rehlko

Controllers

For Industrial Power Systems



Table of Contents

Total System Integration 05

Rehlko Controllers 06

Insight: Controller Terminology 08

Rehlko Generator Controllers 10

Insight: Controllers and Generator Paralleling . 12

ATS Controller Comparison 16

Insight: ATS Controllers: Key Features 18

Paralleling Switchgear Controllers 22

Controller Accessories 26

Service and Support 28



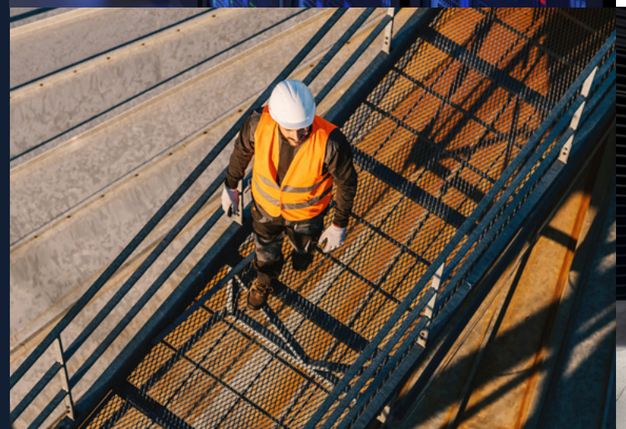
Total system *integration*

Everything works together. Just as it should.

Rehlko designs modular components that work together flawlessly. Then, we use these building blocks to engineer a system custom-made for your space. After rigorous factory testing and expert installation, **every part will work harmoniously with the entire system—for decades.**









Rehlko supports mission-critical infrastructure during an outage.



Rehlko Remote Annunciator

A monitoring system that provides a user-friendly display of the generator's status.



Rehlko Automatic Transfer Switch

This product automatically switches a building's power source from the main grid to a backup generator during an outage. When normal power is restored, the ATS reconnects to the main supply to ensure continuous power without manual intervention.



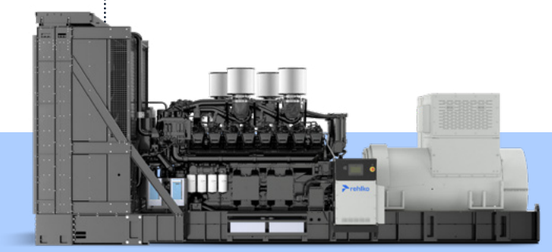
Rehlko Paralleling Switchgear

Paralleling switchgear synchronizes multiple generators to work together, sharing the load and ensuring a reliable power supply. It automatically manages the power distribution, balancing the load between sources and allowing seamless transitions.



Rehlko Generators

Rehlko generators come in a range of sizes and can operate in parallel with multiple units. For added protection, Rehlko offers durable enclosures and user-friendly controls with advanced network communications for seamless operation.



Rehlko *controllers*

The smart choice in backup power.

Controllers are the brains of a power system. They continuously monitor and manage operating conditions to ensure the reliability, flexibility, and performance of the equipment as well as protect it from damage. We design and manufacture every detail of all Rehlko controllers to ensure dependability, ease-of-use, safety and seamless integration with the rest of our equipment.

Our power equipment is used in a wide variety of applications, each of which places unique demands and challenges on its power systems, so we design our controllers to be extremely versatile and customizable. Each one features programmable I/O modules to support customization and is designed to communicate and interoperate with these advanced building-management systems (BMS).



Generator Set Controllers

Available to support either single generator or parallel operation, our generator controllers are easy to operate and provide dependable engine and alternator control, operating information, and system diagnostics.

Advanced Power Management

- APM402: Single Generator
- APM603: Single/Parallel Generators
- APM804: Single/Parallel Generators

Decision-Maker®

- DEC3500: Single/Parallel Generators

Transfer Switch Controllers

Automatic transfer switch controllers communicate with the generator controllers to bridge the gap from utility to standby power, and back again, ensuring a smooth, seamless transition and minimal disruption.

