



Roos Instruments, Inc.
Cassini Operations Quick Start Guide

Issued: 06/27/2011

Cassini Operations Quick Start Guide

Roos Instruments, Inc.

©2011 - 2011



This work is licensed under a [Creative Commons Attribution 3.0 Unported License](https://creativecommons.org/licenses/by/3.0/).
You may reprint, reuse, and redistribute the information contained in this manual.

PDF and source material can be downloaded from
<http://roos.com/docs>
(user account required)



Cassini Quick Start Table of Contents

Open this topic online @ <http://roos.com/docs/CRRS-8G37HT>

Cassini Operations Quick Start Guide

Topic	Page
Operator Guide to Starting and Stopping Cassini 16	1
Operator Guide to Docking Cassini 16 with a Handler/Prober	5
Operator Guide to Using Cassini (Software)	15
Operator Guide for Exchanging Cassini Modules	25
RI Safety Guidelines for Hazards (Cassini & RI7100A)	26

The Cassini Operations Quick Start Guide is limited to the tasks required to operate a Cassini system and does not include all topics covered by the Basic Cassini Training.

Online Manuals are available at ROOS.COM, on the "Support" page.





Operator Guide to Starting and Stopping Cassini

16

Open this topic online @ <http://roos.com/docs/RBEH-8FE5KN>

Starting the System for the First Time

When first installing a RI Test System, make sure all the instruments in the rack are connected to the internal 48 Volt distribution block. The System Controller is powered by the main system rack via the RIFL interface. The 48V Power Distribution panels are configured "On" from the factory, but should be verified when first starting the system. Check that any external safety devices, such as circuit breakers or emergency off switches, are set to the "On" or "Operate" mode, and the main AC power supply cable(s) is plugged into the correct type of outlet. The system is configured at the factory for either the international standard 230 volt AC power or US domestic 115 volt AC power.

ATTENTION! The 20 minute warm up time is required before running test plans, a minimum 2 hours before any calibration.

The Microwave Sources and RFIC Test Head all contain heater ovens to maintain stable elevated temperatures within their critical components. The temperature will take a minimum of 20 minutes to stabilize within the units and we recommend a minimum of TWO HOURS warm up time before attempting a calibration or any precision measurements. Even if the power is shut off for only a very short amount of time, the ovens will corrupt any measurements while they go through a start-up phase by increases the temperature to accelerate the warm-up process.

WARNING! Fixture should NOT be attached to the Test Head while powering on the system.

The Test Fixture should not be connected when turning the system on. It could be possible to damage the Fixture or device because the System Controller has not yet reset the states of the Test Head. The fixture can be freely swapped while the system is idle or off, but a fixture should not be connected during start-up.

System Power-up Sequence

- **Fixture should NOT be connected to the Test Head**
- **Check power cable and handler ground cable are properly connected**
- **Turn ON the main Power Conditioning Unit (PCU)**
- **Verify the 48V Distribution switches are ON**
- **Reset the Emergency Off (EMO) switch (if applicable)**
- **Turn the front panel switch to START, then release it to ON**
- **Push the power button ON the front of the Monitor**
- **Wait 20 minutes for the temperature to stabilize**

Before turning on the RI Cassini system, remove the Fixture from the Test Head. The Handler and Fixture to Handler Ground cable (described later) can be either be connected or disconnected.

The Power Conditioning Unit (PCU) is standard equipment for all Cassini ATE systems. The power indicator light will illuminate when connected to the AC power mains and the Main Power switch is on. The 'Active' lights will glow green when power is being supplied to the system. Do not toggle the local/remote switch that is "locked down" to prevent tampering.

To turn the system on, first move the switch on the Power Conditioning Unit (PCU) to the "ON" position. For "Cassini 16", it is located on the back, near the air supply hose.



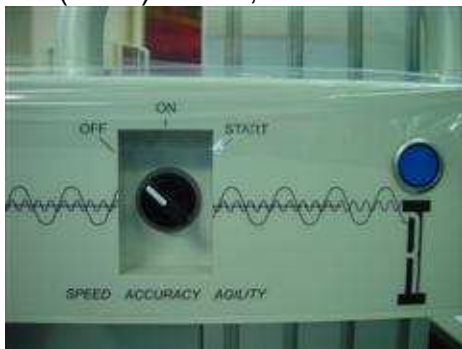
Cassini 16 PCU

Turn on the 48V distribution circuit. For "Cassini 16", it is located near the bottom, clearly visible on the opposite side of the test head.



Cassini 16 48V Distribution Panel

From the front of the system, turn the front panel switch momentarily to 'START', then release it to the 'ON' position. "Cassini 16" is also equipped with an Emergency Off (EMO) switch, that can be reset by turning it clockwise and releasing.



