



# Services+ Remote Engineering

Visor Remote Monitoring & Diagnostics  
for Drives & Automation Systems

DIGITAL TOOLS & SERVICES

[gepowerconversion.com](http://gepowerconversion.com)





GE Power Conversion offers a simple suite of clever software applications. Its flexibility includes ‘on-prem’ and cloud-based options which, together with expert service solutions, help to optimize operations and energy, and enable predictive maintenance and cyber-secure service solutions.

# Services+

Access remote services and experts – on tap support for the health of your assets.

The **Services+** module really helps to expand the capability and resource of your organization with a ‘lean’ mindset. It’s about tapping into GE expertise at the point you need it, and includes our engineering solution for remote monitoring, diagnostics and support.

**Services+** is how we integrate the best of digital technology for a quicker, smarter way of accessing GE’s Power Conversion business regular range of service and support capabilities.

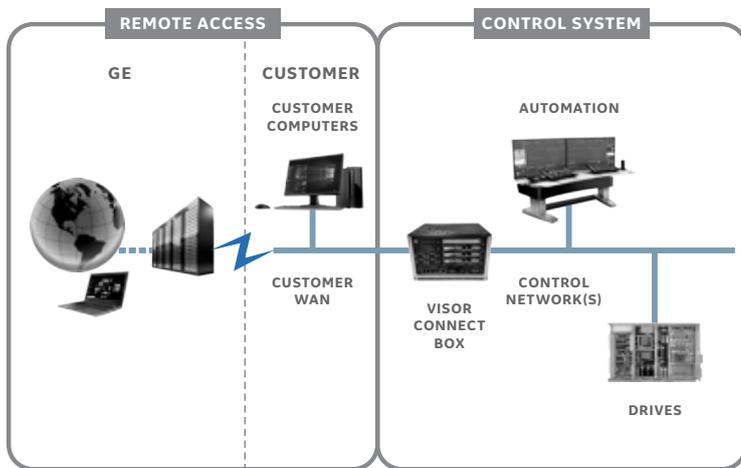
# Safe and Secure

GE's Power Conversion business already provides you with drives and automation control systems. Now, your systems can be remotely monitored—and issues diagnosed—safely and securely through Services+ Visor Remote Monitoring & Diagnostics (RM&D) system.

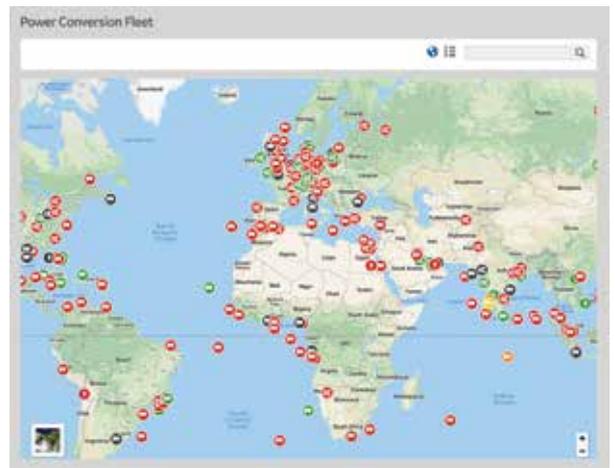
**Services+ Visor RM&D consists of:**

- **Visor Connect Box (VCB).** The compact VCB is installed at your site to monitor control system devices. It hosts integrated Data Historian and Engineering servers that provide a repository for control system data as well as project and engineering information. GE Engineers can access all of this information remotely via a secure site connection.
- **Visor Service Portal (VSP).** The GE VSP provides GE Engineers a secure gateway for remote support and monitoring of assets.

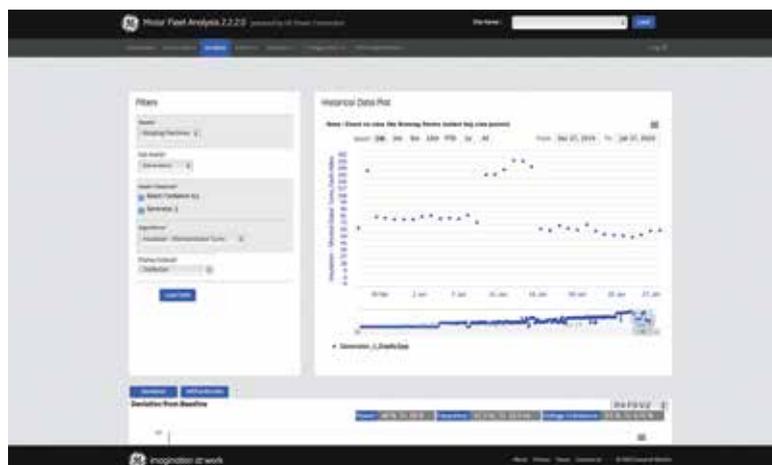
Our system security follows best practices, including the use of hardware firewalls to create a demilitarized zone (DMZ) to isolate the control networks from external networks. Remote connectivity is performed via a single secure encrypted tunnel to the site.