Decision-Maker®

- MPAC 1200
- MPAC 1500

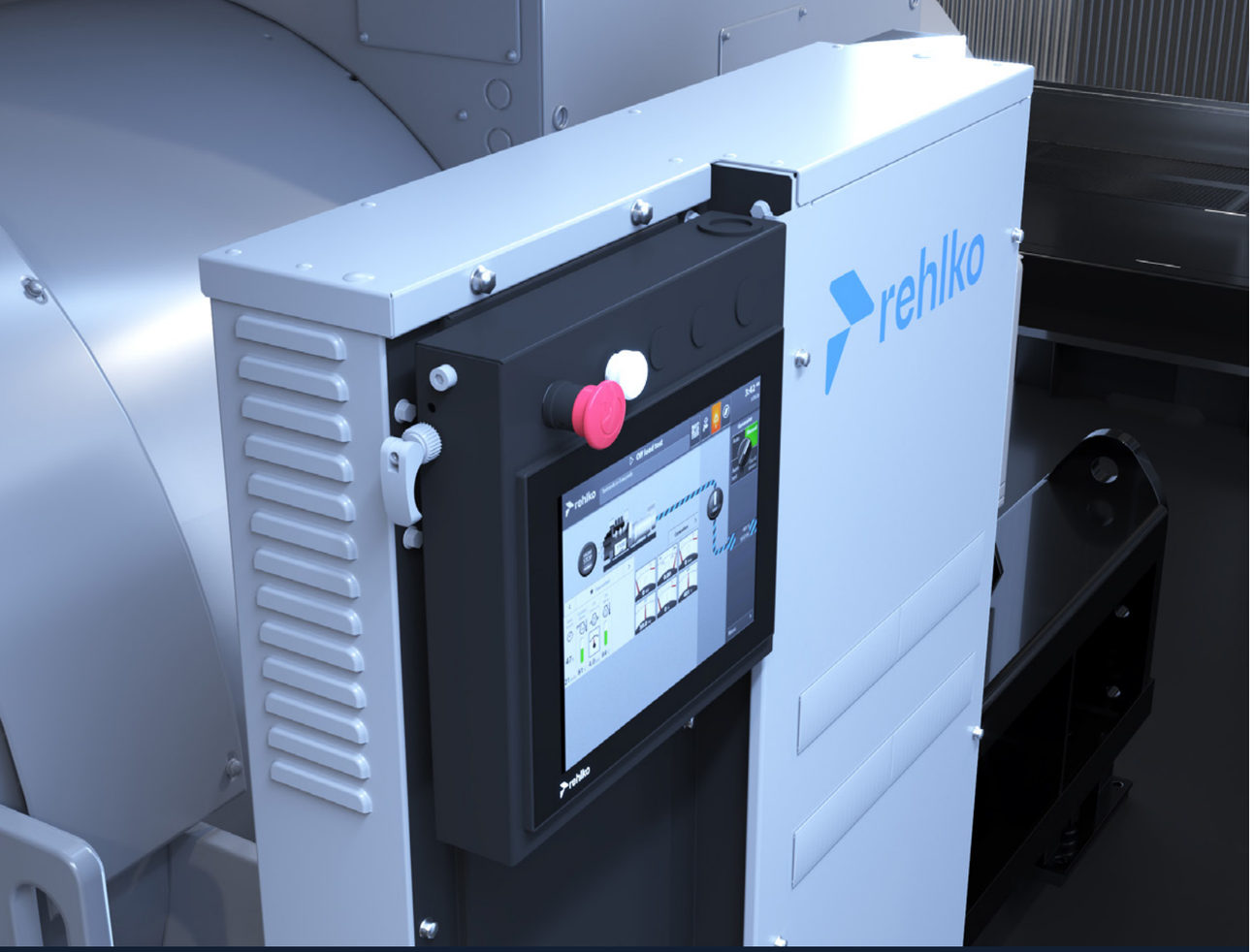
Paralleling Switchgear

Each Rehlko paralleling switchgear solution is developed to meet your specific needs, and the controls are programmed to your exact specifications. Rehlko deploys fault-tolerant programming and provides an intuitive user interface with real-time system information to enable better operational decisions.

Remote Serial Annunciators

Designed for confidence and peace of mind, our remote serial annunciators provide real-time fault and status updates, along with testing capabilities, for generators and automatic transfer switches.

- RSA III
- RSA III with a Single ATS Control
- RSA III with Four ATS Controls



Insight

Controller *terminology*

Generator power systems, and controllers specifically, involve highly complex interactions between mechanical, electrical, and electronic systems. As you evaluate your needs and consider your options, use this glossary of useful terms to enhance your controllers research.

Load Management

Load management allows you to prioritize loads and remove non-critical loads when the power supply becomes unable to support the entire demand.

Each load is assigned a priority level. Load management determines when priority levels are signaled to disconnect (shed) and reconnect (add). When multiple generators are online, load management matches the load to the generator capacity. The system can control feeder breakers or transfer switches. Dry contacts or communications can be provided to interface with your building-management system.

In a paralleled generator system, it is imperative to plan for the unlikely event of a generator failure. Removing or shedding load prevents the remaining online generators from overloading and tripping offline.

Load Add

Loads can be added based on several considerations, including:

- ✓ **Generator bus capacity:** loads are added based on the kW capacity of the bus and an assumed kW demand of the load.
- ✓ **kW overload:** When the generators reach their overload setpoints, low-priority loads sequentially shed until the load falls below the overload setpoint.
- ✓ **Number of generators online:** loads are added based on how many generators are connected to the bus; this is most effective in systems with same-size generators.

Load Shed

A load-shed event can be triggered by several causes, including:

- ✓ **Generator failure:** Loads are shed based on the number of failed generator sets.
- ✓ **Underfrequency:** This is often an indication that the generators are fully loaded and cannot supply additional power to the load. When the bus frequency reaches its underfrequency setpoint, preset loads are shed.

Generator Management

Generator management optimizes the number of online generators based on the load's kW demand, starting and stopping them as required. Generators are sequenced on in order of operator-assigned priority (or based on runtime) and taken off in reverse priority. Operator-defined setpoints determine the load level percentage and time delay at which the genset will be brought on or taken offline.

Voltage Regulation

Voltage regulation helps to minimize voltage fluctuations and quickly stabilize the system when equipment is added or removed. A common experience of voltage fluctuation is when a piece of equipment is turned on and the lights dim or a fan slows down for a moment. While not detrimental to most commercial and industrial equipment, these fluctuations can be distracting.

Generator voltage can be affected by both engine speed and current, and it can be adjusted either manually or through software. Controllers are responsible for detecting and quickly responding to voltage fluctuations, typically maintaining a range between 0.25% and 0.50%.

NFPA 110

NFPA 110 is the National Fire Protection Association's performance standard for emergency and standby power systems. An individual product cannot be marked as NFPA 110–compliant; the overall power system must be installed, maintained, tested, and operated per the NFPA standard to be compliant. Rehlko is committed to designing emergency and standby power components with features that ensure the power system's compliance with NFPA 110.

NFPA 110 has identified two levels of requirements that pertain to the installation, performance, and maintenance of the power system:

- ✓ Level 1 pertains to power systems where failure to perform could result in loss of life or serious injury
- ✓ Level 2 pertains to power systems where failure to perform is less critical to human life and safety

The installation, performance, and maintenance requirements associated with a power system depend upon the power system level.

