Multilin G100

Advanced Substation Gateway

GE's Multilin G100 is a member of the advanced Multi-function Controller Platform (MCP). This platform offers a secure, future-proof, and substation-hardened set of modular and scalable hardware and software components designed to simplify deployment, operation and maintenance of automation systems for a variety of applications including:

- Centralized automation for transmission & distribution substations
- Industrial substation automation systems
- Asset performance management
- Distribution automation & microgrid
- Secure substation automation systems
- Retrofit of substation automation systems

The MCP makes it possible for a single device to host multiple functions and applications such as Supervisory Control and Data Acquisition (SCADA) Concentrator, Remote terminal Unit (RTU), Human Machine Interface (HMI), Advanced Cyber Security Features, and Non-Operational Data Retrieval and Storage. Consolidation of functions reduces the cost of deployment and operation while increasing system reliability through a reduced number of devices in the system.

The G100 gateway provides reliable and accurate collection and control of data (metering, status, events and faults) from serial or LAN-based intelligent devices, input/output modules, or on-board I/O for master applications such as SCADA, EMS, DMS, DCS, or other enterprise applications. With its modern and robust cyber security features, the G100 is designed for smooth integration into NERC CIP and cyber security environments while consolidating functions such as Ethernet communications, time synchronization, HMI and SCADA applications.

Key Benefits and Applications

- Standardize substation architectures with a cost-effective, IEC 61850-3 compliant platform, scalable for small to medium systems with up to 24,000 data points
- Seamlessly operate in both new Digital Substation / IEC 61850 substations and older legacy substations. Perfect for hybrid and retrofit installations
- Provides powerful yet economical distribution substation and feeder control solutions that combines advanced functionality, multiple communication ports and local I/O in a small footprint ideal for retrofit and upgrade projects.
- Easy to use with configuration and standardization with graphical configurations, drop down menus, pre-configured device maps, and single platform DS Agile Studio software
- Reduce system cost by eliminating dedicated HMI computers
- Upgrade D20 RTUs and preserve the I/O with the optional D.20 Link expansion card
- Interface to distribution feeder fault indicators, act as a mini-data concentrator
- Add a SCADA interface for pole-top reclosers and sectionalizing switches

Features

- Advanced Substation Gateway with customizable HMI for multiple floating windows
- IEC 61850 Client Ed.1 and certified Ed.2
- D.20 I/O Module Support
- Advanced IEC 61131-3 compliant automation engine
- Simultaneous communication protocol support
- Comprehensive logging facilities for substation data including events, user actions, cyber security, connectivity
- Automatic or manual acquisition of any type of files from Intelligent Electronic Devices (IEDs)

Security

- User access levels: Administrator, Supervisor, Operator, Observer, Pass through
- Remote Authentication (Secure LDAP, TACACS+)
- Secure tunneling from master station via TLS for DNP3/TCP, Modbus/TCP and IEC 104
- Secure file transfer to enterprise server using RSYNC/ SSH, SFTP, FTP
- Secure Access using HTTPS and SSH
- Secure firmware upgrade
- Built-in firewall

Hardware

- Small form factor for a variety of installation locations
- Compliant to IEC 61850-3 and IEEE 1613
- Reliable SSD Storage
- 2 x built-in RJ-45 and 2 x SFP Ethernet ports
- On-board I/O [Digital Inputs, Digital Outputs, DC Analog Inputs]
- Standard time synchronization [IRIG-B IN, NTP]
- DIN-Rail or Panel Mounting

WORLDWIDE 10 YEAR WARRANTY

Overview

GE's G100 is a secure, hardened, advanced substation gateway that collects metering, status, event, and fault report data from serial or LAN based intelligent substation devices. The G100 summarizes and transforms data from the substation devices. The G100 allows visualization of the data locally and remotely through a secure (HTTPS) web HMI application, and supports transferring data via serial and LAN connections to SCADA masters and control centers.

Advanced Gateway

The G100 collects data from substation protection, control, monitoring, RTU, PLC, and other intelligent devices, pre-processes the data and moves it up to EMS and DMS SCADA systems providing centralized substation management. Gateway features include:

- Data collection, concentration, and visualization
- Protocol conversion
- IEC 61850 Gateway
- RTU functionality with D.20 IO Modules
- RTU functionality with Built-in IO
- Built-in Media Support
- File retrieval capabilities
- Built-in HMI

Advanced Automation

The G100 provides the computing platform necessary to automate intricate substation procedures and processes safely and efficiently. The advanced and customized automation programs are created using IEC 61131-3 compliant tools and math functions are performed on data points using the built-in calculator tools. Automation features include:

- HMI, One Line Viewer and Annunciator
- Math, Logical, Timer Control Logic
- Programmable Logic (using LogicLinx)
- Control Lockout
- Accumulator Freeze
- Analog Value Selection
- Input Point Suppression
- Redundant I/O
- Alarm Management
- Hardware Asset Management Application
- System Status Manager
- Load Shedding and Curtailment

Fault Recording/Data Logging

Using pass-through connections, users can extract valuable non-operational data such as digital fault records (DFR), event and oscillography files. The user can also access the historical log files and upload the archived data for trending and analysis. Fault recording features include:

- Automatic Record Retrieval Manager
- Sync Manager
- Data Logger and Analog Reports
- Trend Viewer
- Database Exporter

Secure Remote Access

The G100 allows maintenance and relay engineers to securely access substation devices, locally or remotely, through advanced visualization and communication tools, increasing operational efficiency. Secure remote access features include:

- Access to Operational and Non-operational Data
- Pass-through/Terminal Server
- Role Based Access Control
- Virtual Serial Ports
- Build-in Firewall
- Local Authentication, Authorization and
- Auditing (Syslog)
- Electronic Access Point (EAP)
- OpenVPN

