ANALOG DEVICES

Technical notes on using Analog Devices DSPs, processors and development tools
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Emulator and Evaluation Hardware Troubleshooting Guide for CCES Users

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Introduction

The troubleshooting advice in this EE-Note can be used to resolve most installation, connection, and software issues affecting the use of CrossCore® Embedded Studio (CCES) tools with Analog Devices In-Circuit Emulators (ICEs), EZ-Board™ and EZ-KIT Lite® evaluation systems, avoiding the need to return the suspected faulty emulator or evaluation board.

Please carry out all troubleshooting steps outlined in this document before contacting Analog Devices Processor Tools Support, who can be reached at:

processor.tools.support@analog.com

Should you require further assistance, e-mail Processor Tools Support with the results from carrying out the troubleshooting steps described in this document, as well as the following information:

- CrossCore Embedded Studio tools version

- Architecture

- Driver version

- Operating system

- Emulator/evaluation board serial number (if applicable)

- Evaluation board, silicon, and bill of materials (BOM) revision

(i) The evaluation board revision is typically silk screened on the front of the board, while the BOM revision is a sticky label on the back of the board. The silicon revision is printed directly on the processor.

Authorization to return a unit for repair or replacement is reserved until we are satisfied that the emulator or evaluation board is indeed faulty.

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CrossCore Embedded Studio Software Installation and Setup

Supported Operating Systems

CCES development tools are supported by the following 32 & 64-bit Operating Systems:

- Windows XP Professional SP3 (32-bit only).
- Windows Vista Business/Enterprise/Ultimate SP2 (32-bit only*).
- Windows 7 Professional/Enterprise/Ultimate (32 and 64-bit).
- Windows 8.1 Professional/Enterprise (32 and 64-bit) from 1.0.2 onwards.

Windows Vista, Windows 7 and Windows 8.1 users may experience User Access Control (UAC) related errors if the software is installed into a protected location such as "Program Files" or "Program Files (x86)".

We recommend installing the software in a non-UAC-protected location. The default installation location is: C:/Analog Devices/CrossCore Embedded Studio

Installing and Troubleshooting Drivers

The emulator and evaluation board hardware device drivers are installed automatically when the device is plugged in and powered up for the first time after installing CCES tools.

If you encounter problems during installation of the drivers, or you are unsure whether the driver has been installed correctly, check your computer's Device Manager. Your emulator/evaluation board should be listed under `ADI Development Tools`.

From CCES version 1.1.0 onwards, when using an ICE-100B/1000/2000 emulator or an EZ-KIT board via SADA/SADA2 board, the tools will be listed under `CrossCore Tools` within the Device Manager.

If listed, double-click on the device to display the Device Driver properties, and ensure that no errors are listed. If there are errors, record them together with the installed driver version number and send these details to Processor Tools Support. If your device is not listed, try to reinstall the drivers manually.

SADA2 and ICE-100B Driver Differences from CCES version 1.1.0 onwards

If you are connecting to an EZ-KIT board via a SADA2 board in CCES version 1.1.0 or later, modifications to jumper settings (`JP1`) on the SADA2 board are required. For more information see the following FAQ on the EngineerZone:

https://ez.analog.com/docs/DOC-11226

If working with an ICE-100B in CCES version 1.1.0 or later, modifications to the jumper settings (`JP2`) on the emulator are required. For more information on this please see the following FAQ on the EngineerZone:

https://ez.analog.com/docs/DOC-11226

Moving between CCES1.1.0 and earlier versions for the ADSP-BF592/506F EZ-KIT Board

To use the ADSP-BF592/506F EZ-KIT board via the Debug Agent with CCES version 1.0.3 or earlier, having previously been using CCES version 1.1.0 or later, you will need to manually select the correct diver through the Device Manager. For Detailed information on how to do this please see:

https://ez.analog.com/docs/DOC-11229

Installing Drivers Manually

Open the Device Manager and locate the emulator/evaluation board, which should be located under `ADI Development Tools`.

