



CheckSum System Configuration and Module Addresses

Primary and Secondary Addresses

There are two addressing methods used for CheckSum modules. Most modules use primary and secondary addressing. The primary address is also called the Base Address (PC I/O address) and the secondary address is called the Board Select address. Some older modules, such as the TR-8 system module and TR-8-1 module use base addressing only. With secondary addressing, a single base address is used. There are a limited number of common base I/O addresses and address conflicts will occur if two modules are configured with the same base address. New modules can avoid address conflicts with secondary addressing since only one base address range is required.

Address Setup

Each hardware module address is set with address jumpers. The module address jumpers are located at the top of the module. Each jumper has two holes to span two pins. The color of the address jumpers is normally black or red.

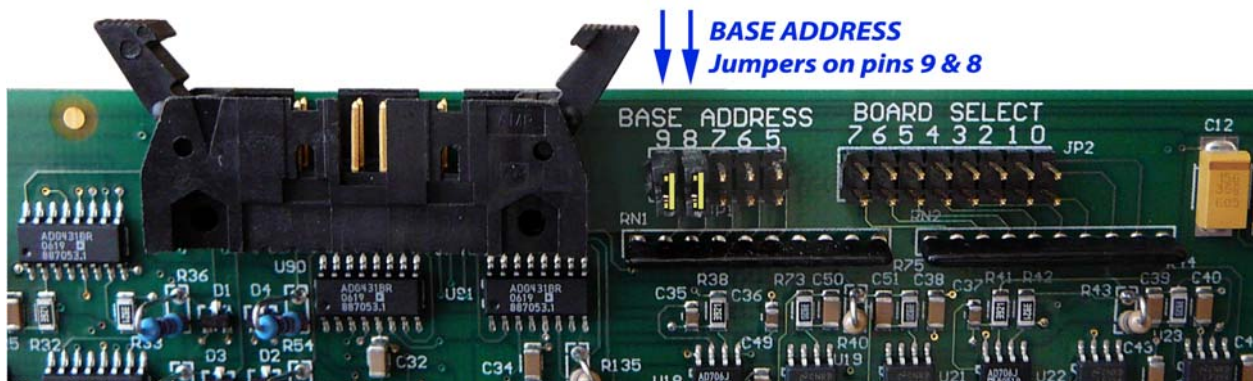


Figure 1 Module Address Jumpers (TR-10 System module shown)

The system stores the module address configuration in a file located in the system directory, typically the C:\checksum directory. This system configuration file contains all of the system setups.

The system configuration file name is dependent on the specific system software:

System Software	Configuration File Name
Analyst ems	\$EMS\$.DAT
Analyst ems+ft	\$TR10\$.DAT
Analyst fcs	\$EMS\$.DAT
MultiWriter pps	\$PPS\$.DAT
Analyst ft	\$TR10\$.DAT
Analyst mc	\$MC\$.DAT
TR-8	\$TR8\$.DAT
TR-4	\$TR4\$.DAT

Figure 2 System Configuration File Names

When the CheckSum system software starts-up, the configuration file is loaded. The module addresses contained in the configuration file are used to communicate with each module. If the module address in the system configuration file does not match the address setup with the module address jumpers, the software cannot communicate with the module and various errors will occur.

Note: For proper test system functionality, each module address jumper setting must match the system configuration setup.

If the system tries to communicate with a module and the module is either not installed in the chassis, defective, or has its base or board select address jumpers on different pins, the system will pop-up a warning message about the problem at start-up. Also, a “?” will be shown in the column in front of the module name in the system configuration window.

To make an address change or verify the address configuration, click on the Configure System button from the main menu, press the F4 function key, or select the menu item *Configure System > Modules F4*. The module configuration window will open and display the current setup for the system.

