Conext™ Automatic Generator Start

Owner's Guide

Conext AGS

- Power
- Generator On
- Network
- Event

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Conext™ Automatic Generator Start

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Document Number: 975-0307-01-01   **Revision:** Rev F   **Date:** March 2014

Product Part Number: 865-1060-01

Contact Information

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Information About Your System

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number   _____

Product Number   _____

Purchased From   _____

Purchase Date   _____

About This Guide

Purpose

The purpose of this Guide is to provide explanations and procedures for installing, operating, maintaining, and troubleshooting the Schneider Electric Conext™ Automatic Generator Start (AGS).

Scope

The Guide provides safety guidelines, detailed planning and setup information, procedures for installing the AGS, as well as information about configuring, operating and troubleshooting the unit. This guide does not provide information about choosing a generator or operating a generator.

Audience

The Guide is intended for anyone who needs to install and/or operate the AGS. Installers should be certified technicians or electricians.

Organization

This Guide is organized into five chapters and three appendixes.

Chapter 1, "Introduction" describes the features and functions of the Conext Automatic Generator Start.

Chapter 2, "Installation" contains information and procedures to install the Conext Automatic Generator Start.

Chapter 3, "Configuration" contains information and procedures for configuring the Conext Automatic Generator Start.

Chapter 4, "Operation" describes the operation of the AGS and how to get the most from its features.

Chapter 5, "Troubleshooting" contains information and procedures to troubleshoot the Conext Automatic Generator Start.

Appendix A, "Specifications", contains the electrical, mechanical, and environmental specifications for the Conext Automatic Generator Start.

Appendix B, "Generator Auto Start Requirements and Types", provides general information about generators that will work with the Conext Automatic Generator Start.

Appendix C, "Relay Timing" contains information about relay configuration and timing for each basic type of starting mode for the Conext Automatic Generator Start.

Conventions Used

The following conventions are used in this guide.

⚠ DANGER
DANGER indicates a hazardous situation which if not avoided will result in death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
CAUTION indicates a hazardous condition which, if not avoided, could result in minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Related Information

For more information about related components, refer to:

Conext XW+ Inverter/Charger Owner's Guide NA (975-0240-01-01)

Conext XW+ Inverter/Charger Owner's Guide E (975-0385-01-02)

Conext SW Inverter/Charger 120/240V Split-Phase Owner's Guide (975-0638-01-01)

Conext SW Inverter/Charger 230V Owner's Guide (975-0636-01-01)

Conext MPPT 60 150 Solar Charge Controller Owner's Guide (975-0400- 01-01)

Conext MPPT 80 600 Solar Charge Controller Owner's Guide (975-0560-01-01)

Conext System Control Panel Owner's Guide (975-0298-01-01)

Conext ComBox Owner's Guide (975-0679-01-01)

Conext Battery Monitor Owner's Guide (975-0691-01-01)

You can find more information about Schneider Electric as well as its products and services at **www.SESolar.com.**

Important Safety Instructions

⚠ WARNING
SAVE THESE INSTRUCTIONS
This Guide contains important safety instructions that must be followed during the installation and maintenance of the AGS. Make sure you read, understand, and save these safety instructions.
Failure to follow these instructions can result in death or serious injury.

⚠ WARNING
SAFETY HAZARD
Disable the AGS if the generator is in an enclosed building or area where the generator exhaust is not vented to the outside.
Failure to follow these instructions can result in death or serious injury.

⚠ WARNING
LIMITATIONS ON USE
Do not use the AGS in connection with life support systems or other medical equipment or devices.
Failure to follow these instructions can result in death or serious injury.

Explosive Gas Precautions

⚠ WARNING
EXPLOSION HAZARD This equipment is not ignition protected. To prevent fire or explosion, do not install the unit in compartments containing flammable materials or in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system **Failure to follow these instructions can result in death or serious injury.**

General Precautions

1. Before installing and using the AGS, read all appropriate sections of this guide.

2. If the AGS is inoperative, see your warranty.

3. Do not dismantle the AGS it contains no user serviceable parts. See your warranty for instructions on obtaining service.

4. Protect the AGS from rain, snow, spray, and water.

5. Disable the generator's starting circuit by disconnecting the starter battery, spark plug, et cetera, before wiring this device.

6. To reduce the risk of electrical shock, put the AGS into Standby before working on any circuits connected to it. See "Placing the AGS in Standby Mode" on page 4–6.

7. Disable the automatic starting circuit and/or disconnect the generator from its starting battery to prevent accidental starting while performing maintenance.

