

# MAJIC Target Connections

## Hardware/Software Integration

The development of *embedded systems* covers a wide range of CPU architectures, CPU core choices and SOC implementations, not-to-mention the simplicity or complexity of the application software, peripheral drivers and OS choices. Add to this, a wide range of IDEs, compilers and preferred debuggers, and the permutations matrix is huge.

The architecture of the EDGE MAJIC series of intelligent JTAG probes is designed to simplify target support by independent layering of debugger interfaces, internal firmware tailored to individual cores, and target support files that allows tailoring the environment for each target, independent from the OS and tools choices higher up the chain.

A variety of standard JTAG cables complete the target connection, so one probe can easily support a wide range of target architectures and software environments.

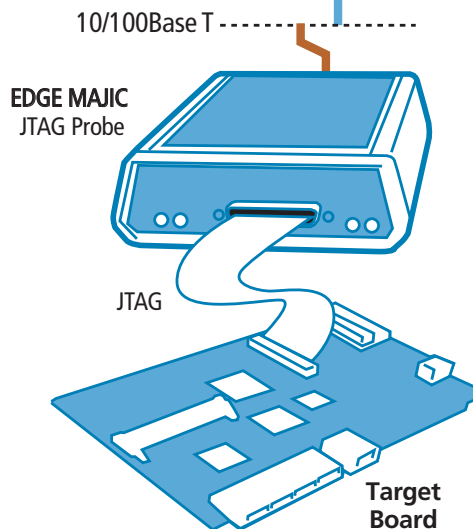
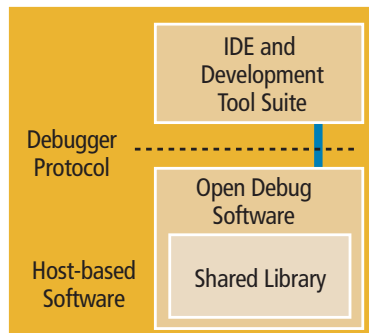
### Standardizing Target Connections

Layering the Target Interface:

- Debugger APIs
- Multiple CPU Architectures
- Core level firmware support
- Startup files
- Target Support files
- Standard memory test patterns
- Flash programming utilities
- Non-intrusive connection modes
- Standard JTAG cables

### Processor Support

ARM and MIPS standard cores and architectural licensee cores (see tables on pages 3)



### Benefits:

#### Multiple Debugger API Support

EDGE MAJIC probes include multiple shared libraries and executables, support industry standard debugger APIs – RDI for legacy ARM tools, MDI (author) for adaptation to many environments including EDGE Developer Toolsuite, eXDI for Windows CE Platform Builder 4.x/5.x, XDB for Intel XScale UDI, MDIserver for any Linux/GDB – one JTAG Probe supports multiple software environments.

#### Setup Wizard, Templates, Target Init files

Provide out-of-the-box setup for Reference Designs and ease the transition to OEM board designs.

#### Multiple Price Point Bundles

- MAJIC-LT – Supports EDGE Developer Suite\*, EDB\* and GDB only, 10 MHz JTAG clock and 3.3V targets.
- MAJIC-LX – Adds programmable JTAG Clock 0 to 40 MHz, Auto-Power-Sense 1.2V to 3.3V, and includes all OpenDebug API support.
- MAJIC-MT – Supports all MAJIC-LX features, plus multiple concurrent debug sessions and Intel XScale trace upload over JTAG

All versions of MAJIC support the same processor list, use the same flash and memory test programs, and use the same JTAG cables.

#### Comprehensive Cache and MMU/MPU Support

Depending on each core type, including all write through and/or write back cache mode support, memory management or protection modes, DMA if available.

#### Pre-Configured Target and Sample Files

Builds early confidence in processor, memory and target system, and provide templates for transition to OEM target.

#### Supported Hosts

PC with Windows 2000/XP or Linux

#### MAJIC Setup Wizard

Builds Windows shortcut with selection for core version, startup and target init files, big/little endian, non-intrusive connect, with opportunity to create custom startup files.

