Enedo
RESHAPING ELECTRICITY

VIDI2 System Controller
UIF User interface display

VIDI Auxiliary Controllers:
VIDI-BM Battery block Monitoring
VIDI-LVD Low Voltage Disconnector
VIDI-SAM Serial Adapter Module

IEC61850 SCADA Converter

Product Description

VIDI2 Controller Platform is powerful tool to set ideal parameters and monitoring architecture for critical OPUS HE backup power systems. True redundancy principle of OPUS power systems applies also for the controller, which means that controller can be changed or updated without any power break in the system.

Controller has intelligent and easy to use local interface and web access to monitor the system behaviour and plan the controlled maintenance process during the expected 15-20 year life time of the power system. System has diagnostics for the battery health and expected battery life time, which typically defines the timing for the modernization investment.

On top of default power system features included in main VIDI2, additional features can be added by auxiliary VIDI controllers. Such aux controllers are VIDI-BM battery block voltage monitoring, VIDI-LVD additional LVD driver, VIDI-SAM inverter controller and IEC61850 converter for SCADA networks.

Features

- Universal controller for all 24 VDC to 220 VDC OPUS DC Power Systems
- Modular structure for optimal performance and system redundancy
- User friendly local UIF and remote web interface
- Comprehensive features and parameter settings
- 12 x configurable relay alarms
  Ethernet TCP/IP, Modbus TCP/IP, RS-232, IEC61850 SCADA, Profibus, SNMP
- Large event log file with real time clock time stamps
- EMC:
  Generic EN 61000-6-1 / -2 / -3 / -4
  Power Utility EN 61000-6-5, surge level 2
  Railway EN 50121-4 & EN 50121-5
  Telecom ETSI EN 300386
- Safety:
  EN/IEC/UL 62368-1
  EN 50124-1 Railway insulation coordination

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Technical Specifications VIDI2 & UIF

Electrical	VIDI2
Input voltage range	20 – 290 VDC, shut-down U_{in} <18VDC or >290 VDC
Input power	<10W (excluding LVD contactor current)
Protections	Internal input fuse 2-pole F5A, input polarity protection diode

Communication Ports	VIDI2
LAN	10/100 Ethernet, RJ-45 connector
Serial communication	RS-232, 9600-115200 kbps

Monitoring and Control, Local	UIF
Local Display	128 x 64 Graphical LCD with Backlight
Local Operation	Dial button, Info button and cancel button
Local LED indication	3 color system Status LED
Info	Dedicated button to open info text
Default view	Charge mode, system voltage, number of active alarms
Languages	Factory defaults: English, Finnish, Russian Custom packages: e.g. German, French, Spanish, Dutch, Czech Republic

Monitoring and Control, Remote	VIDI2
Mechanical data	IP 20, Dimensions (L x H x W) : 218 x 41 x 139 mm, Weight : 400 g
Remote PC connection	Connect via LAN
Local PC connection	LAN port or serial port RS-232
Alarms	12 x Configurable relays, E-mail, SNMP traps
Remote user interface	Web interface, 3 access levels
Remote terminal	Text mode interface over Telnet/SSH
Supported Protocols	HTTP, HTTPS, Telnet, SSH, SMTP, SNMPv2, SNMPv3 NTP, DHCP, Modbus TCP/IP, RS-232, IEC61850 SCADA via adapter, Profibus via adapter
Languages	Factory defaults: English, Finnish, Russian Custom packages: e.g. German, French, Spanish, Dutch, Czech Republic

