

R7000
Electrical Receptacle Analyzer

User's Guide

**Ensuring Patient Safety with Every Medical Gas Outlet,
Electrical Receptacle and Bed System Tested.**



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Introduction

Welcome to the R7000 Electrical Receptacle Analyzer developed by Bionix Safety Technologies. The R7000 was specifically designed to meet all of your electrical receptacle testing needs. The R7000 is an advanced device that will drastically simplify your electrical receptacle testing. It will enable compliance and promote patient safety, while dramatically reducing time spent testing and generating required reports.

The R7000 Electrical Receptacle Analyzer has a user-friendly touchscreen which allows you to rapidly enter the necessary outlet data. Outlet descriptor information and test results are displayed. Color-coding readily identifies whether the results comply with established safety standards. An electrical receptacle is tested in a matter of seconds. The analyzer immediately displays if the outlet is "OK" or "BAD". The large display enables you to review multiple results as you test. Time and date are automatically recorded for every test.

Bionix Safety Technologies' new Report Commander™ software contains multiple options to expedite tedious data entry tasks. Outlet descriptor information can be added prior to testing, during testing or can be inserted after testing is complete. The outlet information can be preloaded by creating template files. To further facilitate data entry, template files can be automatically generated from data files of previous testing sessions.

Generating electrical receptacle test reports is effortless with the BST Report Commander™ software. Multiple test data files can be downloaded from the analyzer in a matter of seconds, and stored in preformatted reports. Test data can be sorted to group data by certain locations or test results. Data can also be filtered, to display only certain test results for maintenance or other specialized reports.

With the new optional reference cord, the R7000 offers two different test routines – an expanded program with comparative testing or simplified program for troubleshooting and quick checks. Your testing frustrations have been eliminated in this convenient package. It's easy to use, yet packed with power!

Capabilities and Tests Performed

Wiring

Connection of the three wires in the wall to correct receptacle screw terminals is important for proper power delivery and patient safety.

Standard and GFCI Wiring

Three wiring tests are performed corresponding to the standard "OKX" test.

1. The "O" test is a measure of proper hot and neutral wiring. An "O" is printed in the wiring column only if the hot to neutral voltage exceeds 50 volts.
2. The "K" test is a measure of proper hot and ground wiring. A "K" is printed in the wiring column only if hot to ground voltage exceeds 50 volts.
3. The "X" test is a measure of proper neutral to ground wiring. An "X" is printed in the wiring column if the neutral to ground voltage exceeds 4 volts.

Isolated Power Wiring

On receptacles that are part of an isolated power system, proper wiring is confirmed by two wiring tests:

1. The "PWR" test is a measure of proper hot wiring. "PWR" is printed in the wiring column if the open circuit voltage across the hot pins is less than 50 volts.
2. The "ISO" test is a measure of isolation of the hot wiring from ground. "ISO" is printed in the wiring column if either hot pin resistance to ground is less than approximately 200 ohms per line volt.

If both power and isolation tests pass, "OK" is printed.

Line Voltage

Line voltage delivered to medical devices must be within proper limits for proper equipment operation and to prevent equipment damages. Open-circuit line voltage is measured between the hot and neutral pins of the test probe. Voltages below 100 volts and above 130 volts are considered unacceptable.

Phase

The phase difference between the test probe and power hot to ground voltages is measured. The phase is considered "IN" if the shift is less than 30 degrees and "OUT" if over 30 degrees. The phase will be "IN" if the test probe and power receptacles are both connected to the same side of the 220-volt line and out of phase if connected to opposite sides of the 220-volt line. Both conditions are acceptable, but "IN" is preferred because of lower worst-case leakage path voltages.

Neutral to Ground Voltage

High voltage implies either a poor connection between the neutral and ground circuits or high line voltage drop because of improper power wiring or excessive loading. This voltage is measured between the test probe neutral and ground pins in pass/fail fashion. Voltage above 4 volts is unacceptable.

Neutral to Ground Resistance

Low neutral to ground resistance is important for proper operation of fuses and circuit breakers. Low resistance prevents high neutral to ground voltage. The resistance is measured between the neutral and ground pins on the test probe. A 60Hz full wave rectified unfiltered test current of 0.7 ampere peak is used to generate a voltage across the neutral to ground resistance. The test starts at a zero crossing of the test current and lasts for 0.3 second or until the generated voltage rises above 0.5 volt (whichever comes first). The average generated voltage is used to compute the resistance by Ohm's law.

Resistance over 1.0 ohm is unacceptable. The resistance measurement includes:

- Resistance of the neutral and ground screw contacts in the receptacle.
- Resistance of the neutral and ground wires back to the common connection point (usually the distribution panel).
- Corrosion and dirt on the receptacle neutral and ground contacts.
- Corrosion and dirt on the analyzer test probe neutral and ground pins.

A short test duration and low test current have been chosen to minimize risk to patients connected to the power system and to prevent false low-resistance values caused by welding. Consequently, this test will not detect fusing effects caused by poor contacts in the presence of large fault currents.

Ground to Ground Voltage

Ground to ground voltage is measured between the test probe ground pin and power plug ground pin. High ground to ground voltage poses a significant shock hazard to patients connected to more than one medical device at a time. In critical areas, the maximum allowable voltage is 0.02 volt for new construction and 0.04 volt for old construction. In non-critical areas, 0.5 volt is allowable.

Ground to Ground Resistance

Low ground to ground resistance is critical to patient safety because it prevents dangerous voltage buildup induced by leakage currents flowing in the ground system. It is measured between the test probe ground pin and power plug ground pin. A 60 Hz full wave rectified unfiltered test current of 0.7 ampere peak is used to generate a voltage across the ground to ground resistance. The test starts at zero crossing of the test current and lasts for 4/60 second or until the generated voltage rises above 0.5 volt (whichever comes first). The average generated voltage is used to compute the resistance by Ohm's law. The resistance measurement includes:

- Resistance of the ground screw contacts on the two receptacles.
- Resistance of the ground wires between the two receptacles.
- Corrosion and dirt on the two receptacle ground contacts.
- Corrosion and dirt on the analyzer test probe and power plug ground pins.

A short test duration and low test current have been chosen to minimize risk to patients connected to the power system and to prevent false low-resistance values caused by welding. Consequently, this test will not detect fusing effects caused by poor contacts in the presence of large fault currents.

Contact Tensions

Low contact tension can cause unreliable electrical contact and poor retention of the plug in the receptacle. The gripping force or “contact tension” of the hot, neutral, and ground contacts in the receptacle are independently measured in a pass/fail fashion and are considered unacceptable if below four ounces (eight ounces in California). Hot and neutral tension results are displayed as power tension and are unacceptable if either tension is low. Ground tension is displayed independently.

Reference Cord Optional Testing

The R7000 analyzer offers two different test routines. With the reference cord attached, the analyzer will perform an expanded program including outlet and comparative testing. The reference cord is required for the analyzer to perform all the tests listed above. The recommended use of the analyzer includes the use of the reference cord.

When the reference cord is omitted the analyzer will perform a simplified program for troubleshooting and quick checks. Only the following test will be performed when the reference cord is detached from the analyzer:

- Wiring
- Line Voltage
- Neutral to Ground Voltage
- Contact Tension

Accuracy of Data for Tests Performed

Wiring Polarity:	Standard OKX test valid between 99 – 135 VAC
AC Line voltage:	100 – 130 volts \pm 2 VAC
Neutral-to-ground voltage:	\pm 20% < 4 volts
Neutral-to-ground resistance:	\pm 20% \pm 0.01 ohms between 0 – 2 ohms
Ground-to-ground voltage four ranges:	20 mV \pm 20% 40 mV \pm 15% 500 mV \pm 10% 500 mV – ∞ \pm 10%
Ground-to-ground resistance:	\pm 5% and \pm 0.01 ohm between 0 – 0.2 ohms
Tensions:	4 oz (115g.) \pm 0.4 oz \pm 10% (California 8 ounces)

Data Collection Capacity

Data files store test results for approximately 10,000 outlets.

Components of your R7000 Electrical Receptacle Analyzer:

1. The R7000 Analyzer with touchscreen display
2. Test probe cable used to test each receptacle
3. Optional Reference/Power Cord
 - ◆ Reference cord must used for comparative testing (recommended use)
 - ◆ Simplified receptacle testing will be performed when reference cord is not attached.
4. Charging Cable
 - ◆ Independent charging cable is provided to charge analyzer on any desktop surface.
5. USB Cable
 - ◆ Standard USB cable to download data files and upload template files to the analyzer.
6. Shoulder/Neck Straps
 - ◆ Two straps are provided which allow user to carry analyzer around the neck, around the shoulder or at waist level by crisscrossing the straps across the back.
7. Software Installation Disc for BST Report Commander™ software.
8. Briefcase with specialty cut foam for storing all of your components
 - ◆ Additional items include red dot stickers, sandpaper, touchscreen protector and cleaning cloth.
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Contact Information

For assistance, please contact Bionix Safety Technologies at following location:

Technical Services Office 996 Old Eagle School Road – Suite 1118 Wayne, PA 19087	Toll Free Phone: (800)678-7074 Toll Free Fax: (800)539-9319 e-mail: techservices@bionix.com
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Or check out our website at www.bionix.com for technical support or product information.

Care of the R7000 Electrical Receptacle Analyzer

Power Modes

To conserve battery power and touchscreen lifespan you have the option to turn off the analyzer at anytime during testing. The red button on the rear panel of the analyzer is the on/off switch. Turn the analyzer on by pressing the button for two seconds. To turn the analyzer off, press and hold the button until the power mode screen appears. You have the three options to choose from:

1. Turn Off – This option will power down the analyzer
2. Sleep Mode – The mode will temporarily turn off the touchscreen, but the analyzer is still powered on.
3. Continue – If you pressed the on/off switch by mistake choose this option. The last screen you viewed will reappear.

Charging the Battery

The analyzer should operate for approximately 10 hours per battery charge. To charge the battery, plug the charging cable into the rear panel of the analyzer at the 4-pin connector. If the analyzer is on, the charging symbol will appear. An overnight charge is sufficient. The analyzer can also be charged using the reference/power cord.

Routine Maintenance

1. Check for corrosion on pins of both the test probe and reference/power cord. This can cause high resistance for some of the measurements. You can polish the pins with the 600-grit sandpaper. Some emery cloth is supplied with the analyzer for this purpose.
2. Check the test probe ground-pin for wear. If this pin becomes very worn, the analyzer will not measure ground-pin contact tension correctly and can also result in high resistance measurements. Return the test probe to BST for ground-pin replacement.