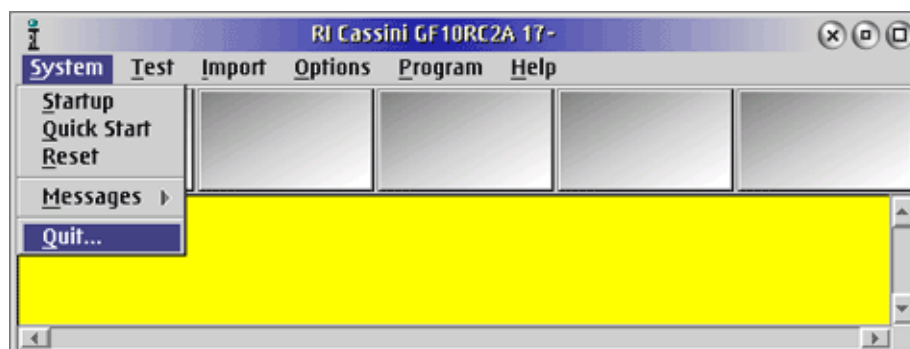
Cassini 16 - Front Panel Switch




Cassini 16 - Emergency Power Off (EPO)

After turning on the Front Panel Switch to ON, the system controller will start booting and the monitor will need to be manually turned on from its normal power button. Cassini systems are designed to be run continually, even if parts are not being tested. Only power down the system to relocate or replace the system controller.

RI System Software Shut Down Procedure



To turn the system software off, remove the Fixture from the Test Head **FIRST**, then follow the RI System Software shut down procedure.

Close all Applications that are running by clicking on the **System** pull down menu and then select **Quit**. The Cassini application can also be stopped by clicking on the **System** button, then click **Quit All**. The system will confirm with a dialog box that asks, "Are you sure you want to exit?" Click **YES** and the RI system software will do some file maintenance and close, leaving the Guru bar left with only System, Apps and Short Cuts buttons. Now perform an OS shutdown by clicking on the Shutdown Icon () from the Menu Bar. Answer "Yes" to exit any remaining programs and confirm the shutdown. The OS will present a message when it has safely shut down. Immediately turn the Front Panel Switch to OFF, otherwise the system controller will automatically restart.

When disconnecting the power to the system, first turn the PCU "OFF" before unplugging the main power cable from the wall outlet. The Handler Ground cable and Handler cable (described later), should be removed only after the PCU is switched "OFF".

System Power-down Sequence

Move the switch on the front panel to the 'OFF' position, then turn OFF the PCU. If the Front Panel Switch is turned to "OFF", all power to the system will be immediately disconnected, including the System Controller. If the System Controller's shut down procedure was not completed, some test data may be lost (whatever data wasn't written to the hard drive) and those parts would have to be tested again. It is important to properly shut down the System Controller because there is a small chance that powering it off without following the shut down procedure will prevent it from restarting.



Operator Guide to Docking Cassini 16 with a Handler/Prober

Open this topic online @ <http://roos.com/docs/RBEH-8F73D3>

Docking the Cassini 16 involves 5 simple steps:

1. Attach Fixture and Handler POD to Handler/Prober
2. Move Handler or Cassini 16 into position
3. Rotate and Align Test Head
4. Latch Fixture to Test Head
5. Attach Handler Pod cable, Handler Grounding cable, lower stabilizing legs

Step 1: Dock Fixture, Handler POD and Grounding Cable to Handler

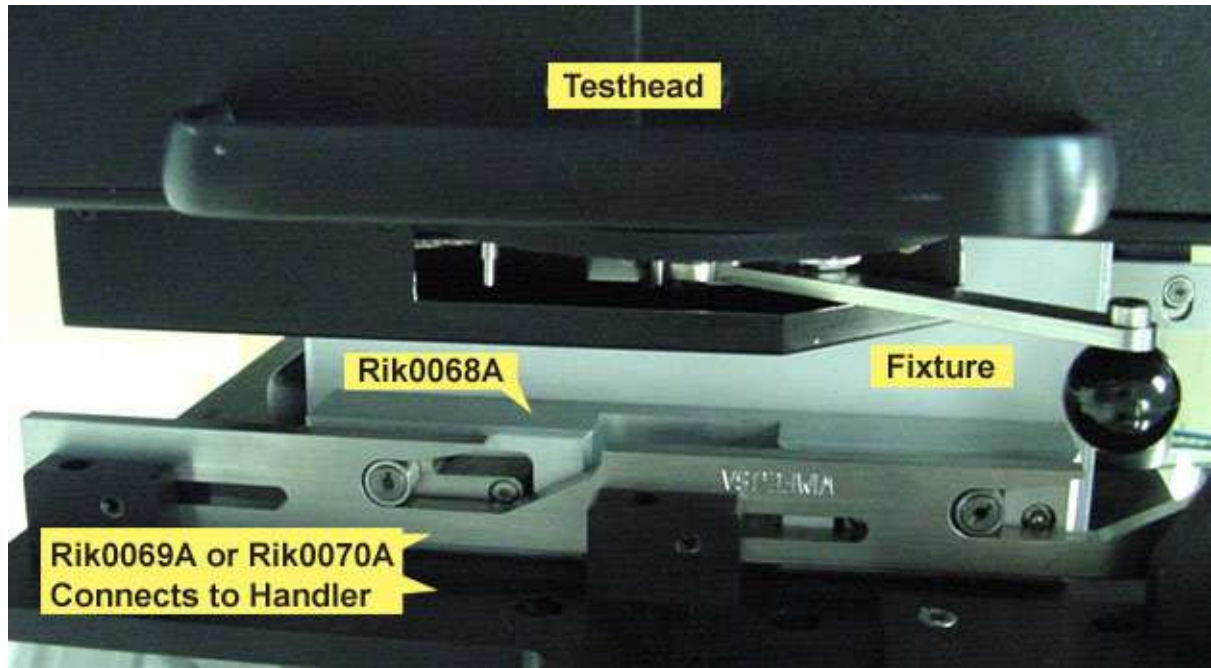


The RI Fixture docking system eliminates any fine alignment issues by connecting the precision Fixture's Top Plate directly to the handler. The compact Test Head is then brought to the Fixture - Handler assembly using the built-in, neutrally weighted, Test Head manipulator. Four large alignment pins protruding from the Test Head guide the assembly together while the RI Test Head Docking Cam locks them in place and guarantees the correct RI mating pressure between the Fixture and the

Test Head.

