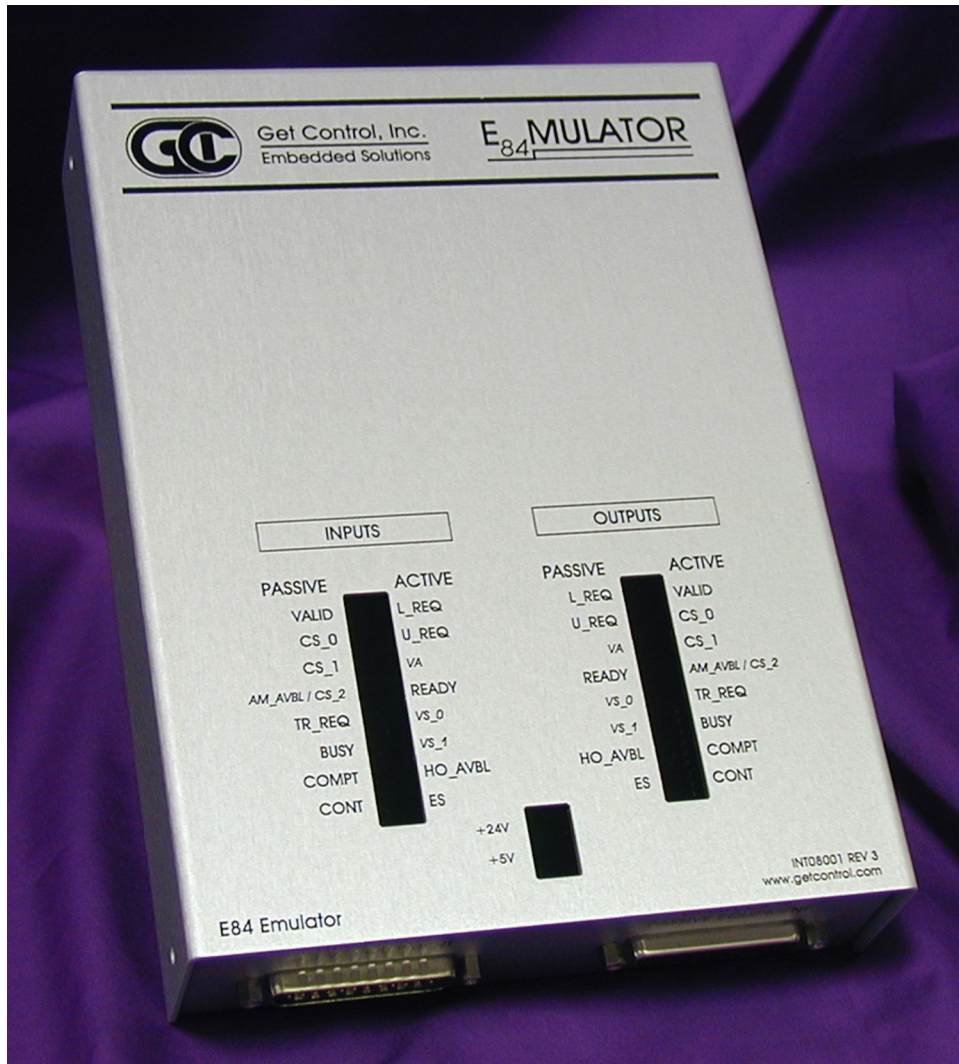


GCI E84 Emulator Getting Started

Version 2.4a



Get Control, Inc.
Embedded Solutions

Table of Contents

Overview	1
Getting Started	1
Minimum System Requirements	1
E84 Emulator Package Contents	1
E84 Emulator Power Requirements	1
Installation	2
Uninstalling the E84 Emulator Application	3
PC to E84 Emulator Connection	3
Connecting to USB	3
Powering Up the E84 Emulator	3
Connection Status Indicator	4
Using Optical Transceivers	4
E84 Handoff Modes	5
Single Handoff Mode	5
Simultaneous Handoff Mode	5
Continuous Handoff Mode	6
Using the E84 Emulator GUI	7
Main Menu	7
Automated Test Setup Screens	7
Select Default Tests Button	8
Select Unload Port Tests Button	8
De-Select All Tests Button	8
Test Setup Option Buttons	8
Continuous Handoff Test Setup Screen	9
Defining the Continuous Mode Test Sequence List	9
SELECTED CYCLES List	9
AVAILABLE CYCLES List	9
Add / Remove Buttons	9
Clear List Button	10
Cycle Sorting Buttons	10
Default Cycles Buttons	10
Test Setup Option Buttons	10
Automated Test Screens	11
Operator Action Required Screen	11
Default Timer Settings Screen	12
Operator Prompted Pass / Fail Screen	12
Test NOTES Field	12
Automated Testing Completed Screen	13
Manual Control Screens	13
Test Plans	13
E84 Emulator Connector Pinout	13
Version History	14
Version 2.4a	14
Version 2.3	14
Version 2.2a	14
Version 2.2	14
Version 2.1.1	14
Technical Support	15

List of Figures

<i>Connection Error Message</i>	2
<i>USB Cable Connection</i>	3
<i>Found New Hardware Message</i>	3
<i>E84 Emulator Main Menu</i>	4
<i>Optical Transceiver connects to the Emulator as Passive Equipment Female DB-25 connector</i>	4
<i>Example Single Handoff Mode Transfer</i>	5
<i>Example Simultaneous Handoff Mode Transfer</i>	5
<i>Example Continuous Handoff Mode Transfer</i>	6
<i>Main Menu</i>	7
<i>Automated Active Mode Test Setup Screen</i>	7
<i>Continuous Mode Test Setup Screen</i>	9
<i>Automated Active Mode Test Screen</i>	11
<i>Operator Action Required Screen</i>	11
<i>Default Timer Settings Screen</i>	12
<i>Timer Test Pass/Fail Screen</i>	12
<i>Active Testing Completed Screen</i>	13
<i>Active Mode Manual Control Screen</i>	13

Overview

The **E84 Emulator** provides an automated method to test the active and passive E84 interfaces on semiconductor processing equipment. The emulator utilizes a software based platform that runs on a PC running Windows XP, 7, or 10 operating systems. This software provides the graphical user interface (GUI) and the control algorithms. The **E84 Emulator** provides the hardware required to interface with the active or passive process equipment. The **E84 Emulator** interfaces with the laptop computers USB port.