System Check

The receptacle analyzer includes a self-check feature. We recommend that you perform a system check regularly to confirm the accuracy of the analyzer before and after each test session. Using this feature you can check the accuracy of the analyzer by testing the receptacles with accurately known values.

Steps to perform a System Check

1. Place the analyzer on a flat surface.
2. Change the Setting of the outlet type to System Check.

3. When prompted by the analyzer instruction screen, plug the test probe into the receptacle located on the rear panel of the analyzer.
4. Unplug probe as indicated on touchscreen.
5. This receptacle should test "OK". If the receptacle does not test OK, discontinue testing and contact BST Technical Services. (The results of the System Check will appear on the screen, but will not be recorded in the data file.)

Note: *The receptacle on the rear panel of the analyzer should never be used to power another piece of equipment. Internal damage to the analyzer may result.*

Annual Calibration

NFPA requires that electrical safety test instruments shall be tested periodically, but not less than annually for acceptable performance (Section 6.3.3.1.5 NFPA 99 Health Care Facilities, 2015 edition).

Your new R7000 will arrive ready to use. To insure proper operation, we strongly recommend that the analyzer be returned to BST for yearly evaluation, cleaning and calibration. The analyzer may also be sent to BST if improper operation is suspected.

Steps to send your analyzer to BST for calibration

1. Place of the analyzer components in the briefcase. The briefcase should be packed in a box with ample padding. To insure optimum performance the analyzer should be calibrated with its components including test probe and reference/power cord.
2. Include the name and phone number of the person who should be contacted if there are any questions regarding the calibration of the analyzer.
3. Ship to BST Technical Services office:

Bionix Safety Technologies
Technical Services Office
996 Old Eagle School Road – Suite 1118
Wayne, PA 19087

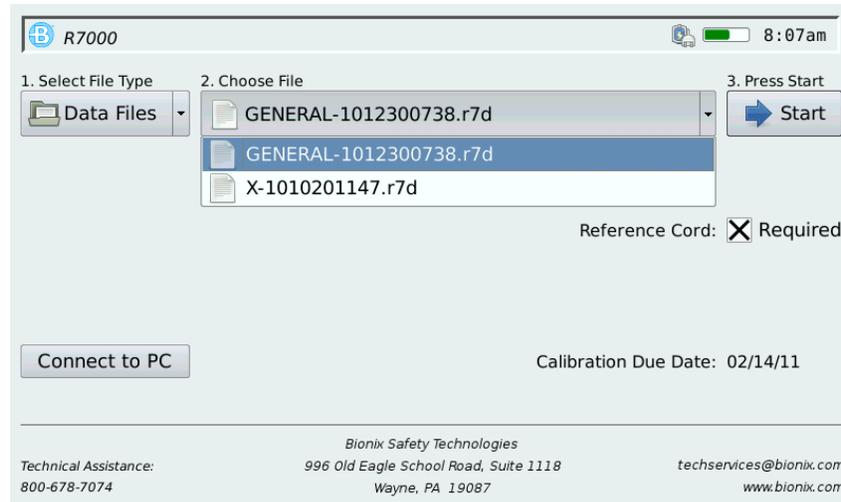
4. We recommend insuring the package for the full purchase price.
5. Allow 2-3 weeks for calibration and return of the analyzer.

Technical Support

If you encounter any difficulty with the R7000, please don't hesitate to contact the BST Technical Services office at 800-678-7074.

Getting started with your R7000 Electrical Receptacle Analyzer

Turn on the analyzer by pressing the red button on the rear panel. The touchscreen will turn on and begin loading. The File Menu screen will appear as pictured below:



Touchscreen File Menu

Data Files

Files that contain test data collected by the analyzer. The data files are automatically saved to the analyzer. A new file is created every time you choose to open a template file and start collecting data. The name of the file includes the facility and time and date stamp e.g. General Hospital -1011271412. (The file was created by General Hospital on November 27th, 2010 at 2:12pm)

Template Files

Files that contain outlet descriptor information only. The template files do not contain test data results. Template files can be uploaded using the BST Report Commander™ software.

Reference Cord Optional

You must choose the Reference cord option prior to starting a data file. The analyzer will default to require the reference cord, therefore the box on the File Menu will be marked with a "X". If you choose not to use the reference cord, select the box, and the "X" will disappear. You must do so before clicking the **Start** button.

Note: The **Reference Cord Required** option will be checked. If you choose to collect data without the reference cord, you must do so before clicking the **Start** button.

Calibration Due Date

The calibration due date is displayed in the lower right-hand corner. If the analyzer is past due for calibration the date will appear in red font. To ensure optimum use, the analyzer should not be used for testing if the analyzer is past due for calibration.

Connect to PC

Select this option to download the data files to the PC. You must have the BST Report Commander™ software installed on the PC before proceeding to download data files. Refer to section *Collecting Data from Analyzer* for further instructions.

Battery Life

The battery life status bar is displayed in the top right-hand corner. If the battery life is greater than approximately 50% the status bar will be green. The bar will change to black when the battery life is between 30% - 50%. A red status bar indicates the battery life is less than 30%.

Preloaded settings are installed to prevent the unnecessary draining of the battery.

- After 1 minute idle time (no test or touchscreen activity) the analyzer screen will dim.
- After 5 minutes of idle time the analyzer will go into low power sleep mode.
- After 15 minutes of idle time the analyzer will power off.

Power/Charging Indicator

There are three possible power symbols that could be displayed on the touchscreen:



This symbol will appear when the analyzer is powered solely on the battery.



This symbol will appear when the analyzer is powered by the reference cord.



This symbol will appear when the analyzer is charging by the charging cable.

Internal Failure Detection

The analyzer will display one of the following icons if the analyzer detects a problem with the internal memory or battery failure:



This icon indicates a problem with the battery. The battery may have an unacceptable voltage reading, and may not hold sufficient charge.



This icon will appear if the analyzer detects a memory failure. The analyzer may not be able to continue collecting data.

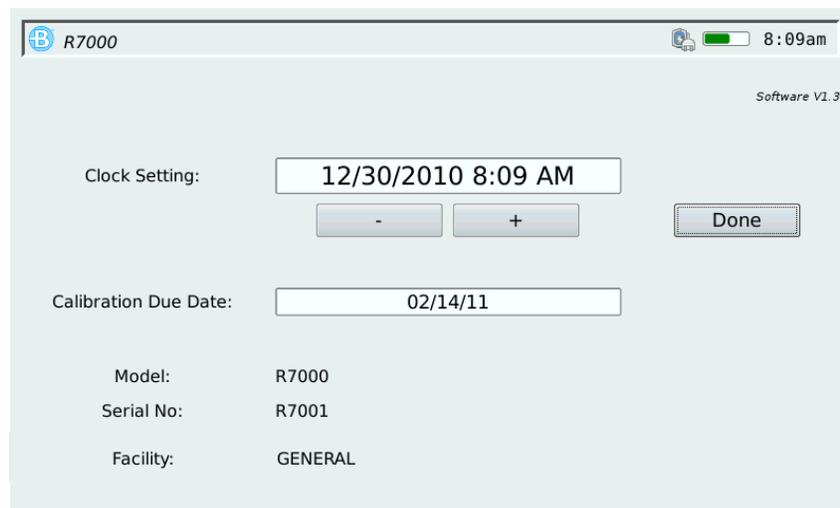
If one of the icons appears stop testing with the analyzer and contact the BST Technical Services office.

BST Contact Information

BST conveniently displayed our contact information on the File Menu screen. You may contact the Technical Services office for any questions or further information.

Time Clock

The time appears in the top right-hand corner on the File Menu Screen and Testing Screen for your convenience. You may change the date to match your specific time zone. Select the time on the touchscreen, and the clock setting page will appear:



Select the date or time and use the -/+ buttons to change the date. The Calibration Due Date, Model, Serial No. and Facility are preloaded and cannot be changed. The version of software is located in the top right-hand corner for your convenience. Once the date and time have been corrected, click the "Done" button. This will return you to the previous screen.

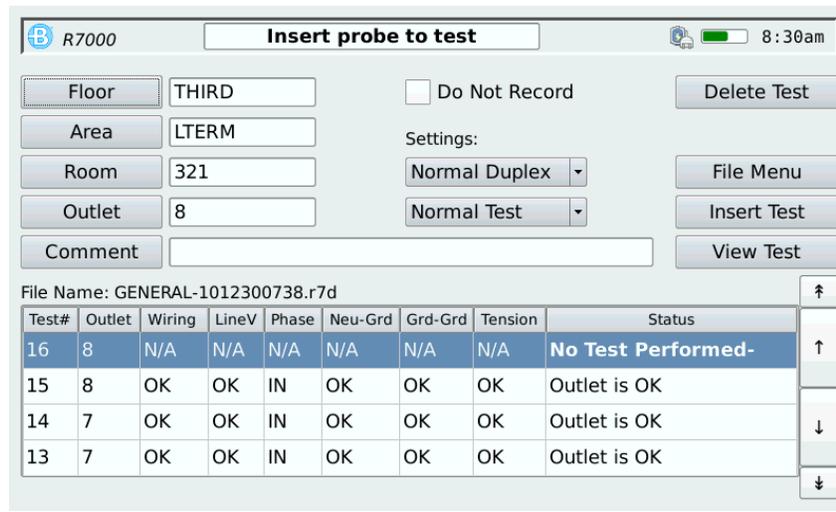
Starting a New File for Collecting Data

Step by Step Instructions

1. Select the drop down option for Template files.
2. Choose new template
3. Select the Start button

Data Entry Screen

The following screen appears once you select the data or template file. The file name is automatically generated, and can be viewed at the top of the display grid. This is the only screen you will use to collect outlet data.



The screenshot shows the R7000 interface with the title "Insert probe to test" and a time of 8:30am. It features several input fields: Floor (THIRD), Area (LTERM), Room (321), and Outlet (8). There is a "Do Not Record" checkbox and a "Comment" field. Settings include "Normal Duplex" and "Normal Test" dropdowns. Buttons for "Delete Test", "File Menu", "Insert Test", and "View Test" are present. Below the form is a table with the following data:

Test#	Outlet	Wiring	LineV	Phase	Neu-Grd	Grd-Grd	Tension	Status
16	8	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-
15	8	OK	OK	IN	OK	OK	OK	Outlet is OK
14	7	OK	OK	IN	OK	OK	OK	Outlet is OK
13	7	OK	OK	IN	OK	OK	OK	Outlet is OK

Outlet Descriptors

The Floor, Area, Room and Outlet fields are used to describe the location of the receptacle to be tested. Edit the fields by selecting the Floor, Area, Room, or Outlet button. The screen will switch to a keyboard for you to type a short description. The fields will auto-increment to the next outlet until you change the entry. You may add additional information in the Comment field as needed.

