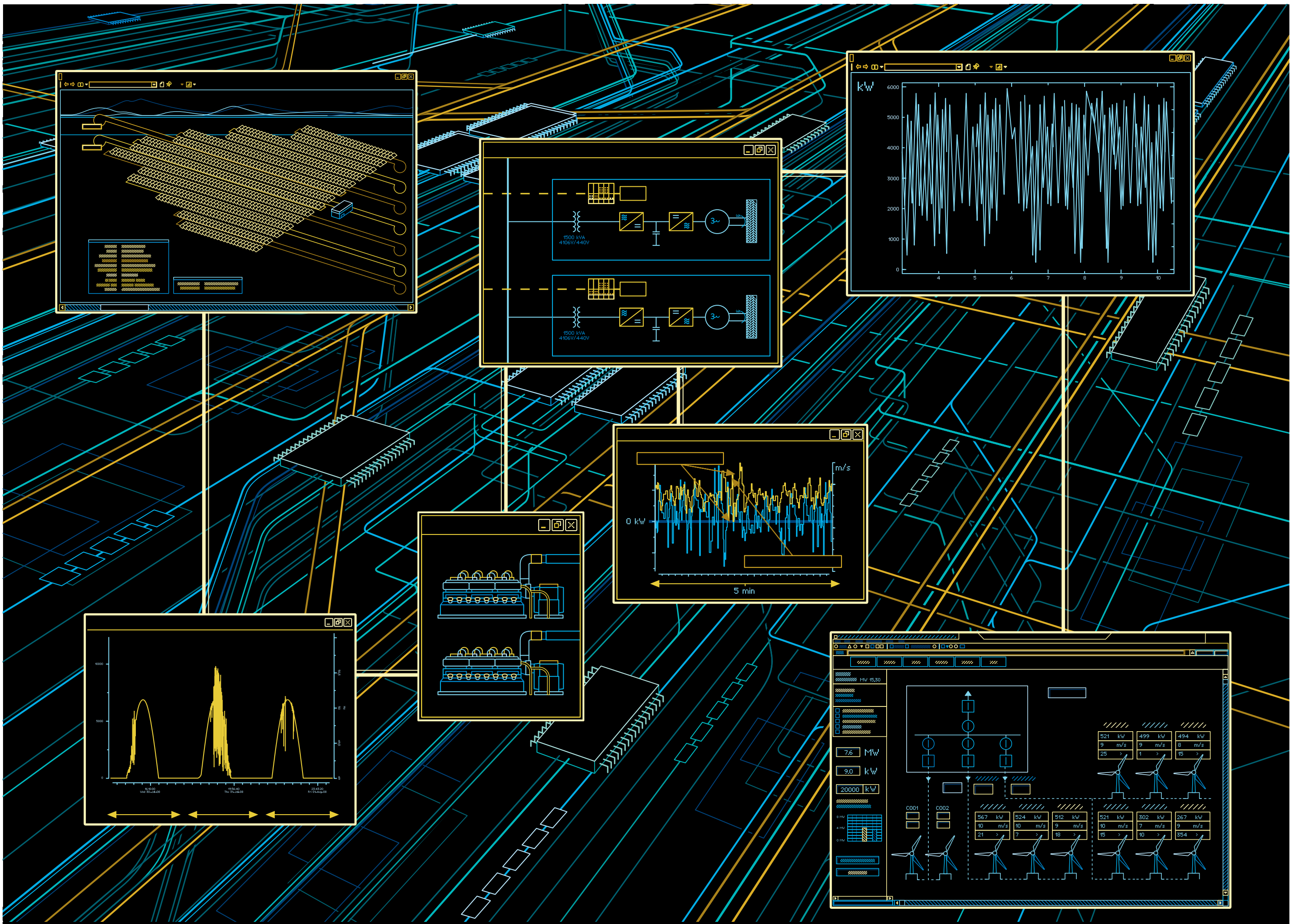


Power Generation

Renewable Microgrid Controller MGC600

Power and productivity
for a better world™

Renewable Microgrid Controller MGC600

ABB`s microgrids and renewable integration platform provides a modular and scalable solution that integrates renewable power generation into microgrids that previously operated solely on fossil fuel. The key is to design a renewable power plant that can maximize return on investment, while delivering a stable, safe and reliable power supply.
ABB`s solution includes grid stabilization technology that enables high penetration of renewable power generation, and distributed control systems that provide intelligent power management and efficient hybrid power plant operation.
Our solution achieves 100% peak penetration of renewables in wind/diesel and solar/diesel power systems, maximizing fuel savings and supplying reliable, grid-quality power in remote off-grid locations.

