8051

series

SIGNUM SYSTEMS CORPORATION

ADM-51

User Guide

SIGNUM SYSTEMS

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Section

1

Installation

Preparing your emulation system for use.

System Requirements

Your computer must be running Windows XP/2000/9x or better and have one USB 2.0 port available. USB 1.1 ports are not recommended because of slow speed.

The shipping package should contain the following:

1. ADM-51 in-circuit debugger (emulator).
2. USB 2.0 (type A/B) cable.
3. 20-pin target cable
4. Signum Systems Development Tools CD-ROM.
5. Software activation key.
6. Printed User Guide (this document).

Installation Procedure

1. Insert the Signum Systems *Development Tools for Microsoft Windows* CD into your CD-ROM drive. From the Master Setup window, select Chameleon Debugger and double-click on ADM51 Emulator, as shown in Figure 1.

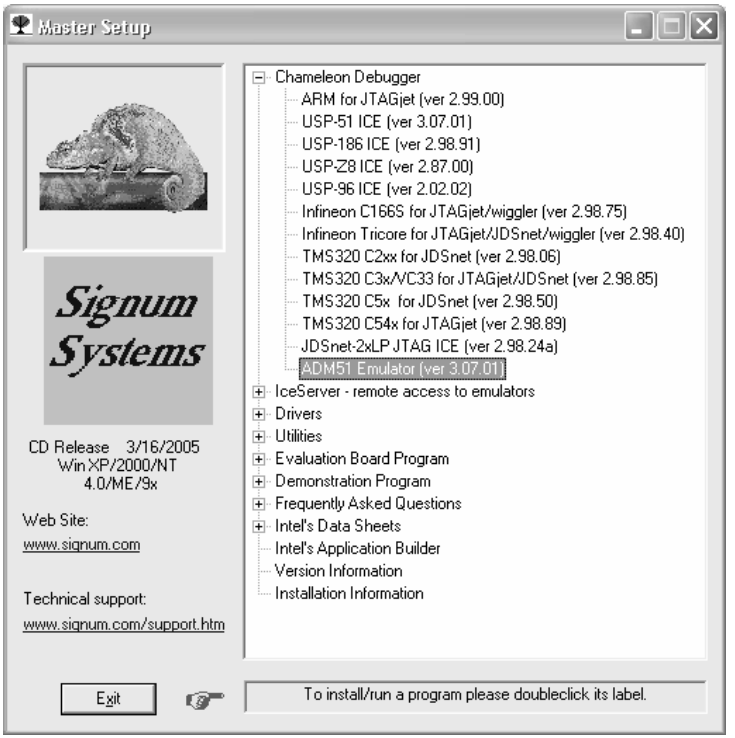

FIGURE 1 Chameleon Master Setup window.

2. Follow the online instructions and complete the installation process.

3. Attach the ADM51 emulator to a USB communication port. If the USB driver for the emulator has not yet been installed, the Found New Hardware Wizard appears. Please follow the wizard's instructions. When asked to provide the location of the driver, select Install from a List or Specific Location and point to the SigUSB.inf file located in the Drivers\USB subdirectory of the main installation directory. The default location is C:\Program Files\Signum Systems\Wemu51\Drivers\USB.

For more USB driver installation details, please refer to the *USB 2.0 Driver for JTAGjet and ADM-51: Installation Instructions* PDF file.

4. Connect the ADM51 emulator to the 20-pin male emulation connector on your target board using the flex cable provided with the emulator. Optionally, turn the target power on now.

5. Start Chameleon WEMU51 Debugger. A dialog box prompts you to create a new debug project or open an existing one (Figure 2). Click the Create New button to build a brand new project.

FIGURE 2 Creating new project on debugger startup.