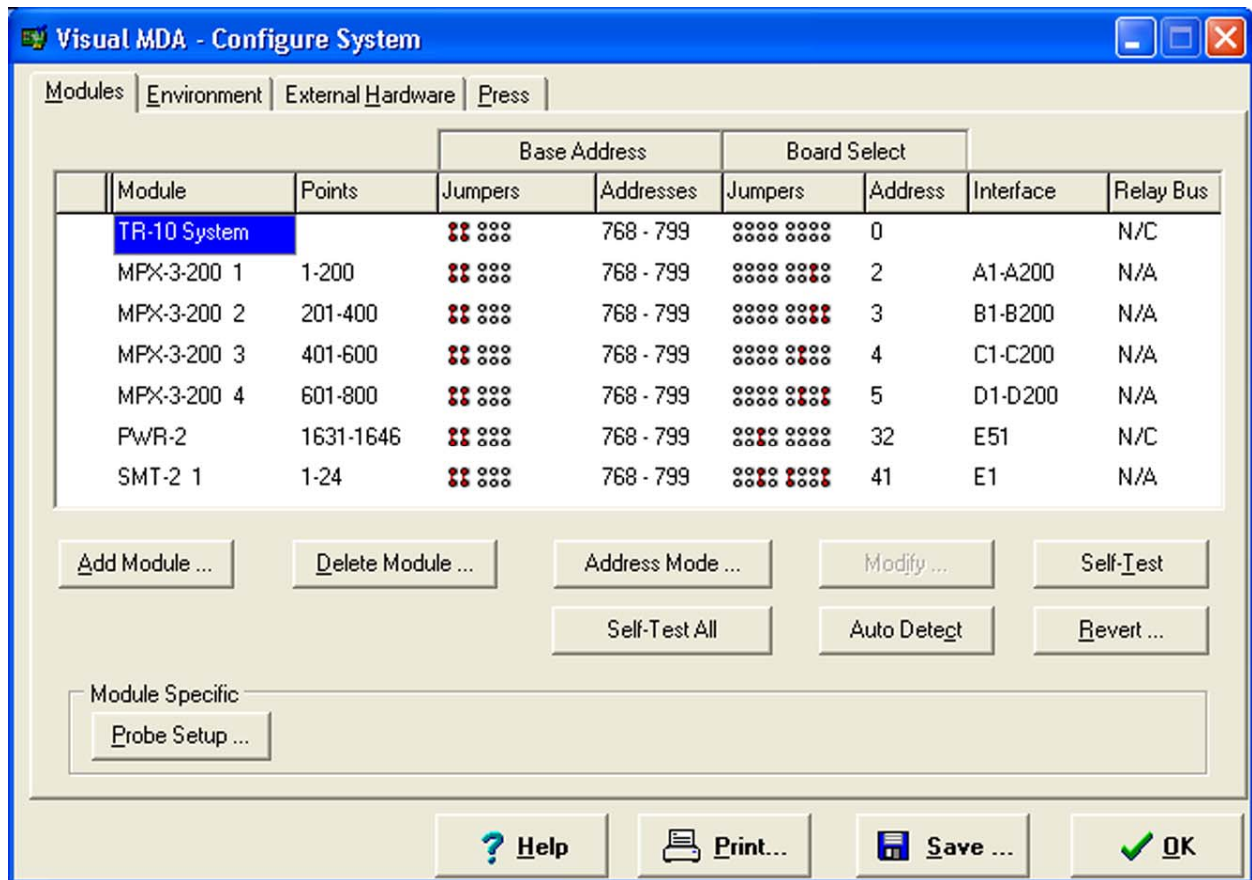


Figure 3 Typical Analyst TR-10 Test System Module Configuration

To view or modify the module address setting, click on the cell for the jumper address setting for any module (see the Base Address Jumpers selection in *Figure 4*) and press the **Modify...** button. This will open the “**Modify Primary Jumper Address**” window:

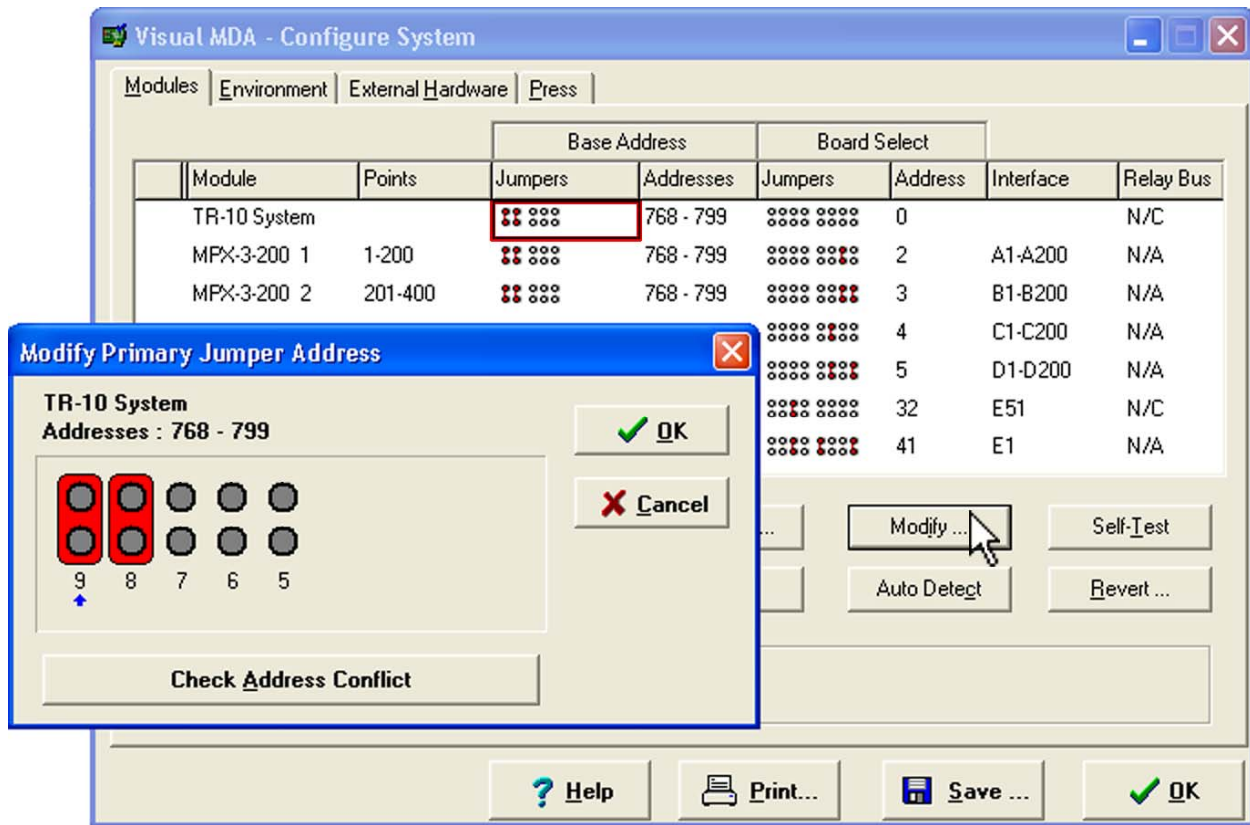


Figure 4 Configuration System, Modify Primary Jumper Address window

Figure 4 shows the **TR-10 System** module setup with the typical base address setting with two base address jumpers installed, on pins 9 and 8. This selects the PC I/O address range of 768 to 799 (hex address of 300 to 31F). The **TR-8 System** module is typically setup with the base address setting with two base address jumpers installed, on pins 9 and 7. This selects the PC I/O address range of 640 to 655 (hex address of 280 to 28F).

To change the address in the “**Modify Primary Jumper Address**” window, double-click on the number below each jumper setting to indicate a jumper is to be removed or installed. Changes to this setting do not change the jumpers on the module; you must change the module address jumpers manually. This window simply shows the address jumpers required on the module to select the address range shown, it does not show the jumpers that are actually installed. The same is true for the Board Select jumpers. Remember, the module address jumpers must match the system configuration setup for proper communication.

Notes: All modules with board select addresses must use the same base address. Each module must have a unique secondary address. Modules that only have a base address and no secondary board select address cannot have an overlap with any other base address range for any other module.

The **Check Address Conflict** button in the **“Modify Primary Address Jumper”** window can be used to insure the CheckSum module addresses do not conflict with each other.

The system configuration file is a binary file so you cannot simply open this file. However, you can print or save the useful contents of this file to a text file that you can open, store and print. The steps to do this are outlined the document **“Test System Configuration”**. A copy of this document can be downloaded from the CheckSum web site: <http://www.checksum.com/support/downloads.asp>. Simply click on the hyperlink to the PDF copy of this document.