At every stage of the docking procedure, inspect the RF and DC connections for bent pins, debris (metal filings) or oxidation. Carefully remove any debris with pressurized air. Damaged or bent pins should be replaced BEFORE docking the fixture to prevent further damage.

RI Fixture / Handler Docking



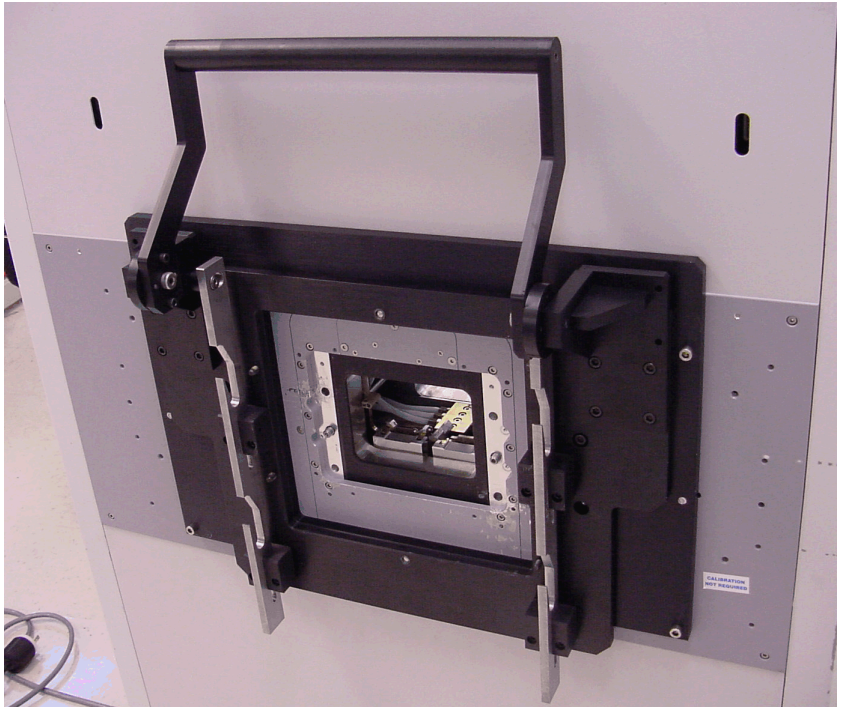
RI has introduced a robust Fixture to Handler docking system for reliable handler docking, developed with customers and proven in production. The universal docking plate for standard single site Fixtures (RIK0069A) and multi-site Fixtures (RIK0070A) mount to the handler and is customized for the Handler's interface plate. The RI Fixture requires Docking Ears (RIK0068A) which contain smooth spring loaded roller bearing cams which mate to the handle docking plate.



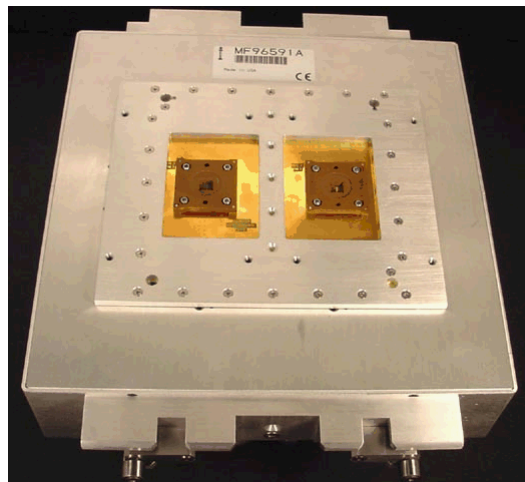
RIK0069A Docking Plate



RIK0068A Docking Ears

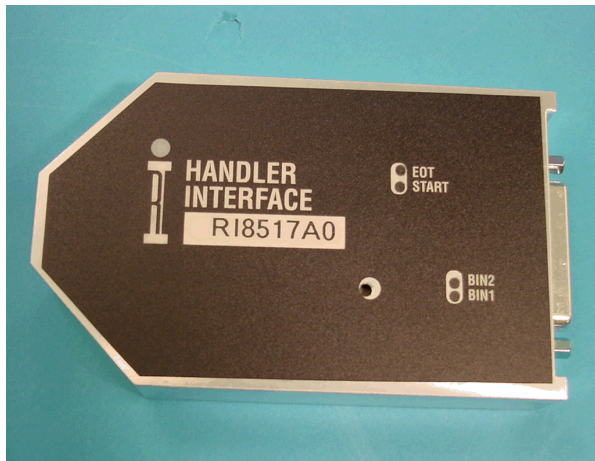


RIK0069A Docking Plate mounted on a Rasco Gravity Feed Handler



Dual Site Fixture to attach to Rasco Gravity Feed Handler

Handler Pod



Handler Interface Pod

Cassini systems use plug-and-play Handler Interface Pods, no configuration is needed, they are programmed for a particular manufacturer and model at the factory. These Pods contain a programmable ASIC that handles all the timing and signal level control to interface the system to any handler. RI supports many Handler Manufactures and we can always program a custom Pod for your handler. You will need to contact RI Support and furnish us with the handler programming manual to program the Pod at the factory. Some current supported handler manufacturers include: Atrium, Delta, Rasco, Multitest, Sekio-Epson, Soya, and Synax.