Rehlko® controllers are designed to meet the requirements of NFPA 110. Key features include:

- ✓ Emergency stop
- ✓ Master switch including Stop/ Run/Auto controls
- ✓ Audible horn, visual warnings, and visual fault indicators
- ✓ System faults and status monitored and annunciated on
- ✓ Both the controller display and remote annunciator

Programmable I/O

Every job is unique and using a controller that allows for customization to support your needs is critical. Controllers offer programmable inputs and outputs to help with the customization.

Inputs are external signals the controller receives from various connected monitoring and management systems, which the controller can then process and respond to based on its programming. Likewise, outputs are information about the generator and/or automatic transfer switch operating conditions that the controller provides to external systems.

- ✓ **Analog Inputs and Outputs:** These are typically used for sensors that show varying amounts of a given metric, such as fuel level in a diesel tank. Analog inputs and outputs identify a system state within a range of values, typically from 0% to 100%.
- ✓ **Digital Inputs and Outputs:** These are used for sensors that show a high or low state, such as an alarm, which is either active or inactive. As an example, a power system can be programmed to trigger a remote shutdown when an input reports a high state.



Rehlko generator *controllers*

Advanced technology made simple

At Rehlko, we don't do one-size-fits-all. With our controls, we design custom packages, tailored to your needs, from basic controls to multiple generator paralleling.

Standard Features

Tested and Approved
Our controls meet NFPA, UL, and CE standards.

Integral Voltage Regulator
Rehlko controls deliver precise voltage regulation (0.25% to 0.50%) to protect your sensitive equipment from poor power quality.

Alternator Protection
This must-have technology protects the alternator from thermal overload.

Seamless System Integration
Every controller works with our automatic transfer switches and switchgear for complete system integration.

Model-Specific Features

Inputs and Outputs
All models include digital and analog input and output with option for additional inputs and outputs.

Engine Status and Condition Indicators
- Oil pressure/temperature
- Coolant temperature
- Engine speed
- Number of starts
- Battery voltage

Alternator Status and Condition
- Voltage, L-L, and L-N for all phases
- Current/frequency for all phases
- Total kW/kVA and KVAr
- kWh
- Power factor
- Per phase kW/kVA and KVAr

Alternator Protection—Shutdown/Indication
- Over- and undervoltage/frequency
- Overcurrent
- Overpower
- Locked rotor*
- Reverse power/VAR

Engine Protection—Shutdown/Indication
- High engine coolant temperature
- Low coolant level
- Low oil pressure
- Overcrank
- High/low fuel level/pressure
- Overspeed
- Load-shed output*

*Except APM804

Controls


APM402



APM603


APM804



DEC3500

Model	APM402	APM603	APM804	DEC3500
Integral voltage regulator	x	x	x	x
Engine diagnostics	x	x	x	x
Engine starting aid	x	x		x
Event and data logging	x	x	x	x
Programming access via laptop	x	x	x	x
Key switch		x	o	
User Interface				
Alphanumeric digital display	x			
Monochromatic graphical display				x
Color graphical display		x	x	
Emergency stop (remote)	x	x	x	x
Exercise function				x
Communications				
Local and remote area network capability	x	x	x	x
Monitoring software	o	o	o	o
Paralleling				
Remote input for external paralleling controller		x	x	x
Dead-bus paralleling		x	x	
Dead-field paralleling		x	x	x
Color graphical display		x	x	x
Synchronizer		x	x	x
Real and reactive load sharing		x	x	x
First-on logic		x	x	x
Circuit breaker control		x	x	x
Base load control		x	x	x
Var/power factor control		x	x	x
Load management		x	x	x
Generator management		x	x	x

KEY: STANDARD = x / OPTION = o

APM402



1. Emergency stop button
2. Two-line LCD digital display
3. Push-button/rotary selector dial
4. Master control buttons
5. Alarm silence button
6. USB communication connection

Usage	Stationary gaseous <400 kW Stationary diesel up to 1,000 kW
Onboard paralleling	None
Protocols supported	Modbus RTU

The APM402 generator set controller provides basic control, system monitoring, and system diagnostics for optimum performance. The APM402 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

Display, Interface, and Accessibility

- ✓ A digital display and push-button/rotary selector dial provide easy local access to data
- ✓ The scrolling display shows critical data at a glance
- ✓ The controller supports Modbus protocol. Use with serial bus or Ethernet networks. (Ethernet requires an external Modbus/ Ethernet converter module)
- ✓ Integrated hybrid voltage regulator provides +/- 0.5% regulation
- ✓ Built-in alternator thermal overload protection
- ✓ Simple programmable function for input and output configuration

Onboard Diagnostics

- ✓ Immediate visibility for up to 1,000 events including warnings and faults
- ✓ Intuitive descriptions of ECM fault codes

APM603





1. 7.5-inch color TFT touch-screen
2. High-visibility alarm LEDs
3. Master control buttons
4. Alarm silence/lamp test button
5. USB and SiteTech connections

Usage	Stationary gaseous and diesel generators 80 kW+
Onboard paralleling	Up to 8 gensets
Protocols supported	Modbus RTU and TCP; SNMP; BACnet

The APM603 generator set controller provides advanced control, system monitoring, and system diagnostics for a single generator set or for paralleling multiple generator sets. The APM603 connects the generator set to other power system equipment and network management systems using standard industry network communications. It uses a patented hybrid voltage regulator with unique software logic to manage alternator thermal overload protection and serve as an overcurrent protective device—features that normally require additional hardware. The APM603 controller meets NFPA 110, Level 1 and UL6200, the newest UL standard for generator controllers.