\* EDGE Developer Suite and EDB C Source Level Debugger are optional Mentor Graphics products





# MAJIC Target Connections

EDGE MAJIC® intelligent JTAG probes fully support a wide range of processors and SOCs from the licensees of ARM and MIPS core IP, based on standard cores, synthesizable cores and architectural licensee variants (e.g., Broadcom, Cavium Networks, Intel Xscale, Marvell and Texas Instruments).

MAJIC also bundles OpenDebug™ interface software, to support a wide array of ARM and MIPS family preferred development tools. OpenDebug™ software preserves your investment in software and tools by interfacing the MAJIC JTAG probe to both your legacy and future preferred debuggers.

## Product Lineup

**MAJIC-LT** - Targets price sensitive users with debugger support for Mentor Graphics' EDGE Developer Suite\* and GNU/GDB for any Linux environment.

**MAJIC-LX** - Targets single core debugging, and includes OpenDebug™ support for development tools from ARM, Green Hills, IAR, Intel, Mentor Graphics, Microcross and Microsoft.

**MAJIC-MT** – Supports all MAJIC-LX functionality and environments, and adds multi-session, multi-core, concurrent debug support, and execution trace data upload support for Intel XScale® applications processors with on-chip trace buffers.

*\* EDGE Developer Suite and EDB C Source Level Debugger are optional  
Mentor Graphics software products validated for use with MAJIC JTAG probes.*

## MAJIC OpenDebug™ Supported Development Tools

Company	Development Tools
Mentor Graphics	EDGE Developer Suite
ARM	AXD
GNU	GDB
Green Hills	MULTI
IAR	C-SPY (EWARM)
Intel	XDB
Linux (any)	GDB
Microcross	GNU X-Tools
Microsoft	Platform Builder

## Hardware/Software Integration

### MAJIC Probes Features

- Non-intrusive JTAG target connection (uses no target power, memory space or I/O ports)
- Non-intrusive connect mode (can connect to target without stopping the processor)
- Interactive debug mode (debug process steals cycles while target keeps running)
- Hardware breakpoint support (number determined by number of HWBP registers in the processor core)
- Unlimited software breakpoints
- Programmable JTAG clock (see individual spec) up to 40 MHz
- Download speeds to >400KB/s
- Supports RT Adaptive Clock Mode for ARM

### MAJIC Probe Deliverables

- Preconfigured and customizable template startup files
- Preconfigured reference design target initialization files
  - memory map info blocks access to invalid addresses
  - memory controller initialization data for SDRAM
  - facilitates start up with empty or broken flash
  - scripts can control target-specific functions (watchdog or OS timers, on-stop, at-stop or on-go controls)
- Comprehensive memory tests support board bring-up and memory system initial testing
- NOR Flash programming utilities for over 200 types
- MAJIC Set-up Wizard
  - builds shortcut to select pre-built start-up files
  - facilitates custom start-up files for your target configuration
  - programs static IP address for MAJIC probe
  - supports MAJIC firmware updates for added processors and features
  - configures environment variables for local or remote GDB connection
- Includes all documentation and html index
- Windows or Linux host for software tools
- Hardware and software QuickStart Guide
- Ethernet and serial cables
- Cable kit for standard target connectors (specify on order)
- Power supply brick with international power cord
- MONICE command line debugger
- MON scripting language



# MAJIC Target Connections

## Supported Processor Families

### ARM® Core/Processor Support

#### ARM cores

7TDMI, 7TDMI-S, 7EJ-S, 720T  
9TDMI, 9E-S, 920T, 922T, 926EJ-S,  
940, 946E-S, 966E-S, 968E-S  
1136JF-S, 1156T2, 1176JZF-S  
MPcore

#### Altera

EXPA Series

#### Atmel

AT7x, AT91x

#### Cirrus Logic

EP7x, EP9x

#### Conexant

CN/CXxxxxx

#### Faraday Technology

FA526 core

#### Freescale

i.MX family

#### GlobespanVirata

Helium 100, 210-80, 500

#### Marvell Semiconductor

Feroceon, PXA3xx

#### Digi International (NetSilicon)

NET+ARM, NS7520, NS9360, NS9750

#### Oki Semiconductor

ML67xxx

#### Qualcomm

MSMxxxx

#### Samsung

S3xxxxx

#### Sharp Microelectronics

LH7xxxx

#### ST Microelectronics

ARM7/9 SOCs, Nomadik

#### Texas Instruments

ARM7/9/11 in OMAP family

#### Winbond

W90N740

### Intel XScale Processor Support

#### Intel Storage Components

IOP310	80200
	80219
IOP321	80321
IOP33x	8033x

#### Intel Control Plane Processor

IXC1100

#### Intel eXchange Architecture

IXP42x  
IXP46x  
IXP2350, 2400  
IXP2800, 2850

#### Intel Personal Internet Client Architecture

(Intel PCA Processors)