The physical wiring of the Handler Pod to the handler is the responsibility of the customer which is usually a custom cable that can contain some pull up resistors to supply digital control logic that is powered by either the Tester or the Handler for isolation reasons. Most handlers have an opto-isolator built into the tester interface that needs to be connected to Tester power through the interface cable.

For reference:

 **Handler Control Pod Pinouts**

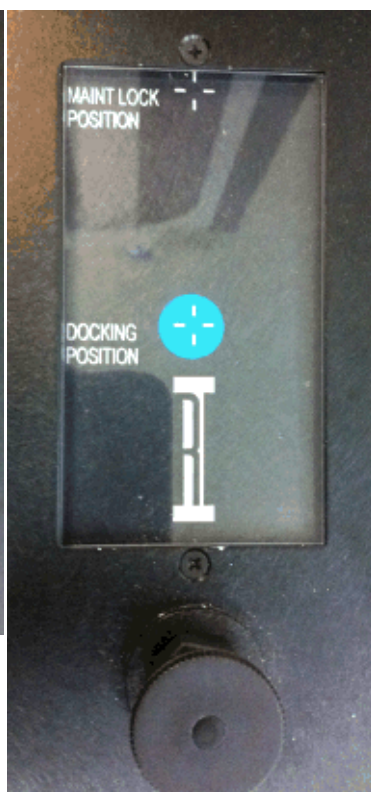
<http://roos.com/docs/RBES-6D6RSX?Open>

Step 2: Position Cassini 16 and Handler



Locked

from the "Docking NOT lock when freely, allowing the test attached to the handler.



Unlocked

First, unlock the fixture arm by pulling up on the knob on the top of the test head, below the docking position indication window. Move the blue dot from the "Maintenance Position" to the center "Docking Position" by pushing outward on the test head. The Docking Position represents the "center", allowing the most freedom of movement for aligning the Test Head. Position the system into place so that the Fixture alignment holes are directly below the Fixture alignment pins. Final adjustments are made by positioning the Test Head and moving the dot away from the "Docking Position". The test head does not lock when docking, it is designed to move slightly when

Step 3: Rotate & Align Test Head

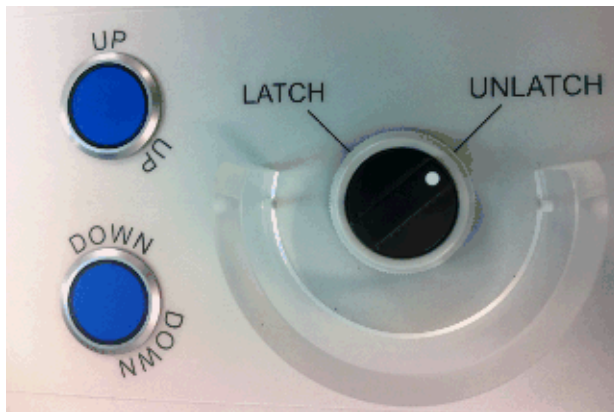
Rotate the Test Head to match the angle needed to interface properly with the Fixture by rotating the "Head Rotation" knob from "Lock" to "Unlock" position. Once the test head is at the correct angle, rotate the knob back to the "Lock" position. The Test Head only locks in 0° (up), 90° (side), and 180° (down) positions. Other angles can be used while the test head rotation remains unlocked, but use caution when docking and undocking the fixture.



Head Rotation Lock

Step 4: Align & Latch Fixture to Test Head

Align the Test Head by using the UP/DOWN buttons on the top of the system to raise/lower the test head onto the Fixture. The "Fixture Align" and "Fixture Lock" lights stay Red until the fixture is properly aligned. Rotate the knob on top of the system to "Latch" position once the Fixture Align light is Green. The Fixture is ready only when the Align and Lock lights are both green.



Test Head verticle Alignment (UP/DOWN) and Latch



Fixture Align and Lock lights

Step 5: Attach Handler POD and Grounding Wire, Lower 2 Stabilizing Feet

With the Handler Interface POD attached to the appropriate Handler/Prober via a Parallel, Serial or GPIB connection, plug the RIFL 2 (Grounded Ethernet) into the Handler Pod and the RIFL 3 (round) connection to the RIFL 3 Hub along the back of the Test Head.



Handler Pod



RIFL II (Handler Pod) to RIFL III (Test Head) Cable



RIFL III Hub on Test Head

Connect the Alligator clip to an exposed metal surface on the handler/fixture to avoid damaging the DUT in rare circumstances when the facility ground differential is too large. Lower both stabilizing feet to prevent the system from moving during an earthquake.