G100 Multifunction Controller Platform Applications
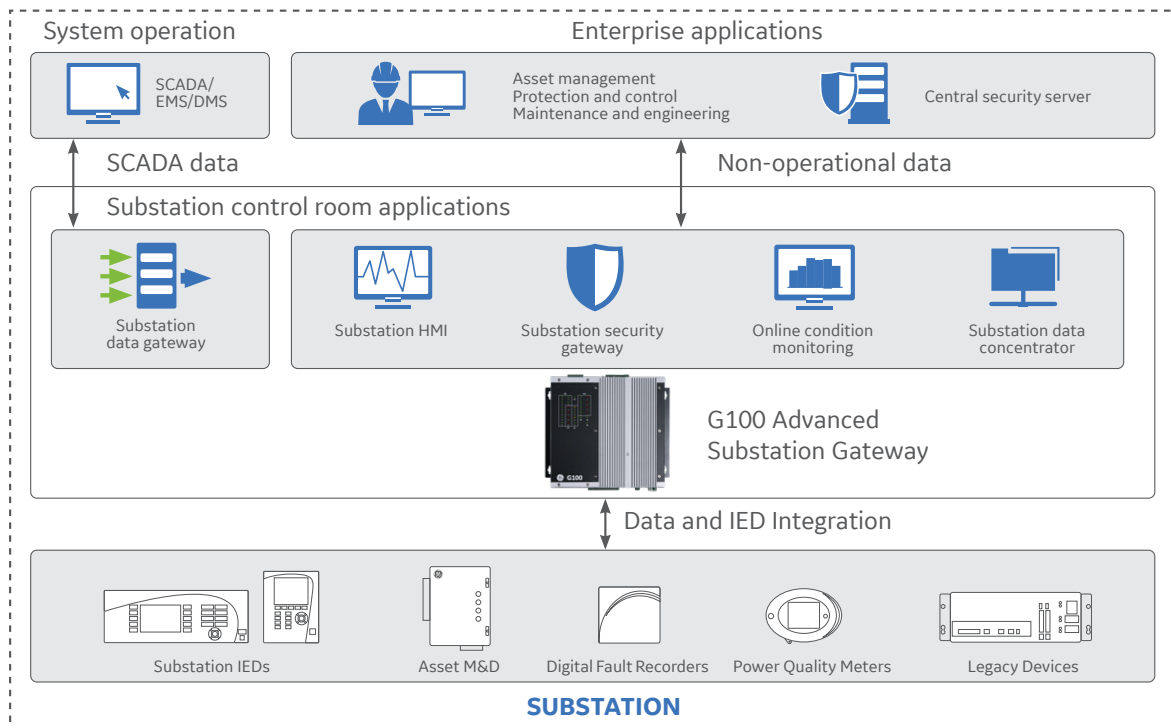
Advanced Gateway, Data Concentrator, Protocol Converter, Remote Terminal Unit

Data Collection and Concentration

The G100 advanced substation gateway can operate as a SCADA host, collecting, filtering, and sorting data from a wide range of intelligent devices (RTUs, PLCs, relays, meters), preserving original data time stamps for accurate sequence of event analysis. Data can be simultaneously presented to multiple SCADA hosts of different communication protocols. The G100 comes with a built-in suite of communication protocols to facilitate communication with various devices and SCADA hosts, including:

• DNP3 serial and IP (client & server)

• IEC 61850 Ed.1 and certified Ed.2 (client)

• D.20 Link

• Modbus™ serial & TCP/IP (client & server)

• IEC60870-5-101/103/104 (client)

• IEC60870-5-101/104 (server)

• SEL Binary (client)

• Generic ASCII protocols (client)

IEC 61850

The IEC 61850 Client application allows the G100 to act as an IEC 61850 data concentrator. The G100 also includes valuable features such as Dynamic Data Sets, Buffered Control Blocks, and Enhanced Security Controls.

The IEC 61850 Client and the IEC 61850 Loader Configuration tool are Ed.2 certified and simultaneously compatible with both Ed.1 and Ed.2 devices, as detailed in the Conformance Statements.

On-board General Purpose I/O

For applications and setups requiring only a few I/O points, the G100 comes with built-in general-purpose I/O.

• Eight (8) Digital Inputs

• Four (4) Digital Outputs

• Four (4) DC Analog Inputs

If this is not sufficient, D.20 I/O Modules can easily be configured and connected to the G100 to extend the available physical I/O capabilities.

D.20 I/O Module Support

GE's D.20 I/O Module are popular due to their reliability, flexibility and functionality. With hundreds of thousands of modules shipped over the life of the product, the ability for G100 to communicate, retrive inform action and control these modules has been a very important feature to make available.

D.20 I/O modules are intelligent modules containing an on-board microprocessor. They are configured as slaves to the G100. In this way, specific I/O processing is distributed throughout the G100 to the appropriate I/O module.

There are four types of I/O peripherals supported by the G100:

• D20A analog input

• D20S digital input

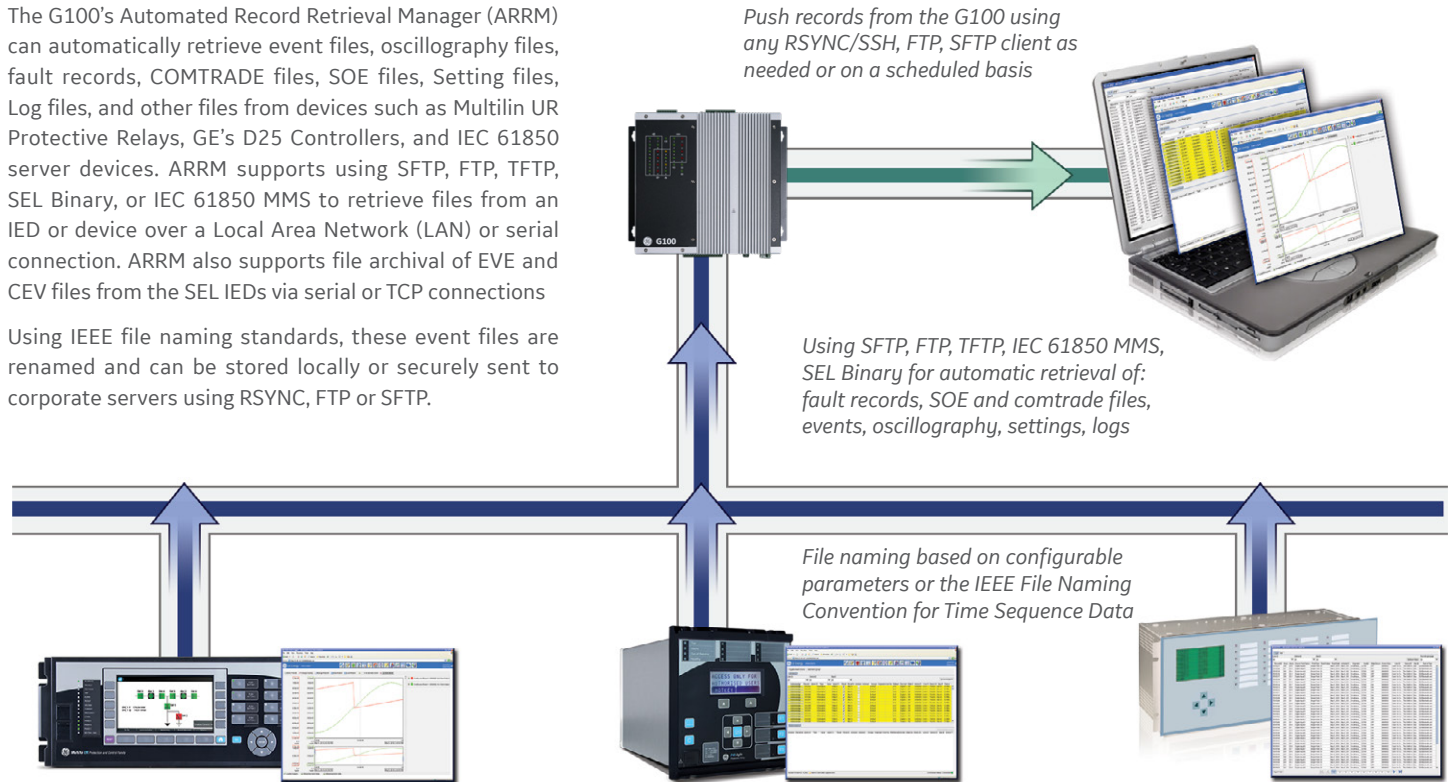• D20K digital output

• D20C combination input/output

Optional high-voltage peripherals and fiber optic communication extenders are also available.

Serial: D.20 HDLC   *Serial: D.20 HDLC*

D.20 I/O   *D.20 I/O*
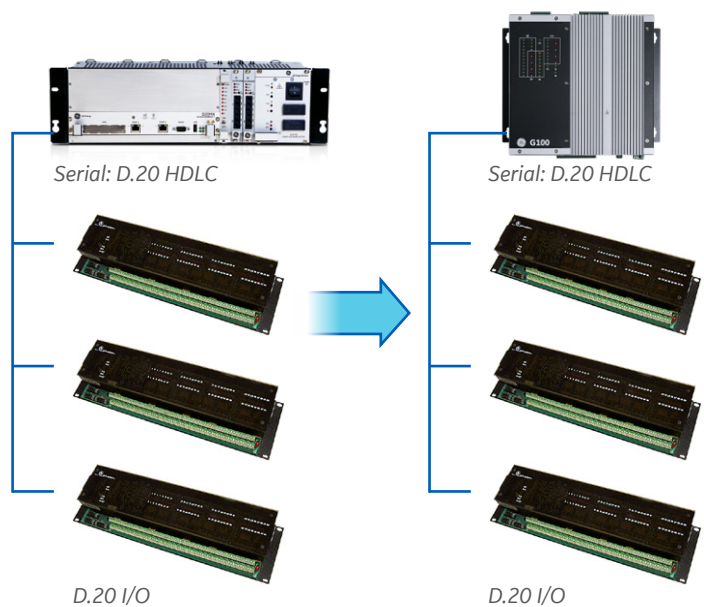
Automatic File and Record Retrieval

The G100's Automated Record Retrieval Manager (ARRM) can automatically retrieve event files, oscillography files, fault records, COMTRADE files, SOE files, Setting files, Log files, and other files from devices such as Multilin UR Protective Relays, GE's D25 Controllers, and IEC 61850 server devices. ARRM supports using SFTP, FTP, TFTP, SEL Binary, or IEC 61850 MMS to retrieve files from an IED or device over a Local Area Network (LAN) or serial connection. ARRM also supports file archival of EVE and CEV files from the SEL IEDs via serial or TCP connections

Using IEEE file naming standards, these event files are renamed and can be stored locally or securely sent to corporate servers using RSYNC, FTP or SFTP.

Push records from the G100 using any RSYNC/SSH, FTP, SFTP client as needed or on a scheduled basis

Using SFTP, FTP, TFTP, IEC 61850 MMS, SEL Binary for automatic retrieval of: fault records, SOE and comtrade files, events, oscillography, settings, logs

File naming based on configurable parameters or the IEEE File Naming Convention for Time Sequence Data

Advanced Automation

The G100 acts as a centralized, substation- hardened computing platform within an advanced automation system. With its advanced IEC 61131 compliant programmable logic tool, users can create simple to complex custom programs for a variety of automation applications.

Math, Logical, Timer Control Logic

Using the calculator tool, users can create advanced solutions that group, manage and control points to produce the required automation results.

The calculator tool can perform mathematical, logical, or timer-based operations on data points stored in the G100. Using a graphical interface, users can define logical expressions using mathematical functions such as addition, multiplication, logarithm, greater than, less than, as well as other boolean functions.

IEC 61131-3 Compliant Programmable Logic

For more advanced applications, programmable logic (LogicLinx) software provides PLC functionality on the G100 platform. LogicLinx offers textual and graphical languages defined in the IEC 61131-3 standard for PLC programming environments, including Sequential Functions Chart, Instruction List, Structured Text, Ladder Diagram and Function Block Diagram. In addition, a wide range of arithmetic, boolean and logical operations are supported.

Advanced Database Points Management

The flexibility of the G100 configuration system enables users to create and manage database points for control or reporting by leveraging the following:

Accumulator Freeze - It might be useful to define groups of points and associate peculiar action(s) to the group based on certain conditions. The accumulator freeze function is used to define a group of points whose values are to be frozen periodically or upon demand. This additional level of automation increases the visibility required when monitoring certain important processes for specific conditions.

Analog Value Selection - The Analog value selection functionality enables the user to define a group of analog input points that have priority. This is valuable especially in a system with numerous points and events. It may be important to identify what's most critical to report. For example: Within the prioritized group, a valid and highest priority point can be reported to a single analog input point.

Input Point Suppression - This is useful during maintenance operations to prevent spurious OFFLINE alarms and false readings while devices are powered off or disconnected. Users can disable groups of analog and digital input points by ignoring their real-time data or quality changes within selected applications. While points are suppressed, a predefined suppression value and the point suppressed quality flags are provided instead.