From CCES version 1.1.0 onwards, when working with an ICE-100B/1000/2000 emulator or an EZ-KIT board via SADA/SADA2 board, these tools will be listed under `CrossCore Tools` within the Device Manager.

If the device is listed with a yellow exclamation mark, the driver was not installed properly and must be reinstalled, as follows.

To install the driver manually:

1. Double-click on the device. The `Device Properties` dialog box appears.

2. Click the `Driver` tab and choose `Update Driver`.

3. When the installer requests a location from which to install the driver, navigate to the driver location, listed in the Default Driver Location.

> ⓘ If the device has not installed properly and you cannot find it within the Device Manager, try doing a scan for any hardware changes. If you find unknown hardware, try loading the relevant driver manually, as explained above.

Default Driver Location

Drivers for all emulators and evaluation boards can be found here:

```
[install_drive]:\Analog Devices\
CrossCore Embedded Studio x.x.x\
Setup\Emu_Drivers\
```

The driver for all emulators and evaluation boards for 32-bit Operating Systems is `WmUsbIce.sys`.

The driver for all emulators and evaluation boards for 64-bit Operating Systems is `WmUsbIce64.sys`.

> ⓘ From CCES version 1.1.0 onwards, when working with an ICE-100B/1000/2000 emulator or an EZ-KIT board via SADA/SADA2 board, the driver is `adiusb.inf`

Creating and Testing Launch Configurations

Information on Launch Configurations can be found in the CCES online Help Pages which can be accessed via the following menu command in the IDE: *Help->Help Contents*. From Help navigate to the section entitled *About Launch Configurations*, available here:

Help -> CrossCore Embedded Studio -> Integrated Development Environment -> Debugging Executable Files -> About Launch Configurations

If you are using a custom board with an emulator, then review the section entitled *Debugging with Emulators*, available here:

Help -> CrossCore Embedded Studio -> Integrated Development Environment -> Debugging Executable Files -> Debugging with Emulators

Once you have set up the desired Launch Configuration you can test it using the ICE Test utility described next.

ICE Test Utility

This utility ensures that the JTAG chain is intact; it is used to test your emulation hardware.

Before connecting to an emulator session, ensure that each action performed by the ICE Test utility results in a `Pass`.

> ⓘ In order to test your Launch Configuration you must use the ICE Test utility.

Where to find it

The ICE Test utility is available via the `Target Configurator` which is accessible by clicking `Configurator` from any page of the `Session Wizard`.

To open the ICE Test utility click the `Test button` in the `Target Configurator`.

ICE Test Results

When run, the ICE Test utility performs a series of actions (tests) and reports the status of each action, as follows:

Opening Emulator Interface
Action: Opens the emulator driver and turns on the emulator pod.

Troubleshooting: If this test fails, the most common cause is that the emulator driver is not installed properly.

Resetting ICEPAC Module
Action: Resets the JTAG controller on the emulator hardware and checks for proper reset conditions.

Troubleshooting: If this test fails, there is likely a problem with the ICE Test utility itself. If this step continues to fail, contact Analog Devices Processor Tools Support.

Testing ICEPAC Memory
Action: Tests the memory on the JTAG controller on the emulator hardware and verifies that all locations can be read from and written to. It also resets the JTAG port of each JTAG device located on the target hardware.

Troubleshooting: Generally, if this fails continuously, the emulator is faulty.

Determining Scan Path Length
Action: This step determines the number of JTAG devices located on the target hardware to which the emulator is connected. This is accomplished by placing all the devices in BYPASS mode and scanning a single "1" through the chain. The number of devices in the scan path is determined by the number of shifts required to move the "1" to the end of the scan path.

Troubleshooting: If this test fails, the ICE may be faulty, but can also indicate a problem with the target hardware.

Performing Scan Test
Action: This step tests the integrity of the TDI-to-TDO scan path on the target hardware using each device's BYPASS register. Each time the test runs, 25 packets of 256 bytes are shifted through the BYPASS registers of all the JTAG

devices in the scan path. The data shifted out of the TDI (Test Data Input) signal on the emulator is compared to the data received on TDO (Test Data Output) signal on the emulator. The number of bytes shifted is displayed.

