**Introduction:**

**VCL-2112, PTP Slave Clock** is a high precision, high reliability time and frequency synchronization solution which can be used to synchronize with an IEEE-1588v2 PTP Grandmaster to provide frequency and time-of-day synchronization across all nodes of a PTP network. Multiple 1PPS / IRIG-B Outputs are also provided to synchronize local clock (time-of-day) display units as well as RTUs to a central timing source with nanosecond accuracy.

The **VCL-2112, PTP Slave Clock** is specifically designed for providing synchronization in 2G, 3G, HetNet and LTE mobile telecommunications networks as well as in backhaul wire-line TDM Networks. It may be also used by Railways, Airports (including air-traffic control), Power generation and distribution companies and other Utility companies who need to distribute highly precise time-of-day and frequencies locked to a PTP Grandmaster (GPS) Reference across multiple nodes of their networks.

The **VCL-2112, PTP Slave Clock** is equipped with a highly accurate, low-noise OCXO which provides a high stability holdover that is typical of a Network SSU in the event of a failure of the Ethernet transmission link.

**VCL-2112, PTP Slave Clock**

**Description:** VCL-2112, PTP (IEEE-1588v2) Slave Clock - synchronizes to PTP Grandmaster to provide 1PPS, NMEA, 10MHz, 2.048MHz, 1.544Mbits / 2.048Mbits Frequency Outputs with high stability OCXO holdover.

**Features and Highlights:**
- Reliable, Cost-Efficient Reference
- BCMA (Best Master Clock Algorithm) - allows the unit to be installed in a redundant PTP Grandmaster network
- OCXO Holdover
- 2.048MHz/10 MHz outputs
- 1 PPS / IRIG-B outputs
- Nanosecond accuracy
- Standard RJ45 and BNC connectors for all inputs and outputs
- ToD compliant to NMEA 0183 (DB9 Serial Port).

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**Application Diagram:**

**Additional Features:**
- Password Protection
- Redundant AC and DC power supply options
- USB Serial Port (for local access)
- 1 x 10/100BaseT PTP Network (Synchronization) Port
- 1 x 10/100BaseT OAM (Management) Port
- Power Contact and Lightening Protection as per Telcordia GR-1089-CORE.

**Typical Synchronization Applications**
- Synchronizing mobile communication networks such as UMTS, GPRS, HetNet, 2G and 3G networks
- Wireless and Wireline Telecom synchronization
- Distributing Time (ToD) and Frequency reference for power utilities across all nodes of the network
- Synchronization of Defense Networks
- Synchronizing airports and aviation communications
- Synchronizing railway signaling networks and railway communications
- Synchronizing traffic management
- Broadcasting Network and Broadcast equipment synchronization.

**Management and Monitoring Ports:**
- RS-232C
- USB
- 10/100BaseT Ethernet
- 1 x External Alarm Relay Contact.
Standard Frequency and ToD* Outputs:

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.544 Mbits (T1) / 2.048 Mbits (E1)</td>
<td>RJ45</td>
</tr>
<tr>
<td>compliant with ITU-T G.703</td>
<td></td>
</tr>
<tr>
<td>2.048 MHz, 75 Ohms, phase-locked to</td>
<td>BNC</td>
</tr>
<tr>
<td>PTP Grandmaster (GPS) Reference</td>
<td></td>
</tr>
<tr>
<td>10 MHz, 50 Ohms, phase-locked to</td>
<td>BNC</td>
</tr>
<tr>
<td>PTP Grandmaster (GPS) Reference</td>
<td></td>
</tr>
<tr>
<td>IRIG-B, synchronized to PTP</td>
<td>BNC</td>
</tr>
<tr>
<td>Grandmaster (GPS) reference**</td>
<td></td>
</tr>
<tr>
<td>TOD (Time-Of-Day) output</td>
<td>DB9,</td>
</tr>
<tr>
<td>compliant to NMEA0183</td>
<td>RS-232C</td>
</tr>
<tr>
<td>1 PPS</td>
<td>BNC</td>
</tr>
</tbody>
</table>

*Note: User selectable between IRIG-B and 1PPS Outputs

Environmental:

- Operational: 0°C to +60°C (Typical: +25°C)
- Cold Start: -10°C
- Storage: -40°C to +75°C
- Humidity: 95% non-condensing
- Cooling: Convention Cooled
  - No cooling fans are required.

Mechanical Specifications:

- Rack mounting: Standard 19-Inch. DIN Rack
- Height: 44.00 mm. (1RU)
- Depth: 280.00 mm.
- Width: 480.00 mm.
- Weight: 3.20 kg.

Ordering Information

- VCL-2112, PTP (IEEE-1588v2) Slave Clock
  - 19-inch Rack Mount, 1U High
  - Synchronizes to PTP Grandmaster to provide 1PPS, NMEA, 10MHz, 2.048MHz, 1.544Mbits / 2.048Mbits Frequency Outputs with high stability OCXO Holdover
  - Management: SNMP, Telnet (RJ45 (F) Port), Serial Port (USB, DB-9 COM), EMS, Graphical User Interface (GUI)
  - Installation Kit: System Core Cables, Mounting Hardware, Documentation, User Manual

Add Power Supply Option

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Description</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC220</td>
<td>1 x 100-240V, 50/60 Hz, AC Power Supply Input</td>
<td>1 x 100-240V, 50/60 Hz, AC Power Supply Input</td>
</tr>
<tr>
<td>DC048</td>
<td>1 x (-) 48V DC Power Supply Input</td>
<td>2 x (-) 48V DC Power Supply Input [Redundant]</td>
</tr>
<tr>
<td>AC220R</td>
<td>2 x 100-240V, 50/60 Hz, AC Power Supply Input [Redundant]</td>
<td>1 x 100-240V, 50/60 Hz, AC Power Supply Input [Redundant]</td>
</tr>
<tr>
<td>DC048R</td>
<td>2 x (-) 48V DC Power Supply Input [Redundant]</td>
<td>1 x (-) 48V DC Power Supply Input [Redundant]</td>
</tr>
</tbody>
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