Handler Grounding Wire



Stabilizing Foot



Operator Guide to Using Cassini (Software)

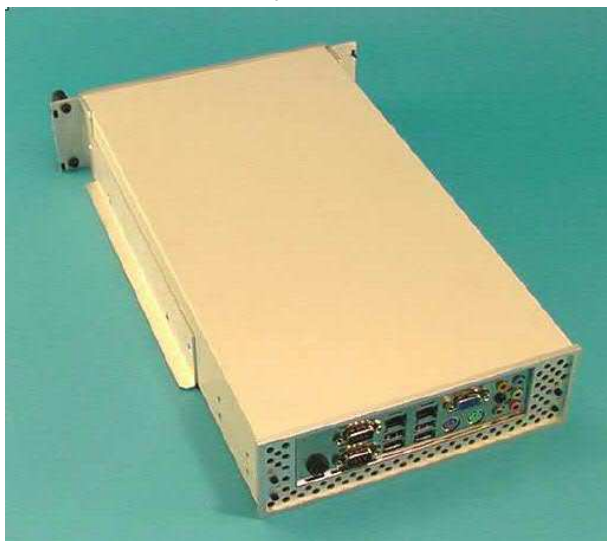
Open this topic online @ <http://roos.com/docs/RBEH-8FE2CJ>

RI Cassini ATE Systems test parts via a Test Executive that combines a test plan with live calibration data to verify the Device Under Test (DUT) meets the designers specifications. The operator is tasked with docking the RI System with a Handler or Prober, loading the devices, starting, pausing and stopping the tester, and unloading the sorted parts from the pass and fail bins. This highly automated process is fast, accurate, and reliable without requiring the operator to know any specifics about the device.

RI System Controller TIM



Cassini 16 - System Controller TIM



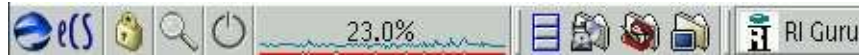
Small & Large Cassini System Controller

Cassini systems use an x86 based system controller with touch screen and/or mouse and keyboard interface. If a Guru Server is available, the system controller can be

easily swapped in the field and the entire operating environment automatically restored from the Guru Server. The system controller connects to the instruments via the Test Instrument Module (TIM) interface's Roos Instruments Fiber Link (RIFL) bus. TIMs can be swapped while "HOT", meaning the main breaker and power distribution blocks can stay in the ON position while connecting or disconnecting TIMs. Because the system controller uses a standard hard drive, the system software (Guru) and eCS operating system should be properly shut down to guarantee that there is no data loss.

System Controller - Graphical User Interface

The RI system software uses an embedded operating system called eComStation that uses a familiar graphical user interface. Once the system starts, the Task Bar provides easy access to popular operating system tasks such as moving data files, accessing network drives, monitoring the system's processor activity, and opening a command prompt.



Test plans are run from the "Guru" task bar that automatically appears on the right side of the screen. The RI Cassini ATE systems use a unique database style file system called "Guru" to manage all the software and data files in the system. The "System" button appears green when it has a live connection to a Guru Server.



Login To Guru

To begin and access the System Controller software, first log-on to Guru to access the system software.



On the upper right hand corner of the system screen, Click the **Logon** button to log-on to RI Guru.

Enter user name and password, then click the **Log on** button.

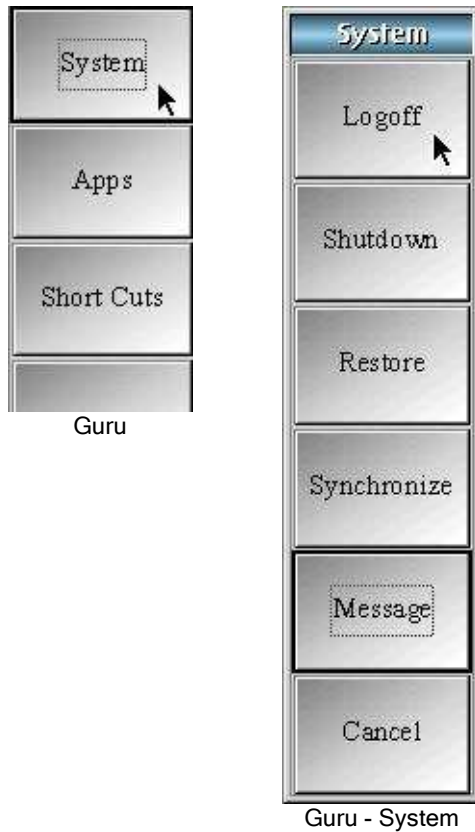


RI provides default user names of "Operator" with default password "password". Your operating environment may have unique user name and password combination for each operator, or a single shared user name and password.

Once you've logged on successfully, you can launch the Cassini software from the **Short Cuts** button.

Guru Log-off

Once you've logged on to Guru successfully, the **Logon** button changes to **System** button. Click on the **System** button to bring up the System guru menu.



From the System window, click the **Logoff** button to Logoff. To change access to Guru, first must Logoff, then Logon again.

Choosing Short Cuts

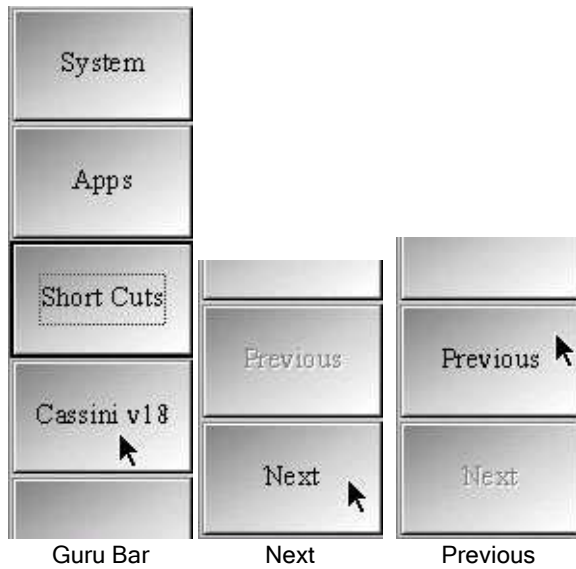
If a user is logged on with operator privilege, only the **Short Cuts** buttons will be enabled.