Troubleshooting: If data mismatches are found, an error is reported and the test fails. Verify that the target hardware is powered, a valid reset had been performed and the JTAG device has a valid clock signal.

If this test fails, contact Analog Devices Processor Tools Support and provide the details of the reported error.

Continuous Scan Mode
Action: When the Continuous scan option is enabled and you start a test by clicking the ICE Test dialog box's `Start` button, the test runs normally to the `Performing scan test` item. From this point on, the test loops continuously scanning data through the JTAG chain until you stop the test by clicking the dialog box's `Stop` button. This scan mode sends a very large amount of data compared with all the previous tests.

Troubleshooting: If the single scan test passed but the continuous test fails then it usually means there is noise on the JTAG signals. They should be observed using a scope to see if there is excessive ringing or noise.

Debug mode
Action: When the Debug mode option is enabled and you start a test by clicking the ICE Test dialog box's `Start` button, the test will halt before each highlighted test to allow you to set up your logic analyzer for capturing the JTAG scan signal.

Troubleshooting Tips and Tricks

ICE Test

Why does the ICE Test utility pass yet I still cannot connect to my board?

The ICE Test utility talks only to the JTAG port on the processor. It sets the processor to bypass mode and shifts bits through the JTAG BYPASS register. This utility only verifies that the JTAG connection is working, nothing more. These tests do NOT test the /EMU signal, which is specific to Analog Devices processors and is used by our emulators as a JTAG emulation status flag from the processor. They also do *not* test for issues with the processors like shorts, opens, parts stuck in reset, no valid input clock, device not powered correctly and so on.

A couple of specific things to check are the state of the bus request signal on power-up and that the processor is not stuck in reset.

If you are using a custom board, it is also recommended to consult *Analog Devices JTAG Emulation Technical Reference (EE-68)*[1] for details of the JTAG specification and to ensure your board conforms to this standard.

If you encounter problems while running the ICE Test utility or connecting to your board, consider the following questions and suggestions:

- Does the ICE Test utility run successfully, or does it fail at any point?

- When you start the ICE Test utility, which LEDs on the emulator light up?

- Try running the ICE Test utility with the emulator not connected to a target board. At which point does it fail?

- For USB emulators, check that Device ID is set to "0" by default. If it is set to something else, it may indicate a problem with the emulator driver.

When reporting a problem to tools support, provide answers to all of the above questions as well as details of any troubleshooting that was carried out.

If the ICE Test utility completes successfully and you still encounter problems when connecting to your hardware (or the CCES connection drops), try running the ICE Test utility again, this time selecting the Continuous Scan check box. This option loops the ICE Test utility continuously and provides a good test for checking the integrity of the JTAG interface between the emulator and target processor. Run the ICE Test utility in continuous-scan mode for a short while (up to an hour). Provide the details of any failures encountered to Analog Devices Processor Tools Support as well as which session you are using to connect to your emulator.

Refer to CCES Help for further information on the Target Configurator and the ICE Test utility.

Additional Troubleshooting

Emulator Error Codes

Emulator error codes and messages may appear in a dialogue box when connecting to or while connected to a Debug Configuration. More information on these error codes can be found in CCES Online Help.

Troubleshooting tips and details on some of the most commonly encountered errors are described next:

Target Connection Error 0x80004005 or 0x80044005

You may encounter this error when connecting to a target. This is a general error indicating miscommunication between the host PC and target board. Common causes of this error include:

- The Debug Configuration setup is not correct (wrong DSP/processor type, wrong emulator type, wrong ordering of devices session

settings, mismatch between target and session [e.g., connecting to a ADSP-BF533 target using a ADSP-BF526 session])

- The hardware is in a bad state to which the emulator cannot connect. Try resetting the hardware and then reconnecting.

- The target hardware is not powered or is not powered correctly.

- The emulator pod is not connected to the target. Ensure that the pod's JTAG connector is properly attached to the JTAG header on the target board.

- The emulator is in a bad state (e.g., the enable LED is stuck on). Reset the pod by running the ICE Test utility.

