

Galaxy Millennium® SC Controller



- Combines the features of the Galaxy Millennium® II controller with the Galaxy SC controller
- Controls up to 16 ferro-resonant and 70 switch mode rectifiers simultaneously
- Replaces Galaxy SC, MCS, CCS
- Controls a wide variety of ferro and SCR rectifiers

Overview

The GE Galaxy Millennium® SC Controller, a standalone version of our flagship Galaxy Millennium® II controller is designed to address the needs of the most modern DC energy systems as well as legacy ferro and SCR rectifiers. Building on the Galaxy Millennium platform, the Millennium SC (MSC) controller delivers state-of-the-art visibility by combining sophisticated control, monitoring, and remote network access in a single integrated unit. The controller has been designed to simplify DC plant operations and maintenance routines as well as optimize provisioning and expansion.

The MSC can be configured locally by using the menu-base front panel display, the local terminal using EasyView2, or the RS485 connection port utilizing the onboard web pages and a standard web browser. Remotely, the MSC can be configured via Modem connection using EasyView2 or a network connection utilizing standard web browsers or SNMP/TL1 management protocols. In addition to its standard

integrated monitoring capabilities, this controller offers extensive external monitoring using bay interface cards (BICs), distribution control cards, and remote peripheral monitoring modules (RPMs) designed for various inputs and transducers. Additional external relay contacts are also available. Ferro rectifier control cards (BJC1_MSC and BJC2_MSC) are available to interface with a wide range of manufacturers' legacy ferro rectifiers.

The MSC, with integrated network access, allows for advanced network supervision using standard network management protocols and available network management software. The GE Galaxy Manager™ software can be used to meet power system engineering, operations and maintenance needs. Via TCP/IP, users gain access to live data and information logged into Galaxy Manager's centralized server from each monitored system controller across the power network.

Benefits

Reliability

- Delivers decades of service
- High availability architecture
- NEBS level 3 certified

Intelligence

- Industry leading controller features
- Ethernet interface for remote access
- Visual, audible and remote alarms

Investment Protection

- Backward compatibility
- Flexible upgrade options
- Seamless integration with GPS plants

On Time Delivery

- 4 - 6 week availability
- 24/7 technical support
- Standard building blocks

Total Efficiency

The GE Total Efficiency™ (TE) architecture reduces energy loss and lowers cooling costs by 50-70%. TE products will prioritize sustainable energy sources like solar, wind, water and fuel cells over traditional utility grid or diesel generator sources – and they will intelligently respond to smart grid information to reduce consumption during peak demand periods. Active Rectifier Management (ARM) and Battery Charging Optimization (BCO) features increase efficiency on current and legacy power infrastructures. The Total Efficiency architecture addresses issues end-to-end based on our proven experience and expertise in batteries, power distribution, DC energy systems, AC-DC power supplies, and DC-DC board mounted power to deliver a solution that is more safe, reliable and energy efficient than competitive alternatives.



Applications

- Galaxy SC Upgrade / Replacement
- Galaxy MCS Upgrade / Replacement
- Ferro Replacement / Migration Projects

Key Features

Remote Access and Features

- Integrated 10/100Base-T Ethernet Network capability
 - TCP/IP
 - SNMP Version 2c for remote management
 - SMTP for email
 - Telnet for remote command line interface
 - TL-1
 - DHCP for network plug-n-play
 - FTP for rapid backup and upgrades
 - HTTP for standard and custom web pages for standard browsers
 - Compatible with Galaxy Manager and other standard network management packages
 - Standard shielded RJ-45 interface referenced to chassis ground
- Optional Modem access
 - Remote access via internal (BJC6) modem option (56k bps modem)
 - Remote access capability via external modem
 - Callback security
- Configurable RS-232/485 port for remote via TL1/X.25
- EasyView2, Windows-based software, for configuration and reporting through local terminal or Modem connections
- Multiple password-protected security levels: User, Super-User, Administrator for all access