The following is a section of a text file that shows the address setup for an Analyst ems:

```

=====
                        System Configuration

Testing Facility:      CheckSum Engineering

System ID:            Analyst ems #10

Test System:         CheckSum Analyst ems

Software Version:    6.1i4

Report Date:         19 Aug 2008
Time:                5:25

=====

HARDWARE:

Module      Points      Jumpers  Addresses  Sec Add.  Conn.      CrossPt
-----
TR-10 System
MPX-3-200  1  1-200      11 000    768 - 799  1          A1-A200    N/A
MPX-3-200  2  201-400    11 000    768 - 799  2          B1-B200    N/A
MPX-3-200  3  401-600    11 000    768 - 799  3          C1-C200    N/A
MPX-3-200  4  601-800    11 000    768 - 799  4          D1-D200    N/A
PWR-2      1631-1646  11 000    768 - 799  32         E51        N/C
SMT-2  1  1-24       11 000    768 - 799  41         E1         N/A

```

Figure 5 Analyst ems System Configuration File (first lines only shown)

Figure 5 shows a test system configured with seven (7) modules that should be installed the test system.

There are thousands of possible test system configurations with different modules. CheckSum sets up each test system and verifies the configuration prior to shipment. If the test system does not include the system PC, the configuration will need to be setup after the PC is connected to the test system. Part of the setup includes the installation of the USB driver on the PC. The steps to do this are outlined the document **“Analyst ems Test System Software and USB Driver Installation Instructions”**. A copy of this document can be downloaded from the CheckSum web site: <http://www.checksum.com/support/downloads.asp>. Simply click on the hyperlink to the PDF copy of the document **“Standard USB Driver Installation”**.

The recommended procedure to verify that the address configuration is correct is that each module in the test system chassis has a corresponding entry in the module configuration list. There should not be any more, or less, test modules in the chassis than shown in the configuration. Some CheckSum modules are not in the module list such as the USB2C control module since the USB2C module does not use any PC I/O base addresses. For systems with multiple chassis, the bus extender modules (Acces I/O) are not in the system configuration. For a TR-8 or TR-4 system, the embedded PC control module/board is not in the system configuration.

Both the Analyst series and the TR-8 systems can use modules with Base Address only or Base Address and Board Select addressing.

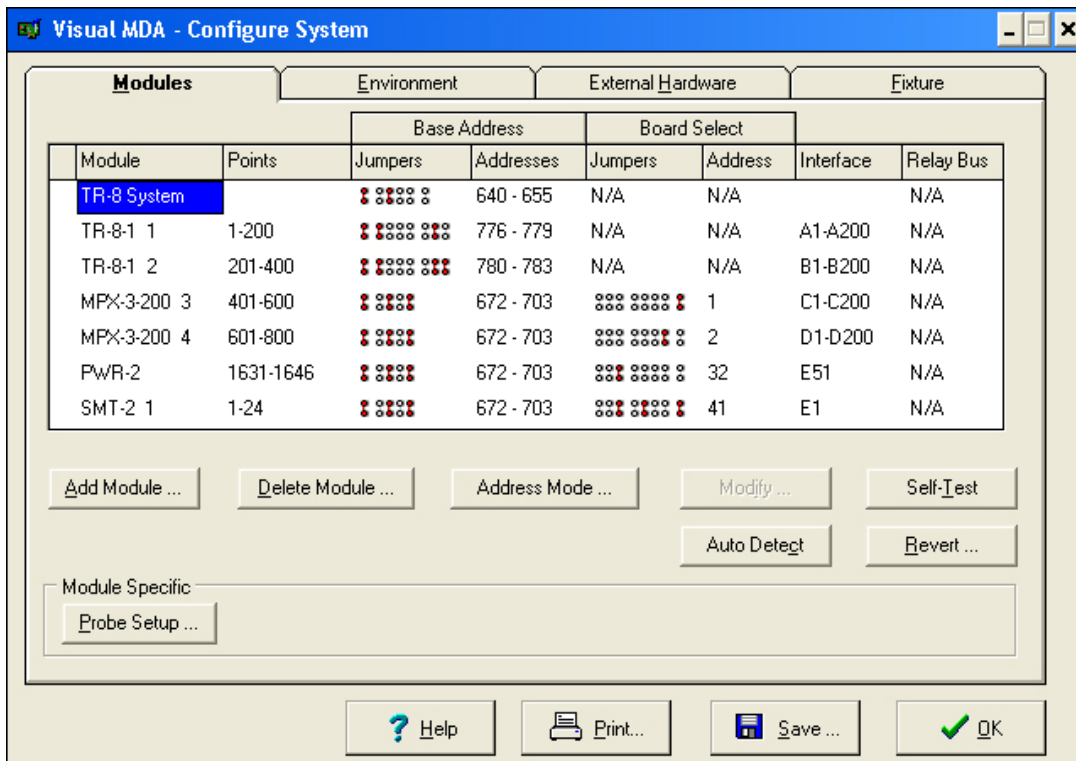


Figure 6 Typical TR-8 Test System Configuration

Figure 6 shows some typical TR-8 modules with different **Base Address** ranges since these modules do not have a **Board Select** address. The **TR-8 System** module and the **TR-8-1** MPX modules have only a base address. The other modules have a common base address range (**672-703**) and a unique secondary, board select address.

