JEDI for ARM ®

Up and Running
In 30 Minutes!

Trademark Acknowledgments

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1 Introduction

Overview

This manual will get you acquainted with the features and hardware architecture of JEDI for ARM in-circuit emulators. The following shows how the topics are arranged in this manual**:**

Chapter	Contents
Introduction	
Emulator Overview	Describing the JEDI for ARM emulator main modules and parts;
	Listing the features, dimensions and weight of the emulator.
Hardware Installation and Setup	Describing emulator interface with host system.
	Explaining how to plug the JTAG cable to target for emulation. Communication setup is also discussed in this chapter.
Application notes	Describing 20-pin and 14-pin JTAG port signals definition;
	Recommend the user a solution to deal with the CPU JTAG signals.

Related Publications and Cross-References

- See the *User's Guide* for the Microsoft Windows Operating System for more information on using Windows, Notepad, and Macro Recorder.

- See the pertinent *Processor User's Manual* for information on the target processor you are using.

- See the manual that came with the compiler you are using.

Registering

Be sure to complete and return the enclosed registration card so that Hitool can provide you with technical support and keep you informed of new product developments.

2 **Emulator Overview**

What You Should Get

JEDI for ARM ® Main Module

The JEDI for ARM Main Module houses the Emulation Control Board. It performs the emulation control and general application emulation processes. Using the following connectors for various interfaces**:**

- A RJ45 socket for communication with Ethernet port of the host.
- A RS232 socket for communication with serial port of the host.
- A 20-pin connector to plug the JTAG cable.
- A DC 5V power jack to external power.

Ethernet Cable

Connecting JEDI with hub.
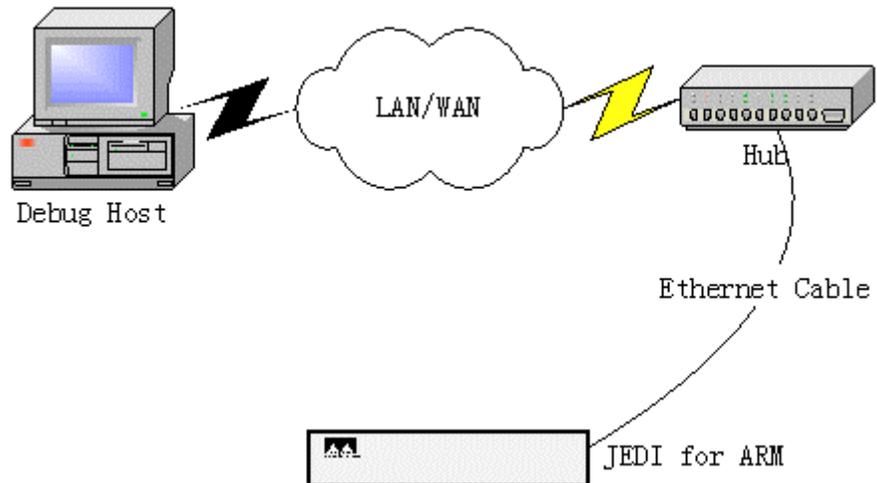
RS232 Cable

Connecting JEDI with serial port of host.
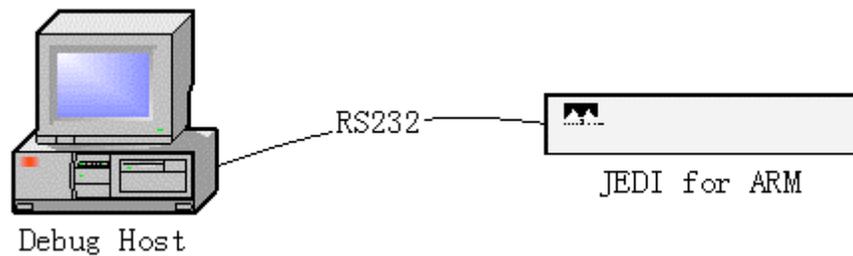
JTAG Cable

The JEDI for ARM will be connected to your target system through a 20-pin flat Cable. Because of the limitation of IEEE 1149.1 standard, this cable can only be used in systems with the JTAG clock frequency (ftck) under 10MHz.

