

# M62 Managed Timing Engine (MTE) Module



## APPLICATIONS

- Small cells, macro-cells (eNodeBs) etc.
- Power grid time synchronization client/slave systems
- Sensor network slave device
- Internet of things & Industrial automation precision timing

## FEATURES

- Full IEEE 1588 -2008 PTP slave clocks
- Support one-step and two- step clock
- Support P2P and E2E modes
- Support multicast and unicast
- Support frequency recovery over SyncE
- Low power, small form factor
- Telecom, power and default profiles
- Fully transparent, low latency pass through traffic
- Industry leading algorithms for G.8261 test suite

## BENEFITS

- Easy integration in host system
- Low power consumption allows POE capability on host system
- Low total cost of ownership



M62 Slave Module

High capacity mobile networks and other emerging applications such as smart grid, wireless sensor networks, Internet of Things etc. require precise time and frequency synchronization. These requirements are getting stricter, especially in the next generation 4G LTE infrastructure. Qulsar's Managed Timing Engine (MTE) Module M62, is a full packet network based synchronization engine, which is custom designed for such 'end-point' applications.

A key innovation is that the M62 can be integrated in an existing communication path. This, along with its standard interfaces, low latency, fully transparent data communication at gigabit speed makes integration into a host system simple. It operates at low power and is a cost optimal solution. The M62 uses industry leading algorithms to extract and deliver highly accurate synchronization performance.

### Design & Integration

The M62 is a slave only module that provides a simple and cost effective option to integrate precision timing by replacing standard generic parts in host systems such as femtocells and small cells. The M62 can replace the PHY in the host system, supporting line-rate traffic.

The M62 offers sophisticated designers the ability to integrate precision synchronization technology into their systems. For rapid 'turnkey' integration, the M62 should be prepackaged in a subsystem (such as a P62 or a Q62) that can be immediately used as a synchronization 'system', enabling a rapid design cycle with future possibilities for deeper integration. The first step towards integration is the purchase of a Evaluation & Developer's Kit that includes all the interface details, licenses and tools necessary for enabling the design effort.

The M62 can operate with the host's IP address. It features an innovative 'wire speed pass through' feature for non-PTP traffic which makes the M62 fully transparent both seen from the network and the host system.

This module is designed for light-weight end applications such as small cells (and femtocells), sensor networks; and Intelligent Electronic Devices (IEDs) in smart grid power utility networks.

# M62 MTE Module



## Pass-Through Technology

One of the innovative features of the M62 is that it can be integrated into an existing communication path. It features a low latency, fully transparent data communication channel at gigabit speed. It also allows for daisy chaining architectures of host systems.

## Multi-sync & Algorithms

The M62 module has industry leading algorithms that enable it to extract precise time signals from packets impeded over the network by traffic load, congestion and delay variation (PDV). In addition, the M62 supports SyncE for frequency recovery unaffected by network PDV. The ability to use multiple synchronization inputs is particularly powerful in today's applications, where a host system may need to be versatile and deployable in multiple environments.

### System Features

- IEEE 1588-2008 PTP Slave clock
- Fully compliant to telecom, power and default profiles
- Multi-sync handling support
- Frequency accuracy better than 1ppb under ITU-T G.8261 test conditions <sup>1</sup>
- Phase accuracy better than  $\pm 1\mu\text{s}$  accuracy under G.8261 testing conditions <sup>1</sup>
- Enhanced synchronization and network performance metrics

### Network Interface

- Upstream 1GbE magnetics
- Downstream 1 RGMII port
- Wirespeed low latency pass-through
- Integrated TCP/IP stack
- IPv4 and IPv6 <sup>2</sup> (PTP)

<sup>1</sup>ITU-T G.8261 tests conducted at both Qulsar internal labs and 3<sup>rd</sup> party labs – details available on request and under NDA

<sup>2</sup>Planned for future release

## Technical Specifications

### Ethernet

- Wirespeed 1GbE pass-through

### PTP Slave

- Supports 1-step and 2-step masters
- Input sync rate: up to 128 Hz
- Accuracy: up to +/- 50 ns

### Other Features

- DHCP client
- FTP server
- TELNET server
- SSH server
- Serial terminal
- Remote firmware upgrade
- Command line interface configuration (Telnet, SSH or serial port terminal)

### Input Synchronization Interfaces

- PTP: Ethernet / UDP / IPv4 / IPv6 (L2 or L3)

### Output Synchronization Interfaces

- Freq out: 5/10/20/25 MHz
- PPS out: up to 2 kHz with 1  $\mu\text{s}$  resolution
- ToD out: TTL 4800/9600 bps on dedicated pin. Up to 115200 bps on serial port.
- PTP: Ethernet (L2) or UDP IPv4 / IPv6

### ToD Format (output)

- ASCII (YYYY-MM-DD HH:MM:SS)
- NMEA & China Mobile binary format

### Other Interfaces

- GPIO, Asynchronous serial, SPI RGMII, MDIO, LVTTTL

### Operating Specifications

- Supply: 3.3V, 1.8V, 1.2V +/- 10%
- Operating temperature: 0°C to 70°C (-40°C to 85°C optional)
- RoHS compliant
- Low power processor module: 1.1W (typical)

### Physical Specifications

- Package: LCC84
- Size: 29.2 mm X 29.2 mm X 2.8 mm

### Ordering Information

- 83-200-00 Managed Timing Engine Module (MTE) M62 Slave