The **E84 Emulator** performs automated E84 interface testing following pre-defined industry standard test plans. These test plans provide a means of verifying the E84 compliance of both active and passive process equipment. All defined handoff sequences are supported, including Single, Simultaneous and Continuous modes.

E84 Emulator Application Version 2.4a requires a USB Interface E84 Emulator whose hardware has been updated to version 1.3. Older versions of the E84 Emulator, both USB and Parallel Port versions, are not compatible. Contact GCI Support (support@getcontrol.com) for hardware upgrade pricing.

Getting Started

Minimum System Requirements

The **E84 Emulator Application** requires the following minimum system configuration:

- Windows XP, 7, or 10 operating system.
- One USB port for the USB Interface version.
- 40 MB of available hard disk space.

E84 Emulator Package Contents

The **E84 Emulator** package includes the following:

- The **E84 Emulator Application** installation CD-ROM.
- The **E84 Emulator**.
- 1 - 15', male-to-female, 25-pin, straight-through interface cable (connects the **E84 Emulator** to the process equipment under test).
- 1 - 6' power cable.
- 1 - USB Cable (for the USB Interface version).
- Printed *Getting Started* manual.

E84 Emulator Power Requirements

- 110 to 220 VAC 50 - 60 Hz (see rear panel).

Installation

To install the **E84 Emulator Application**, run the GCI_E84EmulatorSetup2.4a.exe program from the E84 Emulator Installation CD.

The installer is also available on-line at:

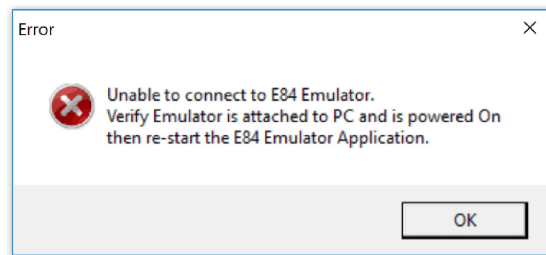
www.getcontrol.com/downloads/GCI_E84EmulatorSetup2.4a.exe

Follow the on-screen instructions, selecting the destination directory. GCI recommends accepting the default directory. Selecting a directory within the C:\Program Files or C:\Program Files (x86) directory structure is not recommended and may cause unexpected application behavior.

When installation is complete, a dialog box is displayed indicating the completion of the installation. You must re-boot your system before using the **E84 Emulator Application**.

The setup program will add a shortcut to the **E84 Emulator Application** to your Start Menu. Use this shortcut to start the **E84 Emulator Application**.

If, when starting the E84 Emulator GUI, you receive an error message of the form:



Connection Error Message

the E84 Emulator Application has failed to connect to the E84 Emulator hardware.

Check that the USB cable is properly connected and the Emulator has power.

Uninstalling the E84 Emulator Application

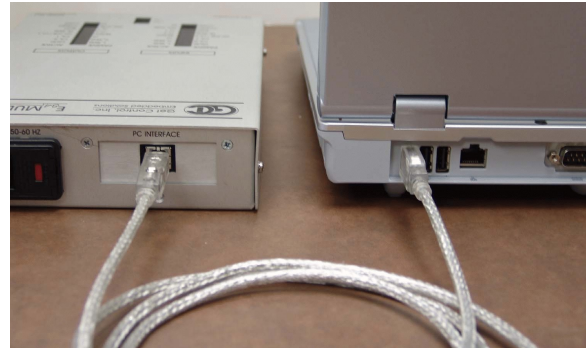
The **E84 Emulator** Installation program adds a shortcut to an uninstall program that will completely remove the **E84 Emulator Application** from your system. If it becomes necessary to remove the Application, simply click on the Uninstall shortcut and follow the on-screen instructions.

PC to E84 Emulator Connection

Connecting to USB

Connect the **E84 Emulator** to a PC USB Port and turn Emulator on before running the **E84 Emulator Application**.

Connect the provided USB cable into a USB Port on the PC and to the USB Port on the **E84 Emulator** as shown. The USB Port is located on the back panel next to the AC power input module. It is labeled PC INTERFACE.



USB Cable Connection

Powering Up the E84 Emulator

Plug the provided standard power cord into the **E84 Emulator** and into a 100V - 240V AC wall outlet. Turn the power switch on. The power switch is located on the power input module.

The top of the **E84 Emulator** has cut-outs showing a series of status LEDs. Make sure the two green power LEDs are both illuminated (+24V and +5V). If either of these LEDs are not illuminated when the **E84 Emulator** is connected to a known good AC power source (and the power switch is in the ON position), there may be a problem with the power supply in the unit.

The first time the USB Interface E84 Emulator is turned on, Windows will display a brief message indicating that it has found new hardware. The E84 Emulator utilizes the Human Interface Device (HID) Class of USB drivers. Windows XP, 7 and 10 all provide a default HID Class Driver. It is not necessary to install any additional drivers. Note, this message only appears the first time you start up the **E84 Emulator**.