6. The Create Project Wizard appears (Figure 3). Click Next.

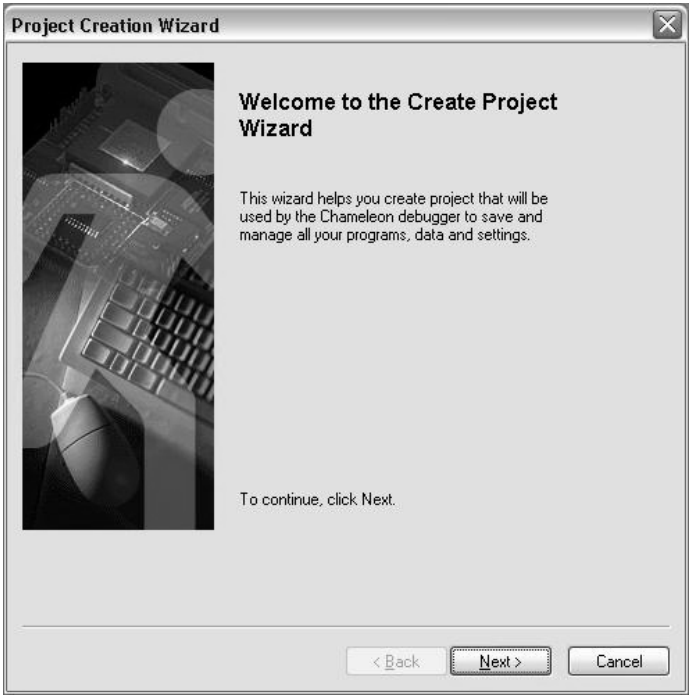

FIGURE 3 Create Project Wizard guides you through the project creation process.

7. When asked to provide the name and optional comment for your project, enter them and click Next. Browse for, or type, the name of the project directory for all project-specific files. Be careful not to use the debugger installation directory as the project directory. Click Next. A list of available targets appear. Select ADM51 Emulator (Figure 4) and press the Next button.

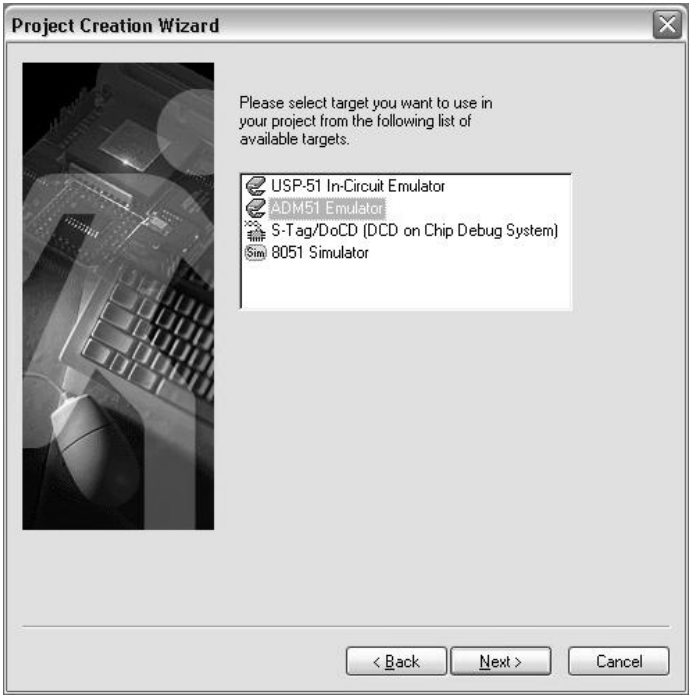

FIGURE 4 Target selection list.

8. Depending on your system, the wizard displays the available communication device or a list of such devices. Select the USB ADM51 device with the serial number of the ADM51 emulator used in your project (Figure 5). Click Next.

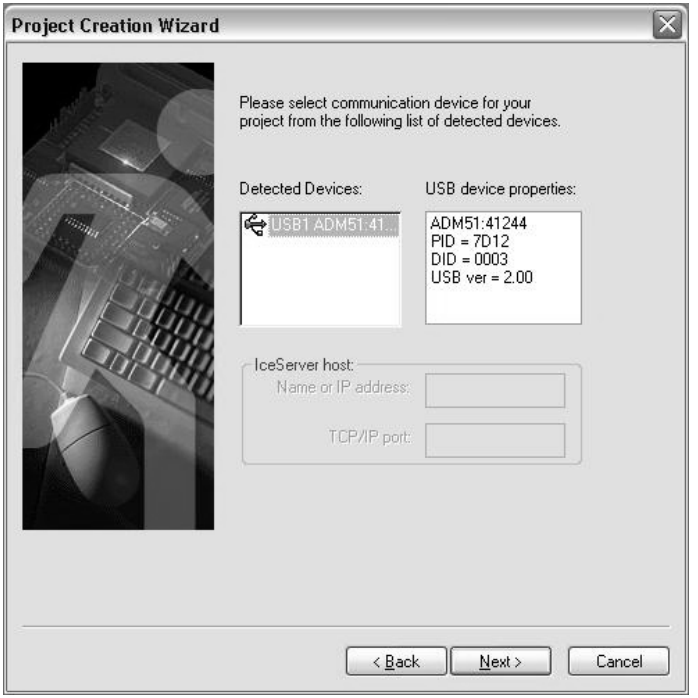

FIGURE 5 Choosing the communication device for a project.

