

RT411

Time Signal Distributor

RT411 - Time Signal Distributor is a signal multiplier to synchronize multiple devices in the substation. It works as a time signal transceiver providing IRIG-B demodulated, PPS or any signal with frequencies up to 5 MHz, through optical and electrical outputs with voltage between 0 and 5 V d.c. The RT411 act as a slave from timing signals received from a clock.

Connector	1x ST
Wavelength	820nm
Multimode fiber type	50/125µm, 62.5/125µm, 100/140µm or 200µm HCS
Sensitivity	-24 dBm
Input Selection	Opened (without jumper)



Customer Benefits

Sustains 100 nanosecond accuracy of GPS clock

10 TTL electrical outputs

10 fiber optic outputs

ELECTRICAL OUTPUTS

Connectors

High level

Low level

Impedance

Connector

Wavelength

Electrical Cable Length

OPTICAL OUTPUTS

Multimode fiber type

Optical Fiber Length

Drive

Robust design for the substation environment

Converts optical and electrical inputs whilst extending the number of outputs available

8x header type

150 mA

< 0.2 Vdc

Up to 100m

18 Ω

10x ST

820nm

up to 2 km

2x BNC (female)

Between 4.5 Vdc and 5 Vdc

50/125 μm, 62.5/125 μm,

-8.5 dBm (100/140 µm) -5.7 dBm (200 µm HCS)

100/140 µm or 200 µm HCS -17.8 dBm (50/125 μm) -14.0 dBm (62,5/125 µm)

Technical Specification

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OPTICAL INPUT

Connector	1x Header type
Voltage level	TTL
Impedance	> 500 Ω
Input Selection	Closed (with a jumper)

POWER SUPPLY

Operating nominal voltage	100-250 Vdc 110-240 Vac
Operating voltage range	80-300 Vdc 88-264 Vac
Frequency	50/60 Hz ± 3 Hz
Power consumption	Max 20 VA
Power consumption	Typical 15 W

IEC 61000-4-2:2008 6 kV contact / 8 kV air IEC 61000-4-3:2006 10 V/m IEC 61000-4-4:2012 2 kV @ 5 kHz

referring to the following standards

EMC tests were performed according to IEC 60255-26

IEC 61000-4-5:2005	Differential mode: 1 kV Common mode: 2 kV
IEC 61000-4-6:2008	10 V
IEC 61000-4-8:2009	30 A/m continuous 300 A/m @ 1 s
	- A.C. and D.C. voltage dips Test level: 0% residual voltage Duration time A.C.: 1 cycle D.C.: 16,6 ms - Test level: 40% residual voltage Duration time

VEIGHT		
1U		
19"		
430 mm (16.9in)		
180 mm (7.1in)		
2.7 Kg (5.0 lbs)		

 IEC 61000-4-11:2004 IEC 61000-4-29:2000

D.C.: 200ms
- Test level: 70% residual voltage
Duration time
A.C.: 30 cycles

- A.C. and D.C. voltage
interruptions
Test level: 0% residual voltag
Duration time
A.C.: 300 cycles
D.C.: 5 s

	Test level: 15% of rated DC value
IEC 61000-4-17:1999	Test frequency: 120 Hz,
	sinusoidal waveform

quasi peak at 3 m

quasi peak at 3 m

230 to 1000 MHz – 57 dB (μV/m)

A.C.: 12 cycles

D.C.:500 ms

	Voltage oscillation frequency:
	1 MHz
IEC 61000-4-18:2006	Differential mode:

IEC 61	1000-4-18:2006

CISPR11:2009

i kv peak voitage,
Common mode:
2.5 kV peak voltage
Chut down ramp: 60

IEC 60255-26	Power off: 5 m Start-up ramp: 60 s
	Radiated emission

Limits: 30 to 230 MHz - 50 dB (uV/m)

SAFETY TESTS

Output power

Safety	IEC 61010-1
IEC 60255-5	Impulse: 5 kV Dielectric withstand: 2.8 kV dc Insulation: > 100 MΩ

DIMENSIONS AND W Height Width (frontal panel) Width (body) Depth Weight 2.7 Kg (5.9 lbs)

ENVIRONMENTAL CONDITIONS		
Temperature range	-40°+55°C (-40°+131°F)	
Enclosure protection	IP40	
Relative humidity	595% noncondensing	

IEC 60068-2-1	-40°C, 16 hours (Cold)
IEC 60068-2-2	+85°C, 16 hours (Dry heat)
IEC 60068-2-30	95% no condensation, +55°C (Damp heat)
IEC 60068-2-14	-40°C to +85°C / 9 hours / 2 cycles (Change of temperature)
IEC 60255-21-1	Class 2 (Vibration)
IEC 60255-21-2	Class 1 (Shock)



RT412

Optical Transceiver

The RT412 is an electrical-optical and opticalelectrical optical-electrical converter for time synchronization pulses, whose characteristics allow multiplication of GPS clock outputs and distribution of time sync across the substation where there are significant distances between panels. It converts a twisted pair electrical input to ST optical fiber output, or conversely it converts an optical input to electrical output.