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FCC Information to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Contents

Important Safety Instructions

3 Configuration

4 Operation

1

Introduction

Chapter 1, "Introduction" describes the features and functions of the Conext Automatic Generator Start.

It includes:

- Overview
- System Requirements
- Features
- Indicator Lights and Connectors

Overview

The Conext Automatic Generator Start (AGS) is designed for use in a Conext system of off-grid solar and backup power equipment.

The AGS requires the use of a Conext System Control Panel (SCP) or Conext ComBox for configuration and monitoring.

While both the SCP and ComBox provide status information and configuration capabilities, the ComBox provides additional access to configuration settings through a web interface. For more information, see the *Conext ComBox Owner's Guide* (975-0679-01-01).

Function

The AGS can continuously access information on battery voltage and State of Charge (SOC) on the Xanbus network, and start or stop the generator when the voltage or SOC drops or exceeds the preset limits. The AGS also starts the generator to assist inverter/chargers when output power demands are high.

To support a single generator, one AGS is needed per Conext system. If there are multiple battery banks, the AGS can automatically start and stop the generator based on voltage and SOC messages sent by the primary inverter/charger connected to each battery bank.

In large off-grid systems with more than one generator, multiple AGS units can be installed. A Conext Battery Monitor is required for multiple battery bank systems and for monitoring SOC.

For more information on managing multiple battery banks and generators, visit **www.SESolar.com**.
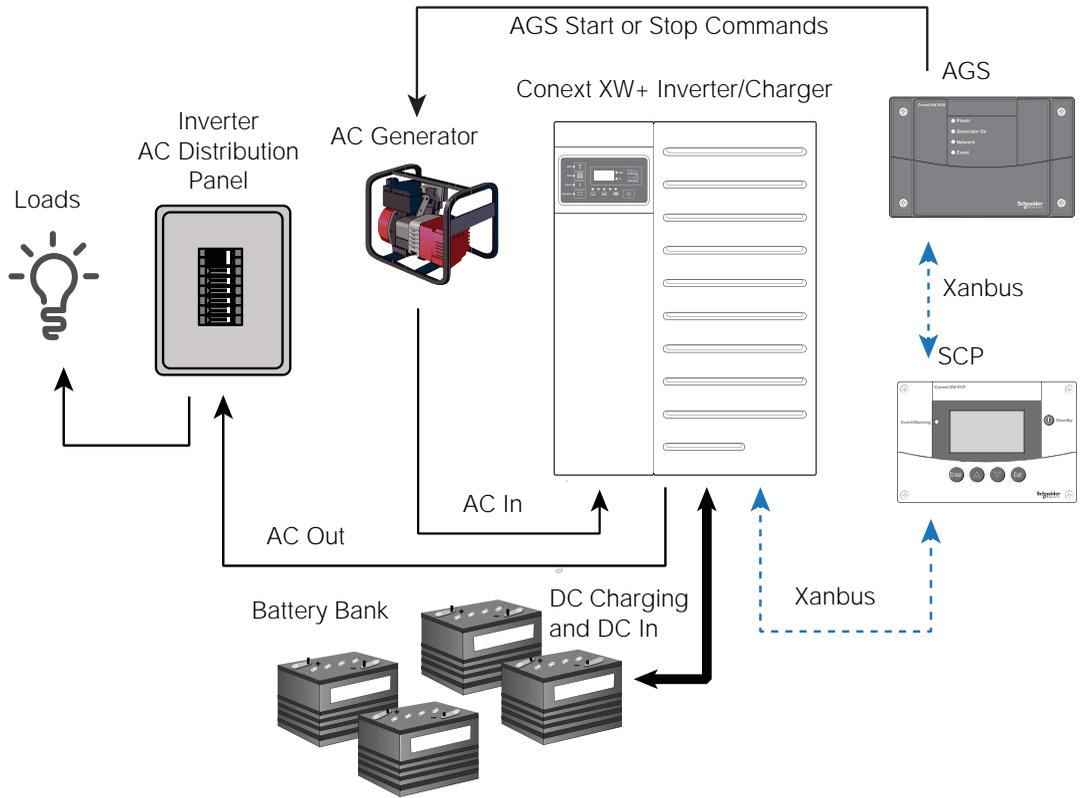
Figure 1-1 Conext AGS Basic Functions

Start and Stop Triggers

The AGS requires a source of start and stop triggers for automatic operation. The AGS monitors the Xanbus network and starts or stops the generator based on the preset triggers which have been programmed into it.

Specific criteria that will trigger the AGS are described in "Features" on page 1–5.