Display, Interface, and Accessibility

- ✓ Intuitive, dynamic 7.5-inch interface with backlight displays key data for easy local access to data
- ✓ Overview screen can be customized to show critical data at a glance
- ✓ Create a custom favorites list for quick access to important data
- ✓ Supports Modbus protocol through serial bus and Ethernet networks, and supports SNMP and BACnet through Ethernet networks
- ✓ Integrated hybrid voltage regulator providing +/- 0.25% regulation
- ✓ Built-in alternator thermal overload protection
- ✓ Real-time clock with battery backup
- ✓ Integrated programmable logic function for advanced input and output configuration
- ✓ Isochronous load sharing ensures that work is distributed evenly across the power system, reducing stress on individual generator sets

Onboard Diagnostics

- ✓ Immediate visibility of warnings and faults with text description and code display
- ✓ 15 seconds of critical data captured around each warning and fault
- ✓ Store up to 3,000 events locally and download to external USB drive
- ✓ Data logging of customized parameter list for report generation and advanced troubleshooting. Store to external USB drive for easy export and in-depth data analysis
- ✓ Intuitive descriptions of ECM fault codes

Onboard Paralleling

- ✓ Parallel up to eight generator sets
- ✓ Automatic synchronizer with random first-on logic built into controller ensures the first available generator is used to power loads while remaining generators synchronize to the bus
- ✓ Integrated protective relays guard power system from potentially harmful operating scenarios
- ✓ Configurable load management of up to 16 loads allows you to shed lower-priority loads if needed to ensure critical loads are always powered
- ✓ Intuitive descriptions of ECM fault codes

APM804



1. 12-inch LED LCD touch-screen display
2. User access menus (shortcuts, alarms, maintenance)
3. Operating mode selector
4. Installation and mechanical values
5. Generator set electrical values
6. Operator and specialist access menus

Usage	Stationary Diesel 700–4,000 kW
Onboard Paralleling	Up to 50 gensets
Protocols Supported	Modbus RTU and TCP, SNMP, BACnet

The APM804 generator set controller is advanced control, monitoring, and diagnostics for single-generator, multi-generator, and paralleling applications. The APM804 delivers reliable power system management, remote connectivity, integrated voltage regulation control, and enhanced cybersecurity while meeting NFPA 110 Level 1 and UL 6200 requirements when properly equipped and installed.

Display, Interface, and Accessibility

- ✓ Intuitive, dynamic 12-inch touchscreen interface with backlight displays key data for easy local access to data
- ✓ Supports Modbus protocol through serial bus and Ethernet networks, and supports SNMP and BACnet through Ethernet networks
- ✓ Integrated hybrid voltage regulator providing +/- 0.25% regulation
- ✓ Built-in alternator thermal overload protection
- ✓ Real-time clock with battery backup
- ✓ Integrated programmable logic function for advanced input and output configuration
- ✓ Isochronous load sharing ensures that work is distributed evenly across the power system, reducing stress on individual generator sets

Onboard Diagnostics

- ✓ Immediate visibility of warnings and faults with text description and code display
- ✓ 15 seconds of critical data captured around each warning and fault
- ✓ Store up to 2,000 events locally and download to external USB drive
- ✓ Data logging of customized parameter list for report generation and advanced troubleshooting. Store to external USB drive for easy export and in-depth data analysis
- ✓ Intuitive descriptions of ECM fault codes

Onboard Paralleling

- ✓ Parallel up to fifty generator sets
- ✓ Manage up to 10 grids
- ✓ Automatic synchronizer with random first-on logic built into controller ensures the first available generator is used to power loads while remaining generators synchronize to the bus
- ✓ Integrated protective relays guard power system from potentially harmful operating scenarios
- ✓ Redundant ring communication with managed switches to maintain communication between APM804s from the same control panel
- ✓ Intuitive descriptions of ECM fault codes

DEC3500



1. LCD touch-screen display
2. Annunciator fault light
3. Alarm silence/lamp test button
4. Master control buttons
5. Push-button/rotary selector dial
6. USB communication connection

Usage	All Mobile, Marine and Stationary Tier 4 Final Generators
Onboard Paralleling	Up to 8 gensets
Protocols Supported	Modbus RTU

The Decision-Maker® 3500 generator set controller provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility. The Decision-Maker 3500 controller meets NFPA 110, Level 1 when equipped with the necessary accessories and installed per NFPA standards.

Display, Interface, and Accessibility

- ✓ A digital display and push-button/rotary selector dial provide easy local access to data
- ✓ Graphical display shows critical data at a glance
- ✓ The controller supports Modbus protocol. Use with serial bus or Ethernet networks. (Ethernet requires an external Modbus/ Ethernet converter module)
- ✓ Integrated hybrid voltage regulator provides +/-0.5% regulation
- ✓ Built-in alternator thermal overload protection
- ✓ Encapsulated to protect against dust and dirt with sealed connectors
- ✓ Simple programmable function for input and output configuration

Onboard Diagnostics

- ✓ Immediate visibility for up to 1,000 events including warnings and faults
- ✓ Intuitive descriptions of ECM fault codes

Onboard Paralleling

- ✓ Parallel up to eight generator sets
- ✓ Automatic synchronizer with random first-on logic built into controller ensures the first available generator is used to power loads while remaining generators synchronize to the bus
- ✓ Integrated protective relays guard power system from potentially harmful operating scenarios
- ✓ Isochronous load sharing ensures that work is distributed evenly across the power system, reducing stress on individual generator sets
- ✓ Configurable load management of up to six loads allows you to shed lower-priority loads if needed to ensure critical loads are always powered
- ✓ Built-in generator management extends maintenance intervals, conserves fuel, and ensures system longevity



Insight

Controllers and *generator paralleling*

While it may be common for a facility to install a single large generator to meet its power needs, paralleling two or more generators offers a number of practical benefits and advantages over a single-generator system.