Customer Benefits

Compact DIN rail mount

Sustains 100 nanosecond accuracy of GPS clock Robust design for the substation environment Converts optical and electrical inputs IRIG-B004, PPx, and DCF77 supported

Technical Specification

OPTICAL INPUT	
Connector	1x ST
Wavelength	820nm
Multimode fiber type	50/125µm, 62.5/125µm, 100/140µm or 200µm HCS
Sensitivity	-24 dBm
Input Selection	Opened (without jumper)

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Connector	1x Header type
Voltage level	TTL
Impedance	> 500 Ω
Input Selection	Closed (with a jumper)

ENVIRONMENTAL TESTS	
IEC 60068-2-1	-40°C, 16 hours (Cold)
IEC 60068-2-2	+85°C, 16 hours (Dry heat)
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IEC 60255-21-1	Class 2 (Vibration)
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ELECTRICAL INDUT

Reason Product Line +55 48 21080300 www.gegridsolutions.com

OPTICAL OUTPUTS	
Connector	1x ST
Wavelength	820nm
Multimode fiber type	50/125 μm, 62.5/125 μm, 100/140 μm or 200 μm HCS
Output power	-17.8 dBm (50/125 μm) -14.0 dBm (62.5/125 μm) -8.5 dBm (100/140 μm) -5.7 dBm (200 μm HCS)
Optical Fiber Length	up to 2 km

ELECTRICAL OUTPUTS	
Connectors	2x header type
Drive	150 mA
High level	Between 4.5 Vdc and 5 Vdc
Low level	< 0.2 Vdc
Impedance	18 Ω
Electrical Cable Length	Up to 100m

DIMENSIONS AND WEIGHT	
Height	117mm
Width	51mm
Depth	95mm
Weight	1 kg

POWER SUPPLY		
Operating nominal voltage	100-250 Vdc 110-240 Vac	
Operating voltage range	80-300 Vdc 88-264 Vac	
Frequency	50/60 Hz ± 3 Hz	
Power consumption	Max 20 VA	

ENVIRONMENTAL CONDITIONS		
Operating temperature range	-240°+55°C (-13°+131°F)	
Maximum operating altitude	2000 m (6560 ft)	
IP rating (IEC 60529)	IP20	
Relative humidity	595% noncondensing	
SAFETYTESTS	•	

ENVIRONMENTAL CONDITIONS

SAFETY TESTS	
Safety	IEC 61010-1
IEC 60255-5	Impulse: 5 kV Dielectric withstand: 2.8 kV dc Insulation: > 100 MΩ



TYPE TEST

EMC tests were performed according to IEC 60255-26
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IEC 61000-4-3:2006	10 V/m	
IEC 61000-4-4:2012	2 kV @ 5 kHz	
IEC 61000-4-5:2005	Differential mode: 1 kV Common mode: 2 kV	
IEC 61000-4-6:2008	10 V	
IEC 61000-4-8:2009	30 A/m continuous 300 A/m @ 1 s	
IEC 61000-4-11:2004 IEC 61000-4-29:2000	- A.C. and D.C. voltage dips Test level: 0% residual voltage Duration time A.C.: 1 cycle D.C.: 16,6 ms - Test level: 40% residual voltage Duration time A.C.: 12 cycles D.C.: 200ms - Test level: 70% residual voltage Duration time A.C.: 30 cycles D.C.:500 ms - A.C. and D.C. voltage interruptions Test level: 0% residual voltage Duration time A.C.: 300 cycles	
IEC 61000-4-17:1999	Test level: 15% of rated DC value Test frequency: 120 Hz, sinusoidal waveform	
IEC 61000-4-18:2006	Voltage oscillation frequency: 1 MHz Differential mode: 1 kV peak voltage; Common mode: 2.5 kV peak voltage	
IEC 60255-26	Shut-down ramp: 60 s Power off: 5 m Start-up ramp: 60 s	
CISPR11:2009	Radiated emission Limits: 30 to 230 MHz – 50 dB (µV/m) quasi peak at 3 m 230 to 1000 MHz – 57 dB (µV/m) quasi peak at 3 m	

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