This document contains an overview of the Renewable Microgrid Controller (MGC600). The MGC600 is specifically designed for the integration of generation devices into isolated power supply systems (mostly microgrids).

In the last decade, the MGC600 has been installed in several power stations among which we find Marble Bar, Ross Island, and Nullagine.

The MGC600 is designed to manage and automate power generation systems that utilize different energy resources such as diesel, HFO, gas, geothermal, hydro, wind, solar, and tidal. It enables and maintains the grid integration of renewable and conventional generators in a cost and energy efficient manner. The power system operator and the environment both benefit from the maximized use of any renewable energy and optimized dispatch of conventional power plants.
The MGC600 forms a generic way to manage the power flow of an islanded microgrid power system, while this can be quite different in appearance.
They can be powered entirely by diesel/HFO/gas engine or gas turbines or they can have renewables integrated which add another layer of complexity to the system.
Microgrids can also be connected to the main grid through a coupling point.
The power flow algorithms of the MGC600 were developed to serve this market and perform best in high penetration renewable systems.

System architecture

A typical microgrid power system consists of:
- Generators (diesel, gas, etc.)
- Wind turbines
- Solar photovoltaic arrays
- Other renewable technologies such as geothermal generation
- Distribution feeders
- Main grid connection/interconnector switch (optional)
- Energy storage devices such as
  - Flywheels (short term storage and stabilization)
  - Batteries (long term storage and stabilization)
- Demand managed devices
  - Industrial controllable loads
  - Commercial/residential loads (air conditioners, pool pumps, etc.)

All these individual devices need to be integrated to interact as a strong and powerful system. There are two ways of interaction between these devices:
1. Electrical connection (existing through the wires that carry the energy to the loads)
2. Communication between the devices

The MGC600 is designed to allow communication between any electrical device of the above. It uses a common hardware platform which is described later on in this document. This hardware is used to run different firmware depending on the type of electrical device attached. The naming convention for the firmware is noted in the table below.
These software packages contain the core control logic of the MGC600. A single device like a photovoltaic control and monitoring system (MGC600P) is not able to do much without other components of the MGC600 range. It requires visibility to diesel generators and other plant equipment to schedule and control the PV array.

The MGC600 has a number of key unique features and benefits. These have been developed to improve both the availability of the power system and to reduce the amount of fossil fuel being consumed in isolated or microgrid power generation systems.

The MGC600 is manufacturer independent and has been successful communications have been established with main producers of wind turbines, diesel generator controllers, solar and battery invertes as well as with ABB components.

Firmware / Controller	Description
Diesel/Gas generator (MGC600G)	To control, monitor and interface to diesel generators
Distribution Feeder (MGC600F)	To control, monitor and interface to feeders and their protection relays
Photovoltaic Solar (MGC600P)	To control, monitor and interface to solar array inverters
Single/Multiple Load (MGC600L)	To control, monitor and interface to large loads like crushers, boilers, etc.
Hydro generator (MGC600H)	To control, monitor and interface to hydro plants
Energy Storage System (MGC600E)	To control, monitor and interface to the ABB PowerStore™ or other energy storage devices like flywheels and batteries
Network connection of Microgrid (MGC600N)	To control, monitor and interface to other microgrids or larger grids
Wind Turbine (MGC600W)	To control, monitor and interface to wind turbines

Renewable Microgrid Controller characteristics

- Modular: to provide flexibility when it comes to interfacing to different devices. Various fieldbusses, digital and analog interfaces are available for interfacing

- Simple: interfacing has been reduced to a minimum number of I/Os to avoid over-engineering the applications by adding too many monitoring points

- Simple to debug

- Readily engineered: the MGC600 is designed to work off the shelf and out of the box without any customization or modification. As long as standard, predefined interfaces are in place, it can be used off the shelf

- Easy to commission: after the hardware installation, the commissioning is very simple. All control algorithms just need to be enabled/disabled with parameters. All control algorithms can be adjusted with parameters

- Future proof: standard Ethernet builds the communication backbone between the various MGC600 controllers

- Smart grid enabling technology: it enables interfaces with smart grid management systems