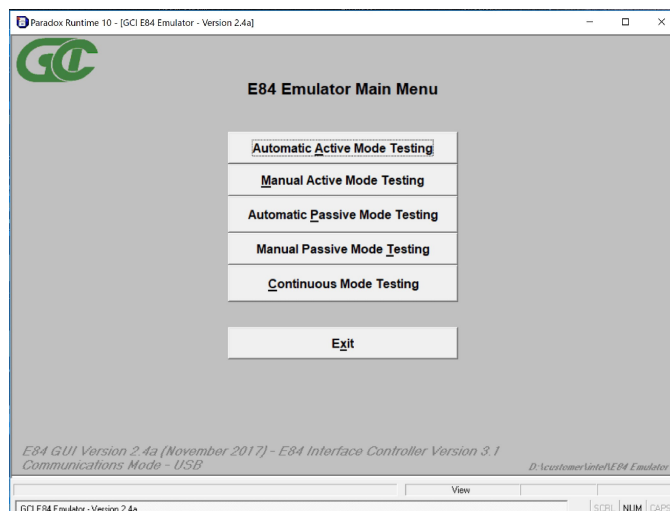
Found New Hardware Message

Connection Status Indicator

Launch the **E84 Emulator Application** from the shortcut in the Startup menu. The *Main Menu* will be displayed, and all option buttons are enabled as shown.

The Communications status is displayed in the lower left of the *Main Menu*. It will display *Communications Mode - USB* when the **E84 Emulator Application** is properly communicating with the **E84 Emulator USB Interface**.

When the user attempts to use any of the four test buttons, the **E84 Emulator Application** attempts to communicate with the E84 Emulator. With communication established, testing continues normally. If the **E84 Emulator Application** cannot communicate with the **E84 Emulator**, a Communication Error Message will be displayed, and testing will be disabled.



E84 Emulator Main Menu

Using Optical Transceivers

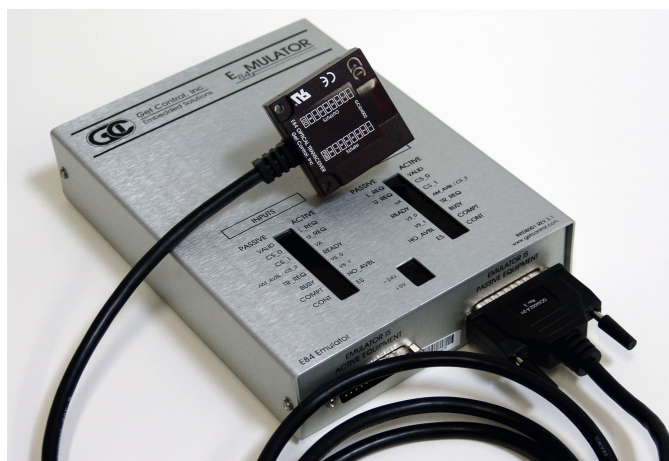
The Get Control **E84 Emulator** is shipped with a 15' connecting cable used for hardwired E84 emulation. The **E84 Emulator** is compatible with all E84 compatible Optical Transceivers. GCI produces several optical transceivers that can be used with the **E84 Emulator**.

- P/N GCI04002 - **GCI E84 Optical Transceiver** (available in 2 and 5 meter cable lengths)
- P/N GCI04100 - **GCI RJ-11 E84 Optical Transceiver** (with data logging)

Optical transceivers from GCI are compatible as shipped. Other optical transceivers must first be properly terminated with a male DB-25 connector, according to the E84 specification.

Plug an E84 compatible optical transceiver into the female DB-25 port on the **E84 Emulator** labeled **Emulator as Passive Equipment** as shown. With an optical transceiver connected in this way, the E84 Emulator Application can run both Active and Passive mode tests.

Do not attempt to install a gender changer between the optical transceiver and the **E84 Emulator**. Connecting the optical transceiver to the male DB-25 port labeled **Emulator as Active Equipment** using a gender changer will not work.



Optical Transceiver connects to the Emulator as Passive Equipment Female DB-25 connector

E84 Handoff Modes

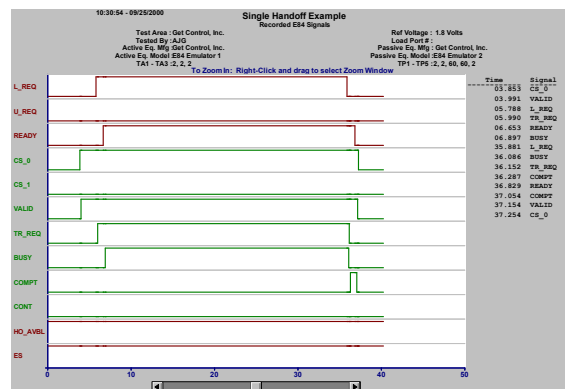
The SEMI® E84 Specification defines three types of handoff modes, Single, Simultaneous, and Continuous. The **E84 Emulator** supports all three handoff modes. This section briefly describes each mode, and explains the associated testing capabilities of the **E84 Emulator**.

Single Handoff Mode

Single Handoff Mode is used to transfer a single carrier to or from a Load Port. The AMHS equipment defines the target Load Port at the beginning of the handoff sequence, using one of the Load Port select signals (CS_0, CS_1). Only one of the two signals is activated during the handoff sequence.

The figure at right shows E84 interface signals recorded during a typical Single Handoff Mode transfer. The timing diagram shows the CS_0 signal turning ON to indicate a Single Handoff Mode transfer.

The **E84 Emulator Application** provides 17 active mode tests (Emulator acts as the active equipment) that can be run using Single Handoff Mode. These tests are selectable from the *Active Mode Test Setup Screen*, which can be reached from the *Main Menu* using the Automatic Active Mode Testing button. To configure a Single Handoff Mode test, simply select either the **CS_0** or **CS_1** button from the LOAD PORT NUMBER field on the *Active Mode Test Setup Screen*.



