VMS Voltage SAMU

Datasheet

GENERIC STANDARDS

Stand-alone merging unit (SAMU)	IEC61869-13	Conventional Instrument Transformers
Measuring relays and protection equipment Electromagnetic compatibility requirements	IEC60255-26	
Product safety requirements for protection relays and measuring equipment	IEC60255-27	

POWER SUPPLY DC

Operating nominal input voltage	24VDC, 48VDC, 110VDC, 125VDC	48VDC and 110VDC type registered (KEMA) 24V partial noncompliance with IEC61000-4-29
Power consumption	Maximally 7W	
Connector	3 pin: positive, negative and Functional Earth	
Insulation	Hazardous Live Voltage	

POWER SUPPLY AC: Using an external power supply adapter with a low voltage DC output (15V...24V)

VOLTAGE INPUTS

Nominal Input Voltage	Line – Line: 100V / 110V - Line – Neutral: 57,7V / 63,5V	
Dynamic input Range	0,577V – 165V (RMS)	3ø4w (Wye) broken delta, 3ø3w (Open Delta) 3ø3w (Wye)
Nominal Frequency	50Hz, 60Hz	
Accuracy	Measuring: Class 1 (WB0) - Quality Metering: Class 0,2 (WB1)	
Frequency response	Protection Measurement: 650/780Hz - Quality Metering: 3kHz	
Burden	0,1VA	
Overvoltage Factor (Fv)	Line – Line: 1,5 Line – Neutral: 1,9	
Secondary loop time constant	T.B.D (contact Grid to Great)	
AC current thermal withstand	220V continuous - 286V for maximally 10sec	
Insulation Class	Hazardous Live Voltage	

COMMUNICATION PORTS

Interface	Dual SFP ports with 100BASE-FX and 1000BASE-X capability	HSR: only 1000BASE-X
Protocol	IEC61850-9-2 with IEC61869-9 profile variant support	F4000S1I4U4 (WB0) F4800S2IxUy (WB0) F14400S6IxUy (WB0) F14400S6IxUy (WB1)
Redundancy	Redundant Ethernet networks (IEC62439-3)	PRP supported - HSR expected in 2025
Insulation	Extra Low Voltage	

SIGNAL PROCESSING

ADC resolution	Simultaneously sampling Delta/Sigma	24 bit resolution
Output Sample rate	F4000S1I0Ux (50Hz) F4800S2I0Ux (50Hz) F4800S2I0Ux (60Hz) F14400S6I0Ux (50Hz) F14400S6I0Ux (60Hz)	80S/Cycle 96S/cycle 80S/Cycle 288S/cycle 240S/cycle
Rated delay time	0µSec	IEC 61869-1:2023
Maximum processing delay time	<1mSec	IEC 61869-9:2016
Bandwidth	Protection Measurement: 650/780Hz (WB0) - Quality Metering: 3kHz (WB1)	

SYNCHRONIZATION

Time synchronization	Ethernet based Precision time protocol (PTP) with multiple profiles	IEC61850-9-3 (extended power profile) C37.238:2011 (power profile) C37.238.2017 (power utility profile)
Accuracy	<1µSec	Depends on the master clock
Drift when not Locked	T.B.D	
Hold over time	>25Sec	
Redundancy	Supports Multiple Grand Masters (selected by PTP best master clock algorithm)	

LOCAL CONFIGURATION PORT

Interface	USB-C
Functionality	Device maintenance and configuration using ICT Suite software application
Insulation	Extra Low Voltage

CLIMATIC

Cold Operational	IEC60068-2-1:2007	-40°C, 16hrs
Dry Heat Operational	IEC60068-2-2:2007	70°C, 16hrs
Cold Storage	IEC60068-2-1:2007	-40°C, 96hrs
Dry Heat Storage	IEC60068-2-2:2007	70°C, 96hrs
Change of temperature	IEC60068-2-14:2014	-10°C to 55°C, 3 hours, 2 cycle
Damp Heat Steady Test	IEC60068-2-78:2012	+55°C ±2°C –93% ±3% RH –10 days
Cyclic temperature with humidity test	IEC60068-2-30:2005	-40°C ± 3 °C–97% -2% +3% RH +70°C ±2°C –93% ±3% RH 6 cycles of 24 hours (12h + 12h) cycles

SEISMIC

Vibration response & Endurance	IEC60255-21-1:1988	Class 2
Shock Response and Bump	IEC60255-21-2:1988	Class 1
Single axis sweep	IEC60255-21-3:1993	Class 2

PRODUCT SAFETY

Overvoltage category	IEC60255-27:2013	OVC3
Pollution degree	IEC60255-27:2013	PD2
Impulse Voltage	IEC60255-27:2013	5kV
Dielectric voltage	IEC60255-27:2013	2500VRMS/50Hz/1min
Insulation resistance	IEC60255-27:2013	>100MΩ @500VDC
Protective bonding resistance	IEC60255-27:2013	100mΩ
Inflammability	UL94	V0/V2
Ingress Protection	IEC60529	IP3X

EMC IMMUNITY

Electrical Static Discharge	IEC 61000-4-2:2008	6kV contact / 8kV air
Radiated, radio-frequency, electromagnetic field immunity	IEC 61000-4-3:2020	80-1000MHz: 10 V/mtr - 1000-2700MHz: 3V/mtr 1400Mhz – 3000MHZ – 10V/mtr
Electric Fast Transient (EFT)	IEC 61000-4-4:2014	4kV (5kHz and 100kHz repetition rate)
Surge Immunity	IEC 61000-4-5:2014	Line-Line: 4kV Line-Earth: 2kV
Conducted, radio-frequency, electromagnetic field immunity	IEC 61000-4-6:2013	150kHz – 80MHz: 10V
Power frequency magnetic field	IEC 61000-4-8:2009	100A/m contínuous – level 5
Pulse magnetic field immunity	IEC61000-4-9:2016	1000A/m (sec) – level 5
Damped Oscillatory magnetic field immunity	IEC61000-4-10:2016	100A/m
Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC61000-4-16:2015	DC, 50Hz, 60Hz: 30V continuous, DC, 50Hz, 60Hz: 300 V for 1sec 15Hz to 150Hz: 30V to 3V (-20 dB/dec) 150Hz to 1500Hz: 3V 1,5kHz to 15Hz: 3V to 30V (+20 dB/dec) 15kHz to 150kHz: 30V

DC ripple	IEC61000-4-17:2002	15% of rated DC value, 100Hz/120Hz
1 MHz/100 kHz Slow Damped oscillatory wave	IEC61000-4-18:2019	Line-Line: 1kV Line-Earth: 2,5kV
Reversal of DC power supply	IEC61000-4-27:2013	Continuous
Gradual Startup Shut-down ramp	IEC61869-13m Clause 7.2.5.2.1302	60s Power off: 5min. Start-up ramp: 60s, perf Cat C
Slow voltage variation test	IEC 61000-4-29:2000	From +20 % to −20 %, perf Cat A
DC voltage dips on Power Port	IEC61000-4-29:2000	50mSec (100% interruption) 200mSec (40% residual), perf Cat C 500mSec (70% residual), perf Cat C 5Sec, perf Cat C

EMC EMISSION

Radiated emission (below 1GHz)	CISPR 11:2015+AMD1:2016+AMD2:2019	Class A
Radiated emission(Above 1GHz)	CISPR32:2015: Amd 1:2019	Class A
Conducted emission	CISPR32:2015	Class A (<1GHz)

DRAWINGS