System Features	VIDI2
Measurements	System Output Voltage and current Battery current, battery midpoint voltage Load current, calculated Rectifier AC input voltage Rectifier DC output voltage and current Inverter DC input and AC output voltages and currents Bypass input and output values Temperatures: system, battery, rectifiers, inverters
Functions	CAN-bus to rectifiers (CAN1) and system modules (CAN2) Energy Save Mode, with MHE rectifiers Alarm configuration, Alarm Matrix System parameters upload and download in XML format Real Time Clock with Battery Backup Plug-and-Play Support, Automatic Module Configuration Inventory Management for Installed Modules
Battery or load LVD	1 x Contactor Coil Driver + Aux contact (more LVDs with VIDI-LVD)
Alarm Relays	12 pcs of configurable alarms Relays 1-4, X21-X24, spring terminals, max contact rating 120VDC 30W/0,5A Relays 5-12, X4, Molex terminal/wire set, max contact rating 60VDC/0,5A Optional interface relay package for relays 5-12, contact rating 220VDC
Alarm/Temperature Inputs	12 pcs of configurable inputs (external alarm, ext control, temp.meas)
Earth fault detection	External EFD resistor module, measurement range 8-500kΩ Detects leakage in DC+ or DC- rail
Max quantity of modules per system	40 x MHE, 1 x UIF, 16 x VIDI-BM, 8 x VIDI-LVD, 1 x VIDI-SAM, total max 48
Log data	512 last alarms, 100 last events, System power log, Cumulative battery temperatures and discharge cycles

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Battery Management features	VIDI2
Battery tests	Manual battery test Periodic battery test (e.g. twice per year) Natural battery test, starts on mains fault Battery test by remote input Battery connection quick test (e.g. once per week) Battery state of health life time analysis, Temp & Cycles Battery midpoint measurement Battery block voltage measurement (VIDI-BM)
Charge modes	Float charge Manual boost charge Periodic boost charge Automatic boost charge Charging off, support level (remote battery test) Temperature compensation in all charge modes Maintenance manual charge mode
Functions	Charge current limiting Discharged Ah-counter Time window for battery tests

Alarms

Example of Alarm Configuration in Alarm Matrix, full freedom for 12 relays (e.g. urgent / non-urgent alarms)

Alarm	Enabled	Delay	Relay 1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
System Over Temperature	x	10s	x											
Low System Voltage	x	1s	x											
High System Voltage	x	1s	x											
Low System Voltage Warning	x	10s	x											
High System Voltage Warning	x	10s	x											
Mains Fault	x	3s		x										
Earth Fault	x	10s		x										
Rectifier Fault	x	1s	x											
Inverter Fault	x	10s	x											
Bypass Fault	x	10s	x											
Battery test fault	x	1s			x									
Battery asymmetry	x	10s			x									
Battery lifetime warning	x	10s			x									
Battery fuse fault	x	10s	x											
Load fuse fault	x	10s	x											
External Alarm Groups 1-4		10s												
...														
Totally +40 alarms														

Applicable Standards

EMC	Generic IEC61000-6-1, IEC61000-6-2, IEC61000-6-3, IEC61000-6-4 Power Utility immunity EN61000-6-5, surge level 2, 2kV line to ground Railway EN 50121-4 signaling systems, EN50121-5 substation environment Telecom ETSI EN 300 386
Safety	EN 62368-1:2014+A11:2017, UL 62368-1 2nd Ed. CAN/CSA C22.2 NO. 62368-1-14 Railway EN 50124-1, Indoor use, Not connected to contact line, Pollution degree 2, Overvoltage category 2
Environment	Operation: ETS 300 019-2-3 cl T3.2 Storage: ETS 300 019-2-1 cl T1.2
Certifications	CE Declaration of Conformity CB Certificate, CB test report UL 62368-1 and CAN/CSA C22.2 NO. 62368-1-14 Certificate & Listing report TÜV Rail and metro system certification: 50121-4/-5, EN 50124-1
Quality	Manufacturing and design conform to ISO 9001, ISO 14001

Technical Specifications VIDI-BM Battery Monitoring Module

Electrical	VIDI-BM
Power Input voltage range	18 – 280 VDC
Communication	PowerCAN connection to VIDI+ Controller
Block Voltage Measurement	Inputs: 4 pcs 12V nominal, Accuracy < 20mV, polarity protection
System voltage measurement range	0 – 280 VDC
Current Sense	1 pc shunt voltage measurement, 60 mV
Alarm inputs	2 pcs configurable alarm/temperature inputs
Status indication	LED Green/Red
Mechanical data	IP20, Dimensions (H xW x D) : 75 x 160 x 27 mm, Weight : 320 g

