplier Formula $((2 \times \text{Operating Voltage}) + 1000) \times \text{Multiplier} = \text{Test Voltage}$

NOTE: The above formula reads; ((2 times Operating Voltage) plus 1000) times xxx. The xxx is normally a value between one and two. This is user configurable. The () are used for Algebraic priority. All inner () are calculated first.

Multiplier Usage

Use DEFAULT Multipliers from PREFERENCES: If you select this button the recommended test voltage will be calculated from the Multipliers set in the Preferences Section.

Use **NEW Multipliers as DEFAULTS**. Selecting this button will change the multipliers for this test and any further test that you perform. (This will NOT change the multipliers in the PREFERENCE Section.

Motor Evaluation Report

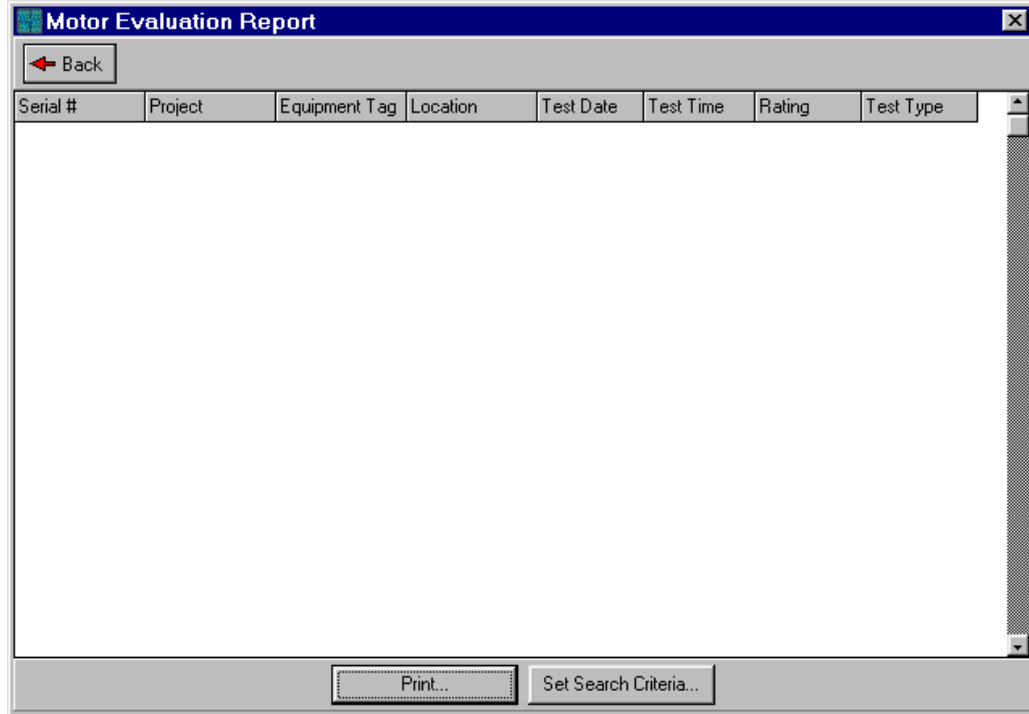


Figure 52 Motor Evaluation Report

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Close this form
Print	Button	Print a Motor Evaluation Report
Set Search Criteria	Button	Open a dialog to set SEARCH CRITERIA.

Service Notes

Service notes can be added to any motor. Type the notes on the form, and then press