Control Lockout

The control lockout feature ensures that only a single master station can access a group of controls at one time. Can lock out groups of controls to allow for safer local maintenance.

Users can create up to 8 remote control groups and up to 256 local control groups. Any digital output can be included in one remote and one local group. This provides a coordinated control of outputs and ensures that the right control actions are executed by the appropriate devices.
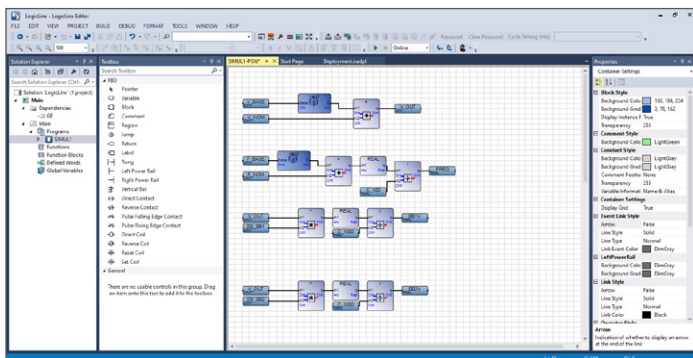
Redundant I/O

To improve the reliability and availability of data for critical processes, it is useful to specify a secondary data point. Just as it is important to have a back-up (redundant) device, it is also useful to have a back-up (redundant) point that represents a real primary point. The value and quality of the redundant point is reported when the associated primary point is invalid or questionable.
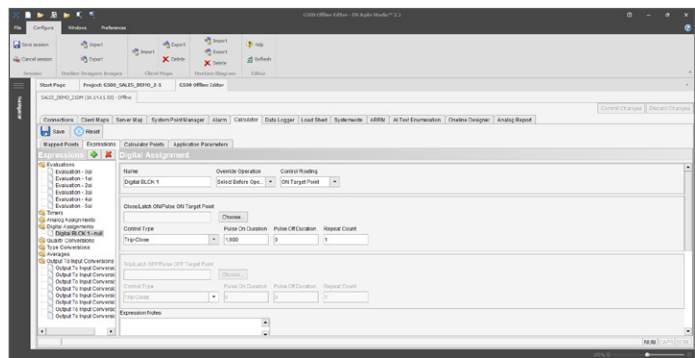

Figure 1 - IEC 61131-3 Logic

Figure 2 - Math, Logical, Timer Logic

HMI, One-Line, Annunciator

The G100 features an embedded HMI that is accessible both locally with a monitor, keyboard, and mouse, and remotely through a secure application over HTTPS.

Without any additional configuration, users have access to all data points in the systems, communications status screens, alarm screens, logs, and more.

The HMI can also be extended with user created screens, allowing for easy and powerful data visualization through dynamic one-line diagrams, animated status screens, and more.

All displays can be used during regular monitoring and operation, and during commissioning.

The HMI supports the following security features to ensure secure remote or local access:

- Configurable auto logout/login for Remote and Local HMI access
- Disabling of Remote HMI Non-Observer Privileges
- Login to specific custom screens for added security to sensitive displays
- Remote access to Redundant or Active HMI screens
- Support for commissioning forcing control/ feedback and acknowledge
- individual/group alarms from one-line diagram

The User experience is important, so the HMI is customizable to a user's preferences:

- The windows can float, allowing for different screen views and improving the productivity of operators
- Columns can be re-ordered to suit a particular user's tastes
- Users can customize the different views to match different background colors or skins
- For every screen type, the last window size, layout, and position is saved and restored on next login. This is very useful so that users do not have to keep recreating the same layout
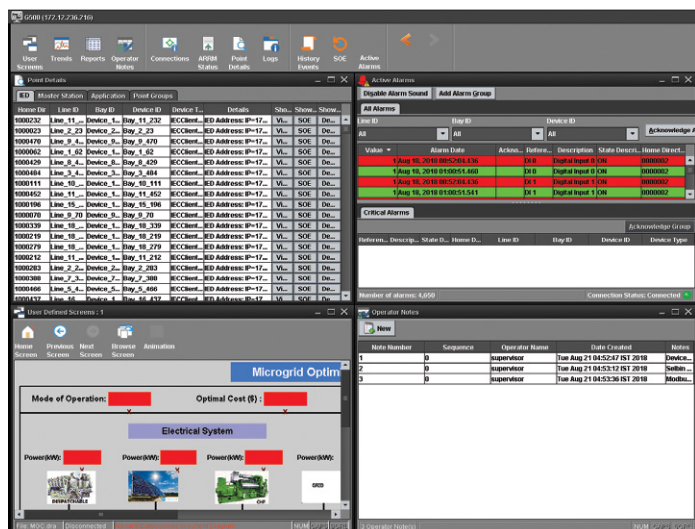

Customizable HMI display

Alarm Management

The G100 Alarm groups are user-definable, with up to 256 groups allowed.

Each group has its own descriptive and display parameters. Alarms may belong to more than 1 group, or none at all. "Critical" and "Default" groups are built-in. SCADA points for the alarm groups remain on-line if component alarm points go offline. SCADA points are provided to acknowledge a group of alarms. Individual alarms must be acknowledged via the G100 GUI.

Data Logger

The Analog Data Logger provides a variety of means to monitor and record analog input point value changes into data files that can be retrieved by the user. A variety of recording methodologies are supported including, Continuous (all changes), Periodic, Time Weighted, Out of Range and Triggered by a digital input point.
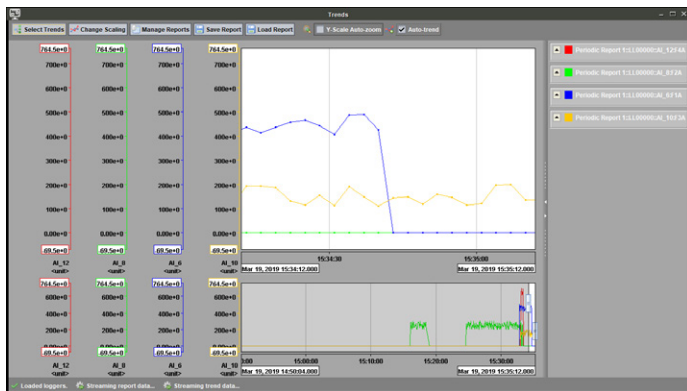
Use device software to obtain non-operational data such as trending and event records through the G100's secure remote access functionality.