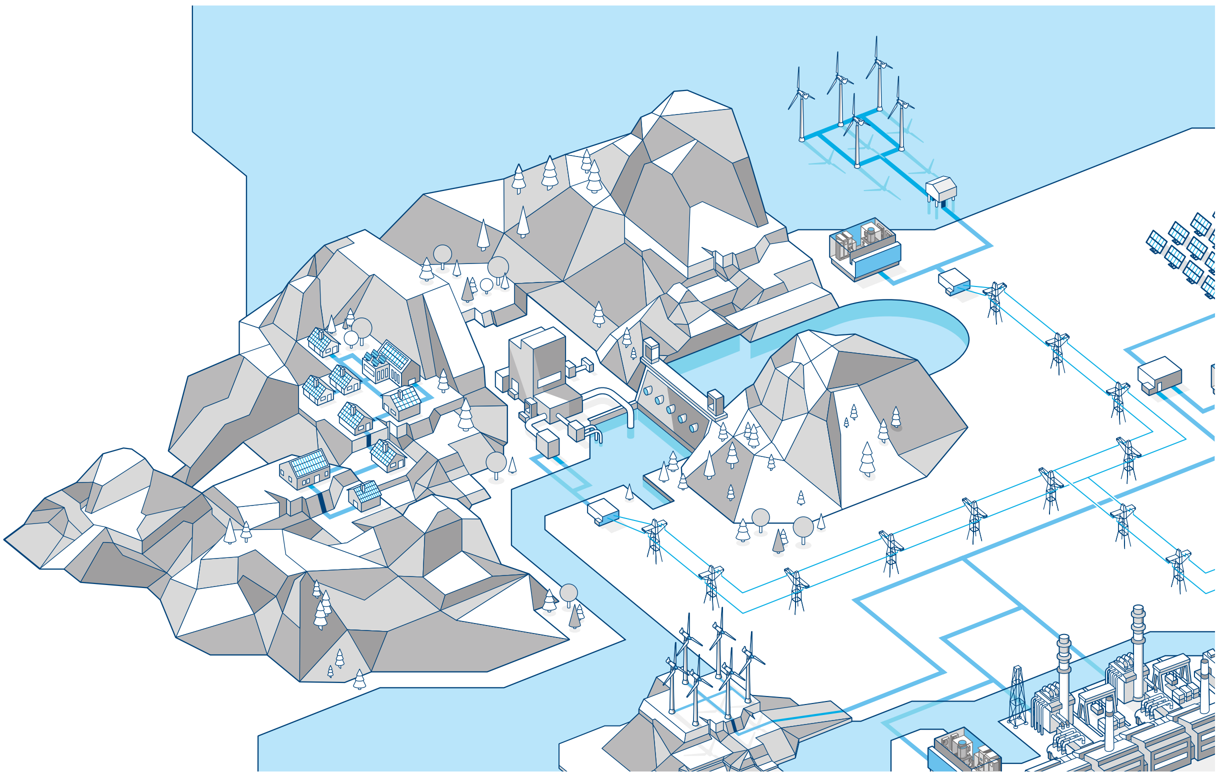
- Designed to utilize the strong history of power flow control algorithms: for more the 20 years we have developed power flow control algorithms together with our customers. This enormous experience together with all these proven algorithms is part of the design and implementation of the MGC600.

- Flexible: new algorithms and major modifications can be developed on request to assure optimal performance. These algorithms are modeled and tested in state of the art modeling tools like Matlab/SIMULINK, Powerfactory, etc

- Scalable: an arbitrary number of devices can be combined to build one system. Generators and loads can be added or removed without the need to change other controllers

- Suitable for retrofits as well as new installations

- Top level control for any generator/feeder/wind turbine/PV array/hydro/etc



Central vs. distributed

The predecessor of the MGC600 was a centralized control system called the Station Management System (SMS). This control system provided strong control algorithms that maximized the renewable input to microgrids while assuring stability of the power system. However, it has been recognized that a central control system has several downsides in a microgrid environment:

1. A failure of the central master controller can be catastrophic
2. Redundancy of central master is often very expensive
3. Large hardware requirements for a central master controller (memory and CPU)
4. System maintenance requires complete shutdowns
5. Scalability and expansion is a complex and expensive task
6. Hard to fault find bugs due to complex isolation of code blocks
7. System relies more on security as attacks on a central controller would be catastrophic
8. Modification requires lots of testing
9. Limited options for network redundancy
10. Works against the nature of a microgrid which is often distributed

Electrical devices in a microgrid environment are usually distributed. A centralized control system works against this very nature by trying to remove the distribution.

The logical solution to this issue was to develop a control system which is local to the various electrical devices. The idea is that every node (generator, wind turbine, etc.) is autonomous. But all these nodes together build a network of peers that represents the whole power system.

To overcome the lack of the central decision making engine (master controller) the peers communicate together. With communication they are able to make the correct control decision in every particular situation.
The advantages of having the control system distributed and split up in individual peers are:

1. Each electrical device can be fitted with a separate, less complex controller that:
   - Mirrors the already existing redundancy of electrical devices back to the control system level. If one generator controller fails, it appears to the system as if one generator has failed, therefore the next generator starts as replacement
   - Is easy to maintain. Parts of the system can be shut down while the rest of the system continues to operate independently. Upgrades and updates can happen on one diesel generator while the rest of the power station is still operating in automatic
2. The failure of one controller doesn't have catastrophic impact since replacement capacity can be brought online immediately
3. The system is more scalable and extendable, not limited to on-board I/O of central master controller
4. It is a more cost-effective solution
5. It is easier to develop upgrades thanks to independence and modularity
6. Communication redundancy can be easily achieved
7. Each node is autonomous and yet closely integrated with its peers

The communication in such a distributed environment works through exchanging messages between the individual controllers.