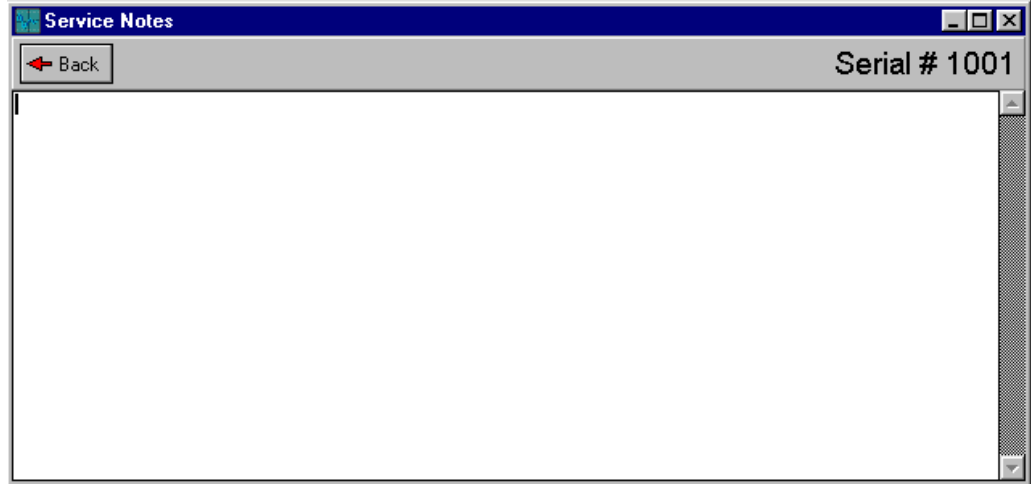


Figure 53 Service Notes

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Returns to previous form.

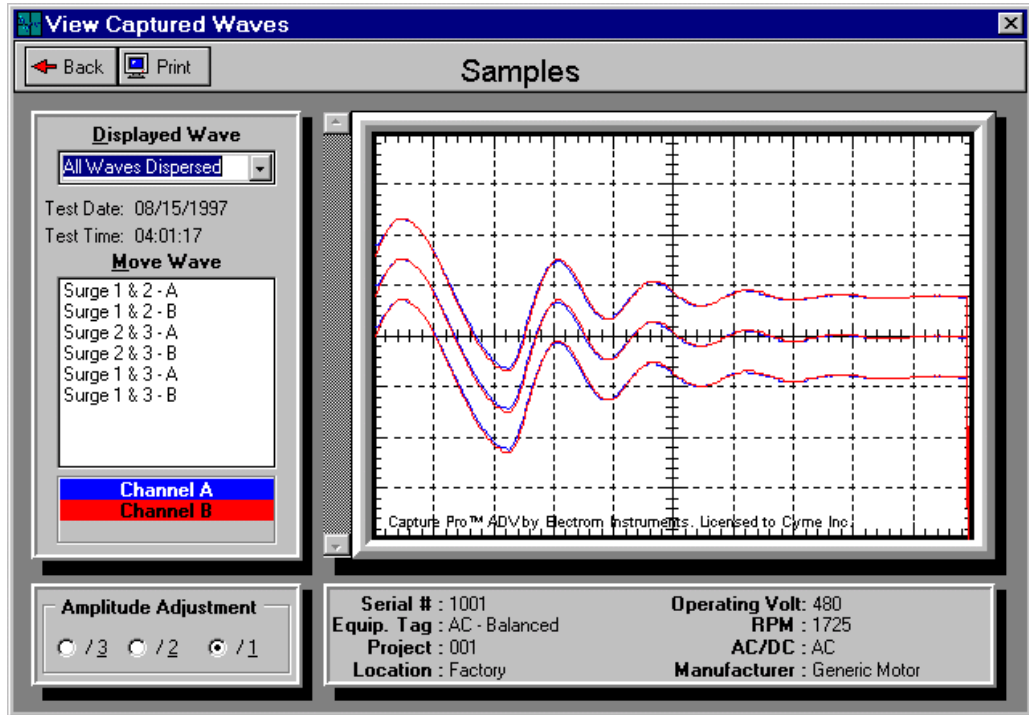


Figure 54 View Captured Waveforms

View Captured Waves

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Back	Button	Return to previous screen.
Print	Button	Screen Dump to current printer.
Surge Leads 1 2	Combo Box	Select the leads you want to view.
Move wave	List Box	Select the waveform(s) you want to move.
/ 3	Radio Button	Cause the wave form amplitude to be divided by 3
/ 2	Radio Button	Cause the wave form amplitude to be divided by 2
/ 1	Radio Button	Cause the wave form amplitude to be divided by 1