Redundancy

The redundancy provided by the paralleling of two or more generators delivers greater reliability and flexibility than a single generator can provide. In critical applications, having more than one generator connected to the bus at all times ensures continuous generator power in the unlikely event that a generator fails.

Efficiency

Instead of one large generator that might operate at an inefficiently low kW, several small generators can be paralleled and turned on and off as necessary to efficiently support the varying demands of the load.

Value

In some cases, multiple small generators may cost less than one large generator.

Power Requirements

If the largest available generator is too small to meet the power requirements, two or more generators can be paralleled to provide the necessary power.

Space Constraints

If space is limited and a large generator will not fit, multiple smaller generators can be utilized.

Future Growth

A paralleled system can be designed to add additional generators as your facility's load requirements expand.



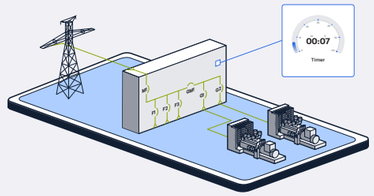
Generator *paralleling*

How it works

Let's look at a typical response to loss of utility power. When a loss of utility power occurs, almost every system responds with the basic sequence shown here.

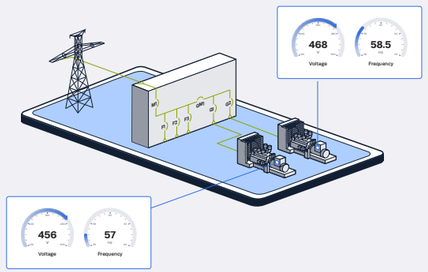
Emergency Start Delay

A timer starts when there is a loss of utility. If utility returns before the timer expires, the system does not start. If the utility outage is long enough for the timer to expire, the system will commit to transferring to generator power.



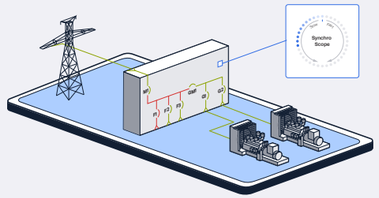
Start / Start-Up Load Shed

All available generators start. If the system is designed to supply power to loads as soon as one generator is online (typical for systems serving critical and life-safety loads), low-priority loads are shed or are inhibited from transferring. This prevents the first-on generator from being overloaded.



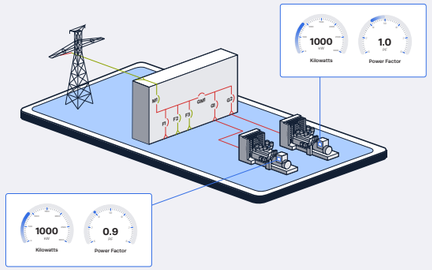
Synchronization

The incoming generator's voltage, frequency and phase are matched to the running bus. When matched, the generator paralleling breaker closes.



Second Generator Breaker Closes / Load Sharing

Additional generator power is available to the load. The system's load-sharing controls actively control the kW and kVAr output of each generator in order to proportionally share the load (maintain the same percent load on each generator) and maintain rated frequency and voltage.



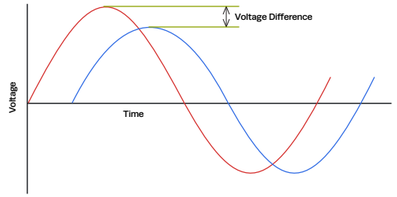
Synchronization

Let's take a detailed look at the synchronization process. The automatic synchronizer matches the incoming generator's output (waveform) to the running bus. When the voltage, frequency, and phase are all matched, the synchronizer will close the incoming generator's breaker.

Voltage Match

The synchronizer adjusts the incoming generator's voltage to match the running bus.

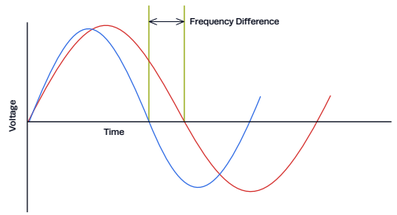




Frequency Match

The synchronizer adjusts the incoming generator's speed to match the frequency of the running bus.

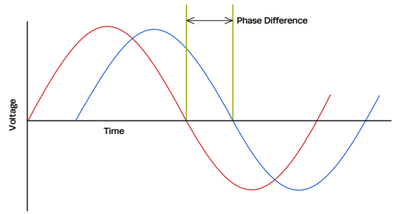




Phase Match

The synchronizer adjusts the incoming generator's speed to match the phase of the running bus. When matched, the two sine waves will be the same.







Rehlko *ATS controllers*

Never miss a beat

The automatic transfer switch (ATS) controller tells the switch what to do and when, dictating the logic that determines the reaction. The ATS controller communicates with the generator set controller to maintain electrical power continuity, managing the power sensing, timing functions, and fault monitoring needed for automatic operation.

Standard Features

Phases
Operate in single- or three-phase applications

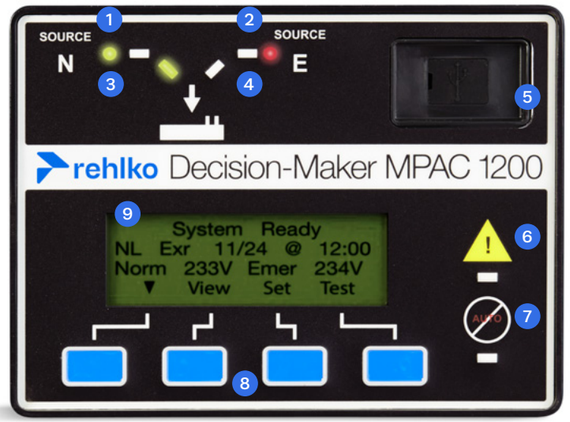
Voltage Settings
Programmable normal source voltage pickup and dropout

AC Frequencies
50 Hz- and 60 Hz-compatible

Load Transfer
In-phase monitor capability

Communications
RS-485 port

MPAC 1200



1. Source N available
2. Source E position
3. Source N position
4. Source E available
5. USB port location
6. System alert
7. Not in auto
8. Exercise button
9. Test button

A customizable solution for your specific application, the MPAC 1200 gives you full control of system behavior including extended I/O customized to your needs.

