SynchroTeq® GateWay

DATASHEET

STG0100x0

2024-04-30

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PRODUCT OVERVIEW

The Vizimax SynchroTeq GateWay (STG0100x0) offers three major functions:

● Integrate SynchroTeq units (SynchroTeq STU, SynchroTeq Plus and SynchroTeq MV) supervisory control into operational SCADA environment through IEC 61850 protocol.

● Integrate SynchroTeq STU units (*) to remote maintenance and diagnostic system for asset management through secure TCP/IP web service.

● For SynchroTeq STU units (*), enable remote parameter edition and value setting through proprietary protocol over secure TCP/IP.

(*): These functions are natively supported over secure TCP/IP web service for SynchroTeq Plus and SynchroTeq MV units.

A single SynchroTeq GateWay (STG0100x0) can be connected up to four (4) SynchroTeq units over a multidrop RS-485 serial link.
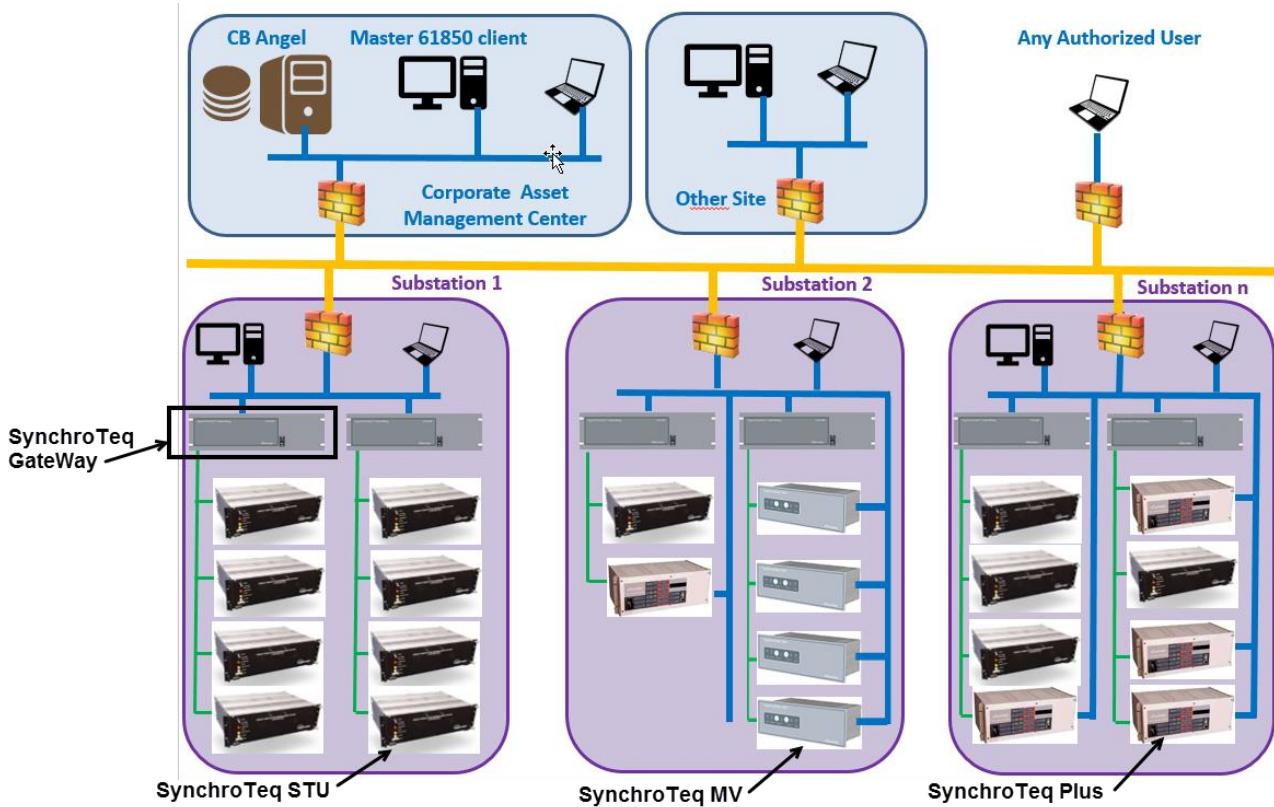

FIGURE 1   EXAMPLE OF SYNCHROTEQ GATEWAY ENVIRONMENT

MAJOR FEATURES

Vizimax SynchroTeq GateWay allows:

- Continuously polling, on a multidrop RS-485 serial link, up to 4 SynchroTeq units to retrieve their current status and alarms.