System Requirements

Minimum Conext system components include:

p   Conext XW+ or Conext SW inverter/chargers

p   AC generator or DC generator

p   Conext SCP or Conext ComBox for configuration and monitoring

p   Conext AGS for automatic generator start and stop

p   24 or 48 VDC battery bank

Optional components include:

p   Conext MPPT 80 600 and MPPT 60 150 Solar Charge Controllers

p   Conext Battery Monitor (required for multiple battery bank systems and for monitoring SOC)

Network Communication Protocol
The AGS uses the Xanbus network to communicate settings and activity to other Xanbus-enabled devices. All network components used in the system must be Xanbus-enabled.

Network Power Supply
The AGS requires 3 watts of power (maximum) to operate. This power supply is provided by the Conext XW+ inverter/charger through the Xanbus network.

Generator
Ideally the generator should be 2-wire or 3-wire generator with Auto Start capability. However, older generators with additional wiring requirements can also be used if connected to the wiring harness correctly.

The Generator Run signal (also called the Hour Meter Signal or Switched B+ signal) which detects whether the generator is running, is optional and only used for redundancy. The AGS requests generator voltage checks from the Conext XW+ inverter/charger in addition to checking the Generator Run signal to detect if the generator is running.

Generator Compatibility
The AGS supports most two and three-wire generator starters. Some manufacturers include, but are not limited to, Onan (Quiet Diesel, gasoline, and LP), Power Tech, Generac, Northern Lights, Fisher Panda, Westerbeke, Kohler, Honda, and Yamaha. Check with the generator manufacturer to ensure the generator in question includes automatic starting capabilities.

Conext SCP	A SCP or Conext ComBox is required to configure the AGS and monitor generator starting and stopping activity.
	The SCP also provides real-time clock information for the AGS Quiet Time and Exercise Time features.
Conext ComBox	In place of the SCP, the Conext ComBox can be used to configure and monitor the AGS and other Xanbus-enabled devices through a web interface on a PC or laptop. For more information, see the *Conext ComBox Owner's Guide* (Part Number 975-0679-01-01).
Conext Battery Monitor	In systems with multiple battery banks, the Conext Battery Monitor is required for monitoring battery capacity, voltage, and SOC. The battery Monitor is also required to monitor SOC on one battery bank.
	For more information, see the *Conext Battery Monitor Owner's Guide* (Part Number 975-0691-01-01).

Features

Generator Starting Triggers	The AGS can automatically start a generator in response to:

- Low battery voltage
- Low battery SOC
- High battery drain due to large AC loads
- Contact closure or thermostat signal
- Pre-programmed exercise period at a specified time of day.

Generator Stopping Triggers	The AGS can automatically stop a generator in response to:

- Introduction of qualified grid power (grid power within acceptable parameters)
- High battery voltage
- Battery charge stage (float or absorb stage)
- High battery SOC
- Removal of a high battery drain from the AC loads
- Thermostat signal
- Pre-programmed quiet time period.

The AGS can also be used to manually start and stop the generator at any time.

Programmable Features	**Quiet Time** The AGS features a quiet time setting, which prevents the generator starting at night or during other inconvenient periods.
	Exercise Period During times of prolonged generator inactivity, the AGS can be programmed to run (or exercise) the generator for a pre-defined period. The exercise period ensures the generator remains operational and that the starting battery stays charged.
Status Reporting	The AGS reports its operating mode, settings, generator activity, and reason for generator starts to the Conext system. This information can be viewed on the SCP or ComBox.
Installation Options	The AGS can be installed with an external shutdown input, a manual generator ON/OFF switch, and an external ON/OFF indicator light.

Indicator Lights and Connectors

Front Panel

Indicator Lights   Four lights on the front panel indicate the operating status and network status of the AGS.
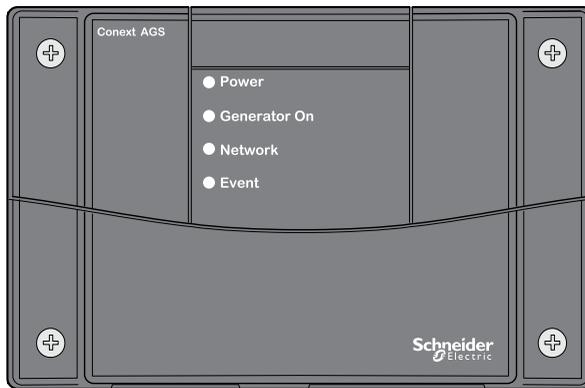
Figure 1-2 AGS Front Panel

Table 1-1 Front panel features

LED	Description
Power	Power light (green) indicates the AGS is receiving network power.
Generator On	Generator On light (green) indicates the generator is running. This light turns on when the generator run signal is active. See "Important" on page 2–29.
Network	Network light (green) indicates the AGS is communicating with other Xanbus-enabled devices.
Fault	Fault light (red) indicates an AGS fault has occurred. See "Troubleshooting" on page 5–1 for information about AGS faults.

