OMNIVERTER VECTO 3

Wave Synchronized Analyzer

Phasor Measurement Unit+ | Power Quality Analyzer+ | Automation+ | Grid Oscillation+

Greater Flexibility:

Voltage (LN): 600V, 480V, LPVT's

Current: CT's, mV Sensors, LPCT's

Product Description

The VECTO 3 is a rugged, multifunction, wave-synchronized, Class-A power quality device, now in its fourth generation. The device is permanently GPS or PTP time synchronized to within <100ns from absolute time, and features high accuracy, and high-bandwidth programmable gain analog inputs.

The analyzer offer significant versatility, accepting various types of current inputs including current sensors (CT''s), current transducers, Rogowski coils, and low powered current sensors (LPCT). Voltage inputs, options include direct input, through a potential transformer, or via low powered voltage sensors (LPVT). It supports secure Gigabit bandwidth IP integration via Ethernet, Fiber, WiFi and 4G Cellular interfaces.

VECTO devices are powered by AC, DC or POE-Plus sources, and include built-in battery support. They can operate standalone or as part of a fleet of permanently connected devices managed by VECTO Grid OS, a comprehensive platform for big data hosting, visualization, analysis and reporting. Various value-adding software modules are also available.

Hardware Features

- 1.5MHz Sampling Rate / 750kHz Analog Bandwidth
  - 50kHz Diagnostic Waveform Capturing
  - 833 Samples at 60Hz
- GPS, IEEE 1588V2 (PTP) & NTP Time Synchronisation
- NVMe SSD Data Storage
- Battery Backed GPS w Active Antenna
- Battery Backed 4G Cellular Modem w MIMO Antennae
- Battery Backed WiFi w MIMO Antennae
- 2 x Gigabit Ethernet Ports
- 1 x Gigabit SFP Fiber Port
- Lockable USB-C Expansion port
- Li-Ion Battery
- Universal AC/DC Power Supply
- IEEE 802.3 compliant POE+
- Fan less Design
- Rugged Aluminium Enclosure with DIN Rail Mounts
- Comprehensive Onboard Device Telemetry

External Interfaces

Universal AC/DC PF Corrected Power Supply Input
4 x Programmable Gain High Impedance Voltage Inputs
4 x Galvanically Isolated Current Inputs
4 x Programmable Gain Differential Current Sensor Inputs (5V Powered)
4 x Digital Event Inputs
4 x Solid State Relay Outputs w LED Indicators
1 x Active GPS Antenna Port
1 x Passive MIMO Cellular Antenna Port
1 x Passive MIMO WiFi Antenna Port
2 x Gigabit Ethernet Ports
1 x 1000BASE-X SFP Cage
1 x SIM Slot
1 x USB-C Expansion port
13 x LED's
1 x PWR ON/OFF Push-Button
1 x Safety Earth Connection Point

Device Compliance

Power Quality Instrument: IEC62586-1 - PQI-A-FI1-H

Power Quality: IEC6100-4-30 ED 3.0 Class-A

Harmonics: IEC61000-4-7 Class 1

Flicker: IEC61000-4-15 Class F1

PMU – IEEE C37-118 Class P&M

Revenue Class Accuracy - IEC62053-22 Class 0.2S

Functional Features

- Linux Operating System with Comprehensive Cyber Security Support
- Encrypted Communication with On-Board Open VPN Client
- Web Server with Real-Time Viewer
- Field Upgradeable
- On-Board LUA Software Prototype Environment
- Rich Diagnostic Event Data Streams with long Pre- & Post Data

omniverter
tame your power—keep your profits

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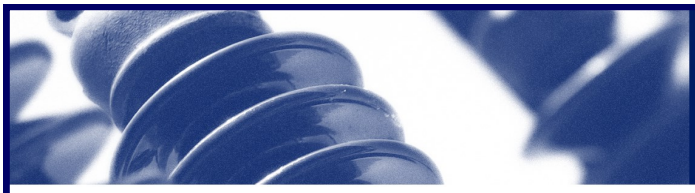

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Functional Features (contd.)