- Supports IEC 61850 Server protocol for reporting specific unit status and alarms, and for processing remote commands (Open / Close).

- Converts and stores up to 500 SynchroTeq STU events into 'user friendly' event XML format and COMTRADE compatible waveform STPEVT format.

- For SynchroTeq STU model, supports converted event transfer (event xml format and waveform stpevt format) to Vizimax VUCS software services and CB Angel services.

- Supports 'transparent mode' for remote connection with SynchroTalk configuration tool for SynchroTeq STU units.

- Designed for 19'' rack enclosure (3U).

- Supplied with a universal AC/DC power supply.

- Supports ethernet link over multimode fiber optic with ST connectors (STG010010 model including a media converter).

TYPICAL TARGETED APPLICATIONS

The Vizimax SynchroTeq GateWay has been specially designed to address the following applications:

- Seamless integration of SynchroTeq units (SynchroTeq STU, SynchroTeq Plus and SynchroTeq MV) in local or remote SCADA operations (collect SynchroTeq unit status and alarms, operate circuit-breakers) through IEC 61850 protocol.

- Seamless integration of SynchroTeq STU model in local or remote asset management center over secure TCP/IP web service, by using Vizimax VUCS software services or CB Angel services. This function is natively supported over secure TCP/IP web service for SynchroTeq Plus and SynchroTeq MV units.

VUCS (Vizimax Unified Communication Services): is a Microsoft Windows background service for Server (or workstation) platforms. It automatically collects at a defined polling rate, status information, events and data records from Vizimax SynchroTeq® Plus and SynchroTeq® MV units, and also from SynchroTeq® STU units through a Vizimax SynchroTeq GateWay.

CB Angel: is a secure web based advanced analytics data tool for asset management center optimization. Data from all monitored units is initially collected with the VUCS software.

TECHNICAL SPECIFICATIONS

COMPLIANCE AND CERTIFICATIONS

TEST TYPE

STANDARDS

Specifications		Standard	Value
Temperature range	Operating temperature	IEC 60068-2-1 IEC 60068-2-2	-40 °C to +85 °C (*see note)
	Storage temperature		-55 °C to +125 °C
Relative humidity (R.H.)		IEC 60068-2-30	95% no condensation
IP Rating		IEC 60529	IP30
Normal environmental conditions		IEC 60255-1 IEC 60947-1	- No significant air pollution - Pollution degree 2
Maximum altitude		IEC 61010-1	2000 m

Specifications		Standard Reference No.
MECHANICAL STRESS	Vibration	Tests Fc: 10 to 150 Hz at 1.0G Behavior 1 sweep/axis Endurance 20 sweep / axis IEC 60068-2-6
	Mechanical Shocks	Withstand 5g/11ms (3) Repetitive bump 10g/16ms (1000) Response 15g/11ms (3) IEC 60068-2-27
	Drop	Drop 100mm Edge/Corner/Face (Drop &Topple) IEC 60068-2-31
EMISSION	Radiated Emissions 30MHz-1GHz	Class A (FCC part15: 2010 B, up to 2GHz) EN55011 CISPR 11, IEC 60255-25, FCC
	Conducted Emissions 150kHz - 30MHz	Class A EN55011 CISPR 11

