



Eventech Stream Time Tagger ESTT 7 Series

Revolution of Riga Event Timing Technology.
Next generation of Eventech Time Tagging Devices.



REALTIME data streaming &
continuous event registration

1.5 picosecond
single-shot time-tagging precision

IMPROVED operating temperature range &
extreme reliability



About Eventech

- Is a **highly experienced engineering company** from Europe (Riga, Latvia).
- develops & manufactures **proprietary timing products and signal processing systems**
- Company staff has strong scientific and engineering background with 50+ years of studies in area of picoseconds precision timing technologies .

Our “Bestseller”

Event Timer A033 - “RIGA TIMER”

- **2.5 ps** single short RMS resolution
- **50 ns** dead time
- **2 channels**
- Parallel / USB / Ethernet interfaces



Eventech Stream Time Tagger ESTT 7 Series



KEY FEATURES

- Full Recording Mode
- Interlisting Mode
- 25 MEPS Continuous Event Rate
- 1.5 ps Precision
- Versatile API
- External Time Scale Synchronisation using 10MHz and 1 PPS Signals
- Performance Stability over Broad Temperature Range
- Reconfigurable Comparison Levels of Input Signals via Software

APPLICATIONS

Satellite Laser Ranging
> 50 % Stations Worldwide

Frequency Stability Analysis

Time Transfer & Synchronisation

Time Resolved Measurements

Time Transfer via Optical Fiber, Open-Air Link

Gravimetry

Lidar Signals for Atmospheric Lidars

Custom Applications Custom Modifications

SPECIFICATIONS

Time Tag Precision (typical)	1.5 ps
RMS (typical)	2.1 ps
RMS (max)	2.5 ps
Input Impedance	50 Ω
Operating temperature range	5–40 °C
Communication interface	USB 3.0
Continuous Event Rate	25 MEPS
Single-input time tag drift	< 1 ps / °C
Input-to-input offset	40 ps
Input-to-input offset drift	< 0.15 ps / °C
Dead time	40 ns
EMC Shielding	~ 30 dB(A) at 1 GHz
Synchronisation error of input signals and 1 PPS signal	± 15 ps (max)
Interval non-linearity for time intervals greater than 100 ns	± 1 ps max

IN
50 Ω

BNC

GATE IN:
REF IN:
TRIG IN:
1 PPS IN:

Pulse LVTTTL level ("LOW" enables Input B)
5 or 10 MHz (> 0.5 V p-p)
Pulse TTL/LVTTTL level (rising edge)
Pulse TTL/LVTTTL level (rising edge)

SMA

INPUT A:
INPUT B:
Operating edge:

Pulse width > 0.5 ns, max -2.0 V to +3.0 V
Level of comparison -2.0 V to +3.0 V, step 1.2 mV
Pulse width > 0.5 ns, max -2.0 V to +3.0 V
Level of comparison -2.0 V to +3.0 V, step 1.2 mV
Positive, negative, positive & negative

OUT
50 Ω

BNC

AUX:

Pulse LVTTTL level

ESTT 7 Series parameters specification comparing to A033-ET



Comparison VS A033-ET



EVENTECH
STREAM TIME TAGGER
ESTT-7 series



EVENTECH
EVENT TIMER
A033-ET

Single-shot RMS
Single-shot RMS (typical)
Single-shot RMS (max)
Input minimum pulse width
Continuous Event Rate
Dead time
Synchronisation error of
input signals and signal 1 PPS
Single-input time tag drift
Input-to-input offset drift
Communication interface
Operating temperature range

1.5 ps
2 ps
2.5 ps
> 0.5 ns width
25 MEPS
40 ns
 ± 15 ps (max)
< 1 ps / °C
< 0.15 ps / °C
USB 3.0
5-40 °C

VS

2.5 ps
3 ps
5 ps
> 5 ns width
1 MEPS
50 ns
 ± 10 ns (max)
< 2 ps / °C
< 0.5 ps / °C
USB 2.0
15-30 °C

NEW FEATURES

Comparison levels of input signals can be set via
software in the range -2÷+3V step 1 mV
Effective edge of the input signal (rising or falling)
can be selected via software
25 MEPS Continuous Event Rate with
Complete Registration