Do Not Record

Select this option when you want to test an outlet, but you do not want the data results to be saved to memory. To choose this option, touch the empty box. A pop-up window will appear, confirm by selecting **Yes**. The box will now be checked, and ready to test. The box will remain checked until you clear the box.

Settings

The settings are used to describe the outlet condition and type. The first option will default to "Normal Duplex". You may select the dropdown and change the outlet condition. The second setting is the outlet type. This option will default to "Normal Test". For example, if you are going to test an Isolated

Power outlet, you must choose “Isolated Power” from the drop down option before testing such an outlet. Once you complete the outlet test, the setting will return to ‘Normal Test’.

Delete Test

Use this option to delete a test that has been saved. Select the test by highlighting the row in the display grid. Select the button ‘Delete Test’. A window will appear to confirm the deletion. Select Yes, and that row will erase from the display grid.

File Menu

Choose this option when you are finished collecting data. This option will return you to the File Menu screen. Once you select this option, the data will be saved and stored in the Data File dropdown. If you chose the wrong file by mistake, you must select this option to return to the File Menu screen and select the correct file to begin testing.

Insert Test

Select this option to insert a new row in the display grid. This option should be used if you forgot to add an outlet or if a new outlet appeared that was not listed in the original template. When you select this button a new row will appear in the display grid with an ‘i’ denoting a new outlet had been inserted. The new inserted outlet will appear below the selected row.

View Test

Select this option to review the actual test results from a particular outlet. Highlight the data row, and select ‘View Test’. A new screen will appear displaying the data results.

Scroll buttons are provided to scroll from the beginning to end of the outlets that were tested and stored.

-  Select this button to scroll each outlet from top to bottom.
-  Select this button to scroll each outlet from bottom to top.
-  Select this button to scroll to the last outlet tested.
-  Select this button to scroll to the first outlet tested.

Collecting Data

Testing Instructions will appear on the status bar at the top of the page. As data is collected the outlet results will appear in the grid, and auto-fill from top to bottom. All data entry will be entered in the data entry rows listed on the left-hand side of the page. Once the outlet descriptors are entered you may begin testing outlets. The file name is listed at the top of the grid to be easily seen.

Step by Step Instructions

1. Highlight the row in the display grid that you would like to start testing.
2. Enter the descriptor information for **Floor, Area, and Room**. The first outlet will default to “RE” for Reference Outlet. (If necessary, change any settings for outlet condition or outlet type.)
3. To test receptacles in a room, you must first locate an acceptable reference outlet. Plug the reference cord into the upper half of the first duplex on the left, when entering the room.
4. The analyzer screen will display “Insert probe to test”. Plug the test probe into the outlet. **Do not unplug the test probe until instructed. Do not modify or add any information to the outlet descriptors until the test is completed.**
5. The screen will change to “Testing...wait” and a few seconds later will switch to “Unplug Probe”. Pull out the test probe slow and straight without applying any twisting or side forces on the pins.
6. After the test, the analyzer will beep and display one of the following test results.

Message on Screen	Meaning
OUTLET IS OK	OK in any location.
BAD IN NEW CONSTRUCT	Bad in new construction, OK elsewhere.
BAD IN NEW, CC AREA	Bad in new construction and critical care area, OK elsewhere.
BAD IN ANY AREA	Unacceptable at any location in hospital.
NO TEST PERFORMED	The note you entered requires no test. The location of the receptacle and note will still be saved.

7. If the lower half of the duplex tests “OK”, a valid reference has been established. Move the reference/power plug to this outlet. The outlet number displayed on the analyzer screen will automatically change to “1”.
If the outlet fails, move the power plug to another duplex and repeat step 5. Repeat this step until a good reference has been established.
8. Once a good reference has been established, test the other receptacles in the room. Move around the room in a clockwise direction, starting with the outlets remaining in the same duplex or double-duplex as the reference. The outlet number will auto-increment to the next number as RE...1...2...2...3...3...4...4 (or as indicated in the preloaded template).

Note: Remember to do a visual inspection, enter appropriate settings for outlet condition and tag any bad receptacles with the supplied “red dot” stickers.

Testing GFCI Protected Receptacles

To test a receptacle wired through a Ground Fault Circuit Interrupter, follow the same procedure listed above and change the settings option from “Normal Test” to “GFCI”. If this setting is not changed, the GFCI will trip and make the results invalid. **Don't forget to clear the GFCI setting after testing GFCI receptacles.**

Testing Isolated Power Receptacles

This test is more successful when the reference outlet is a standard outlet, not an isolated power outlet. To test a receptacle that is part of an isolated power system, follow the procedure above and change the settings option from “Normal Test” to “Isolated Power”. If this setting is not changed, the analyzer will not perform the tests correctly. **Don't forget to clear the “Isolated Power” setting after testing isolated power receptacles.**

Note: The analyzer may activate the alarm in your isolated power monitor.

Recording Untestable Receptacles

Some receptacles cannot be tested. If you find an UNTESTABLE receptacle, change the outlet setting to the appropriate type (i.e. Not Accessible, Improper Type, Non Standard). Lastly, pull on and release the test probe's ground pin.

The analyzer will record the receptacle's location and display “No Test Performed” in the Status column of the grid.

Preloading Data, Auto-Fill & Auto-Numbering

For your convenience, you have the option to enter outlet descriptors prior to testing. You do not need the analyzer to preload outlet information. You may preload data into a template using the BST Report Commander™ software. See *Create Template to Collect Data* section. If you have the templates uploaded on your analyzer, you will be able to choose the specific file from the File Menu screen:

1. Click the dropdown from the **Choose File Type** option, and Select Template.
2. Scroll through the templates listed, and select the file you want to use for collection.
3. Click Start.

The descriptors you added using BST Report Commander™ will be listed in the display grid. Use the scroll arrows to view all the outlets in the file.

Auto-Fill

Once information is typed into any of the descriptor fields (with the exception of Comments), this information is automatically entered into the next available outlet field so that it can be used for subsequent outlets. To change any of the automatically entered information, click on the field name and retype the new information.

Auto-Numbering

The Outlet number field is configured to perform automatic numbering of test data. The reference outlet should begin with "RE" and that the other receptacle in the sample duplex as the reference is numbered "1". Each duplex after that is numbered 2, 2, 3, 3, 4, 4, etc.

As test data is entered into the grid, outlets are numbering incrementally from top to bottom. The most recently tested receptacle will appear at the top of the grid.

Retesting an Outlet

To retest an outlet, highlight the row in the display grid and proceed with outlet testing. The old test data will be overwritten with the new test results.

Outlet Settings

The outlet settings are used to describe the outlet condition and outlet type. The settings can be used to record critical information observed while testing.

Outlet Condition

Since these notes refer to conditions that can make an outlet unsafe, entering these notes **will** change the status of the outlet as necessary. Outlet Conditions can be entered before or after testing receptacles. Below is the list of available outlet conditions:

Outlet Type

This setting is used to prepare the analyzer for a certain type of receptacle testing. The outlet type **must** be changed for the analyzer to correctly perform outlet testing. The outlet type must be changed **before** testing the appropriate outlet. The available outlet types are listed below:

Test Tips or Key Points to Remember

- DO NOT LEAVE THE ANALYZER UNATTENDED WHILE PLUGGED IN!
- For each room, always establish a valid reference outlet for the reference/power cord and label it "RE" on the analyzer display. The reference/power cord carries test signals used for the ground to ground and phase tests. If the analyzer reference/power cord is not plugged into a receptacle that tested "OK", all other outlets in the room may appear bad.
- The analyzer will auto increment to the next outlet number. Always set the outlet number on the screen to identify the next receptacle to be tested. Except for the reference outlet, each receptacle within a duplex, double-duplex, etc. should be tested with the same outlet number. Look at the Sample Report to see examples of how outlets should be numbered. Notice that the reference outlet is "RE" and that the other receptacle in the sample duplex as the reference is numbered "1". Each duplex after that is numbered 2...2...3...3...4...4, etc.
- The Floor, Area, and Room number will auto-fill unless manually changed.
- Carefully choose letters and numbers to identify the floor, area, and room. Be both systematic and creative, and do not choose anything that you may not understand later. Be consistent from year to year so that comparing data will be easier. Look at the sample report for examples.
- Be consistent with the way your outlet numbers relate to the receptacles in the room. For example, upon entering a new room, always turn to the left to find the first receptacle. Then continue to move around the room in a clockwise direction.
- The analyzer will test the receptacle with the highlighted row. Remember to highlight the correct row after scrolling through the outlets listed in the display grid.
- After testing an outlet, you may review the results of each test performed by selecting the "View Test" button.

BST Report Commander™ Software

Bionix Safety Technologies' Report Commander™ for Windows software allows you to collect, store, and view data collected from your R7000 Electrical Receptacle Analyzer. Report Commander™ allows you to prepare comprehensive reports for The Joint Commission audits as well as shorter, more specialized reports for troubleshooting and system repairs.

The Report Commander™ software gives you the option to preload descriptor information before you conduct receptacle testing in the field. You can load receptacle location data into template files, which can then be uploaded to the analyzer. With the Report Commander™ software you have the ability to create template files that can be uploaded to the analyzer.

Another added feature of the Report Commander™ software is the ability to create template files from previously stored BST Report Generator™ files. The descriptor fields in the Report Generator™ files can be transferred to the new BST Report Commander™ template files.

Software Installation

The Report Commander™ software is easily installed with the installation disc. Follow these simple instructions to install the software:

1. Insert disc into CD-ROM drive.
2. The disc should autorun.
3. Run the Setup.exe file.
4. Follow the instructions on the screen.

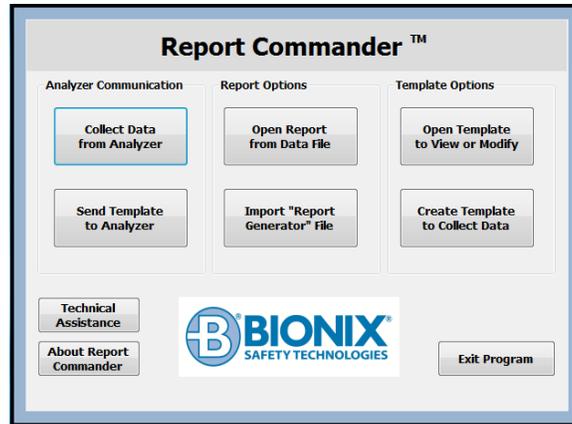
Note: The installation requires *Microsoft .NET Framework 4* program. If your computer does not have this program the installer will prompt you to install this program first. This process may take up to 5 minutes to install. Once the program installs, the Report Commander™ software will continue installing.