Specifications		Standard Reference No.
IMMUNITY	Radiated Immunity	a) 10V/m (80MHz - 1GHz) 80%modulated (1 kHz) IEC 61000-4-3 lev.3 Crit.A, IEC 61000-6-5, IEC 60255-26
	Radiated Immunity	a) 10V/m (1.4 – 2.7GHz) b) 3V/m (5.15 - 5.75GHz) IEC 61000-4-3 Lev.3 Crit.A, IEC 61000-6-5, IEC 60255-22-3 IEC 60255-26
	Conducted Disturbance (cables)	10 Vrms (150kHz - 80 MHz) 80% modulated (1 kHz) Mains, PE, COMM. IEC 61000-4-6 Lev.3 Crit.A, IEC 61000-6-5, IEC 60255-22-6 IEC 60255-26
	Surge Immunity	- Power = +/- 2kV_PE, 1kV_L-L - Ethernet = 2kV L/PE IEC 61000-4-5 Lev.4 Crit.B IEC 60255-22f-5, IEC 61000-6-5, IEC 60255-26
	D.C. Power Ripple	10% UT – 10min. IEC 61000-4-17 Lev.3 Crit.A IEC 61000-6-5, IEC 60255-11, IEC 60255-26
	D.C. Power Voltage Dip & Interrupts	a) Dips. 0, 40, 70% UT b) Slow variations 60 sec. ramp IEC 61000-4-29 Lev.3 Crit.B IEC 61000-6-5, IEC 60255-11, IEC 60255-26
	Electrostatic Discharge:	8KV Contact / 15kV Air Discharge. Enclosure, USB (metal shell) IEC 61000-4-2 Lev.4 Crit.B IEC 60255-22-2, IEC 61000-6-5, IEC 60255-26
	Fast Transient	a) 2 kV 5kHz & 100kHz (Power Supply) b) 4 kV 5kHz & 100kHz (Others) IEC 61000-4-4 Lev.4 Crit.B IEC 60255-22-4, IEC 61000-6-5, IEC 60255-26
	Power Magnetic Field	30A-m continuous 300A-m short term IEC 61000-4-8 Lev 4., IEC 61000-6-5, IEC 60255-26
IMPULSE VOLTAGE	Impulse voltage 1.2 /50	5KV 1.2/50 µs - 500Ohm IEC 60255-5 OVC CAT IV, IEC 61180-1
INSULATION	Insulation dielectric	a) 2000VRMS All ports, b) 1500VRMS Ethernet 100B/T c) 500VRMS G_PPS input IEC 60255-5, IEC 61180-1
SAFETY	EN 61010-1 (European. Community. Safety req.)	Complete evaluation performed by Regulatory Agency IEC 61010-1 3rd edition

*See Temperature Test performances

TEMPERATURE TEST PERFORMANCES

Specifications		Standard Reference No.	Value
Temperature range	Operating temperature For UL applications	IEC 61010-1	-40 °C to +70 °C
	Tested operating temperature	IEC 60068-2-2	-50 °C to +75 °C
	Fiber optic media converter operating temperature (STG010010 model)		-10 °C to +60 °C
Temperature testing	Cold	IEC 60068-2-1	-50 ° C (16hours)
	Dry heat	IEC 60068-2-2	+70 ° C (16hours)
	Damp heat cyclic	IEC 60068-2-30	+55°C at 95 % R.H. (6 cycles)

POWER SUPPLY

The AC/DC universal power supply module is included with the STG0100x0 product.

Parameter	Value
AC/DC Universal power supply module	Frequency range: 50 / 60Hz AC/DC input range: 85-264VAC or 90-375VDC DC Output: 24VDC – 30W max UPS is powered through the terminal blocks available on the DIN rail: TB1: GND TB2: N/- TB3: L/+
Power consumption	STG010000: typical 5W STG010010: typical 8W

COMMUNICATION PORTS

Port	Characteristic	Value
Serial port-RS485	Interface	Multidrop RS-485
	Function	communication with up to 4 SynchroTeq units
	Connection	Terminal blocks on the DIN rail: TB6: RS-485 A TB7: RS-485 B TB8: Chassis
Ethernet Port 1	Interface	100Base-T (RJ-45)
	Function	Service port reserved for maintenance and programming
Ethernet Port 2 (STG010000)	Interface	100BASE-T (RJ-45)
	Function	Communication with local area network
Ethernet Port 2 (STG010010)	Interface	Multi mode fiber optic 100BASE-FX with ST connectors
	Function	Communication with local area network

SYNCHROTEQ GATEWAY FUNCTIONS

The Vizimax SynchroTeq GateWay supports the following functions.