If your target JTAG port is 14-pined, you can use a 20/14 adapter we provided. It is showed as following:

```
                              20-pin
                               Male
                             Top layer

20-pin JTAG Cable ─────────┐
                            ┌──┐
                            │  │
                            │  │
                        ┌───┴──┴───┐
                        │ 20→14 adapter │
                        └──┬────┬──┘      14-pin
                           │    │    ◄─── Female
                           └────┘       Bottom layer

                              ⬇

                        ┌──────┐
                        │      │
              ┌─────────┴──────┴──────────────────┐
              │            Target                  │
              └───────────────────────────────────┘
```
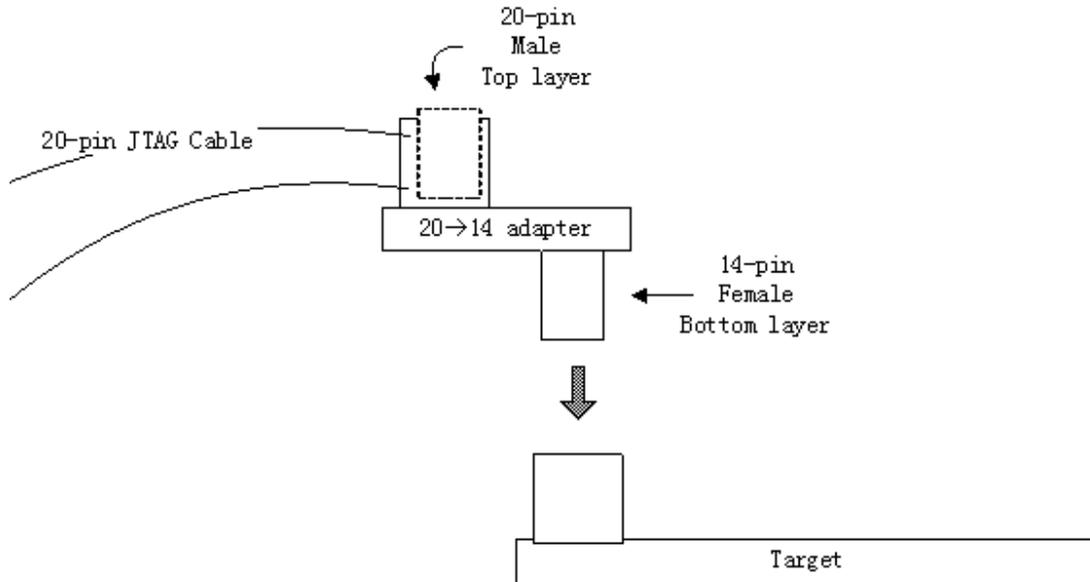
Accessories

A complete JEDI for ARM package also includes the following items:

1. An Ethernet cable;
2. A serial port cable;
3. This manual;
4. A CD containing JEDI for ARM installation program;
5. A 20-to-14-pin adapter;
6. A 20-pin ICE Cable;
7. 5V DC Power Supply.

Features

JEDI for ARM ® Supported Targets

ARM7TDMI series.

JTAG Clock

JTAG TCK can run up to 10MHz.

Breakpoints

- Two hardware breakpoints
- Unlimited software breakpoints

Step Into/Over

Executing Step Into/Over to source or assembly code.

Full-time Emulation

Emulating all on-chip functions, both digital and analog.

Communication Port

JEDI for ARM is equipped with a RJ45 and RS232 socket to provide two communicating channels to host.

Emulator Operation Requirements

Power

- Voltage: 5V
- Maximum Current: 500mA

Environment

- Operating Temp: $0°$ to $50°$ C ($32°$ to $122°$ F)
- Storage Temp: $-10°$ to $65°$ C ($14°$ to $149°$ F)

Emulator Weight and Dimensions

Main JEDI for ARM® Module

- Length: 18.6 cm (7.3 in.)
- Width: 12.0 cm (4.7 in.)
- Height: 4.2 cm (1.7 in.)
- Net weight: 0.25 kg

3 Hardware Installation and Setup

Overview

Before you install the hardware, please:

1. Check your host configuration.
2. Check the environmental conditions.
3. Connect the system cables.

Check Your Host Configuration

Make sure that you have the following minimum host configuration:

1. An Intel 486DX-based or later PC, or 100% compatible system.
2. 8 MB (or greater) of RAM.
3. 7 MB of available disk space for Hitool.
4. 9.5MB (or greater) permanent swap file.
5. Ethernet port and serial port.
6. VGA or Super VGA color monitor and mouse.
7. Windows 3.1, Windows 95, Windows 98, Windows ME, Windows NT, Windows 2000, Windows XP, etc.