Communication

The MGC600 is designed to manage and control distributed power generation plant and loads that use renewable and non-renewable energy resources. Communication to generation plant as well as loads is achieved using an in-house developed distributed communication protocol. All high level communication protocols used by the Renewable Microgrid Controller are based on either standard Ethernet TCP/IP or UDP.

Two methods of communication are utilized by the network:
1. Broadcasting: time-critical messages are broadcasted to the system on a periodical basis. A MGC600G that controls a generator, for example, publishes its current status every 100 ms to all other peers in the network. Based on the information provided, other devices make autonomous decisions to start, stop or adjust their setpoints. A MGC600F for example collects that information to be able to reclose only when there is enough generation online.
2. Point To Point: less time-critical information such as data recording or external operator commands to individual controllers are managed by a point-to-point communication protocol.

The physical layer the above messages are communicated on is standard IEEE 802.3 Ethernet. Fibre optics as well as twisted pair cabling can be utilized. Special industrial Ethernet switches are used to create communication redundancy. In this case a logical ring Ethernet backbone connects all controllers of the MGC600. During normal operation the redundant Ethernet switch of the logical ring will block forwarding traffic. In a fault situation (cable cut, faulty connection, etc.) this switch detects the problem in less than 20 ms and forwards the traffic to the cut off part of the network. See the redundant Ethernet ring in Figure 1.

One level down, each controller uses a variety of fieldbusses (Modbus, CAN-Bus, etc.) or hardwired I/O (digital, analog) to interface to the individual electrical devices. Each controller therefore acts as an interface to the electrical device attached. It translates the data signals into the broadcasting protocol that is commonly understood by all the other controllers and therefore electrical devices.

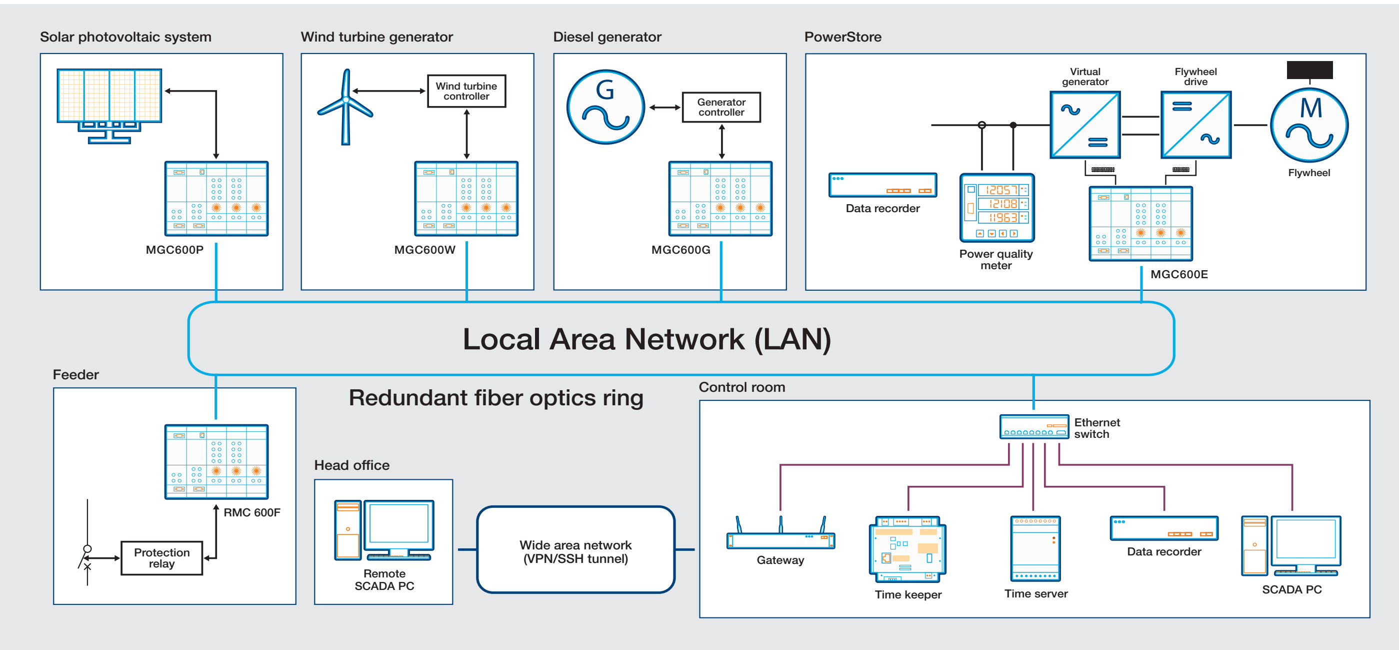
What the Renewable Microgrid Controller is not