Bottom Panel

Connectors   Two network ports on the bottom panel connect the AGS to the Xanbus network. A 20-contact pluggable connector (also on the bottom panel) allows the AGS to connect to the generator's starting circuitry, thermostats and external switches.

Xanbus Network Ports   20-contact Generator
Connector Port
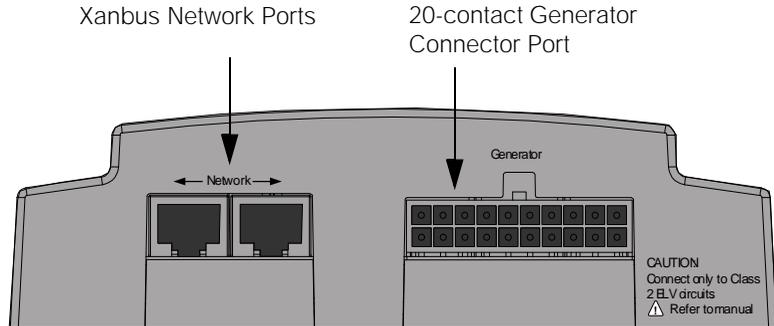
Figure 1-3 AGS Bottom Panel

Network Port

Each network port can accept an eight-pin RJ-45 plug attached to a Category 5 (CAT 5) Xanbus network cable. Depending on the installation, both ports may be required.

NOTICE

EQUIPMENT DAMAGE

Connect the AGS only to other Xanbus compatible devices.

Although the cabling and connectors used in this network system are the same as those used for Ethernet, this network is not an Ethernet system.

Failure to follow these instructions may result in equipment damage.

20-contact Connector

The 20-contact connector supports a wiring harness (included) that connects the AGS to a generator and thermostats. The wiring harness also provides lines for connecting external generator shutdown sensors or switches and external generator ON/OFF controls.
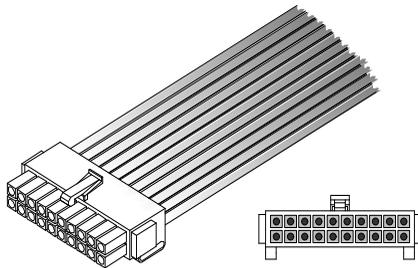
Figure 1-4 Wiring Harness

2 Installation

Chapter 2, "Installation" contains information and procedures to install the Conext Automatic Generator Start.

- Tools and Materials Required
- Choosing a Location
- Routing the Connections
- Mounting the Unit
- Wiring tot he 20-Contact Connector
- Connecting the Generator
- Connecting the Thermostats
- Connecting an External Shutdown
- Connecting the Wiring Harness to the AGS
- Connecting the AGS to the Xanbus Network
- Verifying Power is Available

Preparing an Installation

Before installing the Conext Automatic Generator Start (AGS), consider how and where the unit will be mounted. Pre-plan the connection routes between the AGS, the generator, thermostats, and the Conext System Control Panel (SCP).

Tools and Materials Required

The following tools and materials may be needed to install the AGS:

p   Mounting template (supplied)

p   Wiring harness (manufacturer part number 809-0917, supplied)

p   Four #6 self-tapping screws, 1¼ inch (supplied), or M3, 30 mm (supplied)

p   #16 or #18 AWG wire (1.5 mm^2 or 1.0 mm^2) (see "Wire Size and Length" on page 2–7)

p   Xanbus network cables

p   Network terminator

p   Phillips screwdriver

p   Drywall anchors if mounting on drywall

p   Wire cutters and wire strippers

p   5A inline fuse holders (1 to 3 pieces as required)

Choosing a Location

The AGS should be installed in a location that meets the following requirements:

Dry	The unit is intended for use in a dry location. The AGS complies with UL458 Marine Supplement drip-test requirements, but the location should be as dry as possible.
Cool	The AGS operation is guaranteed between -20 and 50°C (-4 and 122°F).

Safe	The AGS is not ignition protected. Do not install it in areas requiring ignition-protected equipment, such as compartments housing gasoline engines.
Close to generator	Avoid excessive wire lengths and use the recommended wire lengths and sizes (see "Wire Size and Length" on page 2–7). It is more important for the AGS to be close to the generator than close to the inverter, although for safety reasons, the AGS should not be installed in the same compartment as a gasoline-powered generator.