Checking the Environmental Conditions

The emulator resides in the same environment as your host PC. Excessive heat should be avoided. Leave a few inches around the main chassis for air circulation. Use good grounding practices. Locate the emulator away from sources of interference.

Characteristic	Operating Parameter
Ambient temperature	0 - 50° C (32 - 122° F).
Ambient humidity	80% maximum relative humidity, non-condensing.

Protecting the Emulator from Electrostatic Discharge (ESD)

The I/O circuitry of JEDI for ARM will be damaged by excessive ESD. To protect your ICE from ESD:

1. Be sure the chassis, host PC, and workbench are properly grounded before applying power.

2. Work in a static-free work environment.

3. Use a wrist strap attached to ground while handling the probe.

4. Avoid touching the exposed connector on the probe tip when you are not properly grounded.

Setting JEDI for ARM ® to Work with Your Environment

By HyperTerminal, you can set JEDI to adapt your work environment. Firstly, you should connect JEDI with PC by serial cable in COM1 or COM2.Then run PC's HyperTerminal and set COM properties as following:
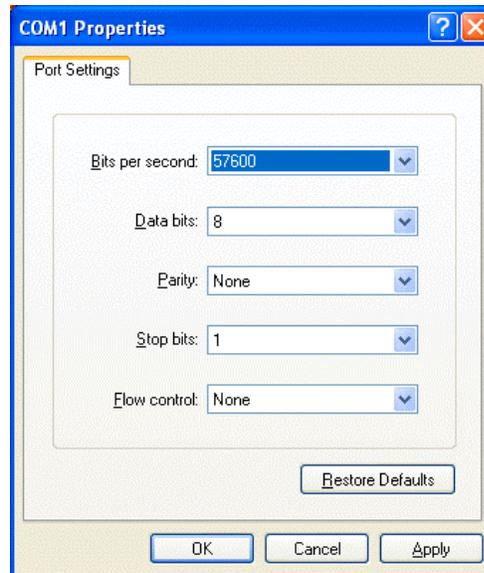
Note that default value of baudrate should be 57600. Click on
"OK"button, then you will get an empty HyperTerminal window.