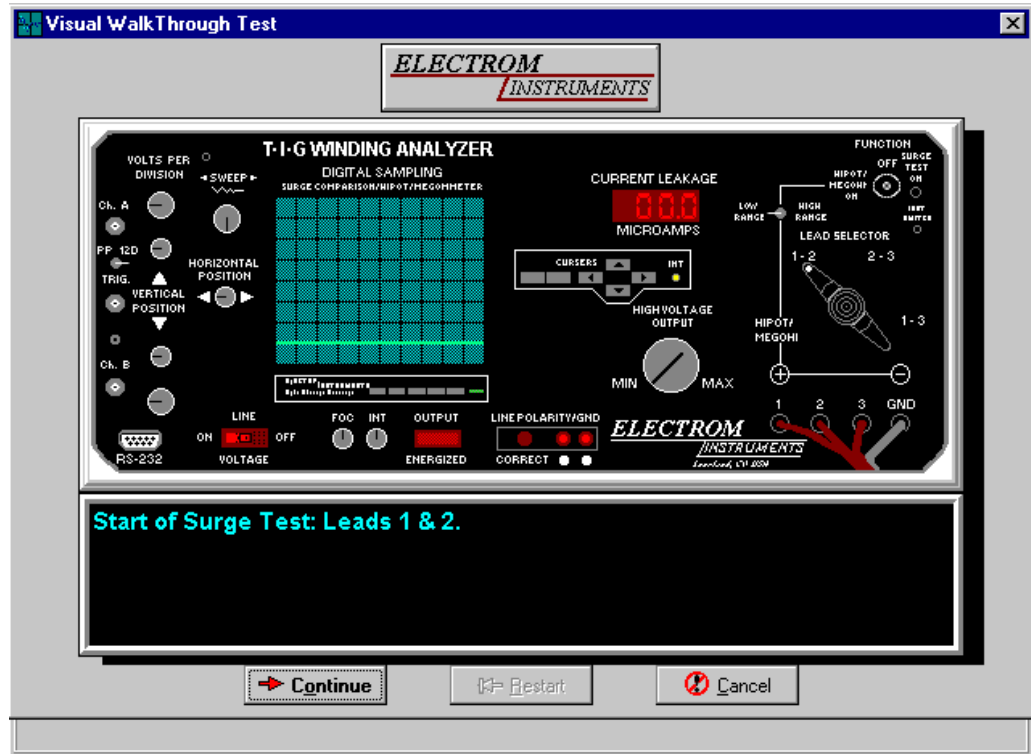


Figure 55 Visual Walk Through Test

NOTE: The lead selector knob can be toggled from the old style round knob to a T-handle by double clicking on it. Once toggled, it will remain the style last used. This functionality was added to conform to older and newer version TIG's.

Visual WalkThrough Test

<u>Control Label</u>	<u>Control Type</u>	<u>Action</u>
Continue	Button	Continue with the next Test Step.
Restart	Button	Restart the current test from the beginning.
Cancel	Button	Cancel the current test.

NOTE: The ESCAPE key functions as a quick abort. Do not use this under normal conditions, as the test data is NOT saved. Always complete ALL procedures in order for the test data to be saved.

Appendix A

Recommended Test Voltages and Insulation Values for Electrical Apparatus

Maximum Equipment Voltage Rating (Volts)	Minimum DC Test Voltage (Volts)	Recommended Minimum Insulation Resistance (MΩ)
250	500	25
600	1,000	100
5,000	2,500	1,000
8,000	2,500	2,000
15,000	2,500	5,000
25,000	5,000	20,000
35,000	15,000	100,000
46,000	15,000	100,000
69,000	15,000	100,000

Insulation Resistance Correction to 20° C and 40° C

Use the chart below to determine the factor needed to correct measured resistance values. The temperature is corrected to 20° C by multiplying the measured temperature (in °F) by the corresponding factor under the x. To correction to 40° C, divide the answer by 4.