Installing the AGS with Multiple Generators

A single AGS is designed to connect to one generator. In large systems where there are multiple generators and battery banks, more than one AGS can be installed.

For more information on designing systems with multiple battery banks and generator redundancy, visit **www.SESolar.com**.

Routing the Connections

⚠ DANGER

EXPLOSION HAZARD

This equipment is not ignition protected. To prevent fire or explosion, do not install the AGS in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of a fuel system.

SHOCK AND ENERGY HAZARDS

Before making any connections to the generator, ensure that the generator's starter is disabled and the generator's start battery is disconnected.

Failure to follow these instructions will result in death or serious injury.

Connection Types

Because the AGS will be part of a Xanbus network, it is necessary to consider how to route two types of connections:

- Connections to the generator, thermostats, and other external devices and switches, using the 20-contact connector and wiring harness.
- Connections to other Xanbus-enabled devices, using network cables.
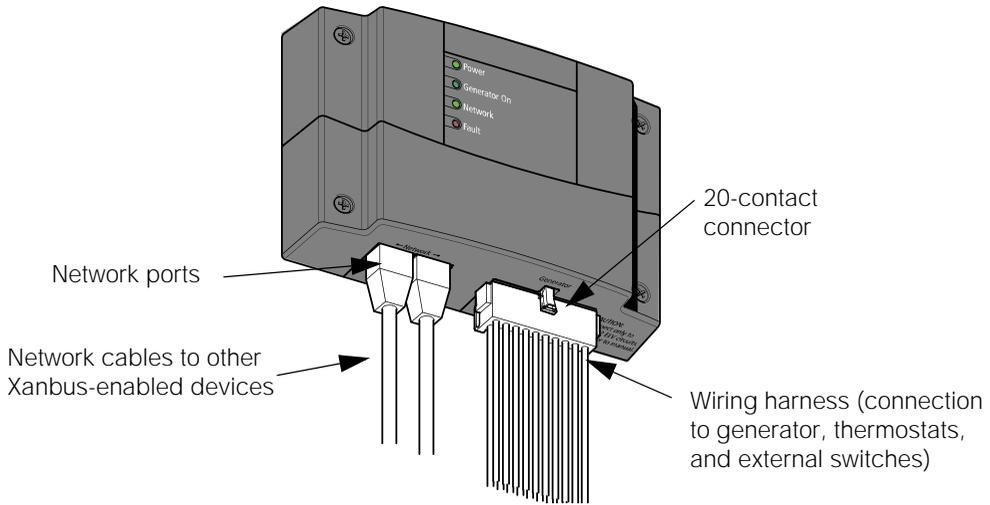
Figure 2-5 AGS External Connections

Installing the AGS

Installation Overview

Installing the AGS involves the following steps:

1. Mounting the unit.
2. Connecting the wiring harness to:
   - Generator (page 2–9)
   - Trigger contacts such as thermostats (optional) (page 2–26)
   - External shutdown switch (optional) (page 2–27)
   - External ON/OFF switch and LED (optional) (page 2–27)
3. Connecting the wiring harness to the 20-contact connector on the AGS.
4. Connecting the AGS to the SCP and other network-enabled devices (page 2–31).

Important: Because each installation varies according to the location, the type of generator, and the overall complexity of the Xanbus network, these instructions offer only general guidelines for the many installation options available.

⚠ WARNING

SHOCK HAZARD

Before installing the AGS as part of a pre-existing Xanbus system, put the system in Standby in order to disable the electrical operation of networked devices. See "Placing the AGS in Standby Mode" on page 4–6.

Failure to follow these instructions can result in death or serious injury.

Mounting the Unit

The AGS is to be mounted vertically on a wall with the connectors facing downwards.

To mount the AGS:

1. Hold the unit flush and square against the wall, panel, or horizontal surface.

    • If the mounting surface requires pre-drill holes for the screws, use the supplied mounting template to mark, then drill, four holes.

2. With a Phillips screwdriver and the supplied #6 screws, secure each corner of the AGS to the mounting surface.

Wiring to the 20-Contact Connector

⚠ WARNING

SHOCK HAZARD

All installation wiring should be performed by a qualified installer or electrician.

Failure to follow these instructions can result in death or serious injury.

⚠ **WARNING**
FIRE, SHOCK AND ENERGY HAZARDS The 20-contact connector is intended for connection to Class 2 ELV (Extra Low Voltage) circuits only. Do not exceed the circuit limitations specified in the following section. **Failure to follow these instructions can result in death or serious injury.**

ELV Circuits

ELV (Extra-Low Voltage) circuits have an open-circuit voltage of not more than 30 V_{rms} or 42.2 VDC or peak, and are therefore not a shock hazard.