Application	Automatic Transfer Switch
Amperage	Up to 4000 A
Voltage range	115–600 V
RS-485 port	Standard
Ethernet port	Optional

Standard Features

- ✓ Adjustable voltage and frequency settings so you can fine-tune the system behavior to your specific site requirements
- ✓ 21-event generator exercise capable to conduct system checks to ensure your power system is in prime condition to handle any event
- ✓ Two programmable inputs and outputs allow for system customization, with the ability to expand capabilities with additional inputs and outputs
- ✓ Transfer commit allows you to decide whether to continue with the transfer in the event that the utility power returns before the transfer-to-generator is complete
- ✓ Time-based load control available so you can ensure all critical loads are powered at the time of load transfer and control the load steps on your generator

MPAC 1500



1. Source N available
2. Source E position
3. Source N position
4. Source E available
5. USB port location
6. System alert
7. Not in auto
8. Push buttons
9. Display

When you need to manage your loads, use your system as a prime power application, or have a backup for your backup (i.e., a three-source system), this controller gets the job done.

Application	Automatic Transfer Switch
Amperage	Up to 4000 A
Voltage range	115–600 V
RS-485 port	Standard
Ethernet port	Optional

Standard Features

- ✓ Adjustable voltage and frequency settings so you can fine-tune the system behavior to your specific site requirements
- ✓ 21-event generator exercise capable to conduct system checks to ensure your power system is in prime condition to handle any event
- ✓ Two programmable inputs and outputs allow for system customization, with the ability to expand capabilities with additional inputs and outputs
- ✓ Transfer commit allows you to decide whether to continue with the transfer in the event that the utility power returns before the transfer-to-generator is complete
- ✓ Time-based load control available so you can ensure all critical loads are powered at the time of load transfer and control the load steps on your generator
- ✓ Current-based load control so you can ensure all critical loads are powered at all times

Rehlko ATS Controller Comparison





DECISION-MAKER®	MPAC 1200	MPAC 1500
Amperage	Up to 4000 A	Up to 4000 A
Phases	Single/Three	Single/Three
Poles	2, 3, 4	2, 3, 4
Voltage range	115–600 V	115–600 V
Product Type		
Standard open transition	Yes	Yes
Standard delayed transition	Yes	Yes
Standard closed transition	Yes	Yes
Bypass-isolation open transition		Yes
Bypass-isolation delayed transition		Yes
Bypass-isolation closed transition		Yes
Service entrance		Yes
Withstand and Close-On Ratings (WCR)		
WCR:Specific breaker	10–200kA	Not Available
WCR:Any breaker	10–100 kA	
WCR:Current-limiting fuses	35–200 kA	
Short-time withstand rating	7.5–85 kA	
User Interface		
LED:Contactor position / source available	Standard	Standard
LED:Service required (fault indication)	Standard	Standard
LED:Not in automatic mode	Standard	Standard
Display	LCD	LCD
Programming	USB, Display	USB, Display
Voltage and Frequency Settings		
Pickup/Dropout normal source voltage	Programmable	Programmable
Pickup/Dropout emergency source voltage	Programmable	Programmable
Frequency selection	50/60 Hz	50/60 Hz
Pickup/Dropout normal source frequency		Programmable
Pickup/Dropout emergency source frequency	Programmable	Programmable
Overvoltage trip	Programmable	Programmable
Overfrequency trip	Programmable	Programmable
Normal and emergency voltage unbalance	Standard	Standard
In-phase monitor	Standard	Standard
Transfer commit	Standard	Standard
Phase rotation sensing	Standard	Standard







DECISION-MAKER®	MPAC 1200	MPAC 1500
Time Delays and Configuration Settings		
Transfer to emergency / Transfer to normal	Programmable	Programmable
Engine cooldown	Programmable	Programmable
Generator exerciser	21 exercise events	21 exercise events
Remote peak shave	Standard	Standard
Start-time delay	Programmable (emergency only)	Programmable
Fail to acquire	Programmable (emergency only)	Programmable
Communications		
RS-485	Standard	Standard
Ethernet	Optional	Standard
Accessories		
Programmable engine exerciser	Standard	Standard
Extended I/O	Optional (Up to 4 modules)	Optional (Up to 4 modules)
Source priority selector	Optional	Optional
Extended engine start-time delay	Optional	Optional
Load shed	Optional	Optional
Load control	Time-based	Time- or current-based
Three-source system		Standard



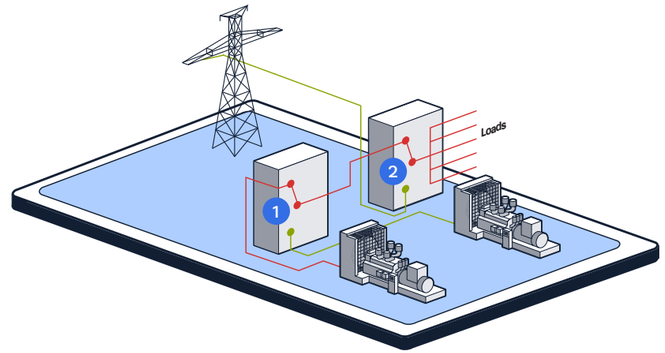
Insight

ATS controllers: key features

Manual vs. Automatic Transfer Switches

As their names imply, manual and automatic transfer switches differ based on how the transfer from utility to generator power is performed. During a power outage, a manual transfer switch requires a person to physically transfer power to the generator. This can potentially take up to several minutes to complete. And the process is performed in reverse when utility power is restored.