9. Select the emulated target processor from the list (Figure 6). Click Next.

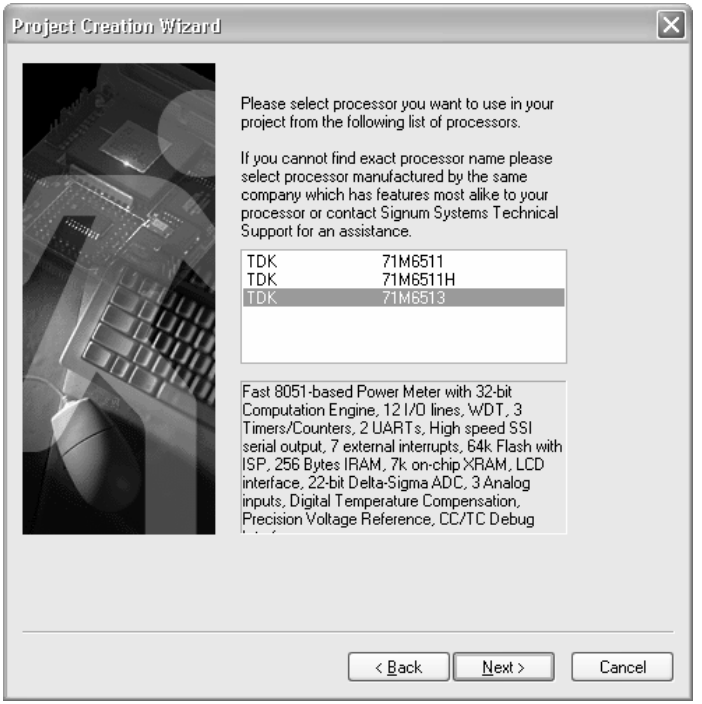

FIGURE 6 Choosing the emulation processor.

10. In its last dialog box, the Create Project Wizard displays all the selections you made. To correct the entries, click Back and modify the settings. If you are satisfied with the setting, make sure that the Open New Project after it is Created check box is checked (Figure 7) and click the Finish button.

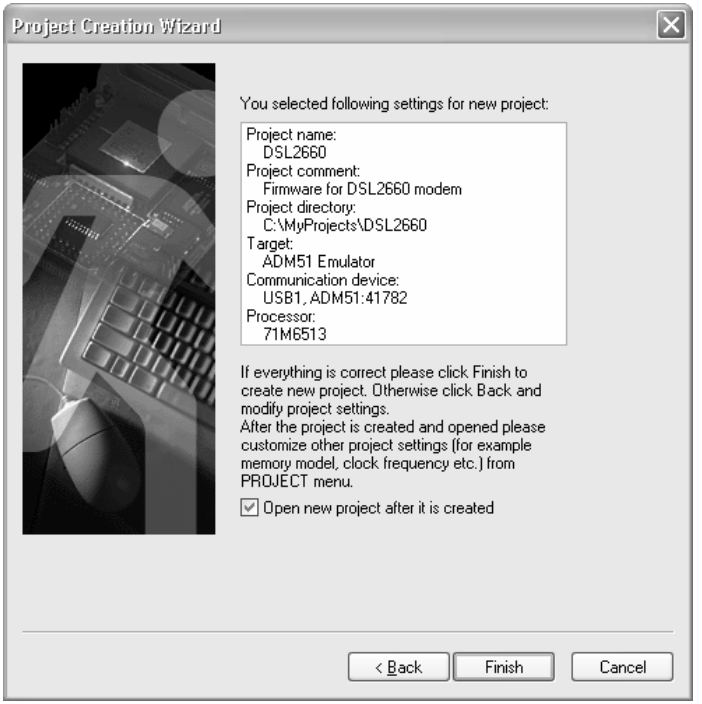

FIGURE 7 Verifying the project settings.