- Connection problems can be caused by a corrupt session. Please try recreating your Debug Configuration.

Target Connection Error 0x80048047 – Failed to Initialize Emulator

This error can be caused if there is no driver installed for the emulator you are using. Check that your emulator is installed properly, if you are unsure try reinstalling your emulator driver. See the Installing Drivers Manually section for details.

Common causes of this error include:

- The Debug Configuration setup is not correct (wrong DSP/processor type, wrong emulator type, wrong ordering of devices session settings, mismatch between target and session [e.g., connecting to a ADSP-BF533 target using a ADSP-BF526 session])

- The emulator is not powered or is not powered correctly.

If you are still having problems please check the following to help narrow down the cause of the problem:

- Does the ICE test run successfully or does it fail at any point?

- For the ICE-100B please ensure that Jumper JP2 is *not* installed.

Target Connection Error 0x8004801e – USB Data Count Error

This error can be caused by either a fault with the emulator or with the target board. To help narrow down the cause of the problem check the following:

- Does the ICE test run successfully or does it fail at any point?

- Do you have another emulator that you can use in place of your current one?

- Do you have another target board you can try connecting to with your emulator?

- If you are connecting to a custom board please consult the *Analog Devices JTAG Emulation Technical Reference (EE-68)*[1] and ensure your JTAG header layout complies with the design guidelines.

Target Connection Error 0x8004881f - Emulator not supported, JP2 may not be installed, or, 0x80048047 - Failed to initialize emulator, with the ICE-100B

CCES version 1.1.0 introduces a new driver for the ICE-100B emulator. In order for the Device Manager to correctly identify these emulator products and install the new driver, modifications to the emulator jumper settings need to be made. For detailed description of the modifications required, please see the following EngineerZone FAQ:

https://ez.analog.com/docs/DOC-11226

Target Connection Error 0x80048015 - Initialization Open Device Failed, or, 0xffffffff, with a SADA2 board.

CCES version 1.1.0 introduces a new driver for the SADA2 board. In order for the Device Manager to correctly identify these emulator products and install the new driver, modifications

to the emulator jumper settings need to be made. For detailed description of the modifications required, please see the following EngineerZone FAQ:

https://ez.analog.com/docs/DOC-11226

Additional Checks

Cables/Ports

Ensure proper insertion of cables. If available, replace cables with known working cables. If available, use another port (USB).

> The recommended maximum USB cable length for an evaluation board is 3 meters. You may encounter communications problems with a cable length greater than 3 meters.

PC

Ensure that the PC has adequate resources and is working. If available, try the emulator/evaluation board on another PC.

Code

Try a CCES demo program (example) or one of the Evaluation Board Support Package (BSP) examples.

Use the Example Browser to find examples included with the EZ-KIT Lite BSP. To access the Example Browser do one of the following:

- Choose `Help > Browse Examples`.
- Click `Browse Examples` from the `Welcome` page.

Power Supply

If available, try another power supply. Ensure that the correct voltage and current requirements are being used.

> The ICE-100B, ICE-1000 and ICE-2000 emulators are all USB powered and do not have a separate power supply.

Other Emulators/Evaluation Boards

If available, use another emulator or evaluation board of the same type (or another type) to ensure that the problem is not related to the particular unit.

Debug Configuration

Ensure that you are connecting to the correct Debug Configuration. See the Debug Configurations section.

Emulator Specific Troubleshooting

For Help with Troubleshooting driver installation issues, see the Installation section.

> Analog Devices emulators are not intended to be used in a production environment. This applies to all Analog Devices Emulators. Using in such an environment will void your warranty.

JTAG Emulator Power Sequence

Your JTAG emulator should be powered on, and connected to a host PC, prior to attaching it to a target JTAG emulator header. All ADI JTAG emulator products can be attached or removed from a powered "hot" target without any power restrictions.

> When powering down the ICE-100B, ICE-1000 or the ICE-2000 emulators, disconnect the USB cable between the emulator and the PC and power down the target board before removing the emulator from it.