Standard System Features

- Monitor and control of up to 85 RS485 serial connected devices
 - Maximum of 85 serial switch mode rectifiers
 - Maximum of 16 ferro rectifiers
 - Maximum of 32 bay interface cards (BICs)
 - Maximum of 16 serial converters
- Standard and custom User Defined system alarms
 - Alarm cut-off
 - Alarm test
 - Multiple-level alarm severity: Critical, Major, Minor, Warning, and Record-only
- Standard Rectifier management features
 - Automatic rectifier restart
 - Reserve engine transfer
 - Adaptive Rectifier Management (ARM)
 - Remote rectifier (on/off) control
 - Automatic rectifier sequence control
 - N + X redundancy check
- Low Voltage Load and Low Voltage Battery Disconnect Options (3)
- Various levels of configuration, statistics, and history
 - All stored in non-volatile memory
 - Remote and local backup and restore of configuration data
- Remote/local software upgrade
- Basic, busy hour, and trend statistics
- Detailed event history
- Maintenance reminders
- Inventory management
- User defined events and derived channels
- Hardware DIP switch access control

Standard Battery Management Features

- Float/boost mode control
 - Manual front panel boost
 - Manual timed boost locally, T1.317, and remotely initiated
 - External timed boost
 - Battery thermal protect module (BTP)
 - Auto boost terminated by time or current
- Battery discharge testing
 - Manual
 - Periodic
 - Plant Battery Test (PBT) input driven
- Slope thermal compensation
 - High temperature compensation
 - Low temperature compensation
 - Step temperature
 - STC Enable/Disable, low temperature Enable/Disable
 - mV/°C adjustments
- High temperature disconnect/step setting
- Sophisticated reserve-time prediction
 - User configurable system reserve low alarm during normal operation
 - User configurable reserve time low alarm
- Recharge current limit
- Integrated "At Rate Calculator" for estimation purposes
- Battery discharge trace data
- Emergency Power-Off input
- Lithium battery fail input

Specifications

General	
Operating Voltage	± 24Vdc, ± 48Vdc (Range: ± 18 to ± 60Vdc)
Input Power	36W (varies by option)
Operating Temperature Range	-40°C to +75°C (-40 to 167°F)
Storage Temperature Range	-40°C to +85°C (-40 to 185°F)
Operating Relative Humidity	0 - 95% (non-condensing)
Physical Specifications	8.75"H x 16.25"W x 15.18"D
Display	8-line by 40-character backlit LCD

Agency Certifications	
NEBs	Evaluated by independent NRTL test lab to Telcordia GR63, Issue 3 and GR1089-CORE, Issue 5 (including level 3 testing)
EMC (Emissions)	FCC and EN 55022, Class B; FCC, Class B; GR1089-CORE, Issue 5
Safety	UL Listed Component as Part of GPS Power System

Features

Integrated Outputs

- Traditional office alarm interface with 19 Form-C alarm outputs (60VDC @.3A)
 - Standard default assignments: Power Critical-Audio, Power Critical-Visual, Power Critical-External, Power Major-Audio, Power Major-Visual, Power Major-External, Power Minor-Audio, Power Minor-Visual, Power Minor-External, Major Fuse (MJF), Minor Fuse (MNF), Battery On Discharge (BD), AC Fail (ACF), Rectifier Fail, High Voltage (HV), Very Low Voltage (VLV), Controller Fail, User Relay 1, User Relay 2
 - 16 Form-Cs are user assignable
- 1 1/3A Auxiliary Battery Supply (ABS) Output

Remote Peripheral Monitoring & Control

- Modular monitor and control growth options for up to 95 monitoring modules optimized for DC voltage and shunt monitoring, binary input detection, temperature monitoring, external transducer monitoring
- Additional Form-C relay output control available
- Devices managed and powered by the controller via one twisted-pair cable over distances of 300m or more
- Daisy-chain connections from module to module reduce installation costs and cable congestion
- Modules can be located near monitored source
- Various panels for rack-mounting available

Enhanced Battery Management Features

- Battery discharge test options including periodic and manual tests (local/ remote) with configurable thresholds or 20% discharge algorithm
- State of charge indication
- Rectifiers on-line during test (minimize risk to service)
- Discharge data stored in non-volatile memory. Graphical data available
- Accurate battery reserve time calculations that factor in battery specific parameters, plant voltage, load, temperature, number of battery strings and number of cells per string
- Thermal compensation (STC) and recharge current limit to maximize battery life

Extensive Plant and Monitoring Statistics

- Real-time data and historical statistics help analyze critical performance parameters
- Statistics for planning preventive or corrective maintenance before serious problems occur

Derived Channels

- 32 derived channels enable arithmetic and Boolean operations to be performed on measured values to allow customer specific parameters such as output power to be calculated and managed