11. The debugger closes the Create Project Wizard and opens the project you have just created and establishes communication with the ADM51 emulator. The Select Clock Frequency dialog box appears (Figure 8). Enter the frequency of your target clock. The value is used by the Trace window to convert processor cycles into time units (microseconds, milliseconds, etc.) when displaying trace data.

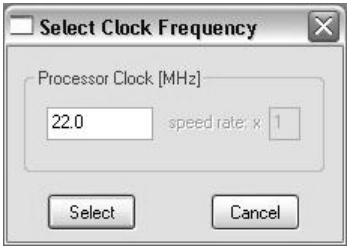

FIGURE 8 Selecting the target clock frequency.

12. Press the Select button. The initial debugger screen should look as shown in Figure 9.

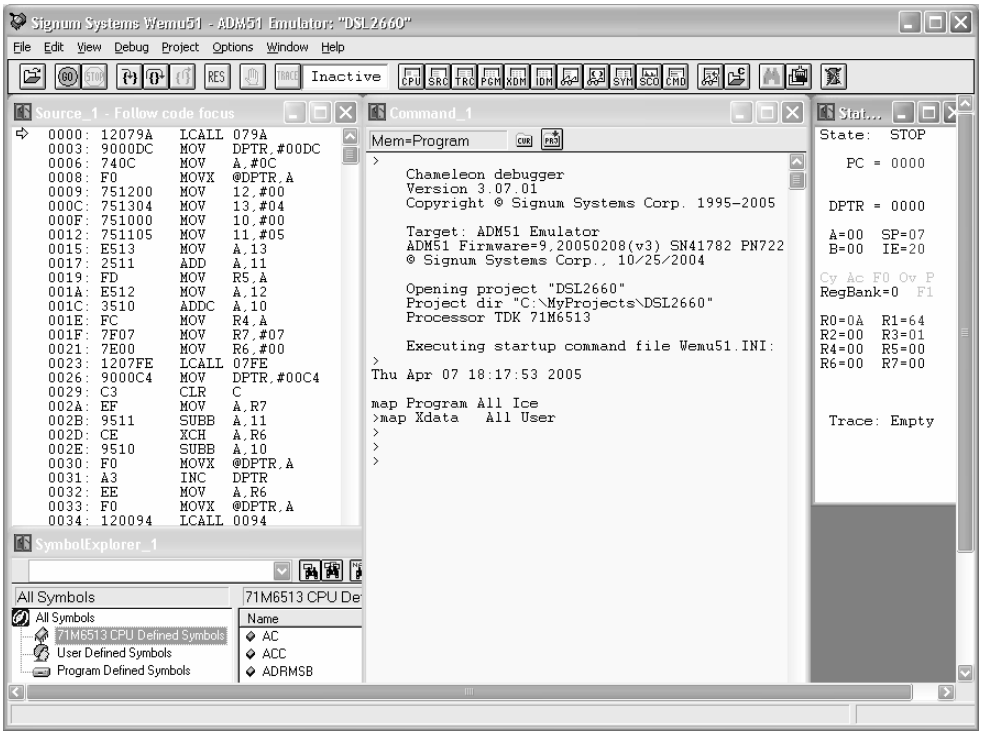

FIGURE 9 Chameleon WEMU51 opening screen.

13. If you have not turned the target power on, the Status window displays the NoPwr state in, and the Command the "No Target Power" message appears in the Command window (Figure 10). If this is the case, turn power the emulator now. Chameleon acknowledges the power-on state in the Status window by displaying STOP as the processor state (Figure 11). It is recommended to keep the Status window opened permanently for monitoring the status of the processor and important processor registers.

