

TTM8000

Time-Tagging Module

GENERAL DESCRIPTION

AIT's expertise in ultra fast time tagging is now concentrated in the new TTM-8000 time-to-digital converter module. It provides 8 input channels for continuous time measurements in the laboratory or in industrial applications. The 8-channel Time Tagging Module TTM-8000 can be used to measure the exact timing of events (rising and/or falling edges) on up to 8 digital signals for a wide range of logic families. Typical time resolution is 82 ps concurrently on 8 channels; In HiRes modes a resolution of less than 10 ps can be achieved simultaneously on 2 channels.

As a unique feature, the TTM-8000 can continuously deliver up to 25 MEvents/sec to a PC via its GBit Ethernet connection. This is almost 10 times faster compared to USB 2.0 interfaces!

4 MEASUREMENT MODES:

- ▶ I-mode: 8 channels / 82.3 ps resolution / up to 3 years measurement range / up to 25 MEvents/s per TTM8000, 10 MEvents/s per channel sustained 180 MEvents/s burst (max. 32 events/burst) / trigger on rising and falling edges
- ▶ G-mode: 2 channels / 41.2 ps resolution / 170µs measurement Range / up to 20 MEvents/s per TTM8000 sustained / 180 MEvents/s burst (max. 32 events/burst) / trigger on rising and falling edges
- ▶ R-mode: 2 channels / 27.4 ps resolution/ 230 µs measurement range / up to 20 MEvents/s per TTM8000 sustained / 180 MEvents/s burst (max. 32 events/burst) / trigger on rising or falling edges
- ▶ M-mode: 2 channels / 1.0 - 27.4 ps resolution / 10 ps variance / up to 500 k measurement intervals per second / trigger on rising or falling edges



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INTERFACES:

- ▶ Use internal reference crystal (standard crystal oscillator or optional oven-controlled crystal oscillator (OCXO)) or external reference clock (10 / 20 / 40 / 80 MHz)
- ▶ Generate output reference clock (1 / 2 / 5 / 10 / 20 / 40 / 80 MHz) for synchronization of multiple TTM8000s or other devices.
- ▶ Threshold voltage for each trigger signal and external clock individually controllable (+/- 4.1 V) to accommodate a wide range of logic standards.
- ▶ Each trigger input can either be high-impedance or can be terminated with a 50 Ω resistor.
- ▶ Measurements results can compensate different source delays (e.g. cable length)
- ▶ 8 Digital I/O Pins (3.3 V) for controlling external devices
- ▶ 4 Analog Outputs (+/- 4.1 V – 8 bit DAC resolution) and 4 Analog Inputs (selectable 0..4.1 V or +/- 2 V – 10 bit ADC resolution) for controlling external devices
- ▶ Built-In pulse generator for calibration (e.g. cable length measurements)
- ▶ Front Panel can optionally be detached for convenient integration in your setup.
- ▶ Convenient C/C++ API (TTMLib) handles all the low-level access to the TTM-8000 hardware.
- ▶ Ready-to-Use software for Linux and Windows (GUI and command line oriented) to get you started as quickly as possible. The software is based on TTMLib and comes with full sources, so that you can easily expand it to match your specific needs.



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