Example Single Handoff Mode Transfer

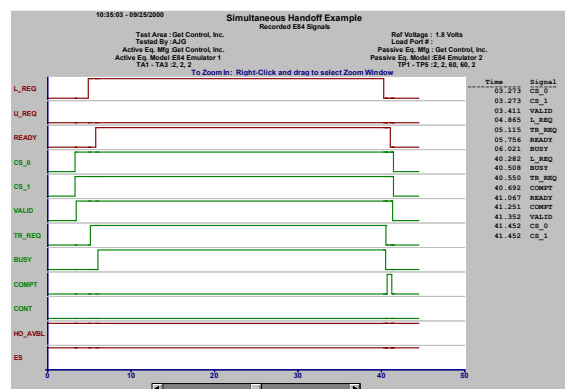
The **E84 Emulator Application** provides 15 passive mode tests (Emulator acts as the passive equipment) that can be run using Single Handoff Mode. These tests are selectable from the *Passive Mode Test Setup Screen*, which can be reached from the *Main Menu* using the Automatic Passive Mode Testing button. The active equipment sets the Load Port select signals. Therefore, in passive mode testing there are no Load Port select options. The Emulator simply provides the proper transfer handshaking, while monitoring and verifying the Load Port select signals detected at the beginning of the transfer.

Simultaneous Handoff Mode

Simultaneous Handoff Mode is used to transfer two carriers concurrently to or from two separate Load Ports. The AMHS equipment indicates a Simultaneous Handoff by setting **both** Load Port select signals (CS_0 and CS_1). Both signals remain activated during the handoff sequence.

The figure at right shows E84 interface signals recorded during a typical Simultaneous Handoff Mode transfer. The timing diagram shows the CS_0 and CS_1 signals turning ON, indicating a Simultaneous Handoff Mode transfer.

The 17 active mode tests provided by the **E84 Emulator Application** can be run in Simultaneous Handoff Mode as well as Single Handoff Mode. The only difference between Single and Simultaneous Handoff Modes is the use of the two Load Port select signals. This allows the **E84 Emulator Application** to use the same pre-defined tests to verify both Single and Simultaneous Handoff sequences. To configure a Simultaneous Handoff Mode test, simply select the Simultaneous button from the LOAD PORT NUMBER field on the *Active Mode Test Setup Screen*.



Example Simultaneous Handoff Mode Transfer

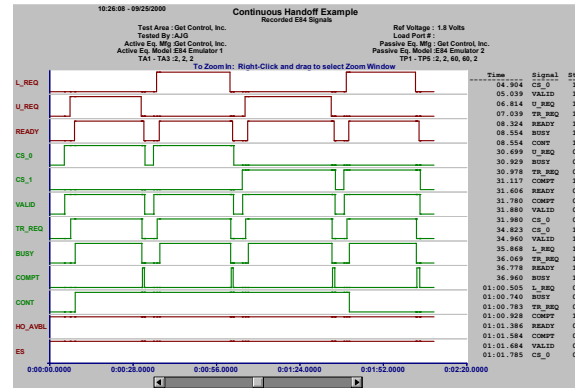
The 15 passive mode tests provided by the **E84 Emulator Application** can be also run in Simultaneous Handoff Mode as well as Single Handoff Mode.

Continuous Handoff Mode

Continuous Handoff Mode is used to transfer multiple carriers sequentially to or from a specific Load Port. The AMHS equipment indicates a Continuous Handoff by setting the CONT signal during the first carrier handoff, at the time the BUSY signal is turned ON. The AMHS keeps the CONT signal ON through subsequent carrier handoff's, turning it OFF during the last carrier handoff.

The figure at right shows E84 interface signals recorded during a typical Continuous Handoff Mode transfer. The timing diagram shows a four carrier, Continuous Handoff sequence: Unload CS_0, Load CS_0, Unload CS_1, Load CS_1. Note how the CONT signal turns ON during the first carrier handoff, and remains ON until the last carrier handoff.

The **E84 Emulator Application** provides three Continuous Handoff Mode tests; two active mode, and one passive mode. These tests are selectable from the *Continuous Mode Test Setup Screen*, which can be reached from the *Main Menu* using the Continuous Mode Testing button.



Example Continuous Handoff Mode Transfer

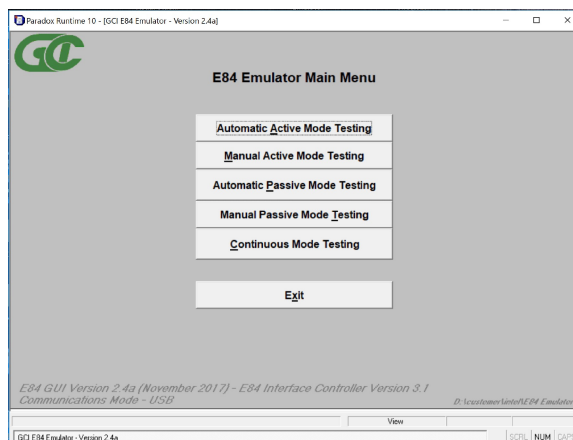
Using the E84 Emulator GUI

The user interface is broken down into a series of menu, configuration, and test screens. The user navigates through these screens by selecting option buttons (with mouse clicks, or keystrokes) provided on each screen.

Main Menu

At startup, the **E84 Emulator Main Menu** is displayed. At the lower left corner of the *Main Menu*, version number information is displayed for both the GUI and the **E84 Emulator** firmware. The communications mode in use between the GUI and the **E84 Emulator** is also shown.