Task	SynchroTeq (STU)	SynchroTeq Plus & MV
STGW to SynchroTeq unit's connection	Multidrop RS-485	
STGW to Master station physical connection	Ethernet port, over: Copper link (STG010000) or Multimode fiber-optic (STG010010)	
Configuration and maintenance	Done through a PC equipped with SynchroTalk software	Done through the SynchroTeq Plus / MV Web interface and configuration tool (VCT or STCS)
Data transfer	Poll and publish current unit status and alarms under IEC 61850 protocol	
Command processing	Process CB commands from IEC 61850 SCADA environment	
Events and Waveforms	Convert and store (up to 500 events) into 'user friendly' xml event format and COMTRADE compatible STPEVT waveform format.	See note*
Data transfer to VUCS / CB Angel	- Converted events and waveforms - Current unit status and alarms	See note*

NOTE: (*) These functions are natively supported over secure TCP/IP web service for SynchroTeq Plus and SynchroTeq MV units.

SYNCHROTEQ GATEWAY CONFIGURATION

The Vizimax SynchroTeq GateWay is configured via an XML customization template provided with the STG0100x0 package.

Parameter	Method
STGW TCP/IP configuration Ethernet ports	STGW configuration is done by editing an XML customization file (provided with the STGW package). Once edited, the customization file is loaded in the STGW unit via the secure web interface.
STGW to SynchroTeq units RS-485 serial link configuration	
STGW web interface label configuration	
IEC 61850 link configuration	
IEC 61850 control (command enabling)	
IEC 61850 controls and data mapping	IEC 61850 data mapping is done by using a dedicated ICD file (Available commands and data may slightly differ depending on SynchroTeq unit model)

IEC 61850 DATA MAPPING

The STGW supports the IEC 61850 Server protocol.

The STGW 61850 IEDNAME is configurable in the customization file.

Each SynchroTeq unit is declared as a logical device (SYNCHROTEQ1 to SYNCHROTEQ4).

The status, alarms, measurements and controls (commands) for each logical device are reported using the following logical nodes as declared in the SynchroTeq GateWay 'IED Capability Description' (ICD) file:

- **LPHD** is used for the STGW and SynchroTeq unit identification
- **XCBR** is used for the position and control of the C/B
- **MMXU** is used to report the network frequency
- **GGIO** is used to report the SynchroTeq alarms and analog measurements

Please refer to the SynchroTeq GateWay user guide (STG0100x0-UG) for a detailed description of the IEC 61850 data mapping.

The SynchroTeq GateWay datasets and reporting blocks are fixed. Please refer to the IEC 61850 Model Implementation Conformance Statement (MICS file) for details.

The STGW does not support GOOSE messaging.

MOUNTING SPECIFICATIONS

SynchroTeq GateWay is designed for 19'' Rack enclosure.

The Ethernet service port is available on the front panel.

PHYSICAL DIMENSIONS

Specifications	Value
Width	483 mm/19 in
Height	3U: 132.5mm/5.22 in
Depth	134 mm/5.25 in
Weight	3.9 kg (8.6 lbs).
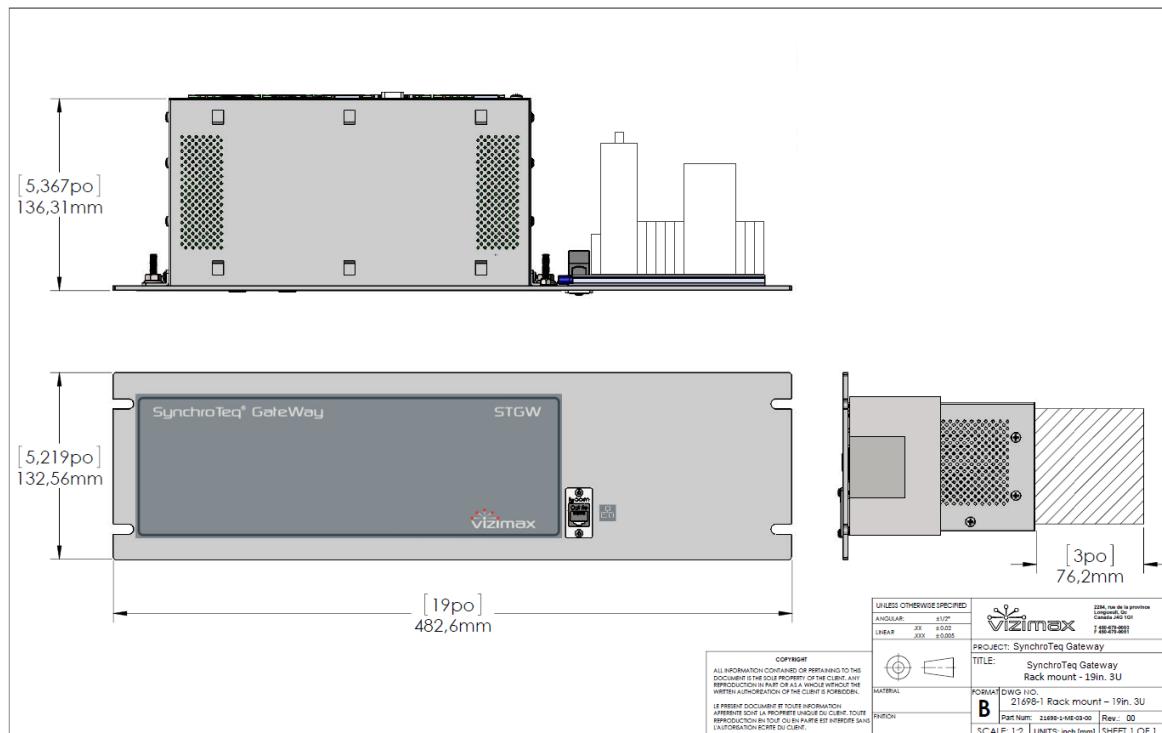
A DIN rail (154mm / 6.0 in) installed on the rear panel supports the terminal blocks and the power supply module (STG010000 model).