- Diagnostic Waveform Data sampled at Fixed Sampling Rate
- XrossTrigger Mechanism
- Measures AC & DC Parameters
- Offline Synchrophasor Recording
- Fast SCADA parameter update speed.
- Supports 16.66Hz, 50Hz, 60Hz & 400Hz Networks
- Harmonic Powers & Phase
- Prevailing Phasors
  - Prevailing Harmonic Magnitude Ratio
- Higher Harmonic Bands (up to 25kHz)
- Frequency Lock on Chopped Voltage Waveforms
- Calculate 3rd or 4th Current from existing 2- or 3-Current inputs
- Compensate Harmonic Amplitude & Phase Angle of External Sensors
- Simultaneously record various time interval data streams

VOLTAGE INPUTS	
Number of channels	4 x high impedance resistive voltage divider inputs (3/4 Wire + 4th Diff)
Measurement range	600 V_{RMS} (V_{LN}) 1,000 V_{RMS} (V_{LL}), ± 850 V_{DC}
Programmable Gain	1,2,4,8,16
Voltage measurement	DC, Single Phase, 3-Phase (Star, Delta)
Input impedance/channel	> 1 MΩ

CURRENT INPUTS	CT's xxx:1A & xxx:5A
Number of channels	4 x galvanically isolated resistive shunt (5mΩ)
VA Burden @ 5A	< 125 mVA
Measurement Range	6.0 A_{RMS}
Max. Continuous Current	10.0 A_{RMS}
2sec over-current withstand	50 A
Galvanic Isolation	1000 V

CURRENT SENSOR INPUTS	mV input
Number of channels	4 x high impedance resistive voltage divider inputs
Measurement input range	2.5 V_{RMS}, ± 4 V_{DC}
Programmable Gain	1,2,4,8,16
Input impedance/channel	> 1 MΩ

DIGITAL INPUTS	
Number of channels	4 x high impedance resistive voltage divider inputs
Input Voltage Rating	± 150 V_{DC}
Input impedance/channel	> 1 MΩ

DIGITAL OUTPUTS	
Number of channels	4 x galvanically isolated solid-state relays
Switch rating	700 mA_{DC}, 200 V_{DC}, 1.5 A_{DC} (max)
Galvanic isolation	1000 V

ACCURACY & BANDWIDTH	
Sampling rate	1.5 MHz (time synchronized)
Analogue Bandwidth	750 kHz
Waveform storage rate	1 kHz – 50 kHz (user configurable) / 833 Samples at 60Hz
ADC Resolution	> 16-bit
Overall accuracy	< 0.1%
Fast transient capturing	≥ 20 µs
Power frequency range	DC – 25 kHz (200 Hz bands)
Harmonic spectrum	1-64th (harmonic and inter-harmonic)
Higher harmonic bands	DC, 40-70 Hz

Product Functionality

- PQI – IEC61000-4-30 ED3.0 Class-A
- PMU – IEEE C37-118 Class P&M
- oPMU – Oscillation Phasor Measurement
- Automation Protocols
  - Modbus
  - DNP3
  - IEC61850
- PMU IEEE C37-118
- Billing
  - Imported
  - Exported
  - Net
  - Month to date
  - Previous Month

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COMMUNICATION	
Ethernet	2 x gigabit ethernet
Fibre	1 x 1000BASE-X SFP cage
Cellular Moden	1 x Battery backed industrial 4G module
Cellular Antennae	1 x MIMO antenna port
WiFi	1 x industrial WiFi module
WiFi Antennae	1 x MIMO antenna port
Operating Modes	Access Point or Infrastructure Mode
USB - Expansion Port	1 x USB-C (USB2.0–480Mbit) (powered)

TIME STAMPING	
On-board precision time source	Battery backed industrial GPS (3.3 V powered active external antenna)
On-board fall-back time source	Battery Backed Real Time Clock
On-Board RTC drift	10 ppm (320 seconds per annum)
External Sources	NTP, PTP (IEEE1588-V2)
Overall time accuracy	< 100 ns (from absolute time) (when locked to GPS or PTP)

POWER	
Power Consumption	< 10 W (20 W Max) (max when charging batteries)
AC supply voltage range	80-300 V_{AC} (40-70 Hz) (power factor corrected)
DC supply voltage range	80-300 V_{DC}
Power over Ethernet	IEEE 802.3 compliant
On-board battery	2 x 18650 type Li-Ion Cells

PHYSICAL	
Dimensions	250 x 135 x 65 (L x W x H) mm 9.9 x 5.3 x 2.6 (L x W x H) inch
Material	Aluminum plates, plastic collar
Weight	1.9 kg / 4.2 lbs
Mounting options	Portable, DIN Rail, 19" Rack (3U)
Electrical connections	Pluggable screw type (screw lock-down)
Electrical isolation class	600 V Class II
Rated range of Operation	-20 C to 60 C / -4 F to 140 F (Internal Battery
Limit range of Operation & Storage	-40 C to 70 C / -40 F to 158 F (Internal Battery Disabled)
Operating humidity	0-95% (non-condensing)