JTAGjet™-Trace for Cortex-M3 –M4

with Real-Time ETM Trace

JTAGjet-Trace-CM is a small, palm-sized In-Circuit Debugger (commonly called emulator) used for debugging, testing and verification of embedded systems based on the Cortex-M3 devices. It is equipped with ETM trace memory that captures the compressed data on the ETM port in real-time so it can be decompressed, decoded and displayed on the PC showing the program execution path and variable changes.

Complete ARM Core Support

JTAGjet-Trace supports all **Cortex-M0, -M1, -M3 and -M4** based devices, however, the trace capability can be only used on devices with the ETM port.

Chameleon Debugger™

Each emulator is bundled with a Chameleon Debugger™, a high-end, full-featured, **multi-core debugger** that handles single and multi-CPU debugging. Chameleon Debugger features macros for automated board initialization and testing, fly-over variable pop-ups in source window, drag-and-drop between windows, Graphical Event Triggering and hundreds of other time saving debug features.

Keil uVision™ Support

JTAGjet-Trace-CM is compatible with Keil uVision debugger making it an ideal complementing tool to their IDE, simulator and code generation tools.

Multi-Core Debugging

One of the unique JTAGjet features is that it may be used concurrently with other debuggers (like TI Code Composer Studio or eSOL eBinder), offering a complete multi-core debug environment.

Smart Flash Programmer

JTAGjet comes with a Flash Programmer that recognizes the type and geometry of the device and automatically configures the flashing algorithm. Both on-chip and external NOR flash devices are supported. NAND flash programming is available as an external utility option.

Adaptive JTAG Clock & Voltage

JTAGjet-Trace supports cores with fixed (1kHz – 30MHz) and adaptive JTAG clocks. Adaptive clock is synchronized with the CPU and is recommended on systems that vary the CPU clock to conserve power.

The emulator automatically adjusts the JTAG output signals to the VTREF voltage on the target board and supports 1.8V to 3.3V targets.

JTAGjet-Trace-CM Features

- ❑ Trace capture of up to the **maximum CPU speed**
- ❑ Supports Cortex-M3 and M4 cores equipped with 4-bit Embedded Trace Macrocell (**ETM**) logic
- ❑ **Keil uVision** compatible
- ❑ **Upgradeable** to support other ARM cores: ARM7, ARM9, ARM11, Cortex-R4, Cortex-A8, OMAP and DaVinci
- ❑ Auto **adjusting timing** eliminates problems with data skew
- ❑ **4.5 MBytes** of internal ETM trace memory, upgradeable to 18 MBytes to capture longer execution times
- ❑ 56-bit time stamp with CPU cycle accuracy for **timing analysis**
- ❑ Easy access to ETM settings, triggers and trace filtering
- ❑ Quiet operation – no fans, no external heat sinks
- ❑ Only one connection to target – both JTAG and trace are taken from a high-density, 20-pin Cortex header.
- ❑ Optional Mictor-38 ETM cable and plain JTAG adapter

Chameleon Debugger™ Features:

- ❑ Non-intrusive **ETM & ETB trace** display and debugging
- ❑ **Synchronized** Source and Trace windows for easy debugging
- ❑ Pre- and post-capture **filtering of trace** data
- ❑ Trace clock (CPU speed) display in real-time
- ❑ Instrumentation Trace (**ITM**) display
- ❑ Support for all on-chip breakpoints, triggers and filtering
- ❑ Super fast code downloads
- ❑ JTAG and **Serial Wire Debug** (SWD) support
- ❑ Support for all three CPU resets: **Core**, **System and Hardware Reset**
- ❑ Automatic **processor initialization** on power-up or reset (memory mapping, peripheral setting, MMU, WD disable etc.)
- ❑ **Flash Programming** from GUI or from macros (DOS batch mode utility is also available)
- ❑ **Multi-Core** support for debugging of two or more devices on the same JTAG or separate JTAG connection
- ❑ Available **Concurrent Debugging** to allow two different debuggers to access two different cores at the same time
- ❑ Windows 7, XP & Vista (32 & 64-bit compatible)

Specifications

JTAGjet™-Trace-CM

Specifications	JTAGjet-Trace-CM
USB type / Speed	USB 2.0 type A / 480 Mbps
ETM Trace Memory	4.5 MBytes standard, 18Mbytes optional
Cores Supported	Cortex-M3, M4, upgradeable to other ARM cores
Max. CPU Speed	120 MHz standard, up to 400MHz optional
Probe Length	4 in
Probe Type	20-pin Cortex/SWD standard, Mictor-38 optional
Max. JTAG Clock	30 MHz
JTAG I/O Voltage	1.8V – 3.3V
Current Draw (typ.)	0.8 A typ., AC adapter included
Dimensions (in.)	5.6L-2.6W-1.2H

JTAGjet-Trace-CM shown with optional blue Mictor-38 cable and JTAG splitter (green)

Trace window showing real-time trace information captured during program execution. Full program path (PC) is shown with function names and the corresponding assembler and C/C++ source code. In addition, on-chip Comparators (shown in the **setup** window) were set to generate **ITM data trace** for **Buf1[0]** and **Buf1[2]** accesses. Comparator2 is used to generate **ETM Event** to start the trace on **processing** function and Comparator3 is used to stop the trace on **write to location Buf1[2].** Red line shows trace discontinuity. Yellow line shows STRB instruction (which was a write of 0x47 to Buf1[2] that stopped the PC trace).
Timestamp is being shown in two columns (in ms and CPU cycles). The gap in trace capture was for 12778 CPU cycles (~178 ms).
Current Trace Clock frequency is shown as **36MHz**. Cortex-M3 CPU always runs twice as fast as the Trace Clock, so the CPU speed is **72 MHz**.

Ordering Information

Part Number	Description
JTAGjet-Trace-CM	JTAGjet for Cortex-M3, M4 with 4.5 MBytes ETM trace memory, Chameleon Debugger, IAR driver and Cortex 20-pin cable
Cable-ETM-6	Mictor 38-pin ETM cable, 6 inch
ADA-ETM-JTAG	Mictor 38-pin ETM to ARM-20 and TI-14 splitter probe. Comes with 20-pin and 14-pin flat cables