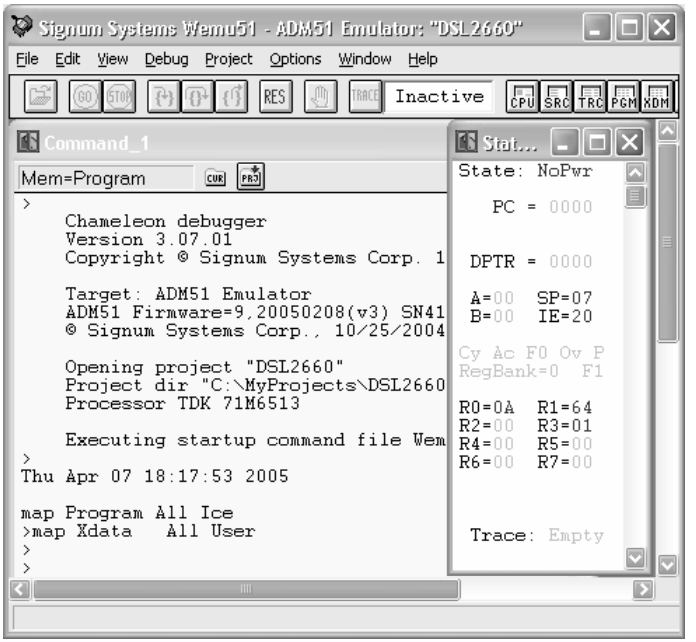

FIGURE 10 Chameleon WEMU51 detects the No Target Power condition.

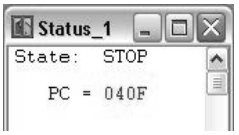

FIGURE 11 Target Power On and CPU Stopped condition acknowledgement.

14. Verify that your ADM51 emulator is equipped with the optional Trace Buffer hardware by executing the VERSION command in the debugger's Command window. In addition to displaying the serial numbers of the debugger's hardware, firmware, software and the serial number of the emulator unit itself, it detects the presence of Trace Buffer. If Trace Buffer is installed, then the debugger's toolbar contains the Trace button, while the Trace option appears in the View menu.

15. Since the trace option is turned off by default, emulators with Trace Buffer require activating the feature from within the debugger. Select Project > Preferences > Trace. Make sure that the Enable Trace check box in the Open Trace Preferences dialog box is checked (Figure 12). Click OK.

FIGURE 12 Enabling the Trace Buffer option.

The Trace setting is stored in your project configuration file Wemu51.cnf located in the project directory. On project startup, the setting is restored.

Before you continue with your project, please familiarize yourself with the documentation available through the Contents option of the (Figure 13). Chapter 6.2 of the text contains information specific to the ADM51 emulator. To obtain HELP information about a specific debugger window, make the window active and then press the F1 key. To obtain information on Chameleon commands, right-click in the Command window and from the popup menu select either the Help on Available Commands or Help on Expression Syntax option.

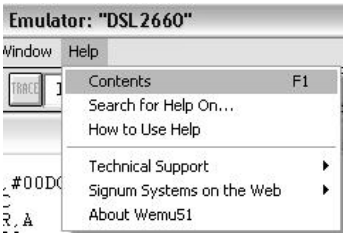

FIGURE 13 Accessing the Chameleon documentation.

Section

2

Emulator Features

Getting familiar with your emulator.

External Characteristics

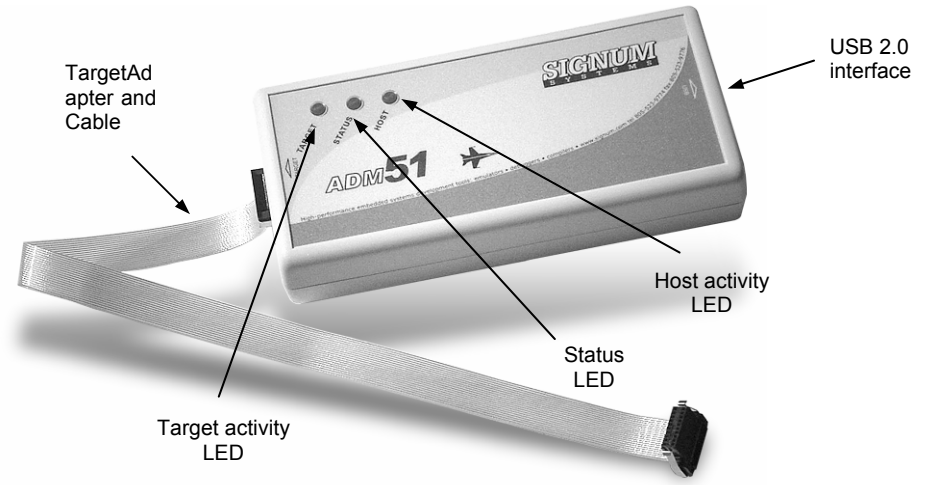

FIGURE 14 ADM-51 emulator.

