



syn1588®

syn1588® 10G NIC

Advance Brief Data Sheet

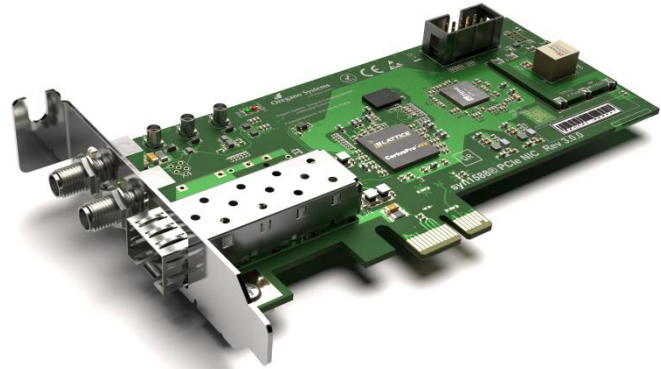
Version 1.0 – May 2024

Features

- 10 Gbit Ethernet network interface card
 - 10 Gbit connectivity but not 10 Gbit bandwidth
- PCI Express card (half height)
 - PCI Express Revision 3.0 (8 Gbit/s lane speed)
- compliant to IEEE1588-2002/2008/2019
- Master and Slave capable PTP Node (with syn1588® PTP Stack)
- IEEE1588 hardware timestamping
- Patented on-the-fly timestamping (1-step mode)
- Clock accuracy up to ±4 ns
- syn1588® PTP Stack binary run-time license included (Linux & Windows)
- Up to 4 programmable I/O signals available on SMA jacks
- Connectivity to an external GPS receiver via the 1PPS input and RS232 port of the host PC
- Drivers for Linux & Windows
- User configuration, remotely upgradeable

Options

- Oscillator option: OCXO
- External clock input driving the syn1588® clock signal



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The syn1588® 10G NIC is a standard 10 Gbit PCI Express Ethernet network interface card with enhancements to provide highly accurate clock synchronization via the IEEE1588 standard. The syn1588® 10G NIC provides all real-time functions required for an IEEE1588 node to operate both in master and slave mode. The syn1588® 10G NIC is based on the Revision 3 of the syn1588® PCIe NIC. It offers on a 10 Gbit network the same accurate and comfortable clock synchronization functions our customers are used from our existing syn1588® NICs.

The syn1588® 10G NIC comes with the network driver and a run-time license of the syn1588® PTP Stack. The latter performs all IEEE1588 tasks like master/slave selection via the best master clock algorithm. Both driver and stack are available for Linux and Windows. Furthermore, the syn1588® 10G NIC may operate either in 2-step or 1-step PTP mode using Oregon Systems' patented on-the-fly time stamping technique for the latter mode.

The card is designed for 10 Gbit network connectivity but not offering full 10 Gbit bandwidth. In many user scenarios there are no more 1000 Mbit network ports available to attach a PTP timing card. That's where this card provides a solution. Note, although the card provides 10 Gbit line speed its power consumption is very low. Thus no special cooling is required.

The syn1588® 10G NIC is capable of handling up to four high accuracy digital IO signals directly linked to the high

accuracy clock within the FPGA device. The direction and functions of these I/O signals may be selected by the user via a remote configuration interface. The options for these signals are:

- **1PPS output** A rising edge is generated once every second.
- **1PPS input** Used to link to an external GPS timing receiver that supplies absolute time reference for grand master applications.
- **EVENT input** A signal transition of an external signal will be time stamped using the high accuracy clock.
- **TRIGGER output** A single event at a programmable time derived from the high accuracy clock.
- **PERIOD output** An arbitrary, user selectable frequency derived from and phase locked to the high accuracy clock
- **IRIG-B output** Optionally an IRIG-B000 output signal can be generated.

The default oscillator is a high-quality TCXO. An on-board high performance analog PLL allows generation of synchronized, high quality single ended clock frequencies up to 156.25 MHz. The card can be ordered with standard copper SFP transceiver modules or with fiber short range or long range modules.



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Technical Specifications	
Standards	IEEE802.3-2015 IEEE802.1Q Virtual Bridged Local Area Networks IEEE1588-2002, IEEE1588-2008, IEEE1588-2019 Precision Time Protocol PCI Express interface & signaling V1.1a, V 2.0, V 3.0
Installable PCI slot	PCI Express 1/2/4/8/16 lane slot
Supported functions	Programmable hardware timestampers IEEE1588 compatible high precision hardware clock Up to 4 programmable SMA I/Os
Storage temperature	-40°C to 85°C
Operating temperature	0°C to 50°C
Humidity	5% to 80% non-condensing
Dimension	135 x 66,4 mm, half height PCI card with bracket
Driver support	Linux kernel version 4.x to 5.15 Microsoft Windows Server 2008 (32/64 bit) ¹ Microsoft Windows Server 2012 (32/64 bit) ¹ Microsoft Windows Server 2016 Microsoft Windows 10 (32/64 bit) ¹ Microsoft Windows 11 (64 bit) ¹

Note (1) there is no support for signed drivers for these OS versions. One has to disable secure boot to use the driver on these OS versions. Windows 7 users might need to install KB3033929.



Franzosengraben 8
A-1030 Vienna
Austria
<http://oregano.at>
contact@oregano.at

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