Class 2 Circuits

As per the US National Electrical Code (NEC) and the Canadian Electrical Code (CEC), available power in Class 2 circuits is limited to 100 VA, usually by current limiting by means of overcurrent protection or series resistance. The current is limited to 5 A for circuits with open-circuit voltage of 20 V, and to $I=100/V_{oc}$ for circuits with open circuit voltage between 20 V and 30 V.

Circuit Limitations

The relay contacts in the AGS are rated at 5 A maximum and all circuits on the 20-contact connector are rated at 30 V maximum.

Ensure that all circuits connected to the 20-contact connector comply with the following limits:

Table 2-2 Circuit Limitations

Circuit Parameter	Circuit Maximum
Open circuit voltage (Voc)	30 V maximum
Overcurrent protection (fuse size for open circuit voltage up to 20 V)	5 A maximum
Overcurrent protection (fuse size for open circuit voltage from 20 V to 30 V)	5 A to 3.33 A ($100/V_{oc}$ amps maximum)

Wiring Harness

Connections to the generator, thermostats, and external ON/OFF switches are made using a wiring harness that plugs into the 20-contact connector (see Figure 2-5).

The wires on the wiring harness can be extended to meet installation requirements. When extending the wire harness, ensure that the extension wires are the same color as the wires on the harness.

To install the AGS using the wiring harness:

1. Connect each wire on the harness to its intended wire or contact on the generator, thermostats, or external switches. Tape, or otherwise secure, the unused wires to ensure they do not make unintended connections.
2. Plug the harness into the connector on the bottom panel of the AGS.

Wire Identification

Each wire on the harness is identified by a number and a color. The wire numbers are shown in Figure 2-6 and their colors and functions are described in Table 2-4.

Wire Size and Length

Required wire sizes for the external connections to the wiring harness are:

Table 2-3 Required Wiring Size Based on Length of Cable

0–30 ft. (9 m)	Over 30 ft. (9 m)
18 AWG (1.0 mm^2)	16 AWG (1.5 mm^2)

When planning the routing for external connections, ensure that wire lengths are sufficient to plug the wiring harness into the AGS once all the external connections are complete.
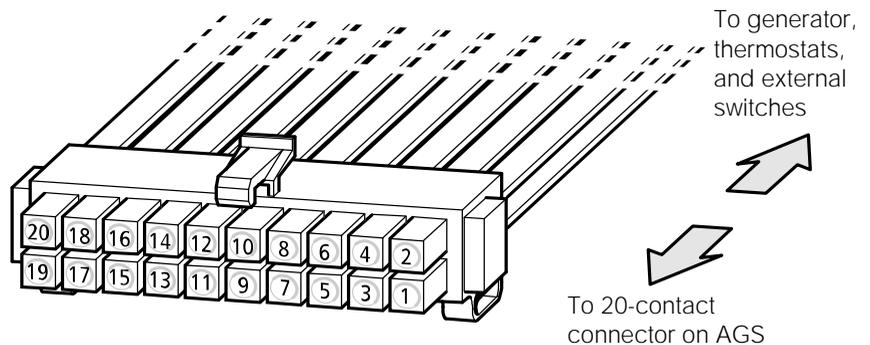
Figure 2-6 AGS Wiring Harness

Table 2-4 Contact Numbers and Functions

Wire Number	Function	Wiring Harness Wire Color
1	Thermostat 1 input	Yellow
2	Thermostat 1 return	Gray
3	Thermostat 2 input	Orange
4	Thermostat 2 return	Gray
5	External shutdown input	White/Black
6	External shutdown return	Gray
7	External manual on input	White/Green
8	External manual off input	White/Red
9	External ON/OFF LED Indicator output	White/Blue
10	Constant 12/24 V B+ (battery positive) for External ON/OFF/LED Indicator	Red
11	External ON/OFF/LED Indicator return (connected internally to wire number 13)	Black
12	Generator run signal (switched B+) sense input	Violet
13	Generator run signal (switched B+) sense return	Black
14	Relay 1 (Generator run/stop) Normally open contact	Blue
15	Relay 1 (Generator run/stop) Normally closed contact	White/Violet
16	Relay 1 (Generator run/stop) Common contact	Gray
17	Relay 2 (Generator start) Normally open contact	White
18	Relay 2 (Generator start) Common contact	Gray
19	Relay 3 (Preheat/cooldown) Normally open contact	Brown
20	Relay 3 (Preheat/cooldown) Common contact	Gray

Connecting the Generator

NOTICE
EQUIPMENT DAMAGE Before connecting the AGS to your generator, read the Generator Type descriptions in this section and consult your generator manufacturer to ensure that Gen Type settings and connections are compatible with your generator. Damage to the generator can result from selecting an incorrect Gen Type and following the connection diagram for an incorrect Gen Type when connecting the AGS to the generator. **Failure to follow these instructions can result in equipment damage.**

To connect the AGS to a generator, identify the start wiring configuration of the generator to be used. Generators must be auto-start capable, and generators equipped with remote operation connections are ideal.