The multi mode fiber optic media converter is also attached to the DIN rail for the STG010010 model.
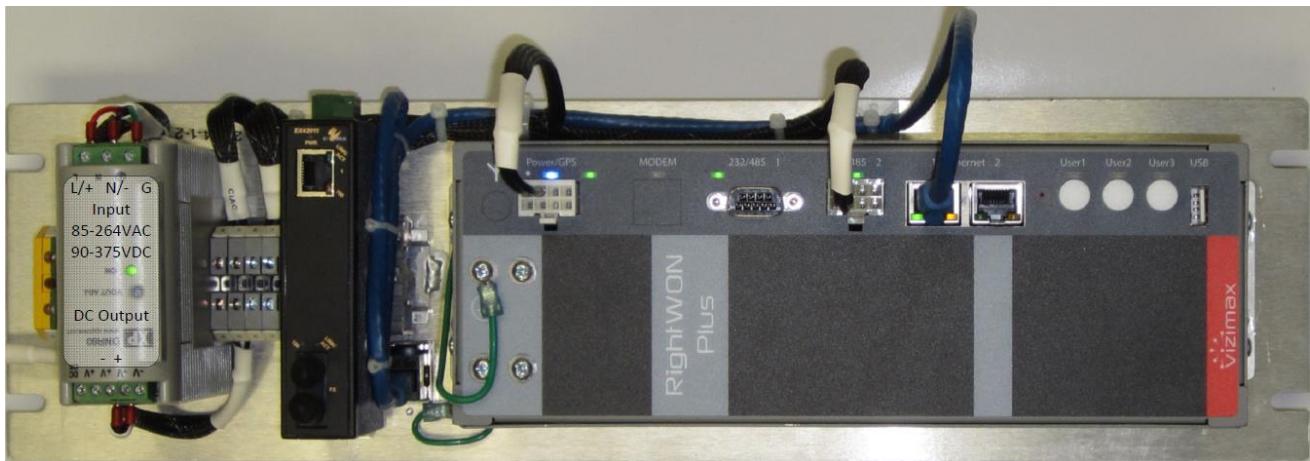
(STG010010 model with media converter shown above)

ORDERING INFORMATION

STG010000:   SynchroTeq GateWay includes: 1 x Ethernet user port 100BASE-T (RJ-45 connectors) +1 x Ethernet service port 100BASE-T (RJ-45 connectors) + 1 x RS-485 multidrop serial port, + 1 x Universal Power supply module, + 1 DIN rail supporting UPS and customer terminal blocks for UPS connection and RS-485 connections. Protocols IEC 61850 server - Temperature: -40◦ C to +75◦ C

or

STG010010:   Same as STG010000 model, excepted the Ethernet user port is a multimode fiber optic 100BASE-FX with ST connectors (using an ethernet media converter 100BASE-TX to 100BASE-FX - Temperature: -10◦ C to +65◦ C).

NOTE: These specifications are subject to change without prior notice.

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