Guru Short Cuts - Select Application

The **Short Cuts** button enables the flexibility of tailoring the Guru applications to a given product release, i.e. launch a specific base release of the operating system software and load a specific set of patches. It allows any Guru application to run with an older, verified or approved version. Click the **Short Cuts** button to retrieve a list of available short cuts from Guru.

To launch a short cut, click the application name. On the right of the Select Application window, the list of the available short cuts can be scrolled by one at a time with the **Up** or **Down** buttons, or the **Pg up**, **Pg down** buttons to quickly scroll thru the list. In this example, there is only one short cut available. Clicking the **Cancel** button will close the Select Application window.



The purpose of these application buttons on the Guru bar is so that one can bring the application to the front (make it to be the active window) in case it is hidden behind any other applications or if it was minimized.

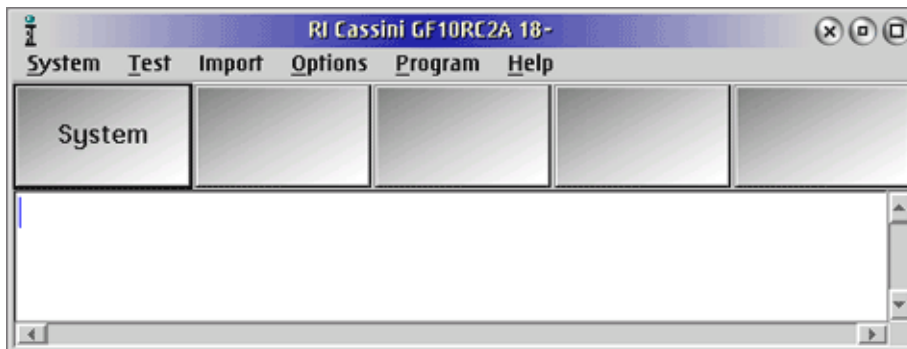
When you have more than seven Guru applications and short cuts running, the **Next** button on the bottom of the Guru bar will be enabled.

Clicking the **Next** button will display the buttons on the next page and the **Previous** button will be enabled. Clicking the **Previous** button will go back to the previous page of buttons.

Opening Test Executives

The **RI Test Executive** is the primary interface that Operators use to control the tester. To invoke the RI Test Executive, first, Log-on with Operator privilege or higher, then [start the "Cassini" application](#) from the Short Cut button of the Guru Bar. Released test plans can be easily opened with a Short Cut for a specific device that can be setup to use the version of RI System software that was checked out and approved, running with a specific set of patches.

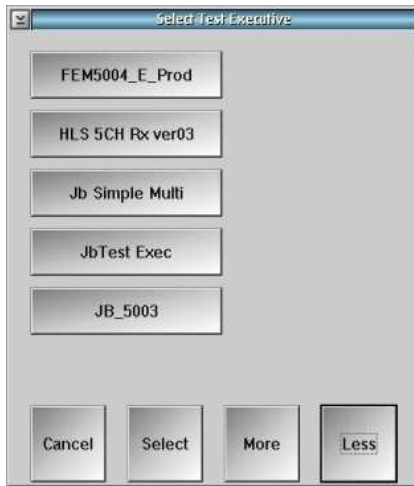
From the RI "Cassini" style Application, click on the **System** button from the main Cassini window.



Cassini Application window

Select the "Test Execs" button from the panel and choose the exec from the dialog box that is displayed next.



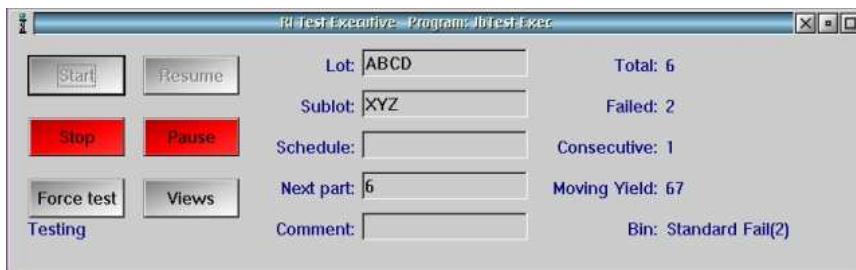


Use the buttons "More" and "Less" to scroll the list and choose the test executive to run.

The Test Executive performs a number of steps automatically when it is first opened. It creates any ancillary views (e.g. "details" worksheet or "pass/fail") and compiles the testplan against the current system hardware. If there are any problems, a warning box appears with instructions to the operator.



If all is well, the "Start" button turns green and the operator enters lot information: Lot, Sublot, Schedule, and Comment.