VISOR SYSTEM ARCHITECTURE



VISOR SERVICE PORTAL (VSP) MAP VIEW



VSP ANALYTICS

## Help Meet Your Complete Needs, Visor is Available in Three Versions:

- **Read-Only Visor.** This version allows GE engineers remote viewing of application software and extraction of files. To comply with some industry practices, all remote access is read-only for Marine applications.
- **Dedicated Write-Enabled.** This version of RM&D is for customers who would like GE to conduct remote changes—when necessary and following strict access protocols.
- **Visor Switchable Read/Write.** Providing the security of Read-Only with the functionality of Write-Enabled leaves the Visor Connect Box in a read-only state as default, but allows you to enable the write-enabled mode with the press of a button that is located on the hardware. By doing this, Visor 2.9 offers the functionality and cost-reducing features of the write-enabled Visor.

In addition the Visor solution allows for the optional inclusion of a VCB DMZ PC for hosting local analytics on premise together with the option of a second VCB Control PC that can be used for hosting 3rd party logging applications, such as IBA Server.

Note: Based on GE's RXi controller hardware, the VCB is a robust and compact solution. If your control system requires enterprise storage and processing capabilities such as large storage capacity or server redundancy, please refer to the Operations+ Process and Maintenance+ Optimization solutions.



# Key Benefits

- **Worldwide remote service support.** Customer sites are accessible via the Visor Service Portal (VSP) and can be securely accessed globally from any internet-enabled location.
- **Increased security.** Strict user access management is controlled by workflows that require multi-level approval. Limited personnel access to sites and SSO authentication required at all times.
- **Reduced response time.** Drive trips or Marine vessel black outs or drift offs are highlighted by GE's Data Historian through the automatic incident detection and notification system, together with incident data upload (including drive trip histories). GE's service engineers and specialists then can quickly analyze the incident data and remotely connect to the installed site system to further help with diagnostics, if required.
- **Compact and cost-effective.** Visor 2.9 brings the hardware into one cubical, reducing Visor's physical footprint and allowing expansion inside the cubical for optional DMZ or Control PCs.
- **Fast tag processing.** The integrated VCB site Data Historian is capable of handling more than 250,000 tags per second, together with support for the open OPC UA (HA & DA) standard for access from third-party clients.
- **Single, onsite repository.** An integrated VCB site engineering server holds and manages all project information in one place on site.
- **Automatic remote data analysis.** Integrated Cloud support is provided for remote analytics, and time-series data can be streamed to the VSP to support automatic remote data analysis.
- **Third-party application support.** Third-party logging and analytic applications can be hosted within the Visor cubicle.
- **On-prem support for embedding solutions.** For instance, Operations+ Energy tool can be embedded into the Visor system.



VISOR CONNECT BOX (VCB)



Achilles Level 1  
Certified

## Visor Basic Features

Cyber Security	Integrated hardware firewalls to customer WAN and to control network. Site initiated connection to VSP over encrypted IPsec secure tunnel. VSP access control using GE identity (SSO)/site with access logging. Achilles Level 1 certified.
Configuration	Via P80-Pilot Engineering Software
Historian Logging Rate	>250,000 tags/s
Historian Logged Data Classes	Time series analogues and digitals Alarms and events Trip histories (up to 150 drives) Generic files (logs, reports, office docs, third-party logger, CCTV)
Historian Logging Rate	512 GB SSD (supports 3-6 months storage on typical system)
Control Network Interface	Single or Dual Ethernet connection to Control Network
Customer WAN Interface	Single network connection via integrated firewall
Automatic VSP Event Notification	On incident detection: Automatic notification, associated logged time series and alarms/events data upload
Data Streaming	Streaming of time-series data to GE Cloud (Predix and/or Visor Service Portal) for remote analytics
Access to VCB Historian Data	Web-based user interface OPC-UA clients may extract data via the VCB OPC-UA server (HA & DA access) Manual selection and storage on USB storage device
Logged Data Archive	Automatic archive of logged data to USB connected storage device
Remote Engineering Access	Full RDP access to engineering tool suite hosted/managed by P80-Pilot View of operator screens (read-only screen sharing) View controller and HMI web pages View all historian data
Access Control	Dependant on system variant, the method to gain remote access to a site varies. For Read-Only units, authorized engineers can gain access at any time to troubleshoot and collect logs. For Write-Enabled variants and Switchable Read/Write variants the engineer must gain customer approval prior to connecting. This is done via a robust workflow requiring written approvals.
Operating System	Windows 10 IOT