If the generator is equipped for remote operation, examine the wiring of the remote cable and connector (or read the generator's documentation, if available) and identify the following wires:

- Ground
- Start
- Stop
- Generator run signal, also known as the Hour Meter or Switched B+ (battery positive)

Wiring Requirements

Either #16 or #18 AWG ($1.5mm^2$ or $1.0\ mm^2$) wire is required to connect to the wiring harness. How many of these wires you connect and in which combination depends on your generator type.

Generator Types

The AGS has 14 preset generator configurations, or "Gen Types" (see "Gen Type" on page 3–12). After installing the hardware, it will be necessary to select one of these Gen Types from the AGS Configuration Menu on the SCP.

Important: To change the Gen Type, the AGS must first be put in Standby. See "Placing the AGS in Standby Mode" on page 4–6.

The following section describes the preset generator configurations and provides diagrams for connecting the wiring harness to the generator's start wiring.

For an explanation of the terminology used in the following section, refer to Appendix B, "Generator Auto Start Requirements and Types". For more information about AGS internal relay activity and timing, see Appendix C, "Relay Timing".

B+ Generator Run Signal

Important: Connecting the B+ Gen Run signal is optional. If the B+ is not connected, it may be necessary to adjust the Gen Run Signal hold time parameter on the AGS. See "Gen Run Hold Time" on page 3–30.

Type 1

Type 1 is a three-wire GlowStop configuration recommended for "three-wire" generators with glow plugs that need to be operated before a start is attempted.

Type 1

Harness Wires

Generator Wires – User Supplied Wiring and Interconnections

12 — GENERATOR RUN SIGNAL
13 — GENERATOR RUN SIGNAL RETURN
14 — 5A fuse — PREHEAT
Relay 1
16
17 — 5A fuse — START
Relay 2
18

For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-7 Type 1 Connection Diagram

Table 2-5 Type 1 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	GlowStop
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	20 s
Preheat to crank delay	1 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 2

Type 2 is a three-wire GlowStop configuration recommended for "three-wire" generators that don't require a dedicated preheat signal. In this configuration, the start signal is applied for longer because the generator does its own preheat and cranking while the start signal is applied.

Type 2

ess Wires   Generator Wires – User Supplied Wiring and Interconnections

```
12 ─────────────── GENERATOR RUN SIGNAL
13 ─────────────── GENERATOR RUN SIGNAL RETURN
14 ──[ 5A fuse ]── RUN
Relay 1
16
17 ──[ 5A fuse ]── START
Relay 2
18
```
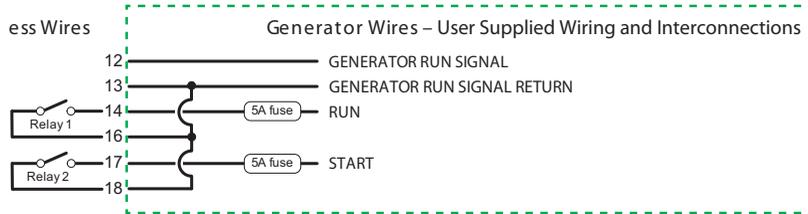
For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-8 Type 2 Connection Diagram

Table 2-6 Type 2 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	GlowStop
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	30 s
Crank retry time	40 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 3

Type 3 is a three-wire GlowStop with shutdown bypass configuration. The configuration shown in Figure 2-9 uses a shutdown bypass output to temporarily disable the generator's low oil pressure shutdown functionality during cranking. Generators with this functionality often have a manual means of disabling it during cranking.

