Technical Data

TICRO 100

IEEE 1588/PTP Time Converter

Visit www.omicron-lab.com for more information.
Contact support@omicron-lab.com for technical support.

Technical data subject to change without notice.

1 Timing Performance

PTP Timestamping Resolution	8 ns
PTP locking speed	Locked after approximately 30 seconds (overall accuracy better than 200 ns)
Supported timing protocol	PTP according to IEEE 1588–2008 (IEEE 1588 Version 2)

PTP (IEEE 1588) Features	• Default profile IEEE 1588-2008, Annex J
	  ○ End-to-end (multicast) and peer-to-peer delay mechanisms
	  ○ PTP over UDP/IPv4, UDP/IPv6 and Ethernet/IEEE 802.3 (IEEE 1588-2008 Annex D, E, and F)
	• Power profile IEEE C37.238-2011 (IEEE profile for use of IEEE 1588-2008 Precision Time Protocol in power systems applications)
	• Power profile IEEE C37.238-2017 (IEEE profile for use of IEEE 1588-2008 Precision Time Protocol in power systems applications)
	• IEC/IEEE 61850-9-3:2016

Holdover performance	Holdover drift in 24 hours at constant temperature, after 48 hours of operation: • With high precision oscillator (OCXO-25): < 25 µs (measured values < 4 µs)

2 Time Code and Frequency Outputs

WARNING:
All inputs and outputs of the *TICRO 100* are electrically connected to the SELV (safety extra low voltage) insulation group of the device. It is strongly forbidden to connect none-SELV compliant voltages to all inputs and outputs.

2.1 Electrical Specifications

10 MHz	• BNC connector • Sinusoidal • 50 Ω output impedance • 4 dBm (1 Vpp) ±2 dBm at 50 Ω load • Short circuit protected • Ground connected to housing
Out 1, Out 2	• BNC connector • 50 Ω output impedance • Unmodulated (digital) time codes: 2.5 V at 50 Ω load, 5 V at open circuit, TTL compatible • Modulated IRIG-B: 3 V amplitude (peak) at 50 Ω load, 6 V amplitude at open circuit • Short circuit protected • Ground connected to housing
Out 3	• Screw terminal • Optocoupler Darlington output • Maximum collector-emitter voltage: 30 V • Maximum current: 100 mA • Pulse delays ton < 3 µs (at all load impedances) toff < 20µs (at 30 VDC, load impedance < 1 kΩ) • Supports digital (unmodulated) time codes
Out 4, Out 5	• Fiber optical output • ST connector • Wavelength 820 nm • Compatible with 50/125 µm, 62.5/125 µm, 100/140 µm fibers and 200µm plastic-clad silica (PCS) fibers • Support digital (unmodulated) time codes

2.2 Supported Time Codes

IRIG-B	• TAI, UTC or local time base • Unmodulated (IRIG-B00x) or 1kHz Modulation (IRIG-B12x) • Coded expressions: Control functions, Straight binary seconds, BCD YEAR
DCF77	• Unmodulated DCF77 time code • CET / CEST time base
PPX	• TAI, UTC or local time base • 1, 10, 100, 1000 PPS, 1 PPM, 1 PPH or custom period • Custom period between: 10 mHz to 2.048 MHz (at output 1 and output 2) 10 mHz to 10 kHz (at output 3) • Custom pulse width (>10ns) • Falling or rising edge • Can be combined with Trigger
Trigger	• TAI, UTC or local time base • Absolute trigger date and time programmable with 1s resolution • Can be combined with PPX

3 Networking and Management

Management	• Web Interface (HTTP/HTTPS) • TFTP, FTP, and SSH access • Automated configuration via SSH, SOAP and XML files • Fail-safe software upgrade in the field • Email notifications • Syslog (local and remote)
Networking	• Twisted pair (10BaseT/100BaseTX, RJ45) and optical Ethernet (100BaseFX, LC, multimode) connectors. One interface useable at a time. • Supports IPv4 and IPv6 • Power over Ethernet according to IEEE 802.3af • DHCP • Zeroconf (MDNS/DNS-SD)
USB	• USB 2.0 (Type B) • USB network gadget (RNDIS) • Allows network connection to the TICRO 100 and devices attached to TICRO 100's Ethernet interface (with USB only IPv4 is supported @ the moment)

4 Other

Power Supply

Power over Ethernet	• Max. power consumption 13W • Powered Device (PD) class 3 according to IEEE 802.3af • Operates as PSE (power sourcing equipment) according to IEEE 802.3af when powered via front or back panel DC input. Capable of supplying a class 1 PD (up to 4W).
Front panel DC input	• 18-57 V DC • power consumption <15W • Terminal block, maximum conductor cross section 1.5 mm² WARNING: Product safety according to IEC 61010-1 and IEC 60255-27 only achieved by using an external power supply unit that complies with the SELV standard.
Back panel DC input	• 18-57 V DC, power consumption <15W • power consumption <15W • barrel connector • WARNING: Back panel DC input does not fulfil the surge requirements of IEC 60255-27. Use the front panel DC input if compliance with IEC 60255 is required. WARNING: Product safety according to IEC 61010-1 only achieved by using an external power supply unit that complies with the SELV standard.