## Additional Features for Marine Applications

### Automatic DP Drift and Blackout Alerts

If a vessel experiences a Dynamic Positioning (DP) drift-off, blackout or partial blackout scenario, the VCB will automatically capture the relevant alarms and time series data from the inbuilt Data Historian (by default, approximately 15 minutes before and five minutes after the incident). This data then will be automatically sent to the GE Contact Center (via the VSP), which will analyze the data aiming to ensure that the issue is handled in a timely manner.

# Visor Cloud Dashboards

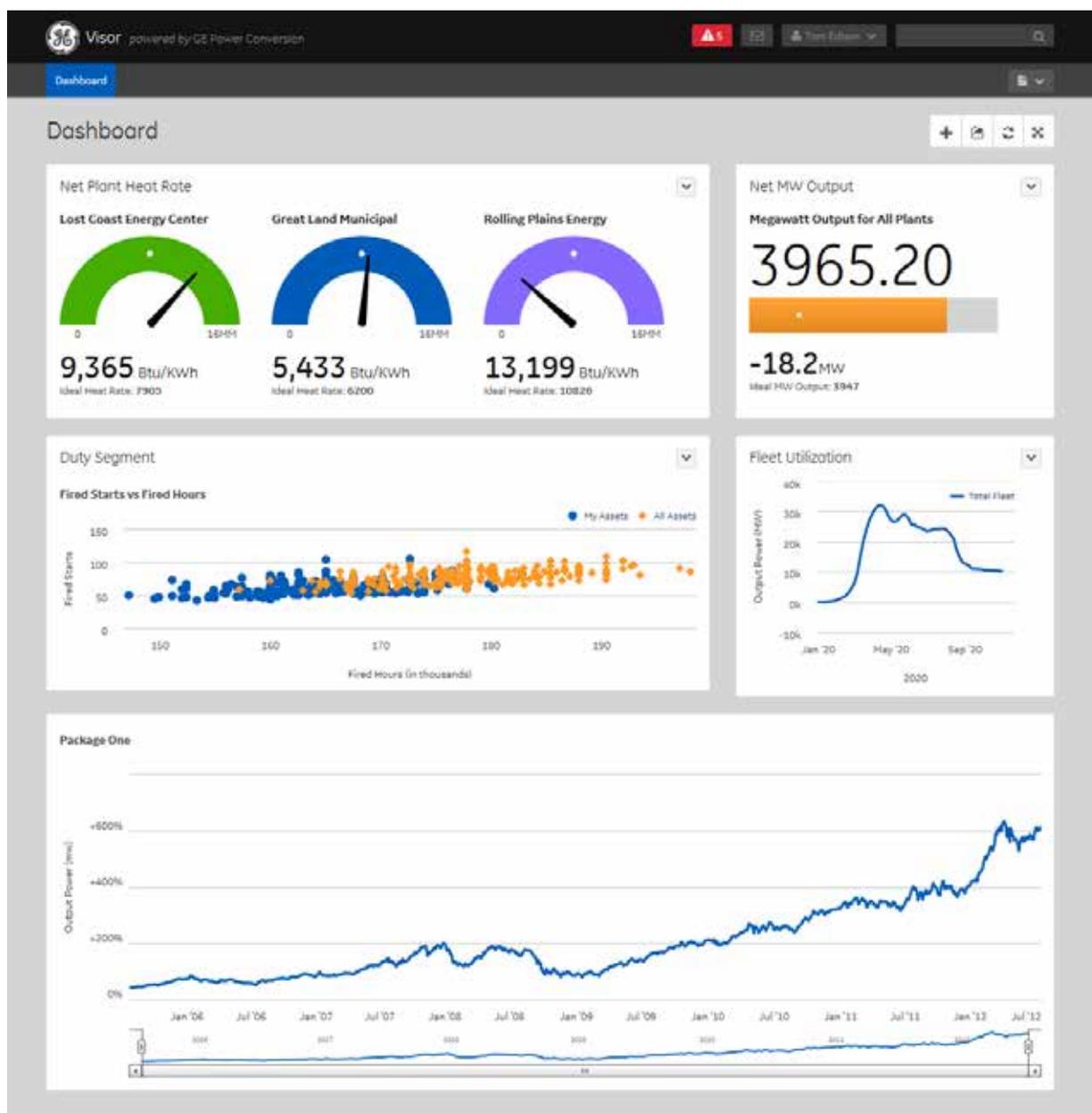
Data driven decisions are critical to plant/ infrastructure up time and that is why GE has extended its powerful Data Historian to enable data monitoring by end users in a web-based cloud environment.