Trend Viewer

All data recorded by the Analog/Digital Data Logger can be viewed by the Digital event recorder using the built in web-based Trend Viewer. Users can select the range of data to be used by time and date, alternately a real time streaming view can be displayed. Up to 8 data points (pens) can be displayed on a single view and support for curve fitting is available.

Database Exporter

The Database Exporter tool allows users to save Analog Data Logger and Digital event recorder points from the G100 to your local PC, using the web interface, in comma-separated values (CSV) format.

Analog Report Generation

In addition to the data logging capability within the G100, users can create or import report templates and configure online and offline reports from operation and non-operation analog data. While online reports can be retrieved instantly and are an extension of the data logger periodic reports, offline reports can be retrieved daily, weekly or monthly.

Offline Reports

- Users can use the Analog report application to generate offline reports
- Users can configure different types of analog reports. For example: Shift , daily, weekly and monthly
- Users can use the offline report viewer to view generated reports
- Output format types includes: PDF, Excel® and HTML

Online Reports

- This is an extension of the data logger periodic reports
- Users can use the online report viewer to view periodic data logger reports
- Output format types includes: PDF,Excel® and HTML

REPORT TYPE	REPORT DURATION	START TIME ALIGNMENT	LOGGING INTERVAL	LOGGING ALIGNMENT
Shift	Configurable: 4, 6, 8 or 12 hours	Configurable: 0-23 hour	Configurable: 15, 30, 60 minutes	Configurable: 00:00, 00:15, 00:30 or 00:45
Daily	Fixed: 1 day	Configurable: 0-23 hour	Configurable: 15, 30, 60 min and 4, 6, 8 hours	Configurable: 00:00, 00:15, 00:30 or 00:45
Weekly	Fixed: 7 day	Configurable: 0-23 hour	Configurable: 12 and 24 hours	Configurable: 0-23 hours
Monthly	Fixed: 7 day	Configurable: 1-31 hour	Configurable: 12 and 24 hours	Configurable: 0-23 hours

Pass-through/Terminal Server

A built-in terminal server emulator allows pass-through connections to be initiated to substation device (relay, meter, RTU or other device). Once the connection is established, the local event records can be uploaded from the substation devices and viewed remotely. Remote access can be secured with TLS or SSH.

Virtual Serial Ports

Virtual serial ports eliminate copper wire communications to feeder bays when a serial-

only device is located in the bay. A small terminal server can be placed in the bay and connected to the Ethernet network, allowing all G100 serial client applications to connect directly to the serial device. Virtual Serial ports can also be used to expand the number of serial ports that the G100 can communicate over.
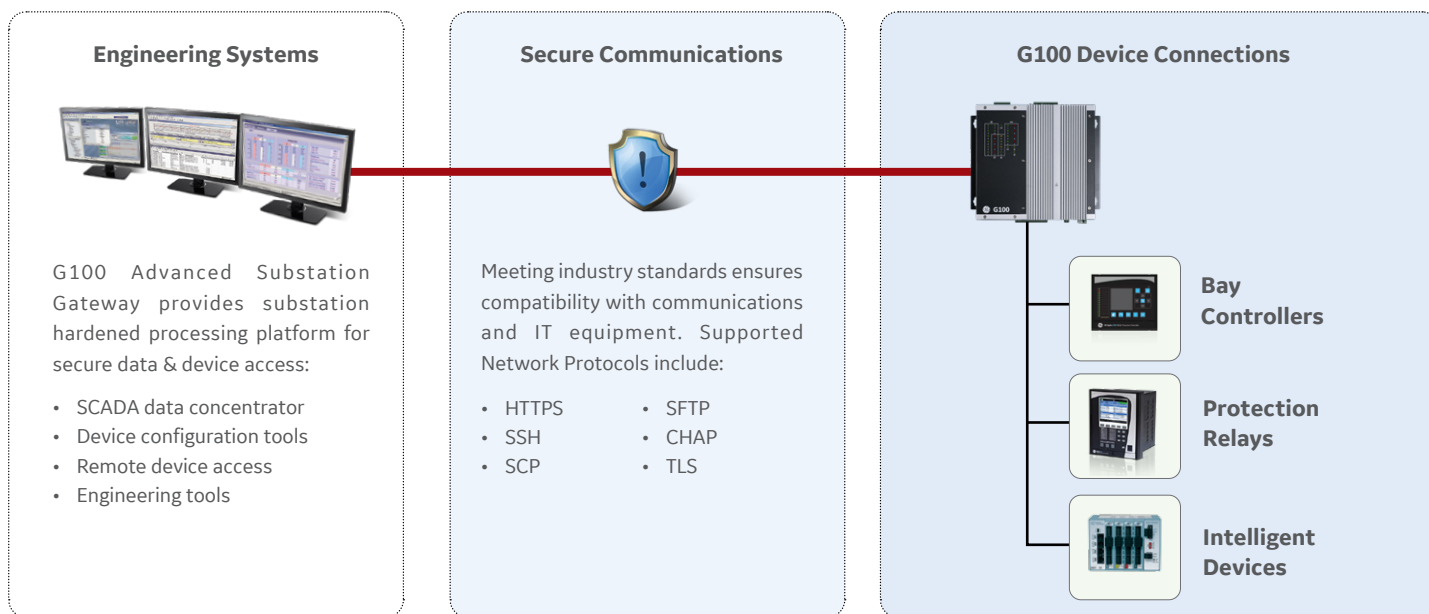
Role Based Access Control

Local and Remote Authentication modes are supported to ensure that only authenticated and authorized users gain access the system. Each user is assigned one of four 4 pre-defined roles or privilege levels to control their access.