Rectifier Management

- Energy Efficiency, provides ability to automatically shutdown selected rectifiers during low plant loads maintaining maximum battery plant efficiency without sacrificing reliability
- Provides Reserve Operation feature for maintaining designated number of rectifiers on during Engine runs as well as proper sequencing for generators
- Provides ability to transfer rectifiers (TR1-TR4) on in certain sequences for return of AC

Efficient Physical Design


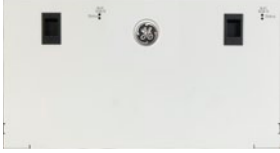
- Single controller circuit pack to manage more features than previous Millennium
- Backwards compatible for Galaxy SC and Galaxy MCS upgrades / replacements
- Designed to mount in Galaxy SC / Galaxy MCS frame space
- Display and controller circuit packs are interchangeable with Millennium II controllers

Galaxy Manager Compatible


Galaxy Manager Benefits Include:

- Utilizes industry standard SNMP/TL1 protocol
- Supports other system components utilizing SNMP/TL1
- Automatically obtains and stores standard and custom information into a Galaxy Manager's centralized database
- Management information from polling or alarms received from alarm traps from multiple sites are available on one screen via the inter/intranet
- Centralized web server with multiple user access to live or managed data with drill down to problem details
- Automatic or manual database updates
- Supports data for unmonitored sites (manually entered data)
- View history of alarms or other critical data points for any managed site
- Trend user selected data over time
- Automatic or manual report generation
- Standard engineering tools like reserve time calculators and cable voltage drop analyzer
- Third party serial device support via Galaxy Portal or NIC

Step 1: Select System





Ordering Code	Description	Photo
CC109169280	Galaxy Millennium SC Equipped with onboard M2 controller and BSL3 _MSC Insulation displacement Alarm Block. (Up to (2) BJC1 or BJC2 circuit cards per system)	
	J2011002 L1	
CC109169272	Galaxy Millennium SC without M2 (Up to (2) BJC1 or BJC2 circuit cards per system) Requires Remote Galaxy Millennium II controller	
	J2011002 L2	

Step 2: Select Ferro Rectifier Control Card


Ordering Code	Description	Photo
CC109167771	BJC1_MSC Monitoring board for ATT type rectifiers. Up to 8 Rectifiers per circuit card	
	J2011002 L21	
CC109167788	BJC2_MSC Monitoring board for non-ATT rectifiers. Up to 8 Rectifiers per circuit card	
	J2011002 L22	

Step 3: Select Alarm Card

Note: List 1 and List 2 systems are E/W BSL3_MCS

Ordering Code	Description	Photo
CC109170123	BSL3_MSC Insulation Displacement Alarm Termination Board Included with List 1	
	J2011002 L40	
CC109170131	BSL4_MSC Wire-Wrap Alarm Termination Board Order separately as a field installed card	
	J2011002 L41	
CC109170362	BSM6 Modem E/W Power Connector Cable	
	J2011002 L81	
CC109130630	MCR1B-MCR2B M2 Controller Circuit Card Included with List 1	

Step 4: Select Rectifier Interface Module (RIM)

Ordering Code	Description	Photo
108028671	For use with List 21, MSC style 24-pin cable, connects up to 8 Lineage ferros without enhanced communications	
	J2011002 L31	
108028697	For use with List 21, 40-pin cables, connect up to 8 J55 Series Lineage ferros with enhanced communications	
	J2011002 L32	
108028689	For use with List 22, 40-pin, connects up to 8 commercial ferro rectifiers with shunt signals	
	J2011002 L34	
108572660	For use with List 22, 40-pin, connects up to 8 ECS style SMR ferro rectifiers with shunt signals	
	J2011002 L35	