Once the installation is complete you will be asked to restart your computer. Please save all other programs running on your computer, and restart the computer.

(If a previous version of Report Commander™ was installed on your computer, the software will override the previous version. All previously data will be saved to your BST Report Commander Data folder.)

Please contact the BST Technical Services office with any questions or concerns.

Getting Started with Report Commander™ Software



This is the main menu screen that appears when you start the Report Commander™ software. This will be your navigational screen which allows you to access all the various functions of the program. You have the following options:

Collect Data from Analyzer

Select this option to download all data files from the analyzer to the computer.

Open Report from Data File

Select this option to open an existing file for modification or review.

Open Template to View or Modify

Select this option to open an existing template file to review or modify.

Send Template to Analyzer

Select this option to send a saved template file to the analyzer.

Import "Report Generator" File

Select this option to create a template file from a previously saved BST Report Generator data file.

Create Template to Collect Data

Select this option to create a new template file.

Technical Assistance

This option provides contact information for any assistance you may need.

About Report Commander™

This option displays general information about the version of Report Commander™ you are using.

Exit Program

Select this option to exit the program.

Collecting Data from the Analyzer

Prepare analyzer for transfer

1. Turn the analyzer on and keep the File Menu screen in view.
2. Plug the USB data cable into the rear panel of the analyzer, and connect the other end to the computer.
3. Select the Connect to PC button and choose **Yes**.
The computer will recognize the analyzer as its own drive letter.

Step by Step Instructions

1. Select 'Collect Data from Analyzer' from the main menu screen.
2. Choose the File.
 - a. A window like the one shown will appear for you to choose a data file. Select the file you want to download. You may select multiple files by using the CTRL key and selecting all the files to be transferred.
3. Click **Open**.
4. The data file(s) will be automatically transferred to the analyzer. A confirmation window will pop-up entitled 'Transfer Complete'.
5. Erasing the File
 - a. Once the data is transferred you have the option to remove the data file(s) from the analyzer. If you would like to erase the file(s) from the analyzer's memory check the box next to the file.
Note: Once you remove a file from the analyzer it will be erased, and you will not be able to upload it back onto the analyzer.
6. Click **OK**.
7. To view the transferred data file (s) click the 'Open Report from Data File' option from the main menu.

Options for Reviewing or Formatting Data Files

Once you have the data transferred from the analyzer you have many options available to you for viewing or formatting the data file.

Export to .CSV file

This option allows the collected data to be exported to a .csv file. The exported files are comma-delimited files, which can be converted to a number of different formats for a variety of spreadsheets and other applications.

1. Click **File**, and choose **Export to CSV**.
2. Save the file.
3. Name the file, and click **Open**.
4. The .csv file will be saved in your BST Report Commander™ Data folder.

Save

The data file will automatically be saved when you close the file. Any modifications made to the data file should be saved by choosing Save from the File option. You may give the file a new name or save to the existing file name. All data files are saved as '.r7d' files; and saved to the BST Report Commander™ Data folder located in your Documents folder.

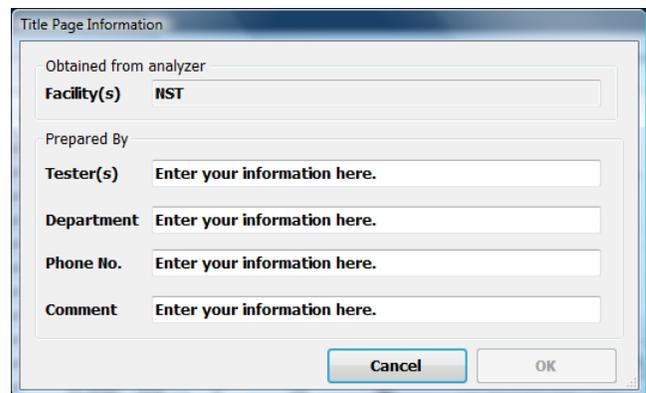
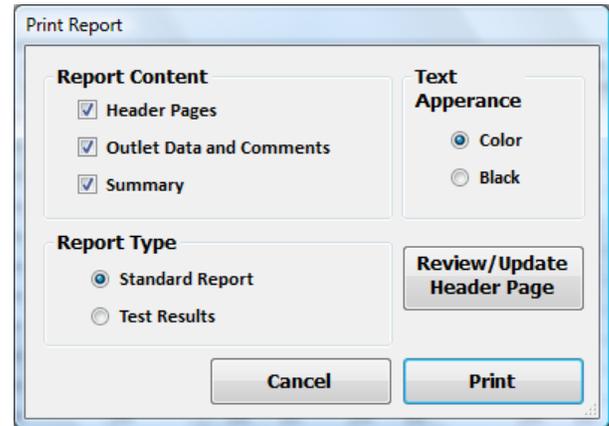
Save as Template

Saving a data file as a template file allows you to preload the outlet descriptor information into a new file with blank results. The template files can then be uploaded to the analyzer and used for retesting receptacles. The descriptor columns, including Floor, Area, Room, and Outlet, are transferred from the data file to a new template file. You can save the data as a template by choosing **Save as Template** from the **File** option. You may give the file a new name or save to the existing name. All template files are saved as '.r7t' files. You can create a template file from any data file.

Print

The print option allows you to setup the print layout and print the data to preformatted reports. The print window allows you to print reports with all the components or you can print only the collected data.

1. Choose **File**, and click **Print**.
2. A new window will appear like one shown. A variety of print options are available.
 - a. **Report Content**
Select the components of the report you would like to print by checking the boxes listed.
 - b. **Report Type**
 - Standard Report – Standard formatted OK results will print.
 - Test Results – Actual number results will print.
 - c. **Text Appearance**
Select the report to print in black/white or color font.
 - d. **Review/Update Header Page**
The header page gives you space to provide additional testing information on the title page of the report. You may enter the name of the individual performing the testing, the department compiling the report and phone number. There is also space for additional comments.



Note: The facility name has been programmed into the analyzer by BST. The information is automatically generated by the analyzer; therefore it cannot be deleted or overwritten.

3. Click **Print**.

Help

The help option provides useful information for reviewing the data results. The help provides a short-cut for contacting the BST Technical Services office for questions or concerns. The second selection provides a copy of the Explanation of Codes page. This page explains the status results generated by the analyzer. The Explanation of Codes is also located on page 2 of each printed report.

Font

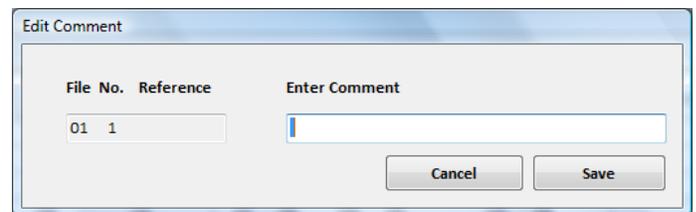
The Font option allows you to change the font size of the data. The font can be viewed in the following standard sizes: 8, 10, 12, 14, and 16. To change the font size, choose **Font** and select the desired size. Select **Default** to view the font in 8-point.

Comment

While the actual test results cannot be changed or overwritten, comments can be added to provide explanation or clarification of test results.

Add a Comment

1. Select the cell in the Reference File No. column of the desired outlet. It will be highlighted in **black**.
 2. Choose **Comment**, and click **Edit**.
 3. A new comment window will appear like the one shown. Type any necessary information into the box.
 4. Click **Save**.
 5. The letter 'C' will appear in the Reference File No. column for any outlet containing a comment.
- Note: You can double-click the cell in the Ref File No. column to add a comment to an outlet.



File No.	Reference	Enter Comment
01	1	

Summary

You can view all the comments listed in the report at one time. Choose **Comment**, and click **Summary**.

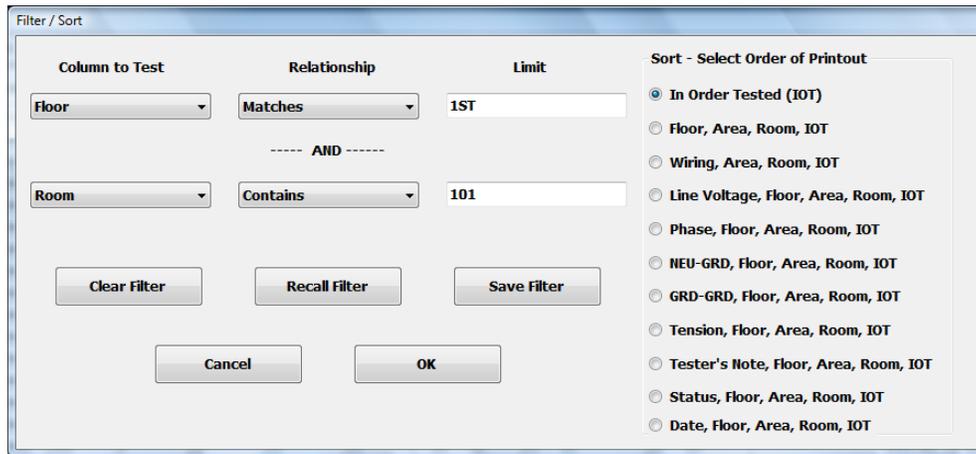
Show / Hide Comments

The software defaults to **Hide** the comments in the report. A '✓' mark appears in the Comment dropdown option. To view all the comments within the report, choose **Comment**, and select **Show**. The *Date* column switches to the *Comment* Column. You can see all the comments listed at the end of each outlet row.

Filter / Sort Options

The filter/sort provides a variety of features for customizing your data results. Reports can be created which contain only specified data.

- Filter will remove selected test results from a report. You may choose one or two criteria for filtering test data.
- Sort will not remove any test results but will rearrange test results into a particular order. You may select any one of the listed options for sorting test data.



Filtering Outlet Test Results

1. Select the Filter/Sort option in the toolbar. A window will open like the one above.
2. Choose Column to Test.
3. Choose Relationship.
4. Choose Limit.
5. Select OK to view the filtered data.
 - The filter criteria that you set will be labeled at the bottom of the data screen.
6. To restore the data to its original un-filtered form, select File/Sort again and click Clear Filter.

In the above example, Report Commander™ will change the display of the data so that the only test results displayed will be those results in which the data in the *Floor* column is “1ST” and the data in the *Room* column contains “101” (e.g. 101A, 101B). All other test results will be excluded from the data.