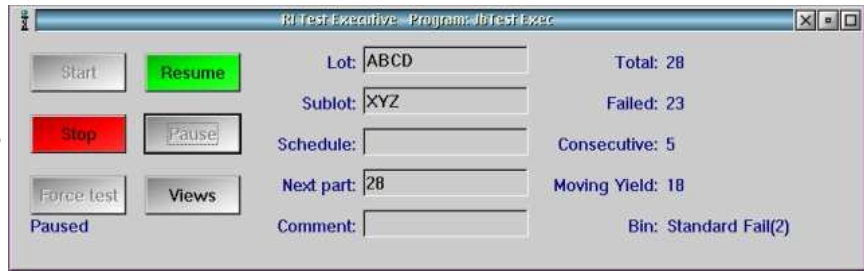


When the "Start" button is pressed, the system waits for a "start test" signal from the handler, and begins testing as soon as the signal is received. The part is tested and limit

checked, and the resulting hard bin is signaled back to the handler. After indexing to the next part, the cycle repeats.

The system displays current information such as the total tested parts, the total failed parts, the number of consecutive failures, and a computation of the yield of the most recent 50 parts.

If the operator needs to interrupt testing at any time, the "Pause" button may be pressed. It will cause the tester to stop testing but it does not close the data log or "finish" the lot.

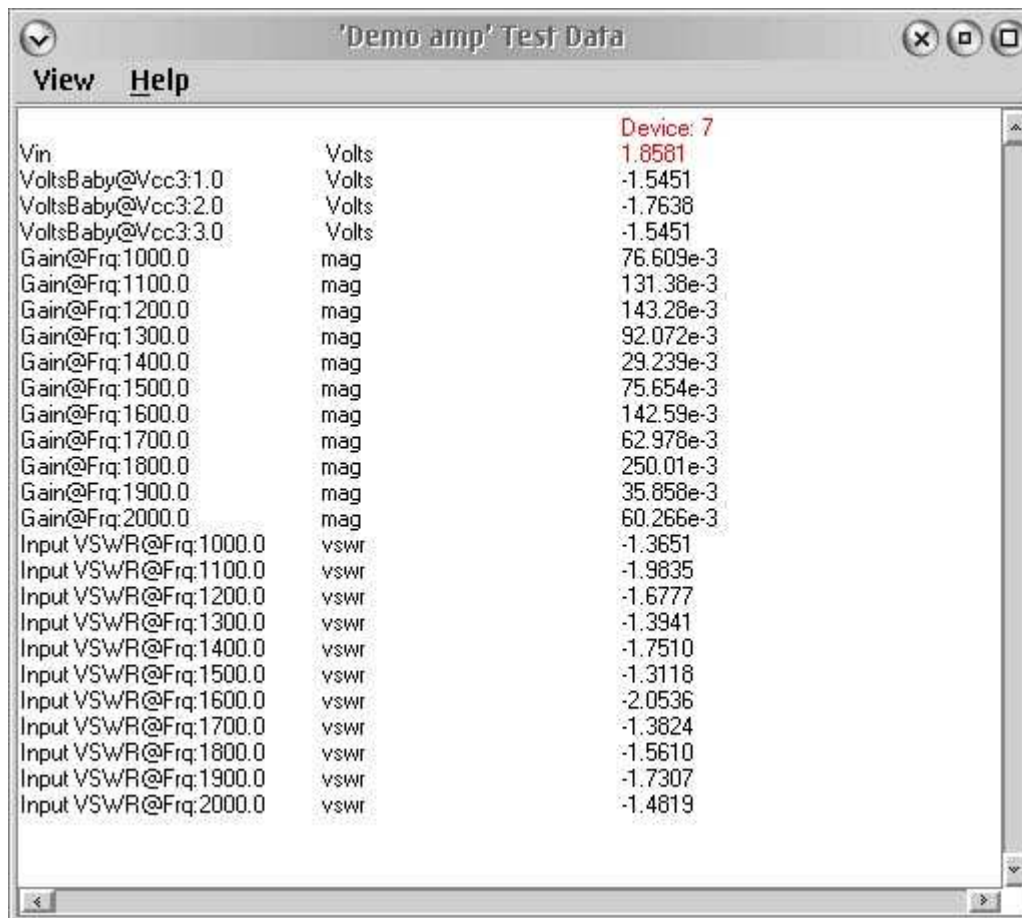


The tester may be paused indefinitely, but the part handler may complain after a period of inactivity. Testing is continued by pressing "Resume".

A Pass or Fail window displays the Bin number the part will be sorted into and 'green' or 'red' background depending on if the part passed or failed the test plan.



A Test Data window displays the detailed results of specific measurements the test plan performed on the Device Under Test (DUT).



The screenshot shows a window titled "'Demo amp' Test Data" with a menu bar containing "View" and "Help". The window displays a list of test results for "Device: 7". The results are organized into three columns: the measurement name, the unit, and the numerical value. The measurements include voltage levels (Volts), gain (mag), and input VSWR (vswr) across a range of frequencies from 1000.0 to 2000.0.