Step 5: Select Control Cables

Ordering Code	Description	List
H285-226 G63 Control Cable (Commercial RIM) all commercial rectifiers		
108967290	60 ft long, H285 G62 control cable (Commercial RIM). All commercial rectifiers For use with L34	List 150
108969486	100 ft long, H285 G62 control cable (Commercial RIM). All commercial rectifiers For use with L34	List 151
H285-226 G60 Control Cable (Ferro Enhanced RIM) J8550x -48V Ferro or J85702H -48V PXS with GCM Interface		
108967258	35 ft long, H285-226 G60 control cable (Ferro Enhanced RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface. For use with L32	List 152
108967274	60 ft long, H285-226 G60 control cable (Ferro Enhanced RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface. For use with L32	List 153
108969478	100 ft long, H285-226 G60 control cable (Ferro Enhanced RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface. For use with L32	List 154
H285-226 G5 Control Cable (MCS Compatible RIM) J8550x -48V Ferro or J85702H -48V PXS with GCM Interface		
108967175	15 ft long, H285-226 G5 control cable (MSC compatible RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface For use with L31	List 155
108967183	25 ft long, H285-226 G5 control cable (MSC compatible RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface For use with L31	List 156
108967191	35 ft long, H285-226 G5 control cable (MSC compatible RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface For use with L31	List 157
108967217	60 ft long, H285-226 G5 control cable (MSC compatible RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface For use with L31	List 158
108969460	100 ft long, H285-226 G5 control cable (MSC compatible RIM) J8550X -48V Ferro or J85702H -48V PXS with GCM interface For use with L31	List 159
108967316	40 ft long, H285-226 G61 control cable (SMR compatible RIM) J85702B-2 L-5 -48V SMR shelf with 364A (50A SMR shelf) For use with L35	List 160
108967308	40 ft long, H285-226 G63 control cable (SMR compatible RIM) J85702E-2 -48V SMR For use with L35	List 161
Serial Cables for List 2 (with remote M2)		
847690799	10' serial	List 200
847865425	25' serial extension cable includes coupler	List 201

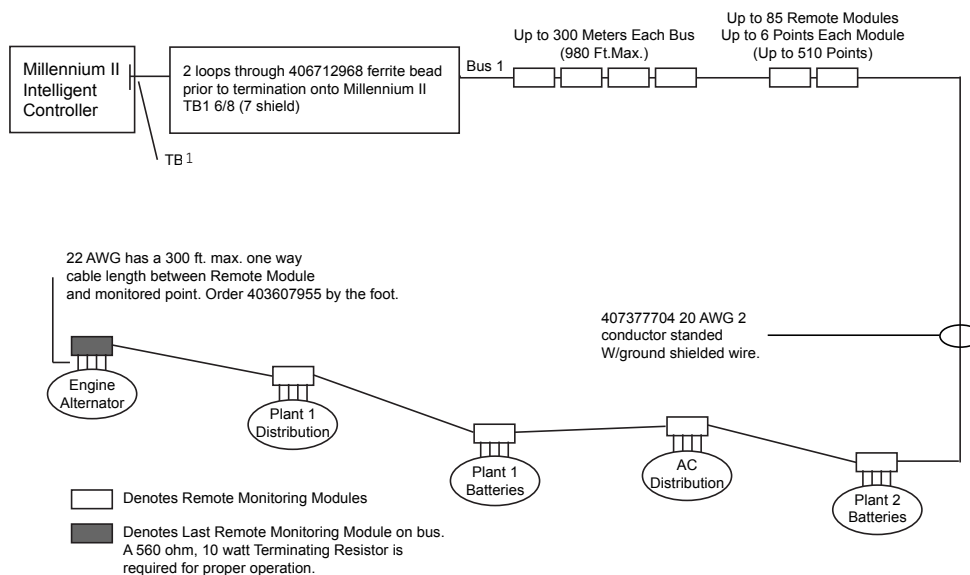
Step 6: Select Miscellaneous Materials

Ordering Code	Description	List
848152997	Optional reserve time prediction kit to provide (cable length, 75 ft) Battery slope thermal compensation and access to software feature (30k)	List 90
848152989	Optional reserve time prediction kit to provide (cable length, 10 ft) Battery slope thermal compensation and access to software feature (10k)	List 91
848153003	Optional reserve time prediction kit to provide (cable length, 8ft) Battery slope thermal compensation and access to software feature (to 210E)	List 92
848669263	10 Foot extension cable. For use with list 91	List 95
847494606	10k ¼ in. diameter ring type thermistor, 2-pin female plug. For use with 1R125 I Unigy batteries	List 96
848194221	10k 5/16 in. diameter ring type thermistor, 2-pin female plug.	List 97
848202743	10k 1/2 in. diameter ring type thermistor, 2-pin female plug.	List 98
CC848764530	V2 Sense Resistors for controller 0-5V measurement (order 2 per controller)	List 110
CC848764522	V2 Sense Resistors for controller 0-30V measurement (order 2 per controller)	List 111
CC848764514	V2 Sense Resistors for controller 0-60V measurement (order 2 per controller)	List 112
CC109111077	Kit for repair or replacement of Millennium II Controller boards Provides CC109130630 controller boards and CC848778497 instruction sheet	List 120