Some examples of how you may want to filter data:

- Filter out all the OK outlets in order to print a report of all the BAD outlets that need to be repaired.
- Filter the receptacles in a certain area (e.g. W WING) to troubleshoot a suspected problem.

Note: The filter option does not remove test data from data files; it only alters the way the test data is displayed.

Save Filters to be Recalled Later

Once a filter criteria is entered, it may be saved for future use – simply click Save Filter. To recall a saved filter, click Recall Filter.

Sorting Outlet Test Results

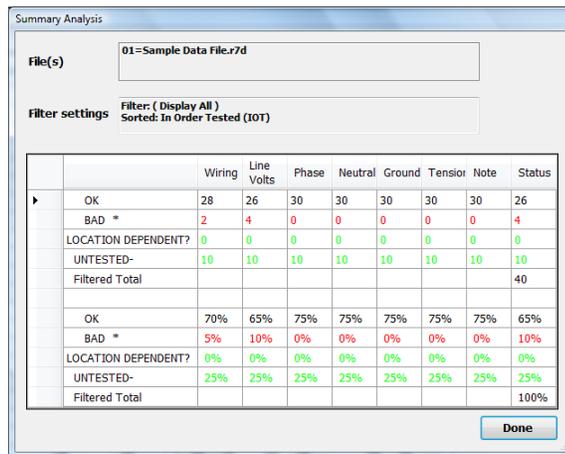
1. Select the Filter/Sort option in the toolbar.
2. Choose the desired sort option.
3. Select OK to view the sorted data.
 - The sort criteria that you set will be labeled at the bottom of the data screen.

In the above example, the test data is sorted by In Order Tested (Reference File No.). This is the order that the outlet information was loaded into the file.

Summary

This option displays a summary analysis of the number of outlets that passed and failed for each category and the percentage of the passed and failed outlets.

1. Click **Summary** option from the toolbar.
2. A window will appear like the one shown. This information can only be viewed, it cannot be edited.
3. Click **Done** to exit.



Summary Analysis

File(s): 01-Sample Data File.r7d

Filter settings: Filter: (Display All)
Sorted: In Order Tested (IOT)

	Wiring	Line Volts	Phase	Neutral	Ground	Tension	Note	Status
OK	28	26	30	30	30	30	30	26
BAD *	2	4	0	0	0	0	0	4
LOCATION DEPENDENT?	0	0	0	0	0	0	0	0
UNTESTED-	10	10	10	10	10	10	10	10
Filtered Total								40
OK	70%	65%	75%	75%	75%	75%	75%	65%
BAD *	5%	10%	0%	0%	0%	0%	0%	10%
LOCATION DEPENDENT?	0%	0%	0%	0%	0%	0%	0%	0%
UNTESTED-	25%	25%	25%	25%	25%	25%	25%	25%
Filtered Total								100%

Done

Viewing Actual Results

The actual measured results for a particular outlet can be viewed individually.

1. Click the cell in any of the test results columns (Wiring, Line Volts, Phase, NEU-GRD, GRD-GRD, or Tension) of the desired outlet. It will be highlighted in **black**.
2. Select **Results** from the toolbar.
3. A window like the one shown will appear. This information can only be viewed, it cannot be edited.
4. Click **Done** to exit.
5. Note: You can double-click the cell in any of the test results columns to view add a comment to an outlet.



Test Results

Test Results	Measurements
Wiring: OK	122 Volts
Line Volts: OK	< 10 Deg.
Phase: III	0 V.x10
Neu-Grd Volts: OK	0.00 Ohm
Neu-Grd Ohms: OK	4 mVolt
Grd-Grd Volts: OK	0.01 Ohm
Grd-Grd Ohms: OK	
Tension Pwr: OK	
Tension Grd: OK	

Testers Notes:

Status: Outlet is OK

Test Date: 11/8/2010 2:53:56 PM

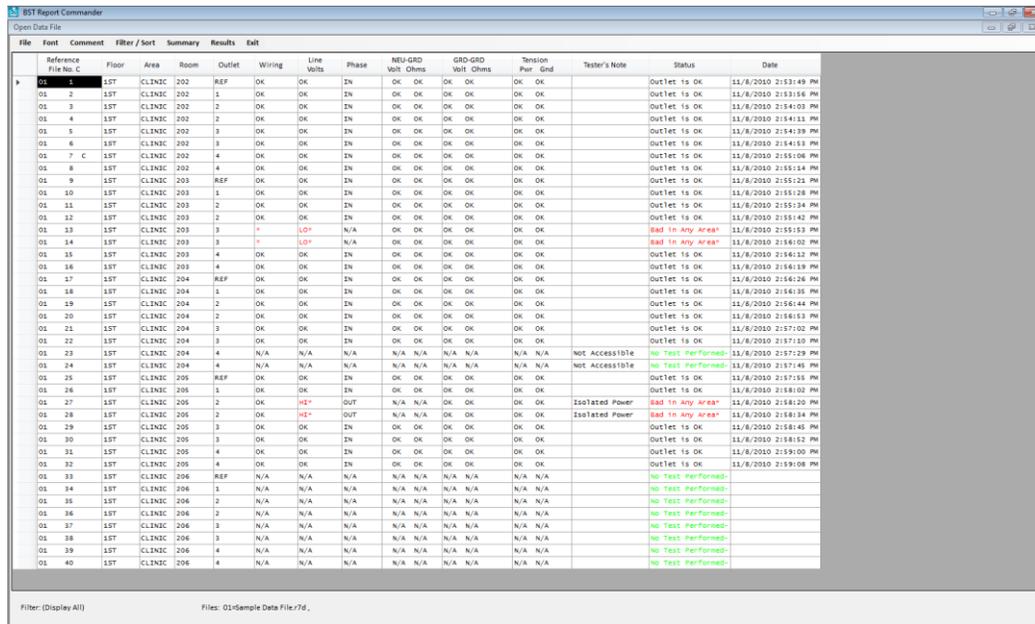
Done

Exit

Once you review or modify the data you can return to the main menu by selecting Exit. If you modified or reformatted the data, the program will ask you if you want to save your changes. You can save the data with its original file name or re-name the file.

Opening a Report from Data File

- To select this option, click button from main menu.
- Choose the existing data file from the BST Report Commander™ Data folder
 - A window will pop-up entitled 'Open'.
 - Select the existing template file that contains the desired data. (You may select multiple files by using the CTRL key.)
 - Click **Open**.
- Report Commander™ will open the data file in a new window.

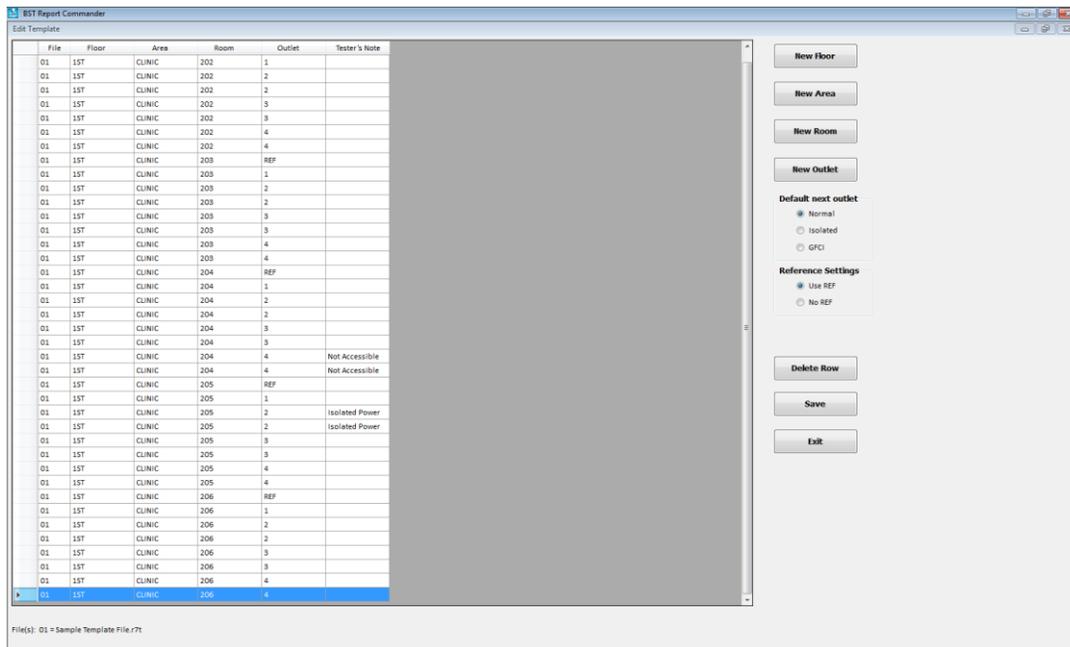


Reference	File No.	Comment	Filter	Sort	Summary	Results	Exit	Floor	Area	Room	Outlet	Wiring	Line	Phase	MU-GRD	GRD-GRD	Tension	Tester's Note	Status	Date
01	1	15T	CLINIC	202	REF	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:49 PM
01	2	15T	CLINIC	202	1	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:56 PM
01	3	15T	CLINIC	202	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:40:03 PM
01	4	15T	CLINIC	202	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:41:11 PM
01	5	15T	CLINIC	202	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:43:39 PM
01	6	15T	CLINIC	202	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:43:53 PM
01	7	C	15T	CLINIC	202	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:06 PM
01	8	15T	CLINIC	202	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:24 PM
01	9	15T	CLINIC	203	REF	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:21 PM
01	10	15T	CLINIC	203	1	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:28 PM
01	11	15T	CLINIC	203	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:34 PM
01	12	15T	CLINIC	203	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:42 PM
01	13	15T	CLINIC	203	3	*	LO*	N/A	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Bad in any area!	11/8/2010 2:15:51:53 PM
01	14	15T	CLINIC	203	3	*	LO*	N/A	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Bad in any area!	11/8/2010 2:15:52:02 PM
01	15	15T	CLINIC	203	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:52:32 PM
01	16	15T	CLINIC	203	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:51:39 PM
01	17	15T	CLINIC	204	REF	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:52:26 PM
01	18	15T	CLINIC	204	1	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:52:30 PM
01	19	15T	CLINIC	204	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:52:44 PM
01	20	15T	CLINIC	204	2	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:53:39 PM
01	21	15T	CLINIC	204	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:57:02 PM
01	22	15T	CLINIC	204	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:57:10 PM
01	23	15T	CLINIC	204	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NOT Accessible	No Test Performed-	11/8/2010 2:15:57:29 PM
01	24	15T	CLINIC	204	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NOT Accessible	No Test Performed-	11/8/2010 2:15:57:45 PM
01	25	15T	CLINIC	204	REF	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:57:55 PM
01	26	15T	CLINIC	205	1	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:58:02 PM
01	27	15T	CLINIC	205	2	OK	HI*	OUT	N/A	N/A	OK	OK	OK	OK	OK	OK	OK	Isolated Power	Bad in any area!	11/8/2010 2:15:58:20 PM
01	28	15T	CLINIC	205	2	OK	HI*	OUT	N/A	N/A	OK	OK	OK	OK	OK	OK	OK	Isolated Power	Bad in any area!	11/8/2010 2:15:58:34 PM
01	29	15T	CLINIC	205	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:58:45 PM
01	30	15T	CLINIC	205	3	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:58:52 PM
01	31	15T	CLINIC	205	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:59:00 PM
01	32	15T	CLINIC	205	4	OK	OK	IN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Outlet is OK	11/8/2010 2:15:59:08 PM
01	33	15T	CLINIC	206	REF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	34	15T	CLINIC	206	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	35	15T	CLINIC	206	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	36	15T	CLINIC	206	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	37	15T	CLINIC	206	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	38	15T	CLINIC	206	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	39	15T	CLINIC	206	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	
01	40	15T	CLINIC	206	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No Test Performed-	

Refer to section *Collecting Data from Analyzer* for all available options in this mode.