Technical Specifications VIDI-LVD Low Voltage Disconnection Module

Electrical	VIDI-LVD
Power Input voltage range	18 – 280 VDC
Communication	PowerCAN connection to VIDI+ Controller
Coil Contact Driver	Maximum allowed continuous coil current: 2A
Coil Driver output voltage	System voltage
Aux contact for contactor	Indication of the actual core position of the latched contactor
System voltage measurement range	0 – 280 VDC
Current Sense	1 pc shunt voltage measurement, 60 mV
Alarm inputs	2 pcs configurable alarm/temperature inputs
Status indication	LED Green/Red
Mechanical data	IP20, Dimensions (H xW x D) : 75 x 160 x 27 mm, Weight : 320 g

Technical Specifications VIDI-SAM Serial Adapter Module for inverters

Electrical	VIDI-SAM
Power Input voltage range	18 – 280 VDC
Communication	PowerCAN connection to VIDI+ Controller
Auxiliary communications	RS-232, RS-485, CAN
System voltage measurement range	0 – 280 VDC
Current Sense	1 pc shunt voltage measurement
Alarm inputs	2 pcs configurable alarm/temperature inputs
Mechanical data	IP20, Dimensions (H xW x D) : 75 x 160 x 27 mm, Weight : 320 g

Technical Specifications IEC61850 SCADA converter

Electrical	IEC61850 SCADA and Profibus converters
Power Input voltage range	18 - 31 VDC, DC/DC converters for nom. 48-220V systems
Communication internal	Modbus/TCP LAN connection to VIDI+ Controller
Communication external	LAN port, IEC61850 or Profibus protocol
Mechanical data	IP20, Dimensions H 71,9mm x W 78,6mm x D 100mm, Weight: 231g

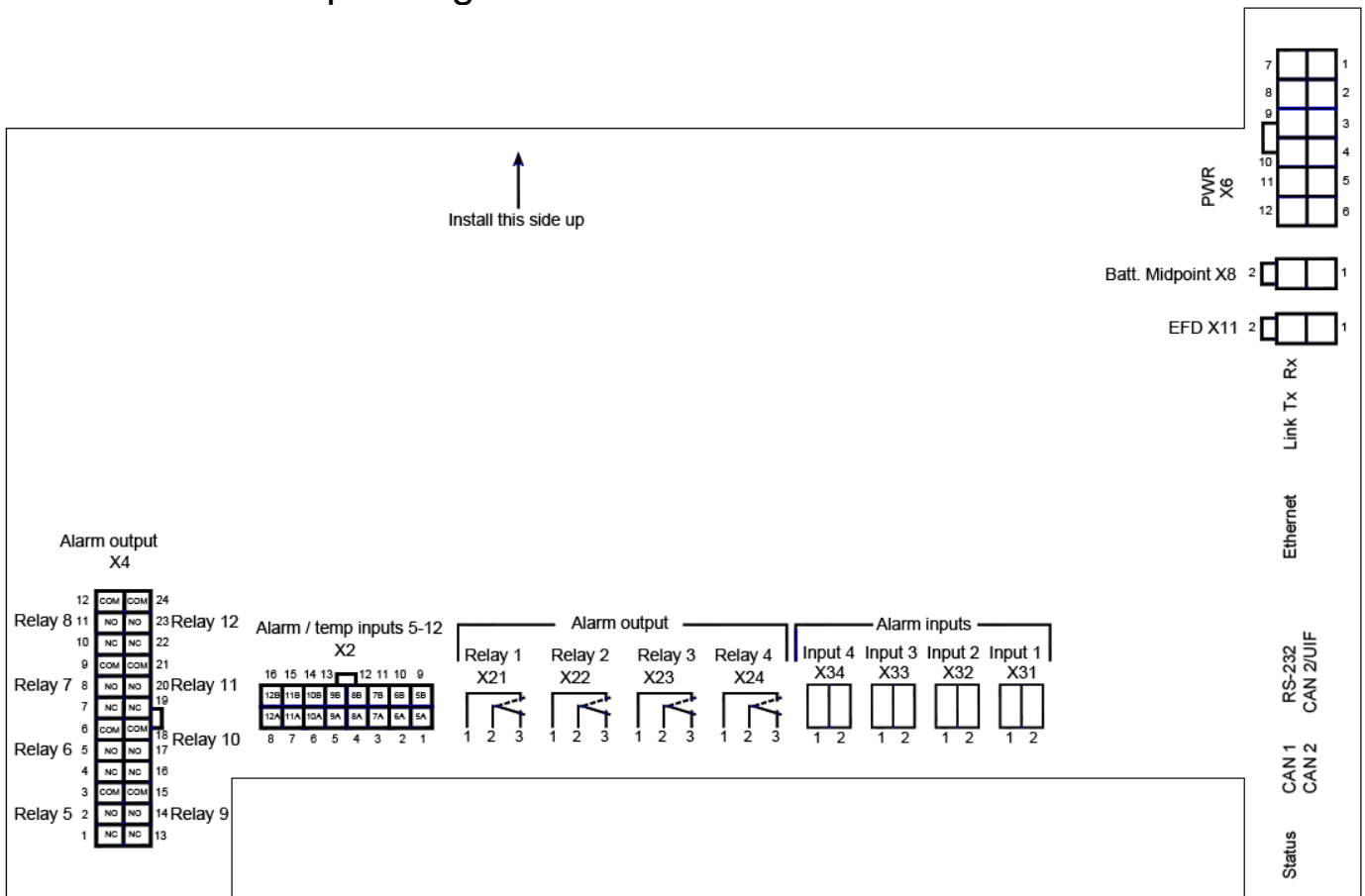## Technical Specifications Profibus converter