Menu options are associated with a button on the *Main Menu*. The desired menu option is selected by clicking the button with the mouse, or using the keyboard to activate the associated hot key. An underlined character in the text of the button designates the buttons hot key. Generally, the first unique character in the buttons text is used for the hot key.



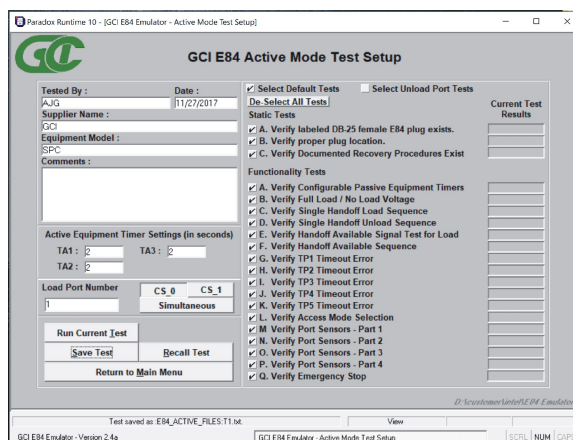
Main Menu

Automated Test Setup Screens

Test suite setup is performed in the *Automated Active Mode* and *Automated Passive Mode* Test Setup screens.

When running Active Mode tests, the **E84 Emulator** is testing as the Active entity. Attach the female end of a straight through, 25-pin, male-to-female cable (provided) to the DB-25 connector labeled EMULATOR IS ACTIVE EQUIPMENT on the **E84 Emulator**. Attach the male end of the cable to the DB-25 E84 plug on the passive equipment being tested.

When running Passive Mode tests, the **E84 Emulator** is testing as the Passive entity. Attach the male end of a straight through, 25-pin, male-to-female cable (provided) to the DB-25 connector labeled EMULATOR IS PASSIVE EQUIPMENT on the **E84 Emulator**. Attach the female end of the cable to the DB-25 E84 plug on the active equipment being tested.



Automated Active Mode Test Setup Screen

Both test modes will also function through an attached optical transceiver. Attach an optical transceiver to the female DB-25 connector labeled EMULATOR IS PASSIVE EQUIPMENT. Either Active or Passive Mode tests will function through a properly attached optical transceiver.

The *Automated Test Setup Screen* is divided into two main sections. The left side of the screen provides data fields for entering details about the equipment being tested.

For Active Mode Tests, the desired Active Mode timeouts can be entered in the three ACTIVE EQUIPMENT TIMER SETTINGS box fields (TA1, TA2, TA3). The Load Port being tested is defined using the LOAD PORT NUMBER buttons and field. For Simultaneous Handoff Mode testing, select the Simultaneous button. For Single Handoff Mode testing, select either the CS_0 or CS_1 button.

For Passive Mode Tests, the desired Passive Mode timeouts can be entered in the five PASSIVE EQUIPMENT TIMER SETTINGS box fields (TP1, TP2, TP3, TP4, TP5). The Load Port being tested is defined using the LOAD PORT NUMBER field. Passive Mode testing does not require the definition of a specific Load Port select signal (CS_0, CS_1). The **E84 Emulator** notes which signal is activated at the beginning of the handoff sequence. This allows for passive mode testing of both Single and Simultaneous Handoff Modes.

A COMMENTS field is also provided to allow the user to enter test specific comments. All fields (with the exception of the COMMENTS field) must be entered before automated testing can begin.

The right side of the screen lists check-off boxes to select pre-defined Automated Tests provided by the **E84 Emulator**. The user simply checks off the desired tests. Next to each test definition on the right side of the screen is a field that shows the current test results for each test. Initially, the fields are empty since no tests have been run. Once each test is executed, the individual test results (Pass, Fail, Untested) are displayed in these fields. For details on the available active and passive mode tests, see the online help system.

Select Default Tests Button

The Select Default Tests button selects default load cycle testing, and marks all tests to run. This provides a quick method of selecting all tests. For Passive Mode testing, this is the only function of the Select Default Tests button. For Active Mode testing, this button has one additional function.

The **E84 Emulator** can test certain Active Mode tests using either the Load or Unload Cycle sequences. The default testing method uses the Load Cycle. This button sets the **E84 Emulator** to use the Load Cycle tests.

Select Unload Port Tests Button

The Select Unload Port Tests button selects only those tests that can be tested using the Unload Cycle sequence. The tests included during Unload Port Testing are the five TP Timer tests, a handoff available test, Access Mode Selection, two Port Sensor tests, and the Emergency Stop test.

When the Select Unload Port Tests button is selected, a note is added to the text report.

Note that the test steps described in the **Active Mode Test Plan** section change to match the Unload Cycle when testing with the Select Unload Port Tests button selected.

De-Select All Tests Button

The De-Select All Tests button un-checks all tests, allowing the user to quickly remove all tests from the test plan. This is useful when the user wishes to run only one or two tests. Instead of having to un-click each unwanted test individually, the user can un-click all tests, then add only those tests desired.

Test Setup Option Buttons

A series of option buttons are provided at the lower left of the screen. These buttons allow the user to: run the currently configured test suite, configure a new test suite, save the currently configured test suite, recall a previously saved test, and return to the Main Menu.

Continuous Handoff Test Setup Screen

The *Continuous Mode Test Setup Screen* is used to configure Continuous Handoff Mode tests. The *Continuous Mode Test Setup Screen* is divided into several sections.