Create Template File to Collect Data

Template files contain receptacle location information only. The files are preloaded with descriptor information prior to analyzer testing. The template files turn into data files when the templates are used to collect data with the analyzer. Template files are created using Report Commander™ software and transferred to the analyzer. Template files appear in Report Commander™ like the illustration below:



Entering Descriptor Information

Use the window above to create a template to be preloaded into the analyzer before testing. Outlet information can be entered creating a plan for conducting receptacle testing. To identify receptacles, Report Commander™ contains cells to identify the Floor, Area and Room number for each outlet. Additionally, outlet type and outlet number are also listed. The outlet number is determined by choosing the left-most outlet as the Reference Outlet and proceeding clockwise around the room.

Reference Settings

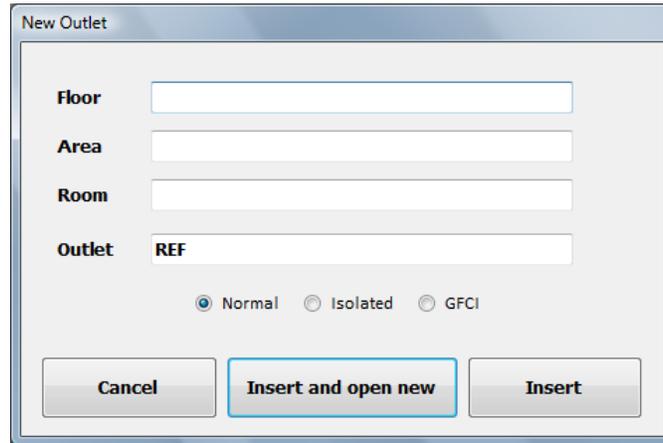
Choose whether to perform comparative testing using the reference cord or simplified testing without the reference cord.

- Use REF – This option will use standard outlet numbering sequence, i.e. REF, 1, 2, 2, 3, 3, 4, 4, etc.
- No REF – This option will number the outlets in a simplified sequence, i.e. 1,1, 2, 2, 3, 4, 4, etc.

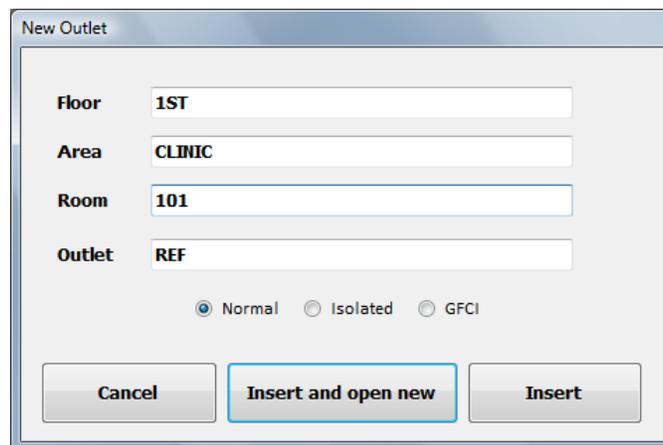
Note: Report Commander will default to use REF when creating a new template.

Step by Step Instructions

1. Begin creating a template by clicking the **New Floor** button.
A new window titled *New Outlet* will appear like the one shown.

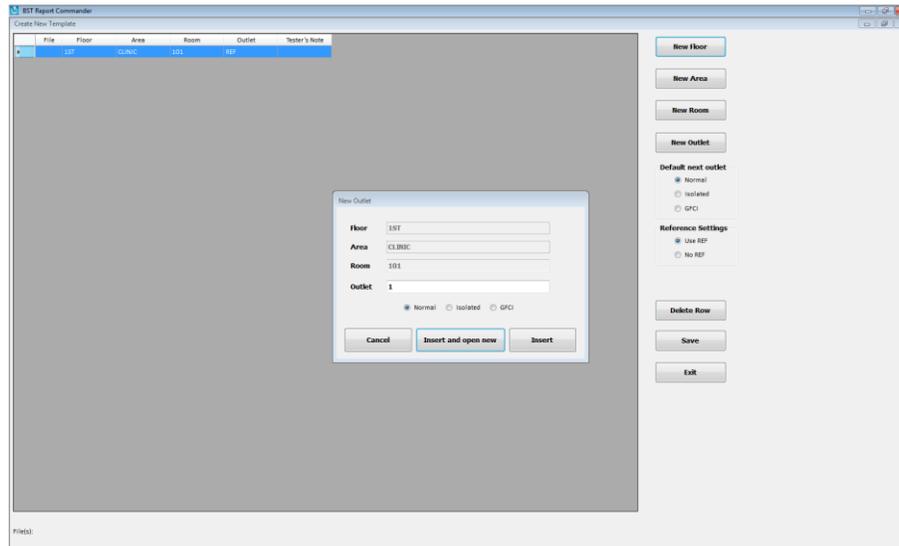


2. Enter location information in the Floor, Area, Room boxes. The Outlet box is preloaded. The example shows the outlet starting with REF (therefore the Use REF was selected for the reference setting).



Note: You can use the TAB key to tab through the different descriptor boxes, Outlet Type and selection buttons.

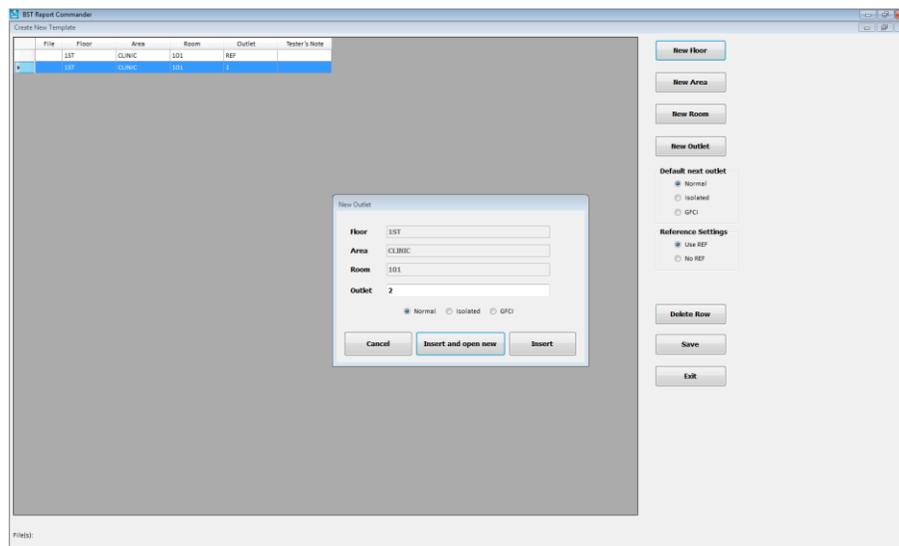
3. Click **Insert and open new**.



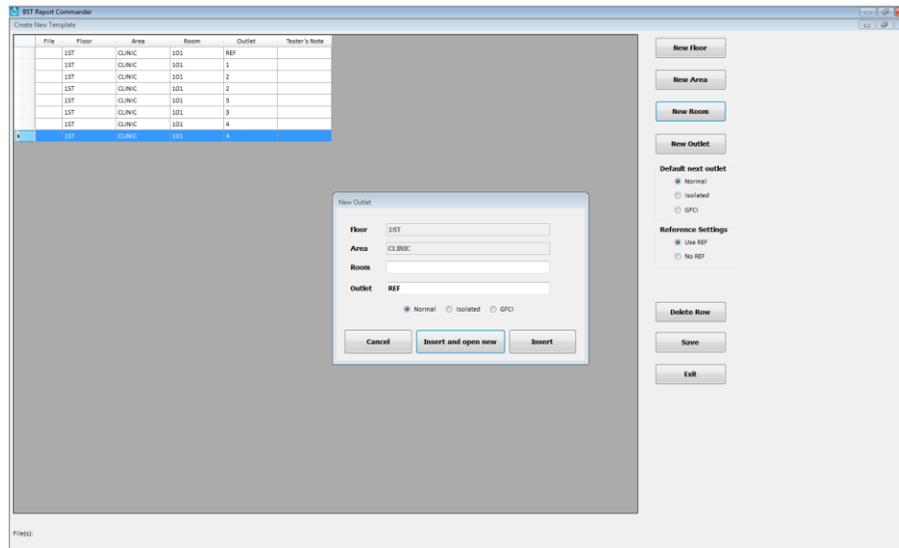
The outlet descriptor information now appears in the grid. The 'New Outlet' window will stay open for you to enter the next new outlet to the grid.

The Floor, Area, and Room boxes are grayed out, and the Outlet number was automatically incremented to '1'.