Power on JEDI or reset it if it is powered on, then you'll see the
following screen:
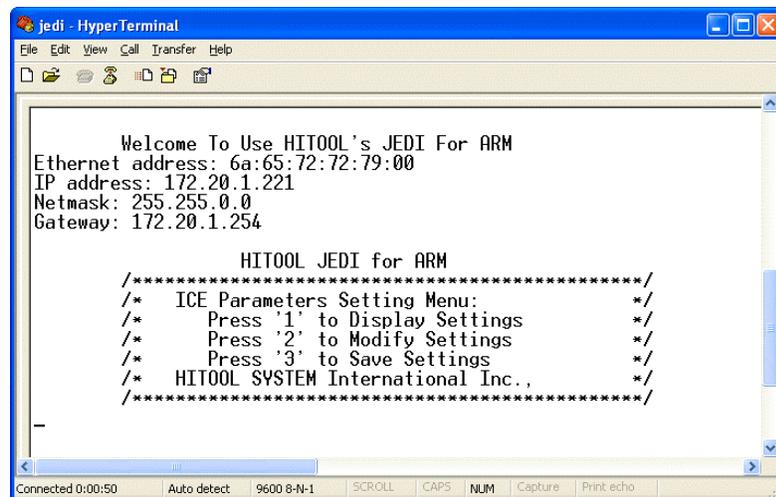
Type "2" to set JEDI for your debug environment:

```
jedi - HyperTerminal
File  Edit  View  Call  Transfer  Help

IP address: 172.20.1.221
Netmask: 255.255.0.0
Gateway: 172.20.1.254

               HITOOL JEDI for ARM
        /************************************************/
        /*   ICE Parameters Setting Menu:               */
        /*      Press '1' to Display Settings           */
        /*      Press '2' to Modify Settings            */
        /*      Press '3' to Save Settings              */
        /*   HITOOL SYSTEM International Inc.,           */
        /************************************************/
Hardware Address:00:0B:51:00:01:01
Use DHCP (Y/N)?n
IP address:172.20.1.111
Net Mask:255.255.0.0
Gateway:172.20.1.254
Baudrate(9600 or 57600 only):57600

Connected 0:01:20    Auto detect    9600 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

"Hardware Address": It is the MAC address;

"Use DHCP": If you use "DHCP", JEDI will be assigned an IP address automaticly by your LAN server. So the following "IP Address" is invalid. If you do not use DHCP, you should assign an IP address manually. To avoid confusion, we recommend you do not use DHCP and assign an IP address manually.

"IP address": you should avoid JEDI's IP address conflict with other device in your LAN.

"Net mask": IP address mask.

"Gateway": If you use JEDI in LAN, gateway is not necessary. However, if you want use JEDI by internet, you must set gateway.