Supported Remote Authentication modes include Lightweight Directory Access Protocol (LDAP) and Cisco Terminal Access Controller Access-Control System Plus (TACACS+).
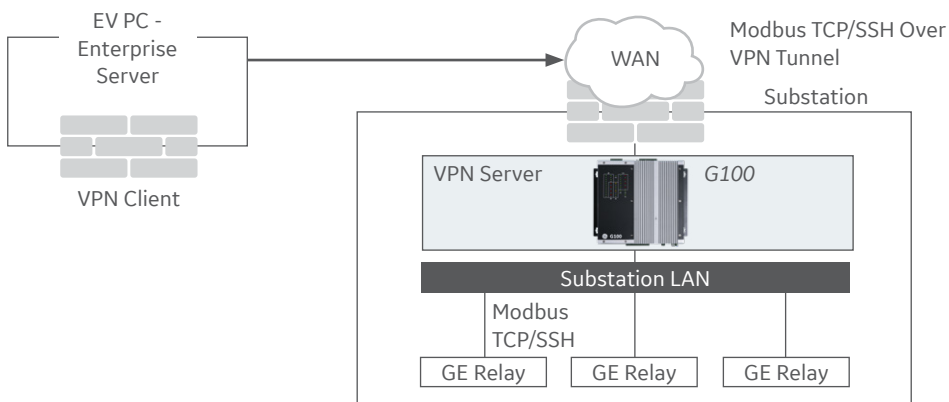
Built-in Firewall

The G100 is equipped with a built-in firewall for enhanced gateway cyber security. G100's firewall is designed to drop unsolicited or invalid routed packets. The firewall is preconfigured to inspect outbound traffic on external interfaces and inbound traffic on both internal and external interfaces. The G100 automatically generates rules allowing inbound traffic on internal interfaces for all configured services, and inbound/outbound traffic for configured secure services on external interfaces. The rules are user configurable for inbound/outbound traffic customization.

Secure Remote Access

Engineering Systems	**Secure Communications**	**G100 Device Connections**

G100 Advanced Substation Gateway provides substation hardened processing platform for secure data & device access:

- SCADA data concentrator
- Device configuration tools
- Remote device access
- Engineering tools

Meeting industry standards ensures compatibility with communications and IT equipment. Supported Network Protocols include:

- HTTPS
- SSH
- SCP
- SFTP
- CHAP
- TLS

Bay Controllers

Protection Relays

Intelligent Devices

OpenVPN Architecture Example

EV PC - Enterprise Server

VPN Client

WAN

Modbus TCP/SSH Over VPN Tunnel

Substation

VPN Server   G100

Substation LAN

Modbus TCP/SSH

GE Relay   GE Relay   GE Relay

Key Features:

- Can configure up to 8 VPN Clients; Can at a maximum serve up to 3 VPN Clients.
- Certificate-key format support for openvpn client [Windows]
- Network interface combination available for Routing
- Support for 1024 Rules in Whitelist
- Rules includes support for:
  - Any ICMP
  - Useful ICMP
  - TCP & UDP

Hardware Overview

Central Processing Unit

G100 features an Intel Atom X5-E3930 1.3GHz Processor, 8 GB RAM, 16 GB SSD

Ethernet Interfaces

G100 has four Ethernet interfaces available:

• Two built-in 10/100/1000BASE-TX (RJ-45 copper)

• Two interfaces through SFP cages. Each SFP cage supports the following SFP transceivers:

   - 100BASE-TX (RJ45 copper),
   - 1000BASE-TX (RJ45 copper),
   - 100BASE-FX (LC fiber multimode),
   - 1000BASE-SX (LC fiber multimode),
   - 1000BASE-LX (LC fiber single mode)

Each interface can be individually configured by software to operate in independent mode or in a Redundant LAN pair.

Local General Purpose I/O

The G100 is equipped with a small number of local I/O points of various types.

• 8 x Digital Inputs, 12/24/48Vdc, 5mA, isolated

• 4 x Digital Outputs, max 60Vdc, 1A, isolated

• 4 x DC Analog Inputs, +5Vdc / 20mA

D.20 Link Module

The G100 supports one D.20 Link PCIe expansion module for connection with D.20 I/O Modules.

This allows for very easy I/O expansion and enables the G100 to be a very effective D20 replacement.

Supported types of I/O modules are:

• D20A DC Analog Inputs

• D20S Digital Inputs

• D20K Digital Outputs

• D20C Combination Input/Output module

Serial Ports

G100 comes with four serial interfaces, which are accessible via individual RJ45 connectors on the bottom of the unit. Each port can be individually configured in software for RS-232 and RS-485 communication. There is no need to open the unit and change jumpers or enter the BIOS/UEFI to change port settings.

Time Sync Support

The G100 supports IRIG-B (TTL) and NTP time sync inputs.

DisplayPort™

The G100 has a DisplayPort™ on the top of the chassis. This allows for a Local Runtime HMI display and/ or engineering diagnostic interface.
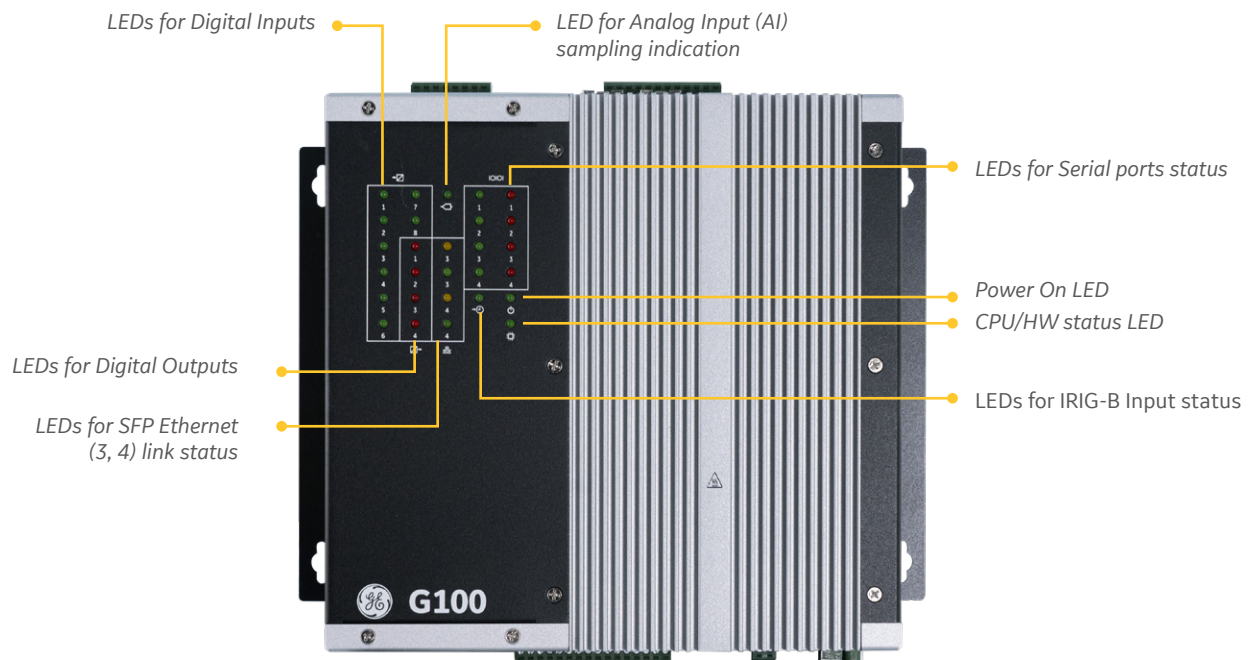
USB Ports