With an automatic transfer switch (ATS), the transition from utility to generator power happens automatically. In order to perform the transfer, ATS controllers monitor a range of parameters, including voltage, frequency, and phase rotation, for both the normal and emergency power sources. An ATS senses and seamlessly transitions back to utility power when it is restored.



Three-Source System

A three-source system, available only on the MPAC 1500 model, offers redundancy without the complexity or cost of a paralleling system. The system is based on two generators and two automatic transfer switches.

1. The first ATS determines which generator is powering the load

2. The second ATS determines if the load is powered by utility or generator

In-Phase Monitor

When large motors or transformers are disconnected from a power source, residual voltage is maintained due to the generator effect created by a rotating motor or by the stored energy released from a transformer's windings or core.

This residual voltage can cause extremely high inrush currents to occur when such loads are suddenly reconnected to a second (i.e., standby generator) nonsynchronized source of power. The resulting effect, frequently described as "bumping," can initiate nuisance tripping of circuit protective devices, or in extreme cases, it can cause mechanical damage to the load equipment.

The in-phase monitor inhibits load transfer until the two power sources are synchronized. The monitor is adjusted to signal the transfer switch to operate when the incoming power source is within an acceptable range of electrical degrees of the newly connected power source. Ensuring that the transfer is made at or near synchronism avoids the creation of damaging transients when transferring loads between unsynchronized sources of power.

Paralleling switchgear *controllers*

System control at your fingertips

The touch-screen operator interface both monitors and controls the system and is customized to your project. It is specifically designed to be user-friendly, eliminate guesswork, and provide comprehensive information on system performance. The operator can navigate the system simply and intuitively without reading a manual.

Rehlko® paralleling switchgear controllers deploy fault-tolerant programming to make sure the system can respond to a fault and seek a source of power for the load if there is a component failure in the system. This programming also allows for a transition from manual mode to automatic mode regardless of the state of the system. Each action and reaction of the system is described with a sequence of operations that is clearly defined on the user interface and embedded into the controls programming.

Controls architecture redundancy is a delicate balance between risk, cost and complexity. With a Rehlko paralleling switchgear system, you choose the level of redundancy you are comfortable with that works with your budget. Whether it's manual backup or a redundant automation system, Rehlko has a solution that's right for you.

Manual Backup

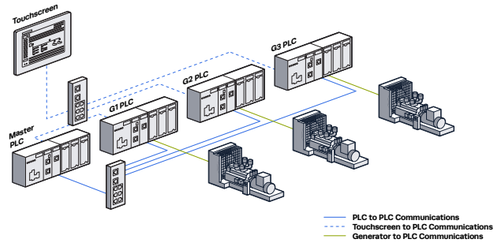
Standard
As a standard, every Rehlko system is designed to be fully functional in the unlikely event of a touch-screen failure. If the touch-screen fails, the operator, using hardwired switches, can start the generators and place them online.

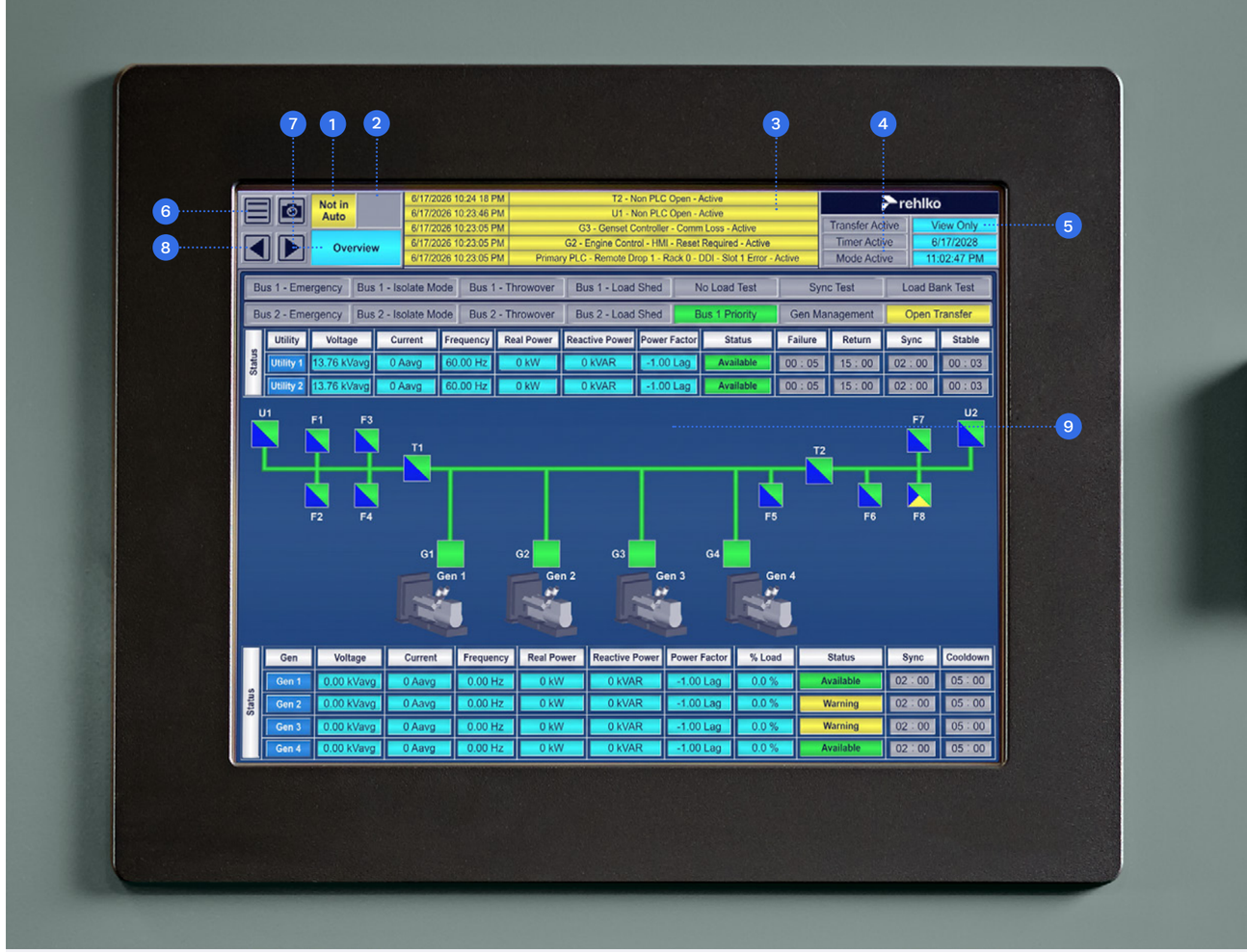
Option 1
This option contains all the features of the standard system and provides the ability to synchronize and parallel (load share) generators if the touchscreen and/or the PLC fail.