Avoid emulation errors by ensuring that the emulation software is not started or executing when power is not applied to the target, or when attaching the JTAG emulator to a target with or without power.

See *Analog Devices JTAG Emulation Technical Reference (EE-68)*[1].

If your USB-ICE or HPUSB-ICE emulator has an 'Enable/Power' LED, this should be green when power is applied. It should be amber when connected to a session or the ICE Test utility is being used.

If the emulator has an 'Enable' LED only, this should be amber when connected to a session or while the ICE Test utility is being used. At all other times, this LED should be off.

JTAG Frequency Selection

This feature is available for the HPUSB-ICE, USB-ICE and ICE-2000 emulators.

Choosing `JTAG Frequency Selection` from the `Target > Settings` menu within CCES tools opens the `JTAG Frequency Selection` dialog box, from which to change the rate at which `TCK` runs.

Only after launching a supported Debug Configuration will the `Target` menu item become available.

After a test is run successfully, click `OK` to save the selected frequency. This button is available only when all tests have passed at the selected frequency.

If the test fails or you encounter problems launching your debug configuration then create a new debug configuration. This resets `TCK` to its default value (10 MHz for the HPUSB-ICE and USB-ICE emulators, and 9 MHz for the ICE-2000 emulator).

Before connecting to an emulator session, always test the frequency in the ICE Test utility. If the frequency fails, the emulator will not work.

The HPUSB-ICE and USB-ICE support a JTAG clock operation of up to 50 MHz.

The ICE-100B and ICE-1000 support a fixed JTAG clock operation of 5 MHz.

The ICE-2000 supports a JTAG clock operation of 5, 9, 15, 23 and 46 MHz.

There is no `JTAG Frequency Selection` dialog box available when connected to an ICE-100B/1000 Debug Configuration.

More information on JTAG frequency selection can be found in the *HPUSB, USB and HPPCI Emulators User's Guide*[2] and *ICE-1000/ICE-2000 Emulator User's Guide*[4].

Info Specific to the ICE-100B Emulator

This emulator can ONLY be used with Blackfin processors.

Troubleshooting the ICE-100B Emulator

Troubleshooting if the emulator does not power or enumerate:

Check the status of the 'MON' and 'PWR' LEDs. If both the 'MON' and 'PWR' LEDs are not lit you should ensure that `JP1` has 2 jumpers installed and the operating voltage is set properly. Consult the *ICE-100B Emulator User Guide*[3] for `JP1` settings.

If `JP1` doesn't have a jumper installed for the operating voltage then the 'MON' and 'PWR' LEDs will not light.

Next check the driver, if the driver has been uninstalled this can cause both the 'MON' and 'PWR' LEDs to stop functioning. If only the 'PWR' LED is lit – This means the emulator is powered up but has not enumerated. Ensure the emulator is installed correctly by checking the Device Manager or running the ICE Test utility which should fail at the 1ˢᵗ step *Opening Emulator Interface.*

If the ICE-100B emulator will still not enumerate, please contact Analog Devices Processor Tools Support.

The *STAT LED* signifies the ICE is ignoring the EMU signal.

Info Specific to the ICE-1000/ICE-2000 Emulators

These emulators can only be used with Blackfin and SHARC processors.

LEDs

On both the ICE-1000 and ICE-2000 emulators there is 1 LED that can display the following:

Green – the emulator is powered, configured and ready to invoke a debug session.

Magenta – the ICE is operating in JTAG mode. The LED will blink during USB activity between the host PC and the emulator.

Cyan – the ICE is operating in SWD mode. The LED will blink during USB activity between the host PC and the emulator.

Yellow – there is an issue with the EMU signal on the target board and therefore this signal will be ignored by the emulator.

If the LED is not lit, check that the driver has successfully been installed. If connection to the target is lost or terminated, the LED will return to the green setting.

Connectors

The ICE-1000 emulator contains 2 different JTAG connectors, J1 and J2. J1 is used for traditional 14-pin JTAG headers and J2 is for use with the new 10-pin JTAG headers.