°F	x	°F	x	°F	x	°F	x
32	.21	56	.61	80	1.72	104	4.80
33	.22	57	.63	81	1.80	105	5.06
34	.23	58	.66	82	1.88	106	5.31
35	.24	59	.68	83	1.96	107	5.57
36	.24	60	.71	84	2.04	108	5.82
37	.25	61	.75	85	2.12	109	6.08
38	.26	62	.78	86	2.20	110	6.33
39	.27	63	.82	87	2.32	111	6.59
40	.29	64	.89	88	2.43	112	6.84
41	.31	65	.89	89	2.55	113	7.10
42	.33	66	.93	90	2.66	114	7.47
43	.34	67	.96	91	2.78	115	7.84
44	.36	68	1.00	92	2.89	116	8.22
45	.37	69	1.05	93	3.01	117	8.59
46	.39	70	1.11	94	3.12	118	8.96
47	.41	71	1.16	95	3.24	119	9.33
48	.42	72	1.21	96	3.41	120	9.71
49	.44	73	1.27	97	3.59	121	10.08
50	.45	74	1.32	98	3.76	122	10.45
51	.48	75	1.37	99	3.93	123	11.01
52	.50	76	1.63	100	4.11	124	11.57
53	.53	77	1.48	101	4.28	125	12.13
54	.55	78	1.56	102	4.45		
55	.58	79	1.64	103	4.63		

Appendix B

Commonly Used Test Voltages

Nameplate Voltage	DC Test Voltage	EASA Test Voltages	
		Old Winding	New Winding
110	1700	2110	3520
230	2000	2110	3520
460	2800	2110	3520
2300	5600	5570	9280
4160	9300	8950	14900

Appendix C

STANDARDS REFERENCES

IEEE Std 43-1974, Recommended Practice for Testing Insulation Resistance of Rotating Machinery.

IEEE Std. 56-1977, Guide for Insulation Maintenance of Large AC Rotating Machinery.

IEEE Std 62-1958, Guide for Making Dielectric Measurements in the Field.

IEEE Std 95-1977, IEEE Recommended Practice for Insulation Testing of Large AC Rotating Machinery with High Direct Voltage.

IEEE Std 432, Insulation Maintenance for Rotating Electrical Machinery (5 HP to less than 10,000 HP).

IEEE Std 522, Testing Turn-to-Turn Insulation of Form-Wound Stator Coils for Alternating Current Rotating Electric Machines.

NEMA MG I, Motors and Generators.

NETA MTS- 1989, Maintenance Testing Specifications, Section 7.15 Rotating Machinery.

NETA ATS- 1991, Acceptance Testing Specifications, Section 7.15 Rotating Machinery.

Bibliography:

Biddle Instruments, The Lowdown on High Voltage DC Testing, 1988.

Biddle Instruments, A Stitch In Time, 1981.

D.E. Crawford, A Mechanism of Motor Failure, Preceding 12th Electrical Insulation Conference, Boston, 1975

**Appendix D
Glossary of Terms**

>	Greater Than. Indicates the left side is GREATER THAN the right side. IE: 8 > 5 or set voltage > 1000.
AIPE	American Institute of Plant Engineers
Amplitude	Amplitude is the height of a waveform in volts.
ANSI	American National Standards Institute
Arc-over	Current flow through a defect in the interturn insulation
BEAMA	International Electrical Insulation Conference
CAPTURE	Capturing is the function of downloading data from the TIG winding analyzer.
CLICK	This refers to the mouse buttons. A SINGLE CLICK means pressing the appropriate mouse button once, and a DOUBLE CLICK means pressing the appropriate mouse button twice, in rapid succession.
Coil	As assembly of turns (turns of wire).
COM PORT	See RS232 port
Comparison Test	The comparison of two waveforms from two windings during a Surge test. Differences in the waveforms indicate shorted turns in one of the windings.
Country Filter	A country filter is a group of “filters” that demand specific type information be entered. For example a filter such as (XXX) XXX-XXXX would require an entry in telephone format. These “filters” ensure data entry accuracy.
Country filters	See country filter
CRT	Cathode Ray Tube, the typical display used on a Surge Comparison tester.
Current Customer	Refers to the “ACTIVE” customer selected on the MAIN SCREEN
Database	A database is the file that contains all the information to be stored. Various data bases are included with Capture Pro to contain user information, test data, and motor information. It is safe to think of a database as a file cabinet full of reports, and information.