The ADM-15 emulator is shown in Figure 14. Their USB connectors are located on the unit's back side. On the front of the ADM-51, there is a 20-pin high-density connector. The emulator has LED indicators for monitoring various aspects of the units' operations, as specified in Table 1.

LED INDICATOR	DESCRIPTION
Target	Monitors the target connection lines. • Stable ON: target powered, no data transfer on target connection lines. • Stable OFF: target not powered. • Blinking: data transmission on target connection lines.
Status	**1.** Monitors the CPU status when the debugger has established communication with the emulator. • ON: CPU is running • OFF: CPU in HALT state. **2.** Monitors the emulator's power when the debugger is disconnected form the emulator.
Host	Monitors the link to the host computer. • ON: debugger established connection. • OFF: no debugger-emulator connection. • Blinking: data transfer between PC and emulator in progress.

TABLE 1 ADM-51 LED functionality.

Note: Chameleon Debugger polls the CPU status approximately every 1 sec. Accordingly, this data transfer is indicated by the TARGET and HOST LEDs as a steady blinking occurring every 1 sec. (even when the CPU is not running).

Reset and Power-Up Conditions

Software

You can quit the debugger and leave the target board running at any time. Re-entering Chameleon Debugger will neither reset the running CPU nor stop it. However, it may be necessary to reset the CPU at times in order to enable debugging.

Emulator

As a rule, the emulator should be always turned on first. When disconnect from the host USB port while the debugger is running, the system displays the Communication Error dialog box In such an event, reconnect the emulator and press the **Settings** button in the Communication Error dialog box to resume normal operation.

Target Board

Chameleon does not report any error when the target board is disconnected from power. The loss of power is indicated in the **Status** window, however. The content of target volatile memory is lost when power is disconnected. Therefore, after power has been turned on, it may be necessary to both reload the application program and execute an initialization macrocommand file.

Reset

Clicking the **RES** toolbar button resets the CPU, making it stop on the fetch of the first instruction at the reset vector address.

Section

3

Troubleshooting

When things go wrong.

Communicating with the Emulator

Encountering a communication error message when Chameleon starts, or during a debug session, indicates either that the debugger cannot connect to the emulator, or that the connection has been lost (Figure 15).

FIGURE 15 Run-time communication error message.

Try this

- Check if the emulator is connected to host computer USB port.
- Check if the emulator's HOST LED is on.

- Try to use different USB port on your computer.

CPU NoPwr Status (No Power)

The NoPwr CPU state displayed in the topmost row of the Status window indicates that Chameleon could not detect power the target board.

Try this

- Check if target power is turned on.
- Check if the emulator's TARGET LED is on.
- Check if the emulator is connected to the target board CCTC connector using a flex cable.

Trace Window Menu Not Available

You are not able to find the Trace option on the View menu or the Trace button on the toolbar.

Try this

- Check whether your ADM51 emulator has Trace Buffer installed. Run the VERSION command in the Command window and verify the Trace installation status.
- Verify the processor type. With the TDK 71M6511 and 71M6511H processors, which do not generate trace data, the Trace window is disabled.
- Disconnect the emulator from the USB port, the target power supply and the external power supply. Reconnect and check the Trace option status again.

Trace window does not display any data

The Trace window does not display any data after program execution is stopped.

Try this

- Select Project >Preferences > Trace to verify that Trace Buffer is enabled: the Enable Trace check box in the Trace Preferences dialog box should be checked.

No Source Code in the Source Window

The debugger's Source window does not display the source code of your application.

Try this

- Select File > Load to display the Load dialog box. Verify that your application is loaded with the Load Code, Load Lines and Load Symbols options selected.
- In the Symbol Explorer window, verify that the loaded application contains debug information about source code lines.
- Review the compilation/linking options applied when building your application. Rebuild the entire application, reload it, and check again.
- Verify that the display mode of the Source window is set to "Source." On the toolbar, press the Reset button (or run the RESET command in the Command window). Check the source code display again.