The ICE-2000 emulator only contains 1 JTAG header, a new 10-pin connector. However, the emulator is shipped with a 14-pin to 10-pin converter for customers working with 14-pin headers.

Using the ICE-100B/1000 Emulators with Custom Boards

Due to the open frame design of the ICE-100B/1000 emulators, care must be taken when locating a JTAG interface connector on a custom target. You should ensure that no components located under the ICE-100B and ICE-1000 emulators are taller than 0.15" and 0.13", respectively.

If you plan to use this ICE with an existing custom target board and are concerned that emulator components may short to the target board, an insulator should be used to provide protection.

Consult the *ICE-100B Emulator User's Guide*[3], *ICE-1000/ICE-2000 Emulator User's Guide*[4] and the *Analog Devices JTAG Emulation Technical Reference (EE-68)*[1] for further information.

Standalone Debug Agent Boards

The Standalone Debug Agent Board (SADA) emulator provides a modular low cost emulation solution for EZ-Boards as well as evaluation boards designed by third parties.

It performs the same function as the original EZ-KIT Lites's onboard debug agent, but because it is generic it can be removed from one EZ-Board and used on another.

The SADA board is compatible with Analog Devices EZ-Boards only. You cannot use it with a custom designed board.

Evaluation Hardware Specific Troubleshooting

For Help with troubleshooting driver installation issues, see the Installation section.

Evaluation Boards

EZ-KIT Lite boards, otherwise known as evaluation boards, originally had an onboard USB debug agent, which is used to connect and communicate with the board.

With many recent EZ-KIT systems, the USB debug agent is in the form of a Standalone Debug Agent Board (SADA) emulator. From the ADSP-BF707 EZ-KIT board onwards, there is no USB Debug Agent and these boards will not be compatible with a Standalone Debug Agent Board (SADA). Instead, these boards will be supplied with an ICE-1000 emulator.

Connecting to an Evaluation Board

EZ-Kit Lite board via USB Debug Agent

Apply power to the EZ-KIT board, then attach the USB cable. Ensure that the USB monitor LED is turned on before attempting to connect to your Debug Configuration.

(i) If an emulator pod is attached, you cannot connect via the debug agent.

Although a lit USB monitor LED is a good sign, it does not always mean that everything is working correctly on the EZ-KIT Lite board.

With no emulator attached:

- The "FPGA DONE" LED on the EZ-KIT Lite board should light up for a few seconds after the board is powered.

- The "FLAG1 LED" should *not* light up.

If either of these is NOT true, it indicates a failure in the debug agent.

EZ-KIT Lite Board via Emulators

If using an HPUSB or USB-ICE emulator apply power and connect it to the Host PC via the USB interface.

If using an ICE-100B, ICE-1000 or ICE-2000 emulator connect it to the host PC via the USB interface.

Apply power to the EZ-KIT board and attach the emulator to the JTAG emulator header of the EZ-KIT board.

With an emulator attached:

- The "FLAG1 LED" should light up.

- The "monitor LED" should *not* light up.

If either of these is NOT true, it indicates a failure with the EZ-KIT board.

EZ-Board via Standalone Debug Agent (SADA) Emulator

Ensure that the SADA board is connected to the EZ-Board system before applying power.

(i) The SADA board should be attached to connectors P1 (labeled JTAG) and ZP1 on the EZ-Board system.

- Ensure that you plug the USB cable into the connector on the SADA board and not the USB connector on the EZ-Board target.

- The green "POWER" LED on the SADA board signifies the board is powered.

- When lit, the yellow "USB Monitor" LED signifies that the board is communicating properly with the host PC.

- If either of these is NOT true, it indicates a failure with the SADA board.

Resetting an Evaluation board

EZ-Kit Lite Board via USB Debug Agent or Standalone Debug Agent (SADA)

- Remove the USB cable.

- Power down the EZ-KIT board and wait 5 seconds.

- Apply power to the EZ-KIT board and attach the USB cable.

- Ensure the "Monitor LED" is lit before connecting to your Debug Configuration

EZ-KIT Lite/EZ-Board System via Emulator

- Power-down the emulator.