DATE & TIME	In Capture Pro, this refers to a list box with Date and Time entries.
Dielectric strength	The ability of an insulator to withstand high voltage without breakdown (Arc-over)
Dielectric test instruments	Instruments such as the ELECTROM TIG Winding Analyzer
EASA	Electrical Apparatus Service Association
EDIT BOX	The user inputs information to Capture Pro through the use of these.
Edit Menu	The menu pulldown labeled EDIT
EXPORT	To make test information available to other programs
File Menu	Refers to the menu choice called FILE
Frequency	Number of cycles (positive and negative peaks) per second in a given waveform
Ground	A conductor in any winding of a motor, or other coil, in direct electrical contact with ground potential or the frame of the device.
Ground Insulation	The insulation between the coils of a motor and the surrounding frame.
Ground Resistance	The resistive value of the dirt and moisture across the ground insulation.
Hipot Test	High Potential test that is used for testing the dielectric strength of the ground insulation.
IAD	Industrial Automation Division
IEEE	Institute of Electrical and Electronics Engineers
Insulation System	The combination of ground insulation and interturn insulation.
Interturn Insulation	The insulation on the magnet wires of a motor.
Leakage Current	The current flow across the insulation system of a motor that is measured during a Hipot test.
LEFT MOUSE BUTTON	Refers to the LEFT HAND MOUSE BUTTON.

CAPTURE PRO

Main Screen	Refers to the opening screen of Capture Pro.
Mechanical strength	The ability of an insulator to withstand mechanical stresses without rupturing.
Megohm	One million ohms of resistance.
Menu bar	Located at the top of the MAIN SCREEN
Multiplier	This is part of the formula to determine the test voltage.
Multipliers	See Multiplier
NCCI	National Council on Compensation Insurance
NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association
Objects	Refers to computer screen objects. Examples of objects (controls) in the program: BUTTONS SCROLL BARS CHECK BOXES LIST BOXES COMBO BOXES EDIT BOXES RADIO BUTTONS MENU BARS
Ohmic resistance	The ability of an insulator to prevent leakage of small currents to Earth ground.
Open Circuit	A break in a conductor that prevents current flow.
Operating Voltage	The voltage at which a motor operates.
Polarity	Proper connection of leads, that is positive-to-positive and negative-to-negative.
RECALL	This refers to “SENDING” the captured waveforms back to the TIG.
Report	Refers to a printout of saved test data.
Reports Menu	Refers to the menu choice REPORTS

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Rm	Minimum Resistance or Resistance Minimum
RS232 port	A type of serial communications connector on a desktop or laptop computer. This “port” is the communication link for Capture Pro to TIG.
Screen Dump	“DUMPS” the screen bitmap to a printer. “What you see is what you get.”
SERVICE NOTES	A memo style scratchpad to put “NOTES” about the motor under test.
Short	Two or more turns of wire touching through an insulation defect within a winding.
Short Circuit	Two or more turns of wire touching through an insulation defect within a winding.
Status bits (RS 232)	These “bits” or in the case of Capture Pro, LED lights, indicate the various conditions of information being used to open a communications link to the TIG.
Surge Test	An impulse test used to determine the dielectric strength of the interturn insulation in a coil or winding.
TEST DATE	The “TEST DATE” refers to the day the test entry was created.
Test Leads	Wires on the test instruments that are connected to the device being tested. See Figure 2 of the Insulation Test Methods manual.
TEST VOLTAGE	The voltage the TIG should be set at, to test the motor.
Thermal conductivity	The ability of an insulator to dissipate heat generated in the conductor by current flow.
Trace	The bright horizontal or waveform lines on a CRT.
Turn	A single loop of wire in a coil or motor.
User logo	This is a bitmap that can be stored in the USER DATABASE. It is printed on reports.
WALK THROUGH	Test procedures that guide the operator through each test.
Waveform	The observed trace on the CRT during a Surge test. Sometimes referred to as a signature, or pattern.

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ADDENDUM:

Windows 2000 / Windows XP users: The maximum screen color resolution Capture Pro uses is 16 bit color. If your computer is set with 32 bit color, it **WILL** cause problems on installation, and subsequent usage. To fix this, follow these instructions.

To set your computer to use 16 bit color, right click the “desktop”, then click on properties. A small dialog box opens, click the “Settings” tab, and locate the “Colors” drop down box. Set the “Colors” to “High Color (16 bit)”, then click Apply, and then OK...

Open Capture Pro, and should you have error dialogs at this point, it will be the result of using a 32 bit color driver when you installed Capture Pro. Do an update install, or un-install then re-install Capture Pro. The problems should be fixed.