Although the MGC600 appears to be very similar to a PLC, it is not. It is not designed to be delivered as a blank product that needs to be programmed by the end customer. It does not come with development tools like IDEs, compilers, etc. to develop a private application.

In summary the MGC600 and its controllers are not:
- To be used as a PLC: there are no libraries or PLC languages that can be modified by the user
- To be customized by the end customer to a greater extent than parameterization

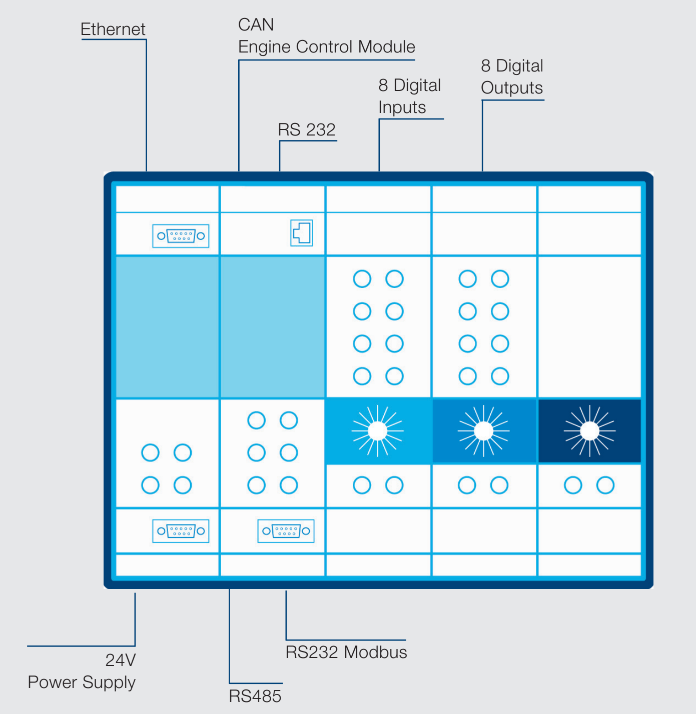
The controllers are engineered and tested before deployment

1. Example of Renewable Microgrid Controller schematics



System hardware
Components

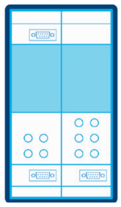
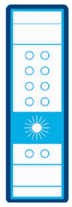
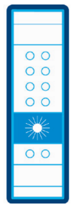
to the site. Customizations are possible, however we strongly advise they be done together and in cooperation with ABB Power Systems engineers. This simplifies development, testing and deployment.



The technology behind the Renewable Microgrid Controller essentially consists of the Intelligent Distributed Controllers (IDC) hardware. This hardware platform has the flexibility of enabling plant-independent control systems to be configured for interfacing to various manufacturers. The control systems have an in-house developed software architecture and support remote software upgrade in the field via Ethernet. All IMGC600 use an Ethernet-based infrastructure to communicate to each other. Information for event analysis and long-term planning is recorded by using one or more DataRecorders. Remote access to the control system is provided through a standard CISCO gateway/route.

IDC
The IDC hardware currently consists of:
- CPU module
- Digital Input module (8 input channels)
- Digital Output module (8 output channels)
- Analog Input/Output module (2 input channels, 2 output channels)