- Unplug the emulator from the target.

- Power-down the target. Wait five seconds and then power-up the target.

- Apply power to the emulator.

- Run the ICE Test utility with the emulator disconnected from the target - an error will occur but the emulator will be reset.

- Connect the emulator to the target.

- Run the ICE Test utility again.

- If successful, you are ready to connect to a Debug Configuration.

Default Evaluation Board Settings

Some evaluation board problems can be caused by incorrect switch or jumper settings. Each board setup is different and switches/jumpers may be changed depending on user requirements.

If you are having difficulties operating or connecting to the board, you may find the functionality of the board has changed because switch or jumper settings have been changed.

Analog Devices recommends that you set your board back to the factory default settings. You can find these default settings in the appropriate Evaluation System manual. *See Appendix B – Further Reading*

Boot Mode/Reprogrammed Flash on Evaluation Board

If you encounter problems connecting to your evaluation board after programming the flash, try changing the boot mode select switch or jumper.

By default, evaluation boards boot from flash. If the flash has become corrupt or inoperable, the board may not boot properly, resulting in connection problems.

You will find more details on your board's boot mode in the appropriate Evaluation System manual. *See Appendix B – Further Reading*.

Extender Boards

Extender Boards, or daughter cards, connect to some of the Blackfin and SHARC Evaluation boards. This allows the user to extend the capabilities and range of functionality of the board.

Default Extender Board Settings

Some extender board problems can be caused by incorrect switch or jumper settings. Each board setup is different and switches/jumpers may be changed depending on user requirements.

If you are having difficulties operating or connecting to the board, you may find the functionality of the board has changed because switch or jumper settings have been changed.

Analog Devices recommends that you set your board back to the factory default settings. You can find these default settings in the EZ-Extender Board System manuals. *See Appendix B – Further Reading*.

Appendix A –
RMA (Repair/Returns) Process

Returns Policy

To enable Processor Tools Support to issue you with a return material authorization (RMA) number, which authorizes you to return an emulator, evaluation board and EZ-Extender board, ensure that you have read the following paragraphs.

Hardware purchased from a Distributor

There are many configuration issues that can lead you to believe your hardware is faulty. If you purchased your hardware from a distributor it is important that you do not return anything to them until you have first contacted Processor Tools Support.

Basic Troubleshooting

Analog Devices Processor Tools Support must know which troubleshooting steps you carried out and the results. Refer to the techniques listed in this document, and provide as much detail as possible. The majority of emulator, evaluation board and EZ-Extender board problems can be resolved without returning the equipment. Include all of the required information at the time of the RMA request; doing so will speed up problem resolution and enable Processor Tools Support to provide a fast turn-around.

Warranty Details and Proof of Purchase

Emulators

The ICE-100B and ICE-1000 emulators are sold with a 90 day warranty period. Returns that are submitted beyond the 90-day period will be replaced at a cost of $50 (USD).

HPUSB-ICE, USB-ICE and ICE-2000 emulators, including SADA boards, less than one year old are within warranty and repairs or replacements within that period are free of charge. However, if requested, you must provide proof of purchase for all returns that fall into this category.

SADA boards that fall outside the one-year warranty period will not be replaced. Customers are advised to purchase a new board.

HPUSB-ICE and USB-ICE emulators that fall outside the one-year period will be replaced at a cost of $600 (USD). Once we have confirmed by e-mail that the emulator is likely faulty, we will request a purchase order for this amount to be faxed to us.

ICE-2000 emulators that fall outside the one year warranty period will be replaced at a cost of $250 (USD).

The order must be from a company with a direct account with Analog Devices. If your company does not have such an account, Analog Devices must receive the PO from your distributor.

Evaluation boards

Any boards that are less than one year old are within warranty, and replacements within that period are free of charge. However, if requested, you must provide proof of purchase for all returns that fall into this category.

Any equipment which falls outside the one year warranty period will not be replaced. Customers are advised to purchase a new board.

We are unable to repair or replace any emulator, evaluation or EZ-Extender board that has been used for anything other than its intended purpose (or has been tampered with in any way).