Step 7: Select Remote Peripheral Monitoring Options

Ordering Code	Description	# Inputs	# Temp	Photo
	Modules			
108469461	J85501G1L21 RPM Shunt Monitoring (221F)	6	1	
108469479	J85501G1L22 RPM Voltage 0-200VDC (221D)	6	1	
108469495	J85501G1L23 RPM Transducers (221J)	6	1	
108298431	J85501G1L24 RPM Voltage 0-3VDC (221A)	6	1	
108298498	J85501G1L25 RPM Voltage 0-16VDC (221B)	6	1	
108469503	J85501G1L26 RPM Voltage 0-70VDC (221C)	6	1	
108298449	J85501G1L27 RPM Binary (222A)	6	1	
108483538	J85501G1L28 RPM Temperature (223T)	0	7	
108298456	J85501G1L9 RPM Control Relay (214A)	3	0	
	Supporting Material			
407377704	Connecting Cable for RPMs (Order by foot)			
848535332	Blue panel for mounting 6 modules above a GPS cabinet			
847307410	12' Cable to be used with Temperature Probes			
847917879	½" Diameter Ring Terminal Temperature Probe (Cable Required)			
848528881	5/16" Diameter Ring Terminal Temperature Probe (Cable Required)			
405298308	Termination Resistor (1 per bus)			
406712968	Ferrite Bead (1 per bus)			
403607955	Monitor Channel cable KS13385 22AWG stranded pair, R&Bk (order by the foot)			
108984477	23" grey panel, 6 RPM mounting panel for Lorain plants			

Millennium Remote Monitoring



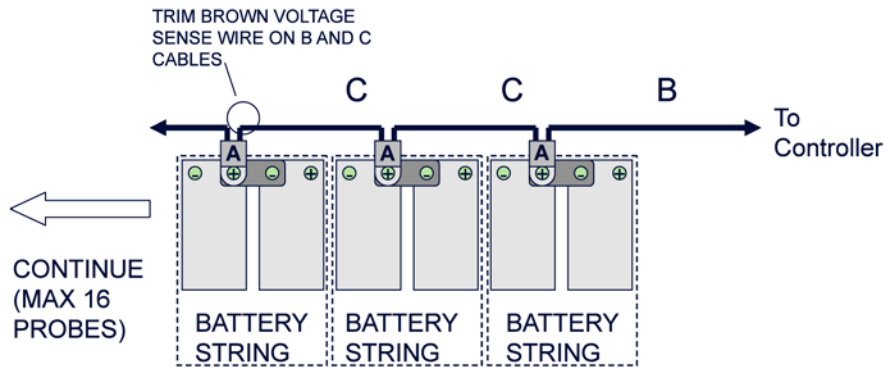
Step 8: Select Optional AC Monitoring Equipment

AC Monitoring Options		
Ordering Code	Description	Photo
Configured Panels		
CC408646005	3P/3W 208/240V Line to Line, 10x12x14 box provides current, voltage, and power	
CC408646046	3P/3W 480V Line to Line, 10x12x14 box provides current, voltage, and power	
CC408646054	3P/4W 208V Line to Neutral, 10x12x14 box provides current, voltage, and power	
Transducers		
CC408645808	1-phase AC Current Transducer (Built-in CT; 150A max current; 350 kcmil max conductor size)	
CC408645816	1-phase AC Voltage Transducer 120V	
CC408645824	1-phase AC Voltage Transducer 208/240V	
CC408644537	3-phase AC Voltage Transducer 208/240V Line to Line	
CC408645741	3-phase AC Voltage Transducer 208/240V Line to Neutral (120V)	
CC408645832	3-phase AC Voltage Transducer 480V Line to Line	
CC408645840	3-phase AC Current Transducer	
Current Transformers (Required for configured panels and current transducers)		
CC408645857	Current Transformer, 200A primary, 5A secondary, 4 in inside diameter	
408524862	Current Transformer, 400A primary, 5A secondary, 4 in inside diameter	
CC408645865	Current Transformer, 600A primary, 5A secondary, 6 in inside diameter	
CC408645873	Current Transformer, 800A primary, 5A secondary, 6 in inside diameter	
CC408645881	Current Transformer, 1000A primary, 5A secondary, 8 in inside diameter	
CC408645898	Current Transformer, 1200A primary, 5A secondary, 8 in inside diameter	
Miscellaneous		
CC408645907	Barrier terminal block to extend the CT secondary leads beyond their 12 ft factory length. Use 12 AWG THHN wire in conduit.	
CC408645915	Bud Industries Wall Box (12H x 10W x 8D) w/captive screw cover & internal mounting panel. For mounting transducers	