"Baudrate": Now we only support 9600 and 57600 and the default setting is 57600. Any value other than 9600 is considered as 57600.

Type "3" to save the settings:

To validate your setting, reset or re-power the JEDI.

Connecting JEDI for ARM ® with Debug Host

If you want to use JEDI by RS232 port, you should connect JEDI and PC with serial port cable and configure Hitool as following:
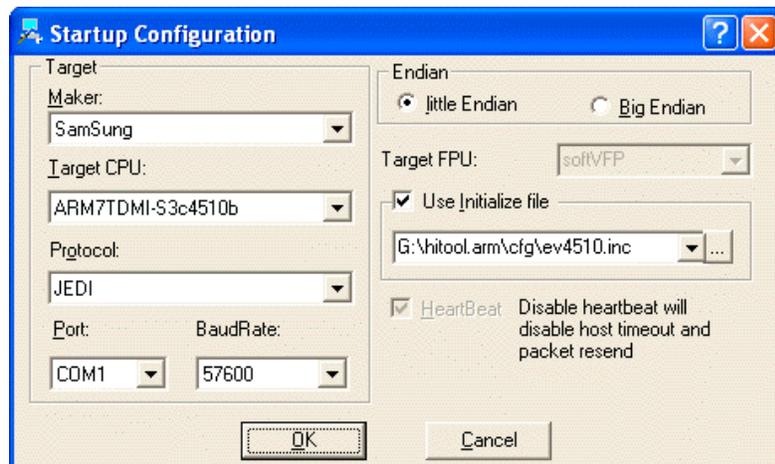
Note that: if you want to connect JEDI through serial port cable, you must confirm no other device in your PC is using the serial port, especially remember to close the HyperTerminal window or break the link.

If you want to use JEDI by Ethernet, you should connect JEDI to hub with a common Ethernet cable or to your PC directly with a twist Ethernet cable. Configure Hitool as following:
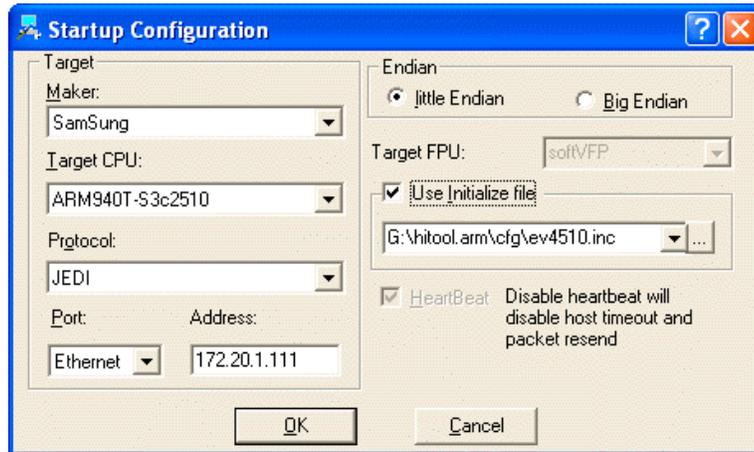
Connecting JEDI for ARM ® with Target

By JTAG cable you can connect JEDI to your target easily.

NOTE

Please pay attention to the direction of the cable, especially when you use the 20/14 convert board!

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4 Application Notes

JTAG Port Description

This chapter is important for the users that are not familiar with JTAG.

Description of JTAG Port Signals

	1	2	
Vtref	1	2	Vsupply
nTRST	3	4	GND
TDI	5	6	RSV
TMS	7	8	RSV
TCK	9	10	RSV
RTCK	11	12	GND
TDO	13	14	RSV
nSRST	15	16	RSV
DBGRQ	17	18	RSV
DBGACK	19	20	GND

	1	2	
Vtref	1	2	GND
nTRST	3	4	RSV
TDI	5	6	RSV
TMS	7	8	GND
TCK	9	10	RSV
TDO	11	12	nSRST
Vsupply	13	14	GND

- **Vtref:** JTAG port pins' reference voltage.
- **Vsupply:** Supply voltage to ICE.