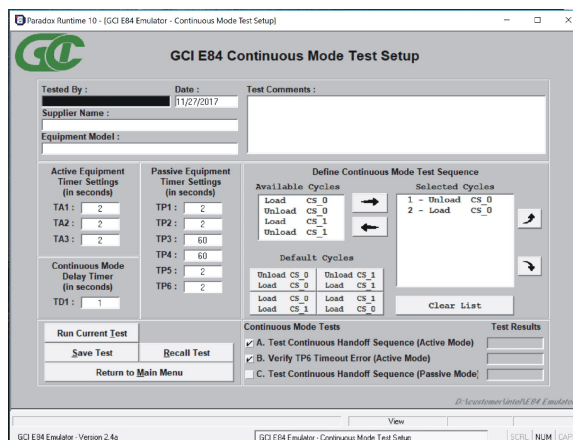
Data entry fields allow the user to enter details about the equipment being tested.

Active Mode timeouts are entered in the three ACTIVE EQUIPMENT TIMER SETTINGS box fields (TA1, TA2, TA3). Passive Mode timeouts are entered in the six PASSIVE EQUIPMENT TIMER SETTINGS box fields (TP1, TP2, TP3, TP4, TP5, TP6). Delay timer settings are entered in the CONTINUOUS MODE DELAY TIMER box field (TD1).

A COMMENTS field is also provided to allow the user to enter test specific comments.

All fields (with the exception of the COMMENTS field) must be entered before automated testing can begin.

The bottom right side of the screen lists check-off boxes to select pre-defined Continuous Mode Tests provided by the **E84 Emulator**. The user simply checks off the desired tests. Next to each test definition on the right side of the screen is a field that shows the current test results for each test. Initially, the fields are empty since no tests have been run. Once each test is executed, the individual test results (Pass, Fail, Untested) are displayed in these fields. For details on the available Continuous Mode tests, see the **Test Plans** section towards the end of this manual.



Continuous Mode Test Setup Screen

Defining the Continuous Mode Test Sequence List

A DEFINE CONTINUOUS MODE TEST SEQUENCE box allows the user to define the specific order of handoff's to run during Continuous Handoff Mode testing. This box contains an AVAILABLE CYCLES list, a set of DEFAULT CYCLE buttons, the current set of selected handoff's (SELECTED CYCLES list), a Clear List button, an Add Cycle button, a Remove Cycle button, and two sorting buttons (Move Up, Move Down) displayed as arrows.

SELECTED CYCLES List

This field shows the list of currently selected handoff's. When running test A (active mode), this list defines the sequence of handoff's requested by the **E84 Emulator** acting as the active equipment. When running test C (passive mode), this list defines the sequence of handoff's the **E84 Emulator** expects to see when acting as the passive equipment. When running test B (TP6 Timeout Error), the first handoff in the list is requested by the **E84 Emulator**, after which the TP6 timeout error is verified.

At least one handoff must be placed in this list before testing can begin.

AVAILABLE CYCLES List

There are four available handoff's: Load CS_0, Unload CS_0, Load CS_1, Unload CS_1. Double-clicking one of these cycles will add that cycle to the SELECTED CYCLES list.

Add / Remove Buttons

The Add and Remove buttons are located between the AVAILABLE CYCLES list and the SELECTED CYCLES list, and take the shape of right and left arrows respectively. To Add a cycle, single click the desired cycle in the AVAILABLE CYCLES list (the selected cycle will be highlighted in blue) and click the Add (right arrow) button. The selected cycle will be added to the SELECTED CYCLES list.

To remove a cycle, single click the desired cycle in the SELECTED CYCLES list, and click the Remove (left arrow) button. The selected cycle will be removed from the SELECTED CYCLES list.

Clear List Button

This button clears the SELECTED CYCLES list.

Cycle Sorting Buttons

Two cycle sorting buttons positioned to the right of the SELECTED CYCLES list. The top button (displayed as an upward pointing arrow) moves the selected cycle up one step in the SELECTED CYCLES list. The bottom button (displayed as a downward pointing arrow) moves the selected cycle down one step in the SELECTED CYCLES list.

Default Cycles Buttons

A set of Default Cycle buttons are provided that allow the user to quickly define one of four standard Continuous Handoff sequences. These standard sequences include: Unload CS_0 - Load CS_0, Unload CS_1 - Load CS_1, Load CS_0 - Load CS_1, and Load CS_1 - Load CS_0.

Test Setup Option Buttons

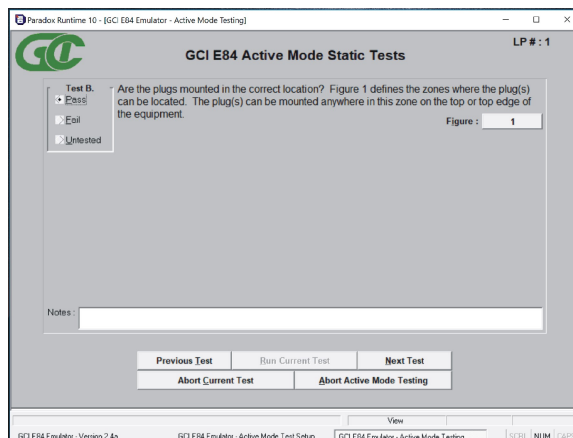
The same option buttons are provided as described above. These buttons allow the user to: run the currently configured test suite, configure a new test suite, save the currently configured test suite, recall a previously saved test, and return to the Main Menu.

Automated Test Screens

An *Automated Test Screen* is used to display test status information during automated testing.

The **E84 Test Plan** for Single and Simultaneous Handoff mode testing includes two types of Automated Tests, Static and Functionality. Static mode tests require the user to mark the test results manually. Typical Static tests include verification of proper E84 plug location.

Static mode tests must be passed / failed by the user. The user must mark the test results by clicking with the mouse, or using the hot-key combination from the keyboard. Hot keys for the three available test results are: Alt-P (Pass), Alt-F (Fail), Alt-U (Untested).