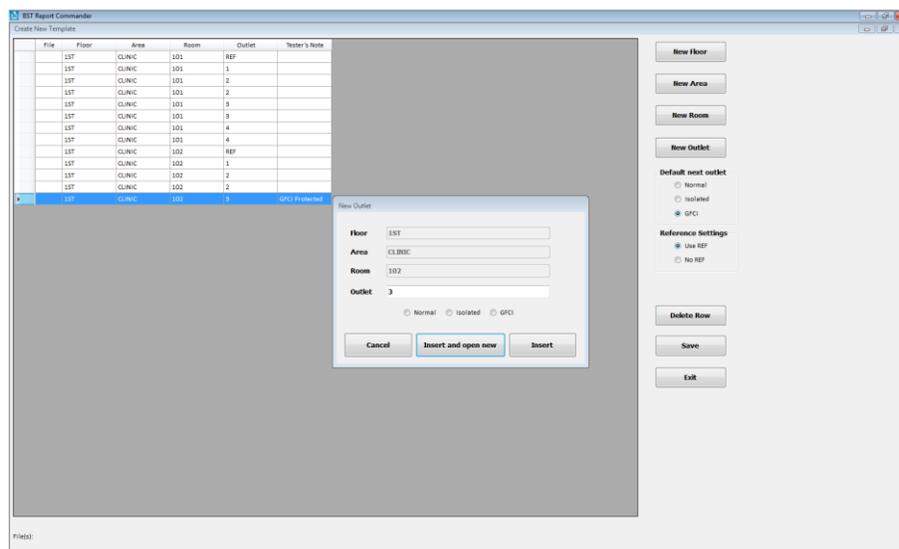
4. Click **Insert and open new** again to add the new outlet '1' to the grid.



- Once you've entered all the outlets in the room e.g. 101, select **Cancel**. The 'New Outlet' window will disappear. Now, select **New Room** to enter all the outlets in the next room. The 'New Outlet' window appears, and the outlet number preloaded 'REF' as expected.



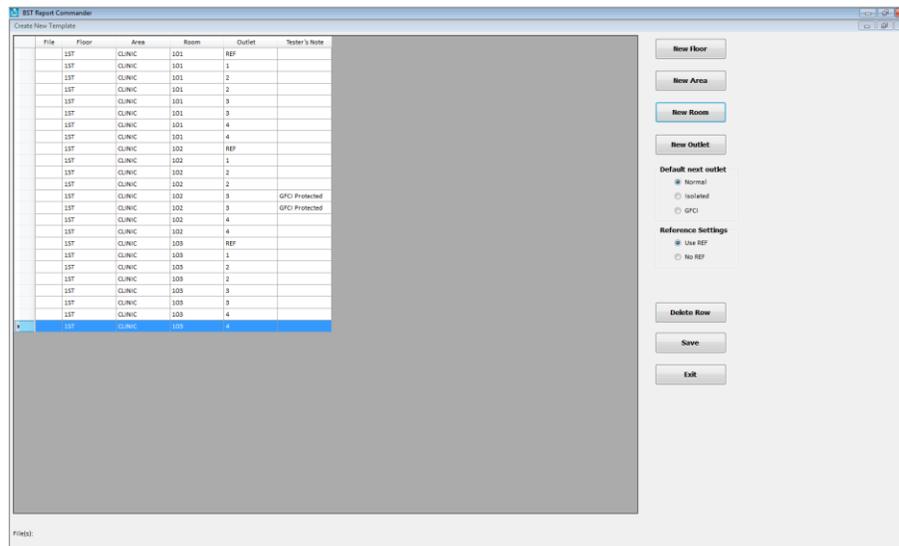
- You also have the option to change the outlet type for each receptacle that is added to the grid. Select the correct outlet type located under the 'Outlet' box. For example, to create GFCI Protected outlet, select **GFCI**. Then click **Insert and open new**. The note GFCI Protected appears in grid. The outlet type will be saved as 'GFCI' until you switch it back to 'Normal'. (Notice the 'Default next outlet' was changed to GFCI as well.) See example below:



7. Continue adding outlets to the grid for all the receptacles.

Enter descriptors for subsequent receptacles

- If Floor remains the same, click **New Area** (Floor information will be preloaded).
- If Floor and Area remain the same, click **New Room** (Floor and Area will be preloaded).
- If Floor, Area, and Room remain the same, click **New Outlet** (Floor, Area, and Room will be preloaded).



Modifying Template Information

To edit a row, place the cursor on the row and double-click.

To delete a row or series of rows, click on the rows to highlight and then click **Delete Row**.

If receptacles were left out of the sequence, they can be added at any time. To do so, place the cursor on the last row where you want to insert and click New Outlet. The new outlet will be added to the grid on the line below the cursor.

Saving a Template

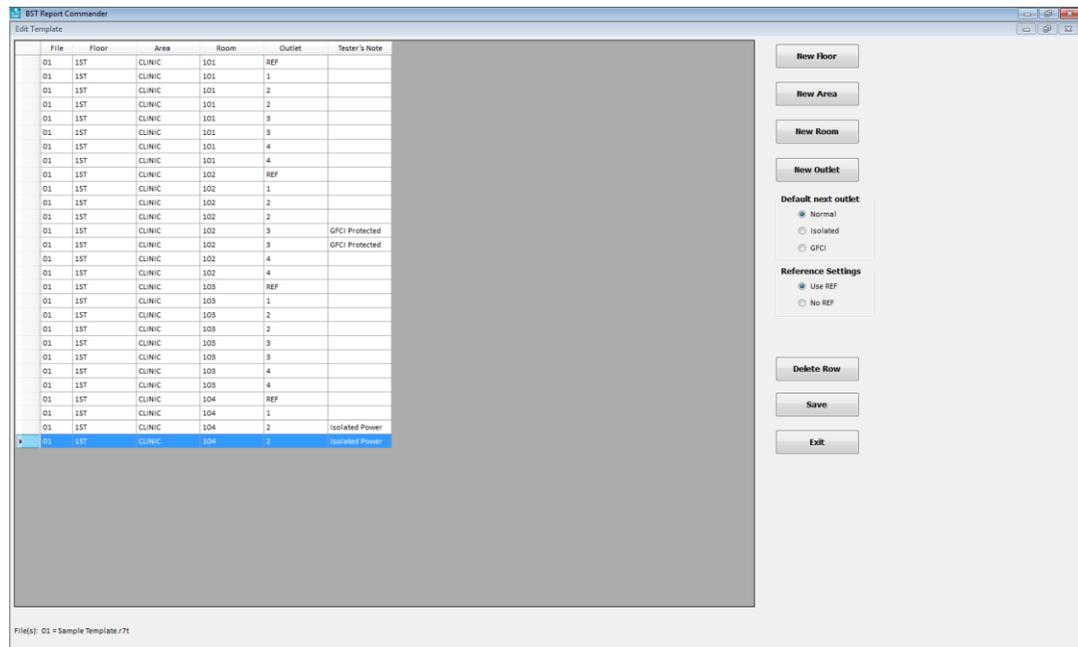
The template may be saved at any time while entering new outlets by clicking the **Save** button. All template files are saved as '.r7t' files, which are saved in the BST Report Commander™ Data folder located in your Documents folder.

Exit

Once you've completed entering all descriptor information for the template close the file by clicking the **Exit** button. The template file will automatically be saved when you exit the file. You may give the file a new name or save to the existing file name.

Open Template File for Review or Modification

1. To select this option, click button from main menu.
2. Choose the existing template file from the BST Report Commander™ Data folder
 - a. A window will pop-up entitled 'Open'.
 - b. Select the existing template file that contains the desired descriptor information.
(You may select multiple files by using the CTRL key.)
 - c. Click **Open**.
3. Report Commander™ will open the template file in a new window.



Refer to section *Creating Template File for Collecting Data* for all available options in this mode.

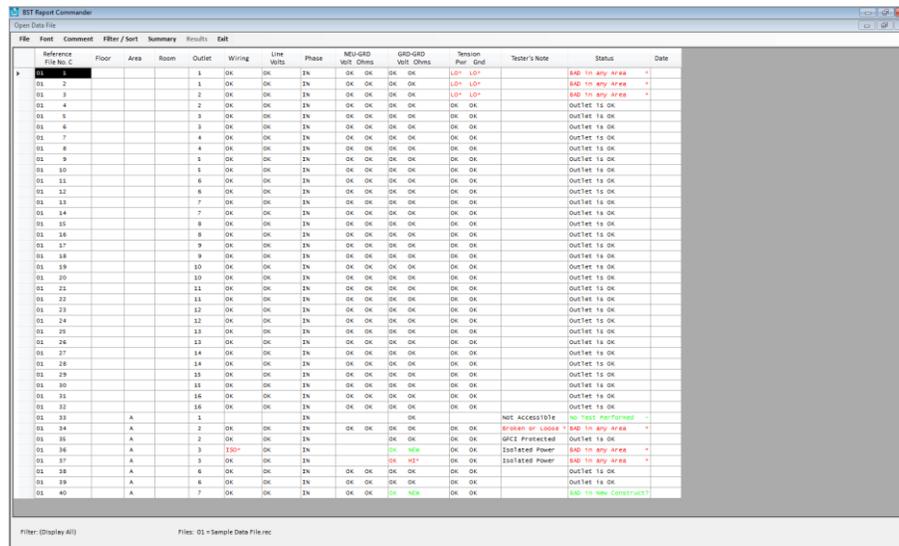
Importing a Report Generator file to Report Commander™

*** This option can only be used if you previously owned the R6500 Electrical Receptacle Analyzer. ***

The Report Commander™ software allows template files to be created from saved Report Generator software data files. The Report Generator software was used with the previous model R6500 Electrical Receptacle Analyzer.

Step by Step Instructions

1. To select this option, click 'Import "Report Generator" File' button from main menu.
2. Choose the existing '.rec' data file from the BSTdata folder. This folder should be located in your C:/Program Files/BST Report Data Generator/BSTdata
 - a. A new window will pop-up entitled 'Open'.
 - b. Select the existing template file that contains the desired data. (You may select multiple files by using the CTRL key.)
 - c. Click **Open**.
3. Report Commander™ will open the data file in a new window.



Reference File No.	Comment	Floor	Area	Room	Outlet	Wiring	Line Volts	Phase	NEU-GND	GND-GND	Tension	Tester's Note	Status	Date
01 1					1	OK	OK	120	OK	OK	OK	LOP+ LOP-	Bad in any Area	
01 2					1	OK	OK	120	OK	OK	OK	LOP+ LOP-	Bad in any Area	
01 3					2	OK	OK	120	OK	OK	OK	LOP+ LOP-	Bad in any Area	
01 4					2	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 5					3	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 6					3	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 7					4	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 8					4	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 9					5	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 10					5	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 11					6	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 12					6	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 13					7	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 14					7	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 15					8	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 16					8	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 17					9	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 18					9	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 19					10	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 20					10	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 21					11	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 22					11	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 23					12	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 24					12	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 25					13	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 26					13	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 27					14	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 28					14	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 29					15	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 30					15	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 31					16	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 32					16	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 33		A			1			120				NOT ACCESSIBLE	No Test Performed	
01 34		A			2	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 35		A			2	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 36		A			3	100+	OK	120	OK	NEW	OK	Isolated Power	Bad in any Area	
01 37		A			3	OK	OK	120	OK	NEW	OK	Isolated Power	Bad in any Area	
01 38		A			4	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 39		A			4	OK	OK	120	OK	OK	OK	OK	Outlet is OK	
01 40		A			7	OK	OK	120	OK	NEW	OK	OK	Bad in New Construct	

4. Choose **Save as Template** from the File option.
5. Enter a name for the new template and click Save. The file will be saved in the *BST Report Commander™ Data* folder, located in your computer's *Documents* folder.
6. Click **Exit** to close and return to the main menu.