   Generally, these two pin are connected together, voltage is 2.0V~5.5V.

- **nTRST:** TAP reset signal.
- **nSRST:** System reset signal.
- **TDI:** Test data in signal.
- **TMS:** Test mode select.
- **TCK:** Test clock signal.
- **RTCK:** Return test clock signal.
- **TDO:** Test data output.

- **DBGRQ:**   Debug request.
- **DBGACK:**   Debug acknowledge.
- **GND:**   Power ground.
- **RSV:**   Reserved.
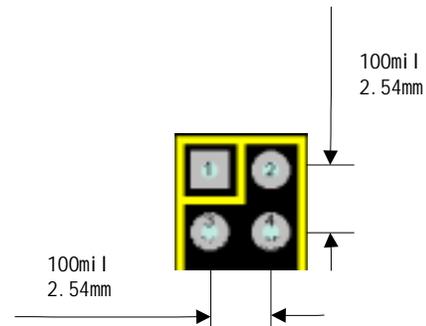
To connect JEDI correctly and tightly, you are recommended to use a 20 or 14 two-side square pin with socket.

How to Deal with nTRST and nSRST Pins of ARM Chip

Many users are confused with these two reset signals: nTRST and nSRST. Firstly, the nTRST is a reset signal only to TAP controller, but not to the whole target system. And the nSRST signal is a reset signal to the whole system, including ARM core, on-chip peripherals and maybe on-board devices.

If your reset device is not open-drain output, e.g. IMP811, you can refer to the following sample:
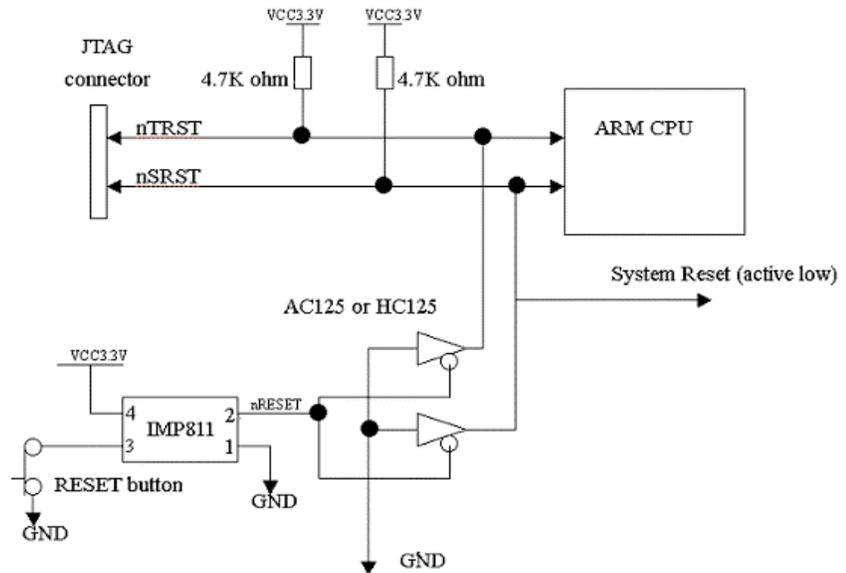
If your reset device is open-drain output, e.g. MAX6337, you can refer to the following sample:
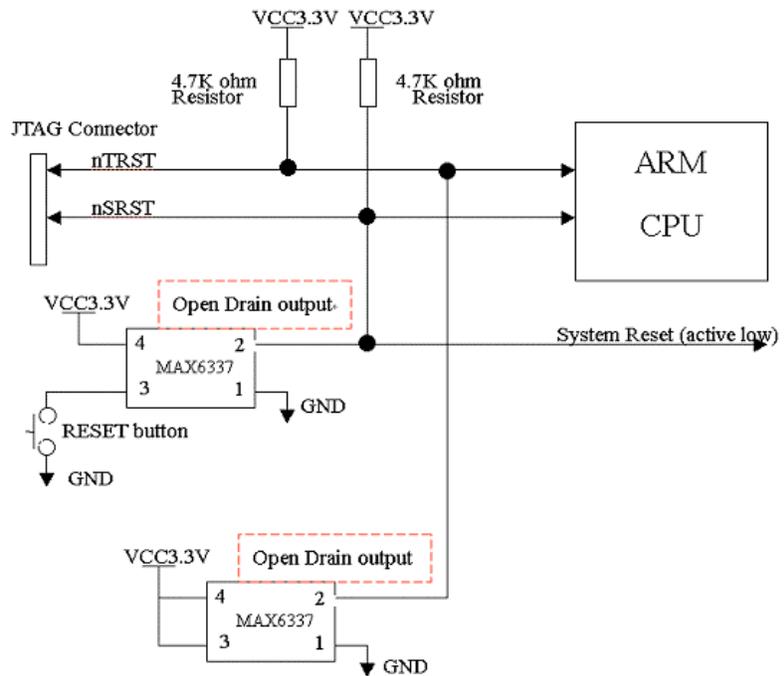
How to do without LAN

Of course, without LAN, you can use JEDI by RS232 connection.

Without LAN, If you want to get higher performance by Ethernet port communication, you can use an Ethernet cable, which is crossover patch cord to connect JEDI to PC directly.

UTP Cable Connections
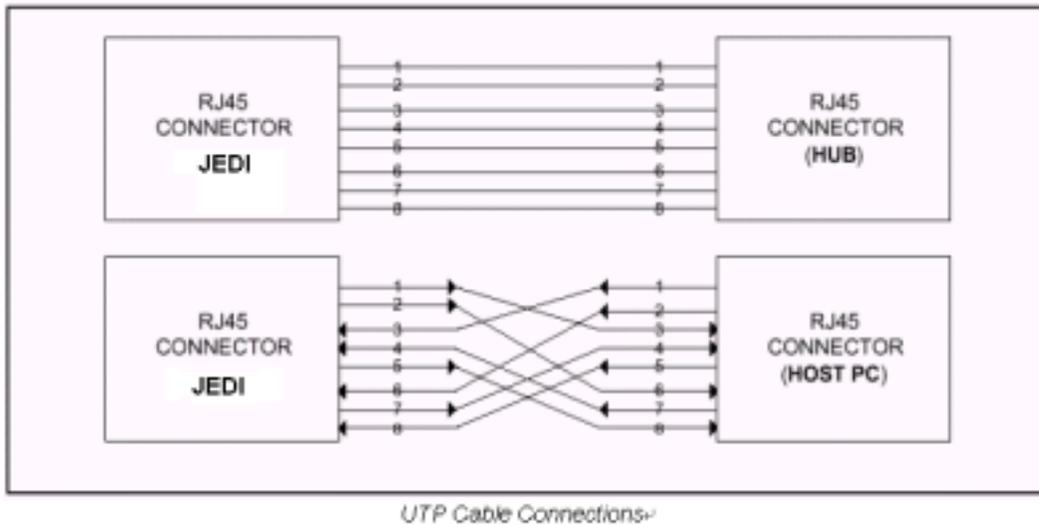
We recommend strongly that you remove the "Gateway" and disable "DNS" in your PC's LAN settings to shorten the connection time.