VPX336
Complete VPX Timing Module with IRIG-B, GPS, 1PPS, IEEE1588, SyncE

Key Features

- 3U VPX timing module
- Single-module complete timing card supporting grandmaster clock / slave clock modes
- GPS receiver on board
- Sine Wave clock input (typically 10MHz)
- 1PPS/IRIG-B DCLS/Manchester input
- Clock/IRIG-B DCLS/Manchester output
- IRIG-B Amplitude Modulated (AM) input
- IRIG-B Amplitude Modulated (AM) output
- Synchronous Ethernet (SyncE) Master/Slave
- IEEE1588 PTP Master/Slave via 10/100/1000Base-T
- NMEA standard serial output from GPS
- 5x DPLL on board for precise timekeeping
- RoHS compliant
- Clocks to P0 as MLVDS

Benefits

- Design utilizes proven VadaTech subcomponents and engineering techniques
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company
VPX336

The VPX336 is a 3U VPX module providing a complete timing solution. The VPX336 has 1PPS, Sine Wave clock, IRIG-B input, IRIG-B out and a GbE.

The module can take its upstream time/frequency from one of:

- GPS (freq and time + location/velocity/other metadata)
- IEEE1588 PTP (freq and time)
- IRIG-B AM/DCLS/Manchester (freq and time)
- 1PPS (freq only)
- Sine Wave Clock In (freq only)
- Synchronous Ethernet (freq only, can be combined with IEEE1588 PTP)

The module can provide its downstream time/frequency to all of:

- IEEE1588 PTP (freq and time)
- IRIG-B AM/DCLS/Manchester (freq and time)
- 1PPS (freq only, can be combined with NMEA for freq and time)
- NMEA (time only, can be combined with 1PPS for freq and time)
- Clock Out (freq only)
- Synchronous Ethernet (freq only)

The module has an on board 5 x DPLL. The DPLL synchronizes 1Hz to 750MHz, providing frequency with jitter cleaning of noisy references. Complies with ITU-T G.8286, G.813, G.812 and Telcordia GR-253/GR-1244. The module will automatically holdover upon loss of reference while still providing its time/frequency outputs to the rest of the system. The DPLL allows for fast lock to 1HZ input taking only 3 to 60 seconds depending on the reference input compared to 10 minutes or more for previous solutions.

The VPX336 has RS-232 routed to the front as well as to the rear (P2 connector). The rear RS-232 has an option to be level shifted or simply as LVCMOS.

The VPX336 provides standard NMEA format via RS-232 for external devices.
**VPX336 – 3U VPX IRIG-B Module**

- **Status/Activity**
  - LEDs
  - Micro USB
  - RJ-45
  - Micro USB
  - Status/Activity
  - GPS
  - NMEA Out
  - Clock Out
  - Sine Wave In
  - GPS ANT In
  - IRIG-B In
  - IRIG-B Out
  - 1PPS In
  - Status/Activity
  - Micro USB
  - Micro USB
  - SSMC
  - SSMC
  - SSMC
  - SSMC
  - LEDS
  - SSMC
  - SSMC

---

**Figure 1: VPX336 Functional Block Diagram**

- Health Management
- GPS
- FPGA
- CBS
- 5 x DPLL and Jitter Cleaner
- REF_CLK
- AUX_CLK
- CPU UART
- 4 x SERDES
- 2x GbE
- 6x GbE
- 16x CLK
- GPIO Single Ended
- PCIe Gen2 x4 or 10 GbE (XAUI) or 4x GbE

**Figure 2: VPX336 Pinout Block Diagram**

- **P2**
  - Row G
  - Management
  - PLL
  - Single Ended
  - +3.3V
  - GND
  - REF_CLK
  - AUX_CLK
  - CPU UART
  - 4 SERDES
  - 2 GbE
  - 6 GbE
  - 16x CLK

- **P1**
  - Row G
  - RS-232
  - N/C
  - N/C
  - 10 GbE (XAU)
  - GbE
  - PCIe Gen2 x4

---

**info@vadatech.com | www.vadatech.com**
## Specifications

<table>
<thead>
<tr>
<th>Architecture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Dimensions</td>
</tr>
<tr>
<td>Type</td>
<td>Type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VPX</td>
<td>Type</td>
</tr>
<tr>
<td>VPX</td>
<td>Type</td>
</tr>
<tr>
<td>Module Management</td>
<td>IMPI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>VPX336</td>
</tr>
<tr>
<td>Front Panel</td>
<td>SSMC</td>
</tr>
<tr>
<td></td>
<td>Micro USB</td>
</tr>
<tr>
<td></td>
<td>RJ-45</td>
</tr>
<tr>
<td>LEDs</td>
<td>Status</td>
</tr>
</tbody>
</table>

| Software Support | Operating System | Agnostic |

<table>
<thead>
<tr>
<th>Other</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MTBF</td>
<td>MIL Hand book 217-F@ TBD hrs</td>
</tr>
<tr>
<td>Certifications</td>
<td>Designed to meet FCC, CE and UL certifications, where applicable</td>
</tr>
<tr>
<td>Standards</td>
<td>VadaTech is certified to both the ISO9001:2015 and AS9100D standards</td>
</tr>
<tr>
<td>Warranty</td>
<td>Two (2) years, see VadaTech Terms and Conditions</td>
</tr>
</tbody>
</table>

## INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.
# Ordering Options

## VPX336 – ABC-DEF-0HJ

<table>
<thead>
<tr>
<th>A = P1 option</th>
<th>D = P2 option</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = Not installed</td>
<td>0 = Not installed</td>
</tr>
<tr>
<td>1 = Installed</td>
<td>1 = Installed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B = SERDES Configuration P1 Ports 1-4</th>
<th>E = RS-232 Level Shifter for P1 G9/G11</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td>0 = Installed (TX/RX are level shifted per RS-232 specification)</td>
</tr>
<tr>
<td>1 = 4 GbE (XAUl)</td>
<td>1 = Not Installed (TX/RX as LVCMOS)</td>
</tr>
<tr>
<td>2 = 10GbE (XAUl)</td>
<td></td>
</tr>
<tr>
<td>3 = PCIe as end point</td>
<td></td>
</tr>
<tr>
<td>4 = Reserved</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C = VPX Connector Type</th>
<th>F = Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = Standard 50u Gold Rugged</td>
<td>0 = No battery installed</td>
</tr>
<tr>
<td>1 = KVPX Connectors</td>
<td>1 = Lithium Ion installed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J = Conformal Coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
</tr>
<tr>
<td>1 = Humiseal 1A33 Polyurethane</td>
</tr>
<tr>
<td>2 = Humiseal 1B31 Acrylic</td>
</tr>
</tbody>
</table>

*Option B applies

## Environmental Specification

### Air Cooled

<table>
<thead>
<tr>
<th>Option H</th>
<th>H = 0</th>
<th>H = 1</th>
<th>H = 2</th>
<th>H = 3</th>
<th>H = 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>AC1* (0°C to +55°C)</td>
<td>AC3* (-40°C to +70°C)</td>
<td>CC1* (0°C to +55°C)</td>
<td>CC3* (-40°C to +70°C)</td>
<td>CC4* (-40°C to +85°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>C1* (-40°C to +85°C)</td>
<td>C3* (-50°C to +100°C)</td>
<td>C1* (-40°C to +85°C)</td>
<td>C3* (-50°C to +100°C)</td>
<td>C3* (-50°C to +100°C)</td>
</tr>
<tr>
<td>Operating Vibration</td>
<td>V2* (0.04 g²/Hz max)</td>
<td>V2* (0.04 g²/Hz max)</td>
<td>V3* (0.1 g²/Hz max)</td>
<td>V3* (0.1 g²/Hz max)</td>
<td>V3 (0.1 g²/Hz max)</td>
</tr>
<tr>
<td>Storage Vibration</td>
<td>OS1* (20g)</td>
<td>OS1* (20g)</td>
<td>OS2* (40g)</td>
<td>OS2* (40g)</td>
<td>OS2* (40g)</td>
</tr>
<tr>
<td>Humidity</td>
<td>95% non-condensing</td>
<td>95% non-condensing</td>
<td>95% non-condensing</td>
<td>95% non-condensing</td>
<td>95% non-condensing</td>
</tr>
</tbody>
</table>

### Conduction Cooled

<table>
<thead>
<tr>
<th>Option H</th>
<th>H = 0</th>
<th>H = 1</th>
<th>H = 2</th>
<th>H = 3</th>
<th>H = 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Vibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Vibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *Nomenclature per ANSI/VITA 47. Contact local sales office for conduction cooled (H = 2, 3, 4).
Related Products

- **VPX336** – 3U VPX IRIG-B Module

- **VPX592**
  - 3U FPGA carrier for FPGA Mezzanine Card (FMC) per VITA 46 and VITA 57
  - Xilinx Kintex UltraScale™ XCKU115 FPGA
  - 20 GB of DDR4 Memory (2 banks of 64-bit wide, and single bank of 32-bit wide)

- **FMC214**
  - Dual complete transceiver signal chain solution using Analog Devices AD9361 transceiver
  - Frequency range 70 MHz to 6 GHz with instantaneous bandwidth from 200 kHz to 56 MHz
  - MIMO transceiver is Time Domain Duplex (TDD) and Frequency Domain Duplex (FDD) compatible

- **AMC585**
  - Xilinx UltraScale+ XCZU19EG FPGA
  - Single FMC+ (VITA 57.4) site
  - MPSoC with block RAM and UltraRAM
Contact

VadaTech Corporate Office
198 N. Gibson Road, Henderson, NV 89014
Phone: +1 702 896-3337   |   Fax: +1 702 896-0332

Asia Pacific Sales Office
7 Floor, No. 2, Wenhu Street, Neihu District, Taipei 114, Taiwan
Phone: +886-2-2627-7655   |   Fax: +886-2-2627-7792

VadaTech European Sales Office
VadaTech House, Bulls Copse Road, Southampton, SO40 9LR
Phone: +44 2380 016403

info@vadatech.com   |   www.vadatech.com

Choose VadaTech

We are technology leaders
•   First-to-market silicon
•   Constant innovation
•   Open systems expertise

We commit to our customers
•   Partnerships power innovation
•   Collaborative approach
•   Mutual success

We deliver complexity
•   Complete signal chain
•   System management
•   Configurable solutions

We manufacture in-house
•   Agile production
•   Accelerated deployment
•   AS9100 accredited

Trademarks and Disclaimer
The VadaTech logo is a registered trademark of VadaTech, Inc. Other registered trademarks are the property of their respective owners. AdvancedTCA™ and the AdvancedMC™ logo are trademarks of the PCI Industrial Computers Manufacturers Group. All rights reserved. Specification subject to change without notice.

© 2019 VadaTech Incorporated. All rights reserved.
DOC NO. 4FM737-12 REV 01 | VERSION 1.0 – JUL/23