For different uses such as storage or access to keyboards, the G100 supports 3x USB ports as follows:

• 1x USB 3.0 on top of the unit

• 2x USB 2.0 on top of the unit
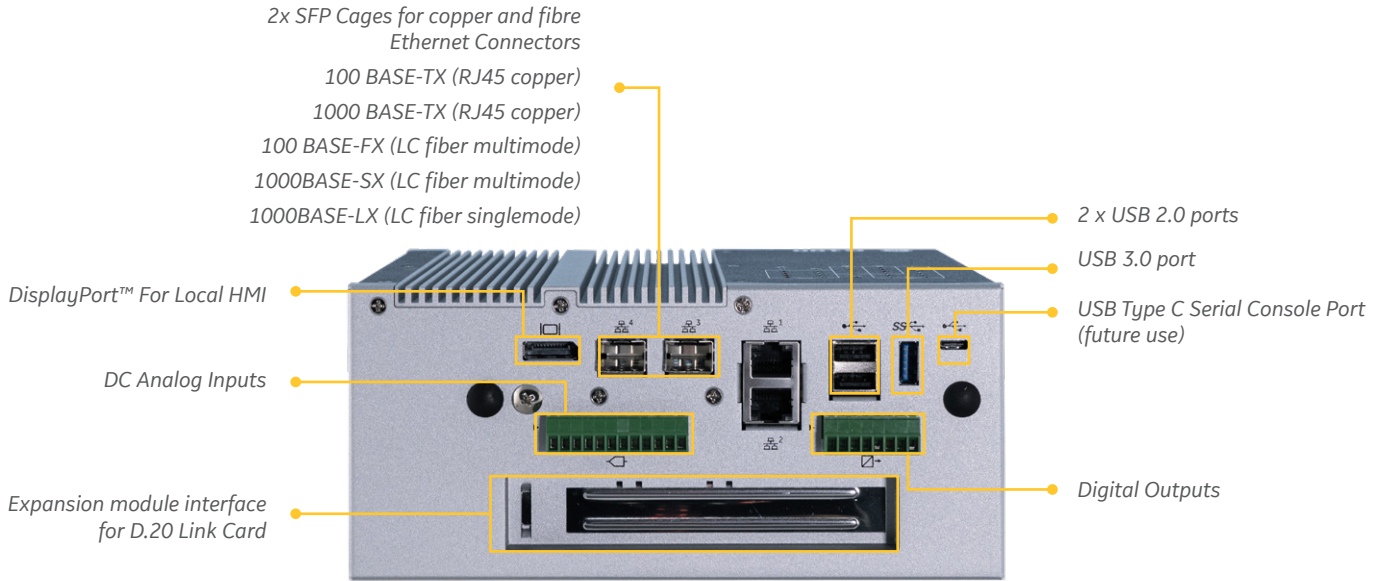
• 1x USB-C (for future use)

Maintenance Port

By default, one of the G100's four serial ports (COM4) is configured to be a local serial console maintenance port. This can be re-assigned to be a regular serial port.

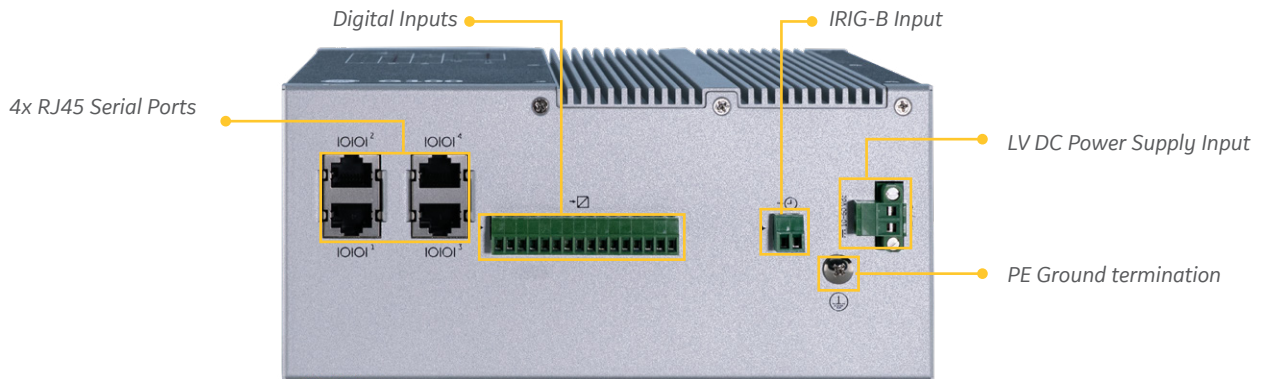## Front Panel

LEDs for Digital Inputs

LED for Analog Input (AI) sampling indication

LEDs for Serial ports status

Power On LED

CPU/HW status LED

LEDs for Digital Outputs

LEDs for SFP Ethernet (3, 4) link status

LEDs for IRIG-B Input status

Top Panel

2x SFP Cages for copper and fibre Ethernet Connectors
100 BASE-TX (RJ45 copper)
1000 BASE-TX (RJ45 copper)
100 BASE-FX (LC fiber multimode)
1000BASE-SX (LC fiber multimode)
1000BASE-LX (LC fiber singlemode)

DisplayPort™ For Local HMI

DC Analog Inputs

Expansion module interface for D.20 Link Card

2 x USB 2.0 ports

USB 3.0 port

USB Type C Serial Console Port (future use)

Digital Outputs

Bottom Panel

Digital Inputs

4x RJ45 Serial Ports

IRIG-B Input

LV DC Power Supply Input

PE Ground termination

Technical Specifications

PROCESSOR, MEMORY, AND STORAGE

CPU	Intel Atom X5-E3930 1.3GHz Processor
Memory	DDR3L (8GB)
Storage	Solid-State Drive (16 GB)