VS

A033-ET

fixed for NIM or
LVTTTL signals only
rising edge
only
1 MEPS



ESTT 7 Series Multichannel Option

MASTER



SLAVE *



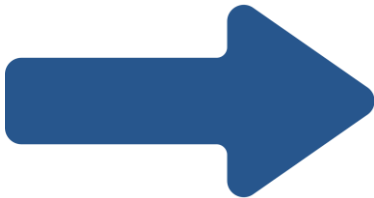
SLAVE *



SLAVE *



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RESULT



continuing Eventech
tradition of the best
price/performance ratio

even for multi-channel
systems

- Each slave module add 2 channels
- The cost of Slave module significantly less than Master module
- Slave module can not work without master

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Picosecond Precise TDC
(Time-to-Digital Converter) Systems
Terrestrial & Space Applications

Photoncounting
for Atmospheric
Lidars

Photoncounting Combined with TDC
& High-speed High-resolution
Analogue-to-digital Data Acquisition

Time-Related
Single Photon Counting Systems
TCSPC

An extra energy-efficient pulse position modulation data
transceivers
(PPM modem)

Terrestrial Applications

Satellite Laser
Ranging

> 50 %
Stations Worldwide

Gravimetry

Time Transfer
via Optical Fiber

Signal Processing
for LiDAR

Time Resolved
Measurements

Time
Synchronisation

Time Transfer
via Open-air Optical
Link (e.g. T2L2)

Space Applications

Accurate TDC for
Space LiDAR

Atmosphere
Aerosols
Backscattering

Debris Tracking
Systems

Space
Gravimetry

Space
Altimetry

Super Low Power Consumption
PPM Based Communication
& Data Transfer

Accurate Signal Registration
in Sensor Systems
to Provide Time Stamps

Quantum Communication
Quantum Key Distribution

Projects by competences



Picosecond Precise TDC (time-to-digital converter) systems Terrestrial & Space Applications			Photoncounting for Atmospheric Lidars	High-rate Low Power Consumption Systems for Telecommunication
ESA Project		Start Year: 2017 Status: Completed Role: Main Contractor Subcontractors: Institute of Electronics & Computer Science, BD Sensors	ESA Project	ESA Project
MPET Onboard implementation of the Multi-purpose Event Timer			SPATILIDAS Space Timer for Lidars and Autocorrelation Sensors	TIPIPLAS Timer for Picosecond PPM based Lasercom Link
ESA Project		Start Year: 2019 Status: Completed Role: Subcontractor Main Contractor: DiGOS	Start Year: 2020 Status: Completed Role: Main Contractor	Start Year: 2022 Status: Completed Role: Main Contractor
ESA Satellite Laser Ranging Operational Prototype. Timing System for ESA SLR station in Tenerife				
ESA Project		Start Year: 2020 Status: Completed Role: Main Contractor	ESA Project	Advantages Compared to Other Telecom:
CUTMB Compact Universal Time Measurement Block ASIC Timer Preliminary Design			EVELIP Eventech Lidar Processor	MINIMUM Power Consumption for the MAXIMUM Data Rate
ESA Project	Part of HERA Mission	Start Year: 2020 Status: Completed Role: Main Contractor	Start Year: 2021 Status: Completed Role: Main Contractor	
LSTM LIDAR and altimetry Specialized Timing Module				
ESA Project	Part of HERA Mission	Start Year: 2021 Status: Ongoing Role: Subcontractor Main Contractor: EFACEC	Photoncounting Combined with TDC & High-speed High-resolution Analogue-to-digital Data Acquisition	
PALT Timing Module for Planetary Altimeter				
Private Project		Start Year: 2023 Status: Completed	ERAF Project	Start Year: 2020 Status: Ongoing Role: Main Contractor
Project with ASIC-producing Partner Request for external TDC testing			Multi-channel Picosecond Precise Time-tagging System with Amplitude Measurement	



Marty McFly:



Perhaps some of you will be interested in the following features of the developed PPM modem.
It can work as:

1

Extra low dead time Event Timer:

- Minimum pulse spacing : 1 ns
- Average dead time : 3.7 ns
- RMS Resolution: 10 ps

2

Extra high resolution Range Gate Generator

- Time granularity 10 ps
- RMS resolution: 11 ps



Picosecond-precise & Extremely Reliable
Time Tagging & Timing
for Space & Terrestrial Applications

THANK YOU FOR YOUR ATTENTION!



VIKTORS KURTENOKS

CTO @ EVENTECH

Email: info@eventechite.com

Mobile: +371 2038 5066



Reliable

Our customers report the extreme reliability of our products!



Trusted

> 50% of all SLR stations are equipped with our products.



Recognised

European Space Agency (ESA) projects for Space Missions.
Recommended by NASA ILRS.