System hardware
Components

	DC – CPU1	IDC – DI8	IDC – DO8	IDC – AIO22
				
Technical data				
Maximum number of I/O modules	16			
Number of inputs		8		2
Number of outputs			8	2
Flash memory (non-volatile)	128 kB			
RAM memory	32 kB			
Nominal voltage	24 V DC	24 V DC	24 V DC	24V DC
Input current high signal		5 mA		
Output current			0.5 A	
Power consumption (internal)		500 mW	500 mW	
Signal current				4 to 20 mA
Resolution				10 bits
Isolation btw. I/O and backplane galvanically isolated				500 V
General specification				
Operating temperature	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C
Storage temperature	-25 to 85°C	-25 to 85°C	-25 to 85°C	-25 to 85°C
Relative air humidity	5% to 95%, non-condensing	5% to 95%, non-condensing	5% to 95%, non-condensing	5% to 95%, non-condensing
Degree of protection	IP20/NEMA1	IP20/NEMA1	IP20/NEMA1	IP20/NEMA1
Dimension (WxHxD)	45 x 100 x 115 mm	22.5 x 100 x 115 mm	22.5 x 100 x 115 mm	45 x 99 x 114.5 mm
Communications data				
Ethernet				
- Transmission medium	CAT 5			
- Data rate	10 mbps			
- Bus coupler connection	RJ45			
Serial ports				
- Transmission medium 1	1x RS232 / RS485			
- Transmission medium 2	1x RS485			
- Bus coupler connection	DSUB-9 or 4-pin screw terminal			
Ethernet				
- External CAN Bus Port	25 to 1,000 m			
- Data rate	10 kbps to 1 Mbps			
- Bus coupler connection	DSUB 9			

T-Bus

These modules are all DIN-Rail mountable. The CPU-module communicates to the I/O modules via the T-Bus which is a CAN-Bus that gets clipped into the DIN-Rail and connects each I/O module with the CPU-module.
For more information about the IDC hardware platform, its modules, wiring, T-Bus and technical specifications please refer to the IDC installation manual.

System functionality

To control the generation and consumption of real and reactive power, the MGC600 consists of any configuration of IDC products. Some of the control and monitoring systems utilize a power measurement meter. This is used to verify how much real or reactive power is being generated or absorbed.

The Renewable Microgrid Controller enables a power generation system to operate automatically. Its control functions provide the following features, among others:

– Spinning reserve management
– System step load capacity management
– Generator scheduling and configuration management based on various measures like runtime, hours, service intervals, etc. (highly configurable)
– Generator single contingency event management
– Generator overload protection
– Wind turbine or solar PV generator power/reactive power limitation
– Energy storage management of excess renewable energy
– Manage load demand
– Feeder reclosing and feeder rotation
– Feeder shedding based on generator overload instead of under frequency
– Feeder management in cooperation with protection relays
– Balance of plant management
– Renewable energy maximization and stabilization
– Demand management

Diesel/Gas generator

The generator control and monitoring System (MGC600G) provides information about the status of a prime-power generator (such as a diesel or gas generator) and is able to control the unit, by starting and stopping (scheduling) and by modifying the amount of real or reactive power it is producing (setpoint control).

Existing engine controllers do not need to be replaced. The MGC600G simply sits on top and manages the scheduling. All MGC600 Gs agree which generators are started and which ones stopped. The entire process works in a distributed manner. There is no centralized controller managing this: the station operator is able to provide scheduling policies through the web interface.

TimeKeeper

A TimeKeeper option is available for the MGC600G to make sure that the system frequency averages to 50/60 Hz in the long run. The TimeKeeper is a separate device which uses a GPS clock to send frequency setpoints to the prime power generators.

The TimeKeeper ensures that frequency referenced clocks keep correct time over the long term.

Function	Description
Automatic generator start/stop based on generator power configuration setpoint	Based on priorities programmed by the power station operator through the SCADA/HMI, the generator will automatically start and stop depending on the spinning reserve in the power system and the minimum run-time of the generator
Automatic call-up of replacement generators before alarm shutdown	In the event that a generator indicates a noncritical or critical alarm, another generator will be automatically brought online
Automatic call-up of replacement generators when switching to manual or operator mode	If the operator switches a generator to manual or operator mode, a replacement generator will be started depending on the station control policy that has been selected
Ideal loading	This is the ideal load at which the generator should operate. Parameters specify the ideal loading of a generator. Other generating devices are limited accordingly to ensure ideal loading is maintained on the generator
Minimum run-time	This is the minimum time that a generator needs to be online before it can be switched off or replaced by other generators
Automatic black start	In the event of a black station, the MGC600G is able to detect a black bus and bring up replacement generation if configured to do so
Spinning reserve management	Switching to higher or lower generator configurations occurs in conjunction with the spinning reserve that is required to be maintained by the entire power system
Frequency/voltage/power setpoint modes	Frequency Control - frequency control/load sharing is carried out at the unit level by the local generator controller. The MGC600G does not influence the speed setpoint of the generator. Voltage Control - voltage control / ad sharing is carried out at the unit level by the local generator AVR. The MGC600G does not influence the voltage setpoint of the generator. Power Setpoint Control - the generator does not load share with the other generators. The generator adjusts its power output to the power setpoint that is issued by the MGC600G, via a series of up and down pulses
Start/online supervision	If the online signal is not received within a certain time frame, replacement generation will be brought online to ensure safe operation

Wind Turbine

The wind turbine control and monitoring system (MGC600W) provides information about the status of a wind turbine and is able to control the unit either by starting and stopping (scheduling) or by limiting the amount of real or reactive power it is producing.