OPERATING SYSTEM

- Predix Edge OS (Linux Kernel 4.14)

COMMUNICATIONS

Ethernet	4 independent Ethernet ports, with separate MAC addresses
	• 2 built-in 10/100/1000 BASE-TX RJ-45 ports
	• 2 Accessible via SFP modules:
	  – 100BASE-TX (RJ45 copper)
	  – 1000BASE-TX (RJ45 copper)
	  – 100BASE-FX (LC fiber multimode)
	  – 1000BASE-SX (LC fiber multimode)
	  – 1000BASE-LX (LC fiber single mode)

Serial (RS-232 or RS-485 2-wire)	• 4x serial interfaces accessible via individual RJ45 connectors on rear of the unit • Serial interfaces use 16550 compatible UART • Supports baud rates 300, 600, 1200, 2400, 4800, 9600, … 921k • Software controlled mode of operation between RS232 or RS485 2-wire • RS232 mode supports flow control and handshaking signals (RTS, CTS, DCD) • Software controlled termination resistor (120 ohm) for RS485 mode • All software selections persist when power cycled • IRIG-B available on all serial interfaces when an IRIG-B input is present
D.20 Link HDLC	• Optional 2x D.20 Link DB9 ports • Terminal block to provide power to the D.20 Link

TIME SYNCHRONIZATION (HW SUPPORT)

IRIG-B Input	• Available as 2 positions removable Phoenix terminal block on bottom of the unit • Supports IRIG-B TTL

VIDEO OUTPUT

Display Port	DisplayPort (DP) v1.2 available on the top of the chassis Resolution: up to UHD (4k, 3840x2160 @ 30 Hz)

USB PORTS

- 1x USB 3.0
- 2x USB 2.0
- 1x USB-C for future use

MAINTENANCE PORT

Console port	1x Serial port pre-configured for local serial Console access for debug. The serial port can be reconfigured to be a regular RS-232/RS-485 port

POWER SUPPLY

Low Voltage	• Built-in LVDC power supply on a removable Phoenix terminal block • Nominal 12/ 24/ 48 VDC ±10%, 5a /2.5A/ 1.25A • Minimum/Maximum DC voltage: 10 VDC to 60 VDC • Maximum power consumption of 60W

PHYSICAL

Dimensions	• 200 mm / 7.87" (L) • 90 mm / 3.54" (W) • 195 mm / 7.68" (H)
Mounting	Panel or DIN rail
Weight	• G100: 2.47 Kg • D.20 Link Card: 0.18 kg • Packaging + accessories: 2.15 kg

OPERATING ENVIRONMENT

Operating Temperature	-40°C to +70°C
Storage	-40° to +85°C
Humidity	5-90% relative humidity, non-condensing
Altitude	Maximum altitude is 5000 m
Ingress Protection	IP40 (Protected from most tools and wires greater than 1 millimeter)

REAL TIME CLOCK

- When powered off, the real-time clock remains active for a period of time

Hardware Standards

Please refer to the G100 Instruction Manual 994-0152 for compliance details.

STANDARD	DESCRIPTION
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Electric Power Substations
IEC 61850-3	Communication Networks and systems for power Utility Automation-Part 3
IEC 62368-1	Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
EN 60255-27	Product safety requirements: information technology equipment
EN 60255-26	Measuring relays and protection equipment –Part 26: Electromagnetic compatibility requirements
IEC 60068-2-1	Cold
	Cold start
IEC 60068-2-2	Dry Heat
	Hot start
IEC 60068-2-78	Damp Heat, steady-state
IEC 60068-2-6	Vibration (sinusoidal)
IEC 60255-21-1	
IEC 60068-2-27	Shock Response
	Shock Withstand
IEC 60068-2-27	Bump (Non-operating test)
IEC 60068-2-31	Drop & Topple
IEC 60255-21-3	Seismic
EN 60255-27	Product safety requirements: information technology equipment
CISPR22	Radiated RF Emission
	Conducted Emission
IEC 61000-4-2	Immunity to Electrostatic Discharge
IEEE C37.90.3	
IEC 61000-4-3	Immunity to Radiated RF
IEEE C37.90.2	
IEC 61000-4-4	Immunity to Fast Transient Burst
IEEE C37.90.1	
IEC 61000-4-5	Immunity to Surge
IEEE 1613	
IEC 61000-4-6	Immunity to Conducted RF
IEC 61000-4-18	Immunity to Damped Oscillatory
IEEE C37.90.1	
IEC 61000-4-8	Immunity to Power Magnetic Field
IEC 61000-4-11	Immunity to Voltage Dip and Interrupt
IEC 61000-4-16	Immunity to Conducted CM Disturbances (DC-150kHz)
IEC 61000-4-17	Ripple on DC power supply
IEC 61000-4-29	Dip and Interrupt on DC power supply

NOTE: See G100 Instruction Manual 994-0152 for latest information

Ordering Codes

	G100	A	A	L	D	A	4	T	T	*	*	*	U	U	**	***	UU	Description
CPU and Memory		A																1.3 GHz 2-core CPU, 8 RAM
Storage			A															16 GB Solid State Drive
Power Supply				L														12-54 VDC (10.8-59.4 absolute min/max), 1A
Digital Input/output					D													8x DI 12/24/48Vdc, 5mA & 4x DO 60Vdc (max), 1A
DC Analog Inputs						A												4x ±5Vdc/20mA analog input
Serial Ports							4											4x Serial Ports, RS-232/RS-485 independently configurable and islated
Ethernet Interface - Built in								T	T									10/100/1000BASE-TX (RJ45 copper)
Ethernet Interface - SFP type										C	C							100 BASE-TX (RJ45 copper) [0123-0004]
										T	T							1000 BASE-TX (RJ45 copper) [580-3786]
										F	F							100 BASE-FX (LC fiber multi-mode) [580-3784]
										S	S							1000BASE-SX (LC fiber multi-mode) [580-3785]
										L	L							1000BASE-LX (LC fiber single-mode) [580-3787]
										U	U							Not required
PCIe Expansion Module												D						2x D.20 Link Ports [528-1007LF]
												U						Not required
Firmware Version															00			Latest Firmware Version (Default)
															B3			v2.3 Firmware Version
Licenses																xxx		SW Licenses (ARRM, IEC61850-Client, LogicLinx IEC 61131-3)

** Visit the online store for application licenses ordering codes.

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