Electrical	IEC61850 SCADA and Profibus converters
Power Input voltage range	18 - 31 VDC, DC/DC converters for nom. 48-220V systems
Communication internal	Modbus/TCP LAN connection to VIDI+ Controller
Communication external	LAN port, IEC61850 or Profibus protocol
Mechanical data	IP20, Dimensions H 100 mm x W 112mm x D 71,9mm, Weight: 231g

Technical Specifications, common

Environmental	VIDI2, VIDI-BM, VIDI-LVD, VIDI-SAM
Cooling	Natural convection
Acoustic noise	< 40 dB
Operating temperature	VIDI2 & UIF: -25 / +70°C, Start-up at -40°C VIDI AUX Controllers: -20 / +50°C IEC61850 & Profibus: -20 / +60°C
Storage temperature	-40 / +85 °C
Humidity	95 % (relative humidity, non-condensing)

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Connectors		VIDI2
PWR X6	PWR, voltage meas, shunt, LVD	Molex Mini-Fit Jr™
BATTERY MIDPOINT X8		Molex Mini-Fit Jr.
EFD X11	to Earth Fault resistor module	Molex Mini-Fit Jr.
ETHERNET		RJ-45 8/8 modular plug
RS-232		Molex Micro-Fit 3.0™
CAN2 / UIF		RJ-11 6/6 modular plug
CAN1/2		RJ-45 8/8 modular plug
ALARM INPUT X31-X34	4 x input/temp	Phoenix screw/spring terminal
ALARM OUTPUT X21-X24	4 x relay alarm	Phoenix screw/spring terminal
ALARM INPUT X2	8 x input/temp	Molex Micro-Fit 3.0™
ALARM OUTPUT X4	8 x relay alarm	Molex Micro-Fit 3.0™

VIDI2 Connector pin diagrams

C01354

Order Information

Main System controller	
VIDI2 System controller unit	94I640
UIF User Interface Display	94M364
Auxiliary Controller kits	
VIDI BM kit. Includes Battery monitoring module and cable set	9040X0002338
VIDI LVD kit. Includes Low Voltage Disconnector controller module and cable set.	8320X0003275
VIDI SAM kit. Serial adapter module. Used with OPUS EIM and DUAL inverters.	8320X0004402
IEC61850 SCADA converter (Wago 750-8202/025-002)	8320X0015545
Profibus Converter (Wago Wago 750-8216/025-001)	C01354
Auxiliary Measurement devices	
VIDI2-EFD Earth Fault Detection Resistor Module	94I650

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