EMC

This Product adheres to the electromagnetic compatibility (EMC) directive 2004/108/EC (CE conform).

General	• Radiated emissions according to EN 61326-1, CISPR 11, IEC 60255-25, EN 55022, class A, 30 MHz - 6 GHz • Radiated emissions according to FCC part 15 class A, 30 MHz - 6 GHz • Radiated immunity according to EN 61326-1, EN 61000-4-3, IEC 60255-22-3: 80 MHz – 3 GHz, AM 1 kHz, m=0.8, 10 V/m • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV, air discharge ±8 kV
Front panel DC input	• Conducted immunity continuous wave according to EN 61326-1, EN 61000-4-6, IEC 60255-22-6, 150 kHz - 80 MHz, AM 1 kHz, m=0.8, 10V, spot measurements at 27 MHz, 68 MHz • EFT (Burst) according to EN 61326-1, EN 61000-4-4, IEC 60255-22-4: 5/50 ns, 5 kHz, 1 minute, ±2 kV • Surge according to EN 61326-1, EN 61000-4-5, IEC 60255-22-5: Line-Line ±1 kV, Line-PE ±2 kV • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV

Back panel DC input	• Conducted immunity continuous wave according to EN 61326-1, EN 61000-4-6, IEC 60255-22-6, 150 kHz - 80 MHz, AM 1 kHz, m=0.8, 10V, spot measurements at 27 MHz, 68 MHz • EFT (Burst) according to EN 61326-1, EN 61000-4-4, IEC 60255-22-4: 5/50 ns, 5 kHz, 1 minute, ±2 kV • Surge according to EN 55024, EN 61000-4-5: Line-PE ±0.5 kV • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV
Ethernet port (RJ45)	• Conducted emission according to EN 55022, IEC 60255-25, 150 kHz – 30 MHz, class A • Conducted immunity continuous wave according to EN 61326-1, EN 61000-4-6, IEC 60255-22-6, 150 kHz - 80 MHz, AM 1 kHz, m=0.8, 10V, spot measurements at 27 MHz, 68 MHz • EFT (Burst) according to EN 61326-1, EN 61000-4-4, IEC 60255-22-4: 5/50 ns, 5 kHz, 1 minute, ±4 kV • Surge according to EN 61326-1, EN 61000-4-5, IEC 60255-22-5: Line-PE ±1 kV • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV
Ethernet port (Fiber)	• ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV
10 MHz, Out 1, Out 2, Out 3	• Conducted immunity continuous wave according to EN 61326-1, EN 61000-4-6, IEC 60255-22-6, 150 kHz - 80 MHz, AM 1 kHz, m=0.8, 10V, spot measurements at 27 MHz, 68 MHz • EFT (Burst) according to EN 61326-1, EN 61000-4-4, IEC 60255-22-4: 5/50 ns, 5 kHz, 1 minute, ±4 kV • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV
Out 4, Out 5	• ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV
USB port	• Conducted immunity continuous wave according to EN 61326-1, EN 61000-4-6, IEC 60255-22-6, 150 kHz - 80 MHz, AM 1 kHz, m=0.8, 10V, spot measurements at 27 MHz, 68 MHz • EFT (Burst) according to EN 61326-1, EN 61000-4-4, EN 55024: 5/50 ns, 5 kHz, 1 minute, ±1 kV • ESD according to EN 61326-1, EN 61000-4-2, IEC 60255-22-2: contact discharge ±6 kV

WARNING:
The back panel DC input does not fulfil the surge requirements of IEC 60255-22-5.
Use the front panel DC input, when compliance with IEC 60255-22-5 is required.

WARNING:
The USB port does not fulfil the burst requirements of IEC 60255-22-5.

Safety

- IEC 60950
- IEC 61010
- IEC 60255

Environmental

Operating temperature range	-20°C … +50°C (-4°F … + 122°F)
Storage temperature range	-40°C … +85°C (-40°F … +185°F)
Climate	Tested according to IEC 60068-2-30, Test Db, damp heat, cyclic (6 cycles, 55°C)
Vibration	Tested according to IEC 60068-2-6 and IEC 60255-21-1 (class 1). • Response: frequency range 10…150 Hz, 0.5 g, 1 sweep cycle per axis • Endurance: frequency range 10…150 Hz, 1 g, 20 sweep cycles per axis
Shock	Tested according to IEC 60068-2-27 and IEC 60255-21-2 (class 1) • Response: 5 g/11 ms, half-sinusoid, 3 pulses in each direction, 6 directions • Withstand: 15 g/11 ms, half-sinusoid, 3 pulses in each direction, 6 directions • Bump test: 10 g/16 ms, half-sinusoid, 1000 pulses in each direction, 6 directions

Mechanical

Housing type:	IP40 according to IEC 60529
Dimensions	H x W x D: 54.6 x 171.6 x 121 mm / 2.15” x 6.75” x 4.76” (without accessories)
Weight	<750 g / <1.65 lbs