PXA25x, 26x, 27x and Marvell PXA3xx

### MIPS® Core/Processor Support

#### MIPS core IP

cnMIPS32, cnMIPS64  
MIPS32, MIPS64  
4Kc, m, p  
4KEc, m, p  
5Kc/f, 24Kc/f, 24KE  
Architectural licensees

#### ATI Technologies

Xilleon 22xIntel eXchange

#### Broadcom

BCM11xx, BCM21xx, BCM33xx,  
BCM43xx, BCM47xx, BCM53xx,  
BCM58xx, BCM63xx, BCM65xx,  
BCM70xx, IBCM71xx, BCM73xx,  
BCM74xx

#### Cavium Networks

CN2xx Nitrox SoHo,  
CN30xx, CN31xx, CN36/38xx  
OCTEON Family

#### IDT

79RC323xx, 79RC324xx

#### Ikanos Communications

AD6xxx

#### Lexra

LX4/5xxx core IP

#### LSI Logic

EZ4102/3

#### Micronas

MDE95xx, VGC

#### Micronas USA

Cypher 7108, DeCypher 8100

#### PMC-Sierra

MSPxxxx

#### Sigma Designs

SMP86xx

#### Texas Instruments

TNETC/D/V-xxxx

# MAJIC Target Connections

## MAJIC Cables and Specifications

### Standard JTAG Cables/Protocols

Supports ARM and MIPS standard and architectural licensee reference platform connector standards

<b>CK-ARM14</b> 14-pin ARM JTAG	<b>CK-EJ12</b> 12-pin MIPS EJTAG 2.0	<b>CK-FPJ12*</b> 12-pin ARM/Intel XScale	<b>CK-MIPS14</b> 14-pin MIPS EJTAG 2.6
<b>CK-ARM20</b> 20-pin ARM/Intel XScale	<b>CK-EJ20</b> 20-pin MIPS EJTAG 2.0	<b>CK-J10</b> 10-pin MIPS EJTAG 2.0	<b>CK-TX14</b> 14-pin Texas Instruments
<b>CK-ARM38/1</b> 38-pin ARM Mictor	<b>CK-EJ52</b> 52-pin MIPS EJTAG 2.0	<b>CK-J12</b> 12-pin MIPS EJTAG 2.0	* For small form factor designs

### Flash Programming Utility

Flash programming utilities are provided for a growing list of standard NOR device types from the following:

<b>AMD</b>	<b>Intel</b>	<b>Sharp</b>	<b>ST Microelectronics</b>
<b>Atmel</b>	<b>Macronix</b>	<b>Spansion</b>	<b>Toshiba</b>
<b>Fujitsu</b>	<b>Micron</b>	<b>SST</b>	<b>Winbond</b>

Ask for current list of supported device types, or support assistance if your device is not listed.

### MAJIC Series Electrical Specs

JTAG Clock -	
MAJIC-LT:	0 or 10 MHz
MAJIC-LX & MT:	prog. 0 - 40 MHz
Target V. -	
MAJIC-LT:	+3.3V
MAJIC-LX & MT:	Autosense: 1.2 - 3.3V
Serial Interface:	RS232 to 115kbaud
Ethernet:	10/100BaseT
LEDs:	Status, Power, Run, Connect

External AC Adapter	
Output :	9 VDC, 2.0A
Input voltage	90 - 264 VAC
Input frequency	47 - 63 Hz
Input power	0.6 A
AC connector LT, LX, MT:	IEC320/C8
DC connector to MAJIC probe LT, LX, MT:	1.7 mm coaxial, center positive



### MAJIC Product Information and Technical Support

[http://www.mentor.com/products/embedded\\_software/development\\_tools/majic\\_jtag](http://www.mentor.com/products/embedded_software/development_tools/majic_jtag)

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