Automated Active Mode Test Screen

The second type of Automated Tests defined by the **E84 Test Plan** is Functionality tests. These tests are automated by the **E84 Emulator**, and include several individual steps to complete. During Functionality testing, a flashing "Please Wait - Testing" message is displayed directly below the test title. As each step of the current Functionality test is completed, a test step message is displayed in the large, center window of the *Automated Test Screen*. This window gives a detailed history of the steps completed for the given test. If the test fails, the test step that the failure occurred is displayed in this window, along with a failure message.

Continuous Handoff Mode testing involves running several separate handoff's sequentially. An typical Continuous Handoff Mode test might first Unload the carrier on Load Port CS_0, then load a new carrier to the same Load Port. For Continuous Handoff Mode testing, the test step details for each individual handoff is displayed during the handoff. At the end of each individual handoff, the message is displayed indicating that the **E84 Emulator** is processing the TD1 delay timer. This timer (defined by the SEMI® E84 Specification as a delay time between the VALID signals of two successive handoff's) is used to separate two handoff's.

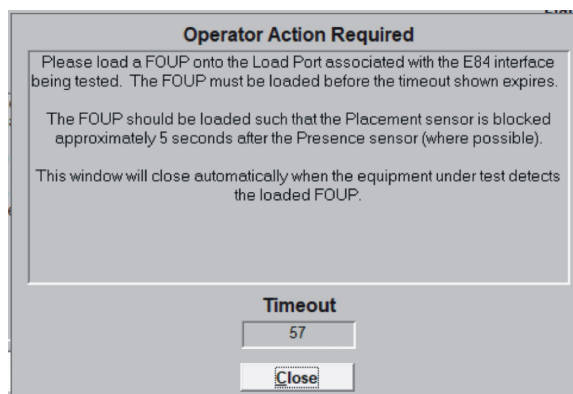
When the TD1 timer has expired, the center window on the *Automated Test Screen* is cleared, and the test steps for the next handoff are displayed.

During Continuous Handoff Mode testing, a CURRENT CYCLE field is displayed above the test step detail window, indicating the current handoff being tested.

Operator Action Required Screen

Most Functionality tests include at least one test step that requires the user to perform some action. A typical action would be loading a FOUP onto the Load Port during a Load Cycle test. When one of these test steps is processed, an *Operator Action Required Screen* is displayed, detailing the specific action required by the user.

Some of these required actions must be completed within a certain time frame. Continuing the example started above, during a Load cycle test, the **E84 Emulator** follows the proper handshaking with the process equipment until the point where the process equipment expects to see the FOUP loaded into its Load Port. The process equipment places a timeout



Operator Action Required Screen

(TP3) on seeing the FOUP loaded. If the FOUP is not positioned properly on the Load Port before the timeout expires, the process equipment will report an error.

Default Timer Settings Screen

The **E84 Emulator** uses timer information entered by the user during Active and Passive mode Functionality Test A to inform the user of the time available to complete the required action. If the user does not run Functionality Test A, the **E84 Emulator** uses the default timer values defined by the E84 specification. It is therefore very important that the user select the Functionality Test A during test setup.

When the *Operator Action Required Screen* is displayed, the value entered for the applicable timer setting is displayed on the *Operator Action Required Screen*. The display will decrement that timer value each second, showing the user the remaining time available to complete the required action.

Enter Default Passive Equipment Timer Settings
(Must be in the range of 1 - 999 seconds)

TP1 : 2
TP2 : 2
TP3 : 60
TP4 : 60
TP5 : 2

Close

Default Timer Settings Screen

Operator Prompted Pass / Fail Screen

Some Functionality tests (specifically the Timer tests) require the user to mark the final Pass/Fail status of the test based on feedback (unavailable to the **E84 Emulator**) from the equipment being tested. For example, when testing passive equipment timeout settings, the **E84 Emulator** will force a timeout error by not following the specified handshaking signals. The passive equipment being tested is required to issue a timeout alarm on its user interface. The details of this timeout alarm are not reported through the handshaking interface. The user is required to make the final Pass/Fail determination. The user is prompted for the Pass/Fail status of the test through a special *Timer Test Screen*. This screen provides the user with details on how to determine the Pass/Fail status of the test, along with two option buttons (Pass and Fail) to mark the actual test results.

Passive TP3 Timer Test

TP3 Timer Test in progress. When the timeout shown decrements to zero, the Passive Equipment under test should generate a TP3 alarm on its User Interface. If the alarm does not occur at the appropriate time (either before, or after the timeout expires) the timer test has failed, and the user should press the Fail Button. If the alarm does occur at the proper time, the timer test has passed, and the user should press the Pass Button.

Timeout
56

Pass Fail

Timer Test Pass/Fail Screen

Test NOTES Field

A NOTES entry field is provided for each Static and Functionality test. The notes field is a free format field (maximum of 32,768 characters) where the user can make notes concerning the current test. These notes are stored along with the rest of the test details when the user saves the test from the associated *Test Setup Screen*.

Five option buttons are displayed at the bottom of the *Automated Test Screen*. These buttons allow the user to: go back to the previous test, run the current test, advance to the next test, abort the current test, and abort all active mode testing.

Automated Testing Completed Screen

When all selected tests have completed (or when the user has aborted the test sequence) the *Automated Tests Completed Screen* is displayed. All automated testing terminates with this screen to inform the user that Automated Testing has ended.

It is important to remember that the test information and results are not automatically saved. The operator must select the *Save Test* button to save the current test setup and results. If the user selects either the *New Test* or *Return to Main Menu* buttons before saving the current test, the system warns the user that the current test results will be lost without saving.

Manual Control Screens

Options from the Main Menu allow for manual control of the E84 interface signals. Both Active and Passive manual control is available.