RMA Form

Attached to this EE-Note are two RMA forms. One form is for emulators, including SADA boards and the other form is for evaluation and

EZ-Extender boards. Fill out the appropriate form, providing all the requested details. Ensure that you have described all the troubleshooting measures you carried out as well as detailed answers to questions listed in this document.

Issue of RMA Number and Return Address

The RMA number is valid for one particular customer and piece of equipment only. Do not use an RMA number to send back any emulator, SADA, evaluation or EZ-Extender boards that Analog Devices has not specifically authorized you to send back. Analog Devices will not accept any piece of equipment without an RMA number.

ⓘ **ADI does not provide support on ADI products purchased through non-authorized distributors or brokers.**

Have a look at the following FAQ for further details.

Appendix B – Further Reading

Manuals are available for each emulator and Evaluation Board. Also, there are EE-Notes, Online Help and the EngineerZone to guide you.

Emulator Manuals

There are three emulator manuals[2][3][4]. Each emulator User's Guide provides directions for installing the emulator hardware and software on your PC. The manual also describes how to configure and use the components of each emulator.

The latest versions of these manuals are available on the Analog Devices web site at:

http://www.analog.com/processors/manuals

Alternatively, you can access these manuals within CCES Online Help at:

```
Help -> Help Contents -> CrossCore
Embedded Studio -> Development Hardware
Documentation
```

EE-Notes

Analog Devices provides a comprehensive technical library of Engineer-to-Engineer notes (EE-Notes) for each processor family to assist you with your design projects. These documents are available from the Analog Devices web site at the following URL:

http://www.analog.com/ee-notes

If you are working with a custom board, ensure that it conforms to JTAG requirements, as described in *Analog Devices JTAG Emulation Technical Reference (EE-68)*[1], which describes the JTAG interface requirements for targets using Analog Devices processors.

Evaluation Board Manuals

Evaluation board manuals provide installation instructions, details on operation and configuration of the board components as well as a schematic and bill of materials.

Manuals can also be found online via the Technical Library:

http://www.analog.com/processors/manuals

Alternatively, you can access these manuals within CCES online Help at:

```
Help -> Help Contents
```

ⓘ An Evaluation Board Manual will only be available from the Online Help if the particular Board Support Package (BSP) is installed.

Online Help

CCES Online Help is available from the CCES program group under the heading of CrossCore Embedded Studio Help. You can also access Help from within the CCES IDE by choosing `Help Contents` from the `Help` menu.

Emulator-related information in Help includes:

- Target Configurator (used to align a hardware target to an emulator)
- ICE Test Utility (used to test an emulator's basic operation)
- Emulator error codes

You can locate this information easily via the Index or Search pane in CCES Help.

Help also incorporates all tools manuals (software and hardware) and processor manuals, so you can easily search across the entire documentation set.

EngineerZone

The EngineerZone offers a resource to find answers and share your expertise with others. Browse the Communities, Discussions and FAQs, share your knowledge by answering questions, or start your own discussion to get answers: http://ez.analog.com

Appendix C – CrossCore Embedded Studio Software Updates

You can find the latest CCES version *(including the latest update)* on the Analog Devices web site at: http://www.analog.com/CCESUpdateSite

References

[1] *Analog Devices JTAG Emulation Technical Reference (EE-68).* Rev 10, April 15 2008. Analog Devices, Inc.

[2] *HPUSB, USB and HPPCI Emulators User's Guide.* Rev 3.2, March 2012. Analog Devices, Inc.

[3] *ICE-100B Emulator User Guide.* Rev 1.1, March 2012. Analog Devices, Inc.

[4] *ICE-1000/ICE-2000 Emulator User's Guide.* Rev 1.1, January 2015. Analog Devices Inc.

Document History

Revision	Description
Rev 1 – September 28, 2012 *by Colin Martin and Linda Gray*	Initial release.
Rev 2 – January 26, 2015 *by David Strathearn*	Updated to include details of the ICE-1000, ICE-2000, emulator error codes, driver modifications and issues relating to the ICE-100B as well as SADA boards.