The MGC600W interfaces to a wind turbine generator to provide scheduling and control of that wind turbine. It provides a wind turbine manufacturer independent control and monitoring interface to allow different machines to be integrated into the power system.

Commonly in a power system, with no PowerStore energy storage device installed, the wind turbines will monitor the power output of the diesel generators to determine if they should increase the amount of power they are delivering (if the diesel generator load is higher than the minimum permissible load) or decrease the amount of power they are delivering (if the diesel generator load is lower than the minimum permissible load).

With PowerStore energy storage device installed, whether to increase or decrease wind power output will be decided on the energy storage level of the PowerStore.

The control mode of the wind turbine varies depending on its abilities. The two possible modes of operation include:

- Power controlled: the control system can place a limit on the power output of the wind turbine and the wind turbine is expected to adhere to this power limitation setpoint. This mode of operation is more effective for stabilizing the energy in the power system although it relies on the performance of the wind turbine generator.
- Not power controlled: the wind turbine cannot be power limited and control of the power output of the wind turbine can only be achieved by turning the entire machine on or off. If running in this mode, it is virtually essential to have some kind of discretionary load on the network, to prevent excessive stop/start cycles of the wind turbine.

Function	Description
Automatic wind turbine starting and stopping	If the wind turbine is in automatic mode then the MGC600W can issue automatic start/stop commands to it
Wind turbine power limitation setpoint control based	The MGC600W issues a setpoint to the wind turbine to limit the power on generator ideal loading output of the wind turbine in order to maintain the ideal load on the generators. This helps to avoid incidents of reverse power and reduces maintenance issues with the generators
Wind turbine power limitation setpoint based on system	The MGC600W issues a power limitation setpoint to the wind turbine to step load limit the power output in order to observe the step load limitation of the power system. This assists in keeping the power output from the wind turbines below the total step load capacity of the power system. This is to avoid excessive load steps on the power system in the event of a wind gust or a turbine trip
Wind farm setpoint loadsharing between wind turbines	Each wind turbine has its own load factor. This figure represents the total actual wind power divided by the nominal capacity of the wind turbine. When the MGC600W issues a power limitation setpoint to the wind turbine, it does so after taking into account the load factors of any other wind turbines in an attempt to equalize the load fators across all wind turbines
Wind turbine performance reporting	This includes external inputs from the power meter, anemometer and so on

A MGC600W can connect to a single wind turbine but is also available as wind farm controller to connect to an existing wind farm managment system.

Photovoltaic Solar

The photovoltaic control and monitoring system (MGC600P) provides information about the status of a photovoltaic array and is able to control the device either by turning on and off (scheduling) or by limiting the amount of real and/or reactive power it is producing.

Function	Description
Automatic solar panel inverter disconnection reconnection	The MGC600P can automatically disconnect and reconnect the solar and panel inverter depending on the control strategy for the power system
Photovoltaic power limitation setpoint control based on generator ideal loading	The MGC600P can turn the solar panel inverter on or off in order to maintain the ideal load on the generators. This helps to avoid incidents of reverse power and also reduces maintenance issues with the generators
Photovoltaic power limitation setpoint based step load	The MGC600P can turn the solar panel inverter on or off in order to on system observe the step load limitation of the power system. This assists in keeping the power output from the photovoltaic components below the total step load capacity of the power system. This is to avoid excessive load steps on the power system in the event of a photovoltaic failure

Single/Multiple Load

The load control and monitoring system (MGC600L) interfaces to a controllable load. The load receives a power allocation depending on the step load capability of the power station and the renewable generator power availability.

If the generators are unable to deliver sufficient power then the load will be allocated less power until the generators can support the load and the rest of the power system.

If the load requires more power than its maximum power allocation, it may consume the additional power however it will be treated as a regular consumer load. In this case additional generating capacity may be started in order to maintain the spinning reserve of the system. The MGC600L provides information about the status of a pump/heater/crusher or other controllable (major) load and is able to control the load by either turning the whole device on/off, switching individual elements within the device or even sending power consumption setpoints.

Hydro generator

The hydro control and monitoring system (MGC600H) provides information about the status of a hydro turbine and is able to control the unit, either by turning starting and stopping (scheduling) or by modifying the amount of power it is producing.

Distribution Feeder

The feeder control and monitoring system (MGC600F) provides information about the status of a supply feeder circuit and is able to control the feeder by opening and closing it based on the conditions of the power system. The MGC600F is usually connected to a power meter as well as a protection relay.