The Active Mode Manual Control Screen allows toggling of all Active E84 output signals. The screen also displays the live status of the Passive equipment's output signals.

The Passive Mode Manual Control Screen allows toggling of all Passive E84 output signals. The screen also displays the live status of the Active equipment's output signals.

No automated timing sequences are followed in the manual control screens. The E84 Tester simply sets the outputs based on the state of the toggle buttons, and displays the inputs based on their current state.

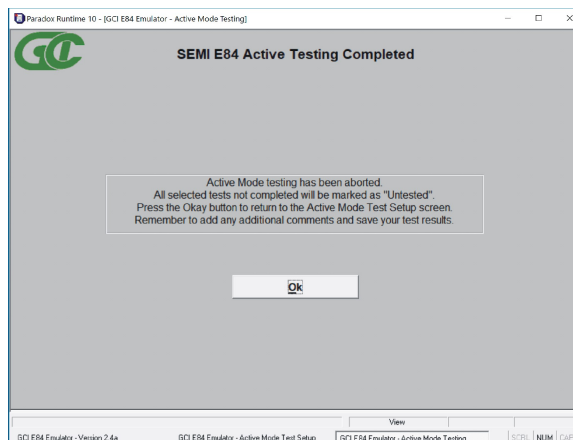
Test Plans

The **E84 Emulator Application** has two built-in test plans, one for Active Mode Testing and one for Passive Mode Testing. Additionally, the **E84 Emulator Application** allows for customized Continuous Mode testing, using the Load and Unload tests defined in the standard test plans.

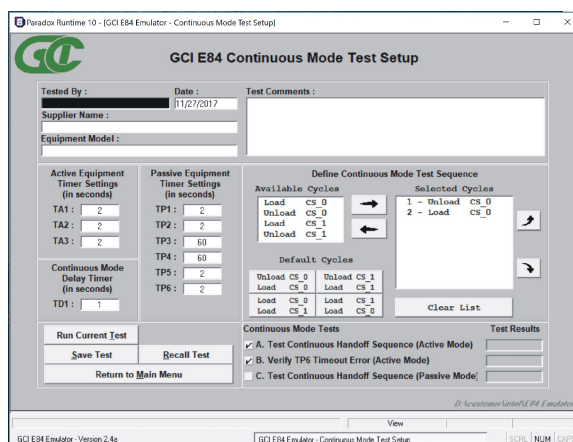
Details on individual tests defined for each Test Plan can be found in the online help system, and in the **GCI E84 Emulator Application Users Guide** which is installed as a PDF file during software installation. A shortcut to this manual is placed in the start menu along with the application shortcut.

E84 Emulator Connector Pinout

The **E84 Emulator** provides two DB-25 connectors (labeled EMULATOR AS ACTIVE EQUIPMENT and EMULATOR AS PASSIVE EQUIPMENT). The connector pin assignments meet the E84 Specification for Active and Passive equipment. A pin assignment table can be found in the online help system, and in the **GCI E84 Emulator Application Users Guide**.



Active Testing Completed Screen



Active Mode Manual Control Screen

Version History

Version 2.4a

- Supports Windows 7 & 10 when connected to a USB Interface E84 Emulator that has been updated for Windows 10 compatibility.
- Added Active Mode Manual Step Control Screen.
- Added PDF report generation.

Version 2.3

- Previous version would issue a system error if communications with the USB Emulator were interrupted. This version captures that error condition, displays an error message, and provides a retry option to the operator.
- The working directory is now displayed on the Main Menu. The Load Port Number entered during Active Mode Test Setup is now displayed on the Active Mode Test screens. These two changes help in distinguishing which Application instance is controlling each USB Emulator.

Version 2.2a

- Modifications to allow multiple instances of the Application to be running on the same PC at the same time. Multiple USB E84 Emulators can be controlled on the same PC by running multiple instances of the Application.

Version 2.2

- The ES signal is now monitored during all Active Mode tests. Previous versions did not monitor the ES signal during timeout and port sensor tests. This falsely passed load ports that dropped ES along with HO_AVBL on timeout errors. This change properly implements testing the ES signal as defined in section A1-4.5 of the E84 standard.
- HO_AVBL is now checked following completion of timeout tests (in Active Mode). The software asks the operator to pass / fail the test based on the load ports display of the timeout error on its GUI. When the operator passes the test, the Emulator now checks the HO_AVBL signal to make sure it has turned OFF. The load port should turn HO_AVBL OFF with the timeout error. If the load port properly displays the timeout message, but fails to drop HO_AVBL, the test is failed.
- An online help system has been added, giving additional details on the use of the E84 Emulator, along with detailed test suite information.

Version 2.1.1

- The Active Mode E-Stop test reported false failures on certain LoadPorts. The 500 mSecond debounce window incorrectly monitored the L_REQ signal. All signals are now allowed to fluctuate during the 500 mSecond window.
- A fix was added to correct for a database lock-up condition reported by some users.
- Interbay signals are now supported in Manual Mode Testing.

Additional version history details can be found in the online help system.

Technical Support

If you encounter problems using your E84 Emulator, Get Control technical support can be reached the following ways.

By email at support@getcontrol.com.

Please include GUI and **E84 Emulator** version numbers in your email, along with the following details:

- The Test Mode (Active, Passive or Continuous) you are running.
- The Test Number and State where the problem is occurring.
- Any Error messages displayed.

By phone at 1-480-539-0478 (9 - 5, Mountain Standard Time).

Please have the same information available when calling.

Also, see our web site at www.getcontrol.com for additional information about Get Control, Inc.

Software upgrades (when released) can also be found at www.getcontrol.com/products/e84emulator.html.