Visors powerful cloud dashboards allow near real time monitoring of assets deployed on the site or installation. Visor will collect and aggregate data from all compatible control system devices, including supported 3rd party devices. The powerful inbuilt Data Historian will process this

data and provides the ability to select 30 key KPIs that will be streamed to the Visor Service Portal Cloud Dashboard environment for near real time viewing of the data.

## Features of the Dashboard include:

- Near real time monitoring of selected KPIs
- Configurable alarm limits with email alerts when limit is exceeded
- Historic timeline view of data for up to 30 days
- Export raw data to CSV for offline analysis



# Visor 2.9:

## A new and improved cabinet enclosure

- **New front panel with a touchscreen HMI.** This front panel displays Data Historian information and Visor status as well as indicating the mode the Visor box is set to—read or write.
- **On-prem analytics PC (VCB DMZ PC).** An optional analytics PC can be added into the Visor box for use with other products such as Operations+ Energy app or other Maintenance+ Asset Performance Management (APM) solutions.
- **Engineering PC (VCB Control PC).** Mandatory for the new Visor Switchable Read/Write functionality, an Engineering PC added to the Visor box is used for write-enabled activities but also will be available for all product variants when there is a need for onsite engineering.

## Visor 2.9 PcVue Alarm Logging to Data Historian

This update expands Visor from just remote access and fault diagnostic file collection to alarm logging to the Data Historian. Remote Read-Only view of HMI mimics allows GE to remotely assist you by giving specific instructions and monitoring feedback and to see faults and errors as they occur.

## Remote Data Access, Enhanced Tech Support

Among the many new features of Visor 2.9 is the ability to connect your data to the cloud for customized analytics, enabling data-driven decisions and performance measuring in real time. Connecting your data to the cloud—the key to driving down OPEX—allows you to intelligently plan maintenance and monitor your asset's health. At the heart of GE's digital eco-system, Visor collects and processes data and provides you with remote access and enhanced technical support.



# Visor Compatibility Matrix

Equipment	Engineering Tools	Logging Protocols	Time Series Data	Alarms & Events	Trip Histories	Files	HMI View	Web Pages	Monitor
HPCi	P80i	Ethernet: WDDE, KPI, OPC UA , Monipert	●		●			●	●
PECe / -Lite	P80i, HDM, Pertu	Ethernet: WDDE, KPI, OPC UA , Monipert	●		●			●	●
CDC					● #1				
AMCx (DP)	DP toolkit, ISaGRAF	Ethernet: proprietary, serial	●		●			●	●
AMCx (AVC)	EMS, Marine toolkit, ISaGRAF	Ethernet: proprietary	●					●	●
PcVue	Proprietary	NetBIOS, HTTP		●			●		
HMI PCs		Various Proprietary Protocols		●			●	●	
Third Party		Shared network drive, OPC-UA and EGD for RX3i			●	●		●	
HPC		WDDE	●						
PEC		WDDE	●						
Logidyn		File logging			● #2	● #2		● #2	● #2

#1 via a separate data gatherer PC

#2 via separate gateway PC



# Services

With a comprehensive global network of service engineers and technicians, GE is uniquely positioned to provide the knowledge, experience and skills to help you protect your assets, maintain critical processes, lower risk and increase productivity.

GE delivers original equipment spare parts around the world and repairs, refurbishes and upgrades customer systems with our latest technology. GE offers risk protection through contractual services based on system experience and sophisticated application calculations.

## About GE's Power Conversion Business

A business unit of GE Power, GE's Power Conversion business applies the science and systems of power conversion to help drive the electric transformation of the world's energy infrastructure. It does so by making and delivering advanced motor, drive and control technologies that evolve today's industrial processes for a cleaner, more productive future. Serving specialized sectors such as energy, marine, renewables and industry through customized solutions and advanced technologies, GE's Power Conversion business works with customers to increase efficiency.

## Conceived for Operators

The suite is built on GE's industry wide expertise in IT, OT (operating technology) and IIoT (the industrial internet of things). Above all we believe it should be intuitive, visual and customized for your operational needs. Featuring simple, clear interfaces it provides organisations of all sizes with access to GE's powerful data analytics, made accessible and usable by providing better intel and situational awareness. Genuine performance improvements are within reach, to help your organisation work with increased efficiency and profitability.

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