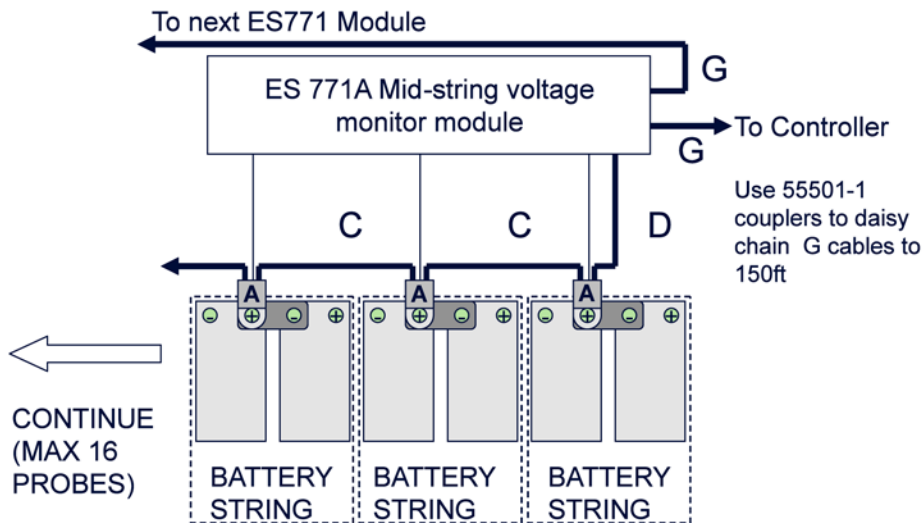
Step 9: Select Battery Monitoring

Ordering Code	Description	Photo
CC109142980	QS873A Thermal Probe (A)	
CC848817024	10 ft wire set (B: thermal probe to controller)	
CC109157434	20 ft wire set (B: thermal probe to controller)	
CC848822560	1 ft wire set (C: thermal probe to thermal probe)	
848719803	5 ft wire set (C: thermal probe to thermal probe)	
CC848822321	10 ft wire set (C: thermal probe to thermal probe)	
850027334	20 ft wire set (C: thermal probe to thermal probe)	
108958422	ES771A Battery Voltage Monitor Card	
CC848791517	2-1/2 ft wire set (D: ES771A to thermal probe)	
CC848797290	6 ft wire set (D: ES771A to thermal probe)	
848719829	10 ft wire set (D: ES771A to thermal probe)	
CC848791500	4 ft wire set (G: ES771A to ES771A or controller)	
848652947	10 ft wire set (G: ES771A to ES771A or controller)	
555052-1	In-Line Coupler (for extending item G above)	

Temperature/Voltage probes are needed for battery monitoring. They are connected to each battery or battery string to provide slope thermal compensation, temperature alarms and voltage imbalance alarms.



Temperature Measurement



Temperature and Voltage Measurement

Management Visibility

Galaxy Manager™ software is the centralized visibility and control component of a comprehensive power management system designed to meet engineering, operations and maintenance needs. The Galaxy Manager client-server architecture enables remote access to system controllers across the power network.

- Dashboard display with one-click access to management information database
- Trend analysis
- Scheduled or on demand reports
- Fault, configuration, asset, and performance management

Training

GE offers on-site and classroom training options based on certification curriculum. Technical training can be tailored to individual customer needs. Training enables customers and partners to more effectively manage and support the power infrastructure. We have built our training program on practical learning objectives that are relevant to specific technologies or infrastructure design objectives.

Service & Support

GE field service and support personnel are trusted advisors to our customers – always available to answer questions and help with any project, large or small. Our certified professional services team consists of experts in every aspect of power conversion with the resources and experience to handle large turnkey projects along with custom approaches to complex challenges. Proven systems engineering and installation best practices are designed to safely deliver results that exceed our customers' expectations.

Warranty

GE is committed to providing quality products and solutions. We have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or replaced as soon as possible.

For full warranty terms and conditions please go to www.ge.com/powerelectronics.



Contact Us

For more information, call us toll free at **+1 877 546 3243**, or +1 972 244 9288 and visit us on the web at www.ge.com/powerelectronics