The system communicates with the modules based on the module configuration setup. The physical position of a module in the chassis does not affect the addressing. There are module placement conventions in the chassis however the address jumpers determine the module address and the module configuration address specifies a particular module. For example, if the board select jumper for **MPX-3-200 3** (shown with **Points 401-600**) and **MPX-3-200 4** (**Points 601-800**) were swapped then the test points would be swapped. This means the 50-pin ribbon cables connected to test points 401 to 600 before the swap would now be test points 601-800. Changing the jumpers can be an aid in diagnosing technical problems with modules. If you have any questions, please contact CheckSum.

TR-8 to TR-10 System Module Conversion

When you change the system module from a TR-8 to a TR-10, some changes may be required for the address jumpers on one, or more modules.

For example, the TR-10 is typically setup with the base address of 768-799 with jumpers on positions 9 & 8. The TR-8-1 modules are normally setup starting with the base address 776-779. This combination will cause an Address Conflict, press the **Check Address Conflict** button on the **“Modify Primary Jumper Address”** window to verify and review any conflicts.

If you change the TR-10 system module base address to 672 with jumpers on positions 9, 7 & 5 then there is no address conflict with the TR-8-1 modules. Figure 7 shows the previous TR-8 setup changed to a TR-10 system module and a new MPX-5-200 module added:

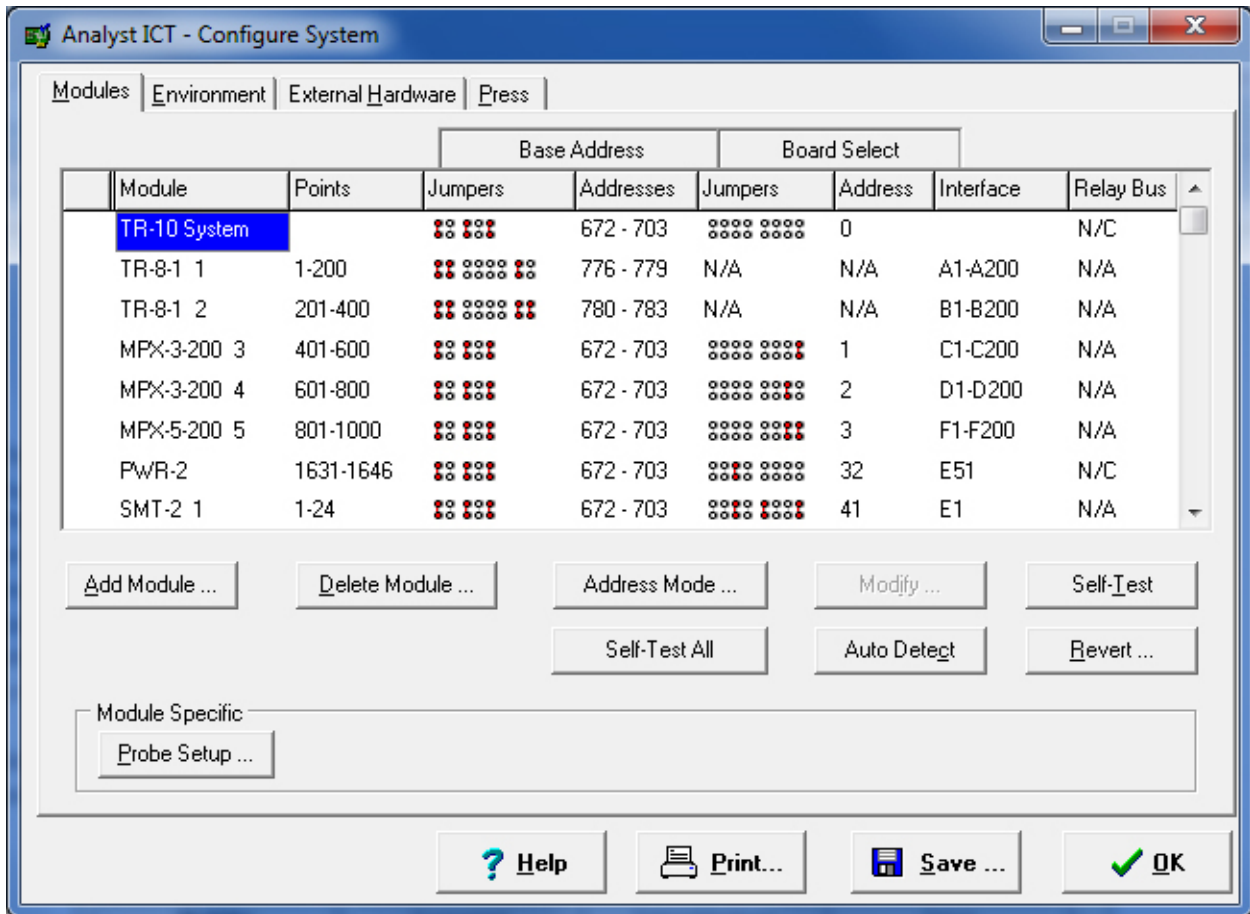


Figure 7 Typical TR-10 Test System Configuration with TR-8-1 Modules

The following is a section of a text file for the address setup as shown in Figure 7:

```

=====
                        System Configuration

Testing Facility:      CheckSum Engineering

System ID:            Analyst ems #19

Test System:         CheckSum Analyst ems

Software Version:    6.1i4

Report Date:         19 Aug 2011
Time:                4:56

=====

HARDWARE:

Module      Points      Jumpers      Addresses      Sec Add. Conn.      CrossPt
-----
TR-10 System
TR-8-1  1      1-200      11 0000 10      776 - 779      N/A      A1-A200      N/A
TR-8-1  2      201-400    11 0000 11      780 - 783      N/A      B1-B200      N/A
MPX-3-200  3      401-600    10 101      672 - 703      1      C1-C200      N/A
MPX-3-200  4      601-800    10 101      672 - 703      2      D1-D200      N/A
MPX-5-200  5      801-1000   10 101      672 - 703      3      F1-F200      N/A
PWR-2      1631-1646  10 101      672 - 703      32      E51          N/C
SMT-2  1      1-24      10 101      672 - 703      41      E1          N/A

```

Figure 8 Analyst ems System Configuration File (first lines only shown)

Off-Line Configuration

It is common practice to use an off-line PC to develop test programs or use the built-in CheckSum Statistical Process Control software to analyze saved test results. In this configuration, no modules are “connected” to the PC. The recommended configuration is to match the test system configuration where the test program is used to test boards. Some test steps are dependent on the system configuration and it is more important to match the test system where the test program will be used than the configuration of the system used to create the test program.

Self-Test

To verify the modules are installed and working properly, open the module configuration window and select the system module (TR-10 or TR-8) and click on the Self-Test button to test this module. The system module is used to test many of the other modules, so be sure this module is working properly before testing other modules. For example, if the system module fails self-test, any MPX module self-test results are not necessarily accurate. The system module uses the first MPX module to verify some system module performance. However, if the first MPX module is missing or defective, a few of the system module self-test steps will fail. Wait for the self-test to complete and if the system module passes then sequentially self-test each module shown below the system module.

Check these items:

- Insure that the module installed in the test system chassis is the module identified in the system configuration window. The TR-8-1 module is different than a MPX-3-200, or MPX-5-200, etc.
- Each module is listed in the system configuration, no more and no less.
- The addresses & jumpers shown in the system configuration must match the addresses & jumpers on the modules installed in the system.
- If any addresses in the system configuration window are red, there is an address conflict between some modules. You must find the conflict and make changes as necessary to remove it.
- All modules with board select addresses must use the same base address. Each module must have a unique secondary address. Modules that only have a base address and no secondary board select address cannot have an overlap with any other base address range for any other module.

Questions

If you have any problems or questions:

- ▶ Use the Help feature and refer to the chapter **System Configuration** sections **Modules Configuration** and **Module Self-Test**
- ▶ Visit the CheckSum web site at: www.CheckSum.com
- ▶ Contact your local CheckSum support office
- ▶ Call CheckSum at 1-877-CHECKSUM / +1.360.435.5510, located in the U.S. Pacific time zone
- ▶ E-mail: sales.support@checksum.com