Option 2
This option contains all the features of option 1 and provides the ability to manually synchronize generators using hardwired speed and voltage adjustment switches and to synchronize and parallel (load share) generators if the touchscreen and/or the PLC fail.

Redundant Automation Systems

Standard Automation Systems
The standard architecture consists of a master PLC (Programmable Logic Controller) for overall system control (load add/shed, generator management, and control of main, tie, or feeder breakers) and a dedicated PLC for each generator, along with a dedicated communication link between each generator PLC and its associated generator. The system consists of two separate communication networks. One for PLC to PLC communication and one for Touchscreen to PLC communications.





1. **Not in auto indication**
Flashes if any control switch is not in auto mode. Touch to see all switches/ controls that are not in auto.

2. **Alarm or warning indication**
Flashes to indicate an unacknowledged alarm or warning. Touch to go to the alarm list.

3. **Active alarm and warning**
Displays the five most recent items on the alarm list.

4. **System status indication**
Annunciator lights up to indicate if any transfer is active, timer is active or any mode is active.

5. **Login indication**
Shows current login information, date and time.

6. **Main menu**
Touch to select submenu.

7. **Current screen**
Displays current screen name. Use push button to capture screenshot of current screen.

8. **Navigation buttons**
Touch to go forward or backward though screens.

9. **Display area**
Shows screens.

Optional *accessories*

Maximize your investment

Remote Serial Annunciator III (RSA III)

Designed for accurate, reliable performance, the Rehlko Remote Serial Annunciator (RSA III) connects to the transfer switch and generator controllers, monitoring and displaying their condition from a strategically convenient location.

RSA III Features and Benefits

- ✓ Monitors up to four automatic transfer switches
- ✓ (Standard) RS-485 Serial Modbus RTU communication
  (Optional) Ethernet Modbus TCP/IP communication
- ✓ Five user-defined inputs
- ✓ Can be located at multiple locations
- ✓ Remote starts and stops of automatic transfer switch tests

RSA III



RSA III with a Single ATS Control



RSA III with four ATS Controls





Other Generator Accessories

- ✓ Monitor III Communications Program
- ✓ Analog & Digital I/O Modules
- ✓ Programmable Standard I/O Module
- ✓ Programmable High-Voltage/Current I/O
- ✓ Programmable Alarm Module
- ✓ External Battery Supply Module (EBSM)
- ✓ RSA III Annunciator
- ✓ Modbus/Ethernet Converter
- ✓ Powerscan Wireless Monitor
- ✓ Run Relay
- ✓ Shunt Trip Relay
- ✓ Common Failure Relay
- ✓ Manual Speed Adjust
- ✓ Keyswitch with Manual Start/Stop Button
- ✓ Prime Power Switch
- ✓ Prealarm Kit for NFPA 110
- ✓ Remote Emergency Stop

Other ATS Accessories

- ✓ Anticondensation Heater
- ✓ Controller Disconnect Switch
- ✓ Current-Sensing Kit
- ✓ Digital Meter Kit
- ✓ Generator Connection Box
- ✓ Line-to-Neutral Voltage Monitor
- ✓ Load-Shed Module
- ✓ Monitor III Communications Program
- ✓ RSA Annunciator
- ✓ Supervised Three-Position Transfer Switch
- ✓ Surge Protective Devices (SPD)
- ✓ User Interface Cover

After-market parts & *services*

You can count on Rehlko to support your products

- Global distribution network
- 24/7/365 service and support
- Parts availability globally
- Global service training centers
- Maintenance and warranty coverage
- Extensive parts inventory is available through our spare parts logistic centers, service centers and global network of distributors to be delivered quickly to any location
- Preventative maintenance kits provide all the parts required to complete scheduled maintenance events extending the service life and protecting your generator
- Parts are available to support your generator through its lifecycle

100+
Years of Industry Expertise



220+
Partners

13,000+
Trained Since 2013



4
Customer Experience Centers

"As businesses increasingly rely on resilient power,

Rehlko continues to innovate and invest in best-in class products with enhanced performance capabilities, delivering clean energy solutions to support businesses and communities worldwide.

Together with our team of dedicated associates, we are committed to providing the expertise and support needed to keep businesses powered and running smoothly, while contributing to a more sustainable future."

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For more information, contact your Rehlko source of supply.
Or call toll-free in the U.S. and Canada 800-544-2444

powersystems.rehlko.com

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