Section

4

Appendices

Emulator specification • Target connector • Technical support

Emulator Specification

PARAMETER	ADM-51
Size (W × L × H)	2.5 × 5.5 × 1.0 inches
Power supply	100 – 240 VAC input 5 VDC @ 1 A output
Compatible voltage	3.3V – 5V
Target cable length	10 in. flex ribbon cable
Storage temperature	0 to 40 C
Operating humidity	0 to 90%
Breakpoints	• Unlimited number of software breakpoints • Two independent hardware breakpoints • Hardware based single step
Communication interface	USB 2.0 High-Speed mode 480Mbps

PARAMETER	ADM-51
File download format	HEX, AOMF51 (Intel, Keil, Franklin, Archimedes, Raisonance), UBROF (IAR, Archimedes), COFF (Tasking), IEEE695 (PLC), FST (Signum)

TABLE 2 ADM-51 emulator specifications.

Target Connector

Trough Hole Part Number	AMP/Tyco #104068-1
Type	Male header, through hole, 20-pin, dual-row, with keying shroud
Surface Mount Part Number	AMP/Tyco # 104549-2
Type	Male header, 20-pin, dual-row, with keying shroud

TABLE 3 Target connector specifications.

TARGET SIGNAL	PIN		TARGET SIGNAL
3.3 V PD	20	19	GND
ISYNC	18	17	GND
TB0	16	15	GND
TB1	14	13	GND
TB2	12	11	GND
TB3	10	9	GND
RXTX	8	7	GND
TCLK	6	5	GND
RST	4	3	GND
	2	1	GND

TABLE 4 Pinout of the target connector.

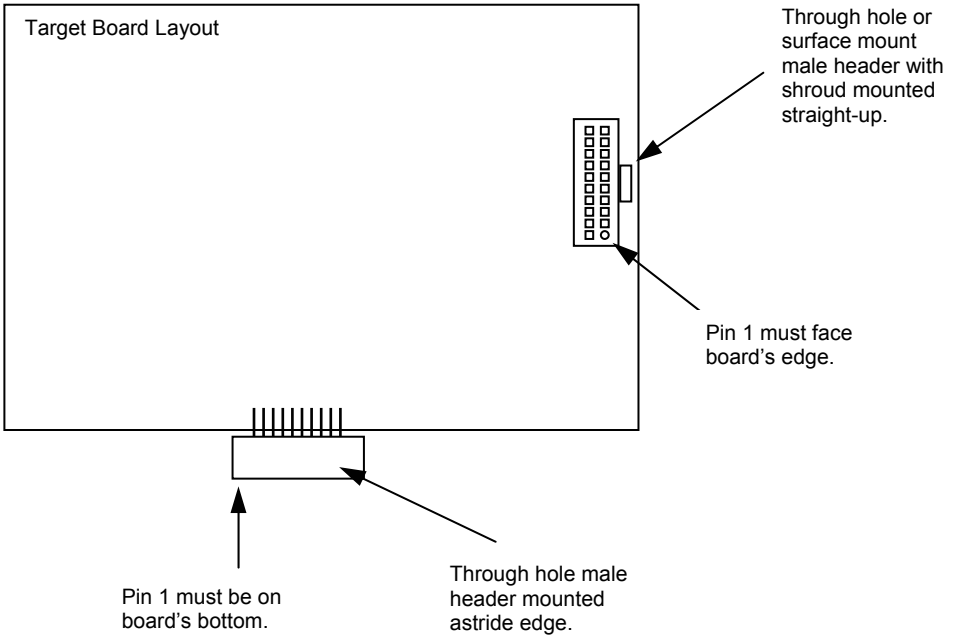

FIGURE 16 Target board layout guidelines

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	signum.com/sales.htm

Contact Signum Systems Technical Support by dialing (805) 523-9774, Monday through Friday between 9 A.M. and 5 P.M. Pacific Time. In order to enable our technical support engineers to process your request efficiently, we strongly recommend submitting the Technical Support Request form available at signum.com/support.htm.

A Friendly Reminder We will be able to serve you better if, when contacting our Tech Support, you are at your computer, have your documentation at hand and are prepared to provide:

1. The version of your Signum Systems software, hardware or firmware that you are using and the serial number of your emulator.
2. The wording of any messages and prompts that appear on your screen.
3. The environment, in which your software is running, including the type of hardware and operating system.
4. A description of what happened and what you were doing when the problem occurred.

For more information, please visit our home page on the World Wide Web.

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