Function	Description
Automatic black start	The feeder demand is reviewed and an appropriate generator configuration is selected. The relevant generators are then started and the feeder reconnection process is commenced. In the event that all feeder breakers are opened due to load shedding, a fault or a manual operation, one or more generators will remain online to service the power station local light and power requirement
Open/close supervision	If the open feedback is not received from a feeder within a specified time, following an open command, then an alarm is raised. If the closed feedback is not received from a feeder within a specified time, following a close command, then an alarm is raised
Station spinning reserve management	Connection of a feeder occurs in conjunction with the expected power demand of the feeder and the available online generating capacity of the power station
Automatic feeder reconnection	Should the feeder be shed, the MGC600F will request additional generating capacity so that it can reclose. Once the capacity is online, the feeder will close (after various open timers have expired). This mode of operation is automatically entered after a blackout
Priority-based feeder connection	The MGC600F checks that sufficient generating capacity is online. It waits for the reconnection delay timer to expire to protect equipment that is being supplied by the feeder (eg, compressors). The MGC600F then waits for a minimum separation time between feeder closings to expire to ensure that the power system remains stable between each feeder closure. The order in which multiple feeders are reconnected is defined by the feeder priority parameter

Network connection of Microgrid

The network control and monitoring system (MGC600N) provides information about the status of a Grid/Network connection switch. The MGC600N makes a microgrid be synchronized with the main grid and can control power flow across the connection by controlling the power consumption/ generation of the electrical devices in the microgrid. It is usually connected to two dedicated power meters on each side of the connector.

Energy Storage System

The energy control and monitoring system (MGC600E) provides information about the status of energy storage devices such as a flywheel or a battery system and is able to control the unit by either turning it on and off or by modifying the amount of power/reactive power it is producing or absorbing.

Remote I/O Monitoring

The Remote I/O Monitoring (RIO) is for monitoring and switching of remote inputs/outputs in a system. This auxiliary device makes it possible to extend the functionality of the other MGC600 components. It allows visibility of fuel pumps, tank levels, temperatures, irradiation monitoring, fire system monitoring etc. It can trigger safety lights, alarm horns etc.

DataRecorder

The DataRecorder is based on an industrial PC. It provides a storage solution to record all monitored data points of the connected MGC600 controllers. It can be equipped with standard 2.5" hard drives (500 GB, 1 TB, 1.5 TB)
The DataRecorder also hosts the SCADA web interface to allow operators to monitor and control the distributed control system.

Data acquisition and management

Each monitoring point in the system has a corresponding pool carrying the information that is required for controlling the devices. Like in a PLC environment they can be set, get, forced and unforced. The pool protocol is an ABB developed protocol to exchange power plant information in a quick and efficient readable format.

Historical trending

An in-house developed trending engine is available to record all data points of the system. It can record any pool variable within the system.
Various settings for recording are available:

- Data filters based on time (dt)
- Data filters based on change of value (dv)
- Periodic sampling of arbitrary ranges like 1 s, 10 s, 1 m, 10 m, 1 h, etc
- High resolution sampling (as data gets measured)
- Number of samples recorded per monitoring point

Data get stored in a round robin database that overwrites oldest values. Typical storage capacity on a 500 GB hard drive for high resolution data is around 6-12 months. This is highly dependent on the number of data points and resolution. Storage capacity for 10 minutes worth of data is around three years.

Offsite data warehousing - long-term data storage

For long term data storage ABB offers an offsite storage package. This solution pulls data from the site data recorders on a periodic basis and stores it in databases hosted inside the ABB network. Access to this data is available through a web portal.

Automated reporting

Automated reporting based on the aggregated data is available in two options:

1. Onsite report generation
2. Offsite report generation

The Onsite report generation engine is very limited and is not currently being actively developed due to little demand.
The Offsite report generation engine has access to the offsite data warehousing database. It is used for:

– Fault analysis
– Optimization of operating parameters
– Long-term load monitoring
– Availability reports
– Out-of-limit reports

Interface to external systems

If required, the DataRecorder can provide the aggregated data of the MGC600 to any external/third party system through Modbus TCP or Modbus RTU.

SCADA/HMI

To control and monitor the MGC600 a standard web browser is sufficient. All HMI can be done through a web interface hosted on the data recorder. No installation of additional software or programs is required.

The web interface allows to:

– Monitor of data points
– Change of parameters
– Issue control commands (like remote start, stop, etc.)
– Visualize historical data
– Dislplay real-time and hystorical trend
– Display alarm status and history

Remote access

Since the Microgrid Controller 600 is based on standard Ethernet components remote access to a site can be done through standard routers and gateways. 3G, ADSL, satellite or even dial up modems are possible.

The remote access is used for:

– Remote service and support of plant
– Remote updates of software
– Link for long-term data storage offsite

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