Measurement	Unit	Value
Vin	Volts	1.8581
VoltsBaby@Vcc3:1.0	Volts	-1.5451
VoltsBaby@Vcc3:2.0	Volts	-1.7638
VoltsBaby@Vcc3:3.0	Volts	-1.5451
Gain@Frq:1000.0	mag	76.609e-3
Gain@Frq:1100.0	mag	131.38e-3
Gain@Frq:1200.0	mag	143.28e-3
Gain@Frq:1300.0	mag	92.072e-3
Gain@Frq:1400.0	mag	29.239e-3
Gain@Frq:1500.0	mag	75.654e-3
Gain@Frq:1600.0	mag	142.59e-3
Gain@Frq:1700.0	mag	62.978e-3
Gain@Frq:1800.0	mag	250.01e-3
Gain@Frq:1900.0	mag	35.858e-3
Gain@Frq:2000.0	mag	60.266e-3
Input VSWR@Frq:1000.0	vswr	-1.3651
Input VSWR@Frq:1100.0	vswr	-1.9835
Input VSWR@Frq:1200.0	vswr	-1.6777
Input VSWR@Frq:1300.0	vswr	-1.3941
Input VSWR@Frq:1400.0	vswr	-1.7510
Input VSWR@Frq:1500.0	vswr	-1.3118
Input VSWR@Frq:1600.0	vswr	-2.0536
Input VSWR@Frq:1700.0	vswr	-1.3824
Input VSWR@Frq:1800.0	vswr	-1.5610
Input VSWR@Frq:1900.0	vswr	-1.7307
Input VSWR@Frq:2000.0	vswr	-1.4819



Operator Guide for Exchanging Cassini Modules

Open this topic online @ <http://roos.com/docs/RBEH-6WQ62M>

In rare cases, the Test Instrument Modules (TIMs) may be reconfigured for a different fixture. This can be done while the system is running and does not require any TIM to be calibrated.

Cassini Test Instrument Module (TIM) Exchange

Cassini Test Instrument Modules (TIMs) can be easily removed while the system is powered on without causing damage (hot swap). If a Fixture is attached, remove the Fixture before removing a TIM. Simply pull the handle at the top of the TIM to power it down and prepare it for removal. Remove the module by securely grabbing the module's side, then pulling the lower handle to release it from the Test Head.



TIMs can be just as easily replaced by sliding the module up into the slot until you hear it click. Then push in the top handle to power up the modules.



The system may take up to 20 seconds before the new module is detected and can be used by the system. From the Cassini application, use the **System | Check** button to force the system to identify and use any hardware changes.



RI Safety Guidelines for Hazards (Cassini & R17100A)

Open this topic online @ <http://roos.com/docs/RBEH-8F8U8A>

General Safety

RI systems are designed with an emphasis on safety and introduce no hazards that should be considered in an OSHA¹ compliant safety program. The topics below review specific issues, but each section discusses how hazards are not exposed in the normal operation of a RI Test System. If the system is used in a manner not specified in the instructions, the protection provided by the equipment may be impaired. The warnings below are based on a standard operating air temperature is from 10° to 35°C (50° to 95°F) and humidity from 8% to 80%.



Conforms with the essential requirements of the EMC Directive 2004/108/EC and LVD Directive 2006/95/EC, based on the following specifications applied:
EU Harmonized Standards: EN 61326-1:2006, EN 61000-3-2:2006+A1:2009+A2:2009, EN 61000-3-3:2008, EN 61010-1:2001CE

Certificate available upon request.²



Pinch Point Hazards

Always use caution when docking the Handler or Prober to the Fixture and Fixture to the Test Head. For some models, a pinch hazard only occurs when the test manipulator arm is moved to a maximum (up) or minimum (down) position. Do NOT insert fingers into the protected manipulator arm path at any time.



Electrical Shock Hazards

There are NO electrical shock hazards from any of the exposed electrical connections on the test head or on any surface of the system. The system uses 48 volts or less and shock hazards are typically designated as to 50 volts or higher³. No high-voltage cables or connections are exposed at any time during operations or when moving the system. Fixtures and Tester Instrument Modules (TIMs) can be safely removed "hot" without disconnecting power without damaging the equipment or exposing live connections to the operator. The system is equipped with an Emergency Off (EMO) button that instantly disables all 48 volt connections. The "Main Breaker" is used to disconnect all electrical connections and should be switched "Off" before performing any infrastructure maintenance that requires tools to remove protective metal covers.



Ergonomic Hazards

Repetitive stress injuries created by ergonomic workstation hazards are not of concern with normal system operations. Operators are **NOT** expected to use the touch screen or mouse and keyboard for an extended period of time (more than an hour). Most operators only use the system for minutes at a time, below industry guidelines for workstation safety⁴. If the system is primarily used for test plan development, however, extended periods of work may occur. A chair or stool with proper height adjustment and back support or a padded mat for standing support is suggested if the person remains in position for more than 60 minutes with 5 to 10-minute breaks.



Fire and Chemical Safety Hazards

There are NO explosive or combustible materials in the system. No chemical safety guidelines are required because no hazardous chemicals are used in the operation of the system. Exposure to hazardous amounts of lead is not possible due to the lack of direct contact to components that may have been soldered with lead. As a precaution, **DO NOT EAT, DRINK, OR SMOKE** after handling damaged internal electronic components until you have washed your hands.



RoHS Exemption

RI is exempt from RoHS standards for lead free components due to the performance characteristics of lead free components and the class of hardware⁵ (EEE Cat. 6: Large-scale stationary industrial tools).

Footnotes:

- 1 - Occupational Safety & Health Administration, <http://www.osha.gov/>
- 2 - CE Declaration of Conformity for Cassini 16 attained June, 16 2011.
- 3 - Encyclopaedia of occupational health, Jeanne Mager Stellman, pg. 52-5
- 4 - Handbook of OSHA constructions safety and health, Charles D. Reese, [pg 218](#)
- 5 - ROHS Directive, UK Government, <http://www.rohs.gov.uk/DecisionTree.aspx?id=21,http://www.rohs.gov.uk/Docs/All%20Current%20Exemptions%202011.pdf>