Send Template File to Analyzer

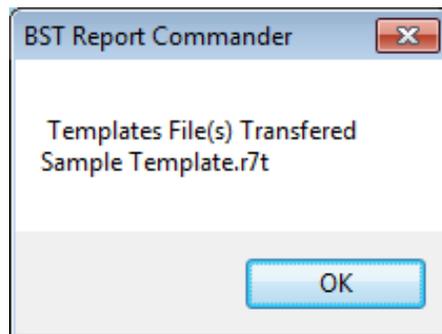
Use this option to upload template files to your R7000. You may send one template at a time to send multiple templates in one upload. Once the files are uploaded they can be modified using the analyzer touchscreen display.

Prepare analyzer for transfer

1. Turn the analyzer on and keep the File Menu screen in view.
2. Plug the USB data cable into the rear panel of the analyzer, and connect the other end to the computer.
3. Select the Connect to PC button and choose **Yes**.
The computer will recognize the analyzer as its own drive letter.

Step by Step Instructions

1. To select this option, click 'Send Template to Analyzer' button from main menu.
2. Choose the existing template file from the BST Report Commander™ Data folder
 - a. A window will pop-up entitled 'Open'.
 - b. Select the existing template file that you want to upload to the analyzer.
(You may select multiple files by using the CTRL key.)
 - c. Click **Open**.
3. The template file(s) will be automatically transferred to the analyzer. A confirmation window will appear like the one below:



4. Choose **OK** to confirm transfer.

Warranty

Bionix Safety Technologies warrants the model R7000 Electrical Receptacle Analyzer to be free from defects in material and workmanship under normal use and service for a period of one year from date of purchase. This warranty shall not apply to any unit or parts subject to alteration, misuse, neglect, accident, or abnormal conditions of operation. In addition, this warranty does not apply to any parts subject to normal wear during operation.

This warranty is limited to repair or replacement by BST of any parts found by BST to be defective. Such repair or replacement will be made without charge, provided the analyzer is returned within one year of the original date of purchase. If the failure is found to be caused by alteration, neglect, accident, or abnormal conditions of operation, parts and repairs will be billed at the prevailing charges.

BST's liability for damages for any cause whatsoever will be limited to the payment actually received by BST.

IN NO EVENT WILL BST BE LIABLE FOR ANY LOST PROFITS, INCIDENTAL DAMAGES, SPECIAL DAMAGES, OR CONSEQUENTIAL DAMAGES, EVEN IF BST HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

IN ADDITION, BST WILL NOT BE LIABLE FOR NAY DAMAGES OF THE CUSTOMER BASED UPON A THIRD PARTY CLAIM.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHNATABILITY AND FITNESS OF A PARTICULAR PURPOSE.

EXPLANATION OF CODES

A maximum of twelve tests can be conducted on each receptacle and its wiring:
 If the reference cord is attached, outlet and comparative testing is performed.
 If the reference cord is omitted, only outlet testing is performed.

Results are listed in the following coded format:
 * indicates that the result is beyond acceptable limits in any location.
 NEW indicates that the result is beyond acceptable limits in NEW construction
 N&C indicates that the result is beyond acceptable limits in NEW construction and Critical care areas

Following are descriptions and pass/fail criteria for all of the possible tests performed:

WIRING

For standard and GFCI protected receptacles:
 * Open HOT
 OKX* High NEU to GRD voltage, open NEU, or open GRD
 O X* HOT, NEU reversed
 KX* HOT, GRD reversed
 other codes - multiple problems or intermittent connections.

For isolated power receptacles:
 PWR* Either or both HOT wires open
 ISO* Power not isolated from ground
 other codes - multiple problems or intermittent connections.

LINE VOLTS
 LO* Line voltage is below 100 volts
 HI* Line voltage is above 130 volts

PHASE
 IN Test and reference receptacles are on the same side of the 220 volt power line.
 OUT Test and reference receptacles are on the opposite side of the 220 volt power line.

NEU-GRD VOLTS
 HI* NEU-GRD voltage over 4 volts

NEU-GRD OHMS
 OK+ NEU-GRD resistance between 0.5 and 1.0 ohm
 HI* NEU-GRD resistance over 1.0 ohm

GRD-GRD VOLTS
 NEW GRD-GRD voltage between 20 and 40 millivolts (not acceptable for NEW construction)
 N&C GRD-GRD voltage between 40 and 500 millivolts (not acceptable for NEW construction or critical care areas)
 HI* GRD-GRD voltage over 500 millivolts

GRD-GRD OHMS
 NEW GRD-GRD resistance between 0.1 and 0.2 ohm (not acceptable for NEW construction except quiet ground systems)
 HI* GRD-GRD resistance over 0.2 ohm
 Resistance includes the effect of dirt and corrosion on the receptacle contacts

TENSION - PWR
 LO* Either or both of the HOT and NEU contact retention forces are below 4 (8 in California) ounces.

TENSION - GRD
 LO* The ground contact retention force is below 4 (8 in California) ounces.

NOTE
 Notes are entered by test personnel and reflect observations beyond the scope of the twelve automatically performed tests.

STATUS
 Indicates overall status of receptacle
 BAD IN CC AREA - Receptacle is BAD if located in a critical care area.
 BAD IN NEW CONSTRUCT - Receptacle is BAD if located in a new construction area.
 BAD IN NEW, CC AREA - Receptacle is BAD if located in a critical care or new construction area.
 BAD IN ANY AREA - Receptacle is BAD in any area.

ELECTRICAL RECEPTACLE SUMMARY REPORT

FILE NAME: Sample Data File.r7d DOWNLOAD DATE: 12/16/2010 10:11:03 AM FACILITY: NST

Filter: (Display All)

	Wiring	Line Volts	Phase	Neutral	Ground	Tension	Note	Status
OK *	28	26	30	30	30	30	30	26
BAD *	2	4	0	0	0	0	0	4
LOCATION DEPENDENT?	0	0	0	0	0	0	0	0
UNTESTED-	10	10	10	10	10	10	10	10
Filtered Total								40
OK *	70%	65%	75%	75%	75%	75%	75%	65%
BAD *	5%	10%	0%	0%	0%	0%	0%	10%
LOCATION DEPENDENT?	0%	0%	0%	0%	0%	0%	0%	0%
UNTESTED-	25%	25%	25%	25%	25%	25%	25%	25%
Filtered Total								100%

Appendix B: Suggested Room Abbreviations

Room	Abbrev.
Administrative Offices	ADMIN
Animal Laboratory	ANIM
Audiology	AUD
Autopsy and Morgue	AUT
Blood Bank	BBNK
Blood Gas Lab	BGAS
Cardiac Cath Lab	CATH
Cast Room	CAST
Central Supply	CEN
Chemistry	CHEM
Chemistry, Automated	CHEMA
Clinic	CLIN
Clinic, Dental	CDEN
Clinic, Ear, Nose, & Throat	CENT
Clinic, Endoscopy	CEND
Clinic, Eye	CEYE
Clinic, Medicine	CMED
Clinic, Pediatric	CPED
Clinic, Surgery	CSRU
Clinic, Urology	CURO
Clinical Laboratory	CL
Clinical Laboratory, Cyst	CLCYS
Clinical Laboratory, Hemo	CLHEM
Clinical Laboratory, Micro	CIMIC
Clinical Laboratory, Sero	CLSER

Room	Abbrev.
Clinical Laboratory, Urin	CLURI
Clinical Laboratory, Viro	CLVIR
Coronary Care Unit	CCU
Coronary Care Unit, Progressive	CCUP
Cystoscopy	CYS
Dark room	DKRM
Delivery Room	DELR
Delivery Suite	DELS
Dialysis Unit, In-Patient	DIALI
Dialysis Unit, Out-Patient	DIALO
Dietary	DIE
Electrocardiography	ECG
Electroencephalography	EEG
Electromicroscopy	EMIC
Electromyography	EMG
Emergency Care Facility	ECF
Emergency Room	ER
Emergency Vehicle	EV
Examination Room	EXAM
Fluorescent Microscopy	FMIC
Fluoroscopy	FLO
Fracture Room	FRAC
General Office Area	GO
Heart Station	HS
Histology	HISTO

R7000 Electrical Receptacle Analyzer

User's Guide

Room	Abbrev.
Housekeeping	HK
Immunology	IMM
Industrial Medical Facility	IMF
Intensive Care Unit, Burn	ICUB
Intensive Care Unit, General	ICUG
Intensive Care Unit, Infant	ICUI
Intensive Care Unit, Medical	ICUM
Intensive Care Unit, Neo	ICUNN
Intensive Care Unit, Neur	ICUN
Intensive Care Unit, Pediatric	ICUP
Intensive Care Unit, Progressive	ICUPRG
Intensive Care Unit, Respiratory	ICUR
Intensive Care Unit, Surgical	ICUS
Labor Room	LABOR
Laundry	LAU
Library	LIB
Medical Records	MEDR
Multiphasic Screening	MULTI
Nuclear Medicine	NUC
Nursery	NUR
Nursery, Intensive Care	NURI
Nursery, Premature	NURP
Nurses Station	NS
Occupational Therapy	OCC
Operating Room	OR
Operating Suite	OS
Out-Patient Department	OUTP

Room	Abbrev.
Pathology	PATH
Patient Room, Isolation	PRI
Patient Room, Pediatric	PRP
Patient Room, Private	PRPR
Patient Room, Semi-Private	PRSP
Patient Room, Ward	PRW
Pharmacy	PHAR
Physical Therapy	PT
Plant Support Area	PLANT
Post-Anesthesia Recovery	PAR
Psychiatric Unit	PSY
Pulmonary Function Lab	PULF
Radio-Isotope	RISO
Radiology Suite	RAD
Recovery Room	RR
Research Lab	RLAB
Respiratory Therapy	RT
Special Studies Room	SSR
Speech and Hearing Lab	SPECH
Student Laboratory	STU
Treatment Room	TRE



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