For additional information, see "Circuit Limitations" on page 2–6.
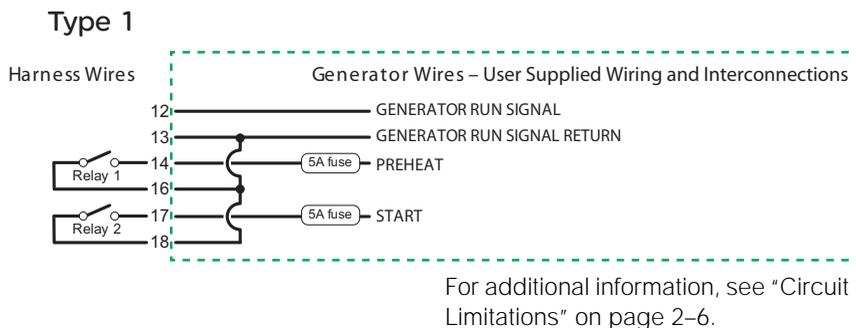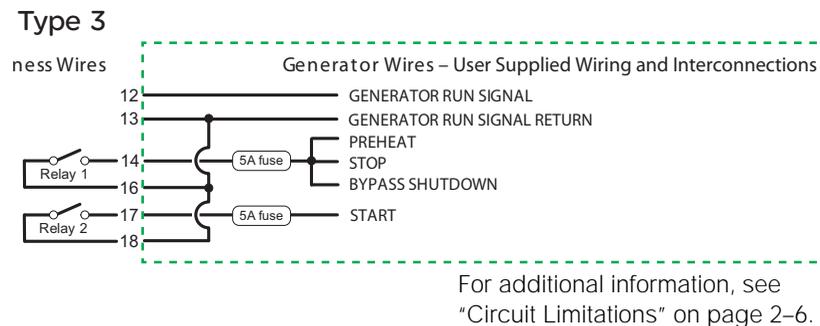
Figure 2-9 Type 3 Connection Diagram

Table 2-7 Type 3 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	GlowStop/Shutdown bypass
Relay 3 mode	Preheat/Shutdown bypass
Gen Run signal hold time	0.5 s
Preheat time	20 s
Preheat to crank delay	0 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	10 s
Start tries	3

Type 4

Type 4 is a three-wire StartStop configuration that uses relay 3 to provide a 60-second preheat signal.

Figure 2-10 Type 4 Connection Diagram

Table 2-8 Type 4 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	StartStop
Relay 3 mode	Preheat
Gen Run signal hold time	10 s
Preheat time	60 s
Preheat to crank delay	5 s
Crank time	15 s
Crank retry time	15 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 5

Type 5 is a three-wire StartStop configuration that uses relay 3 to provide a 15-second preheat signal.

Type 5

Harness Wires   Generator Wires – User Supplied Wiring and Interconnections

12	GENERATOR RUN SIGNAL
13	GENERATOR RUN SIGNAL RETURN
Relay 1 — 14 — 5A fuse	STOP /PREHEAT
16	
Relay 2 — 17 — 5A fuse	START
18	
Relay 3 — 19 — 5A fuse	FUEL PRIME (PREHEAT)
20	12V GENERATOR BATTERY

For additional information, see "Circuit Limitations" on page 2–6.
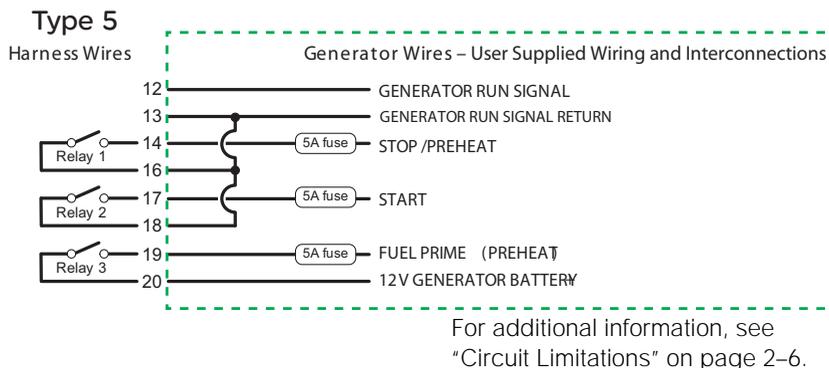
Figure 2-11 Type 5 Connection Diagram

Table 2-9 Type 5 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	StartStop
Relay 3 mode	Preheat
Gen Run signal hold time	2 s
Preheat time	15 s
Preheat to crank delay	2 s
Crank time	15 s
Crank retry time	15 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 6

Type 6 is a three-wire GlowStop configuration that has a normally closed Run/Stop contact.

Type 6

Harness Wires   Generator Wires – User Supplied Wiring and Interconnections

12 ——————————— GENERATOR RUN SIGNAL
13 ——————————— GENERATOR RUN SIGNAL RETURN
14 ———— [5A fuse] — PREHEAT
15 ———— [5A fuse] — STOP
Relay 1
16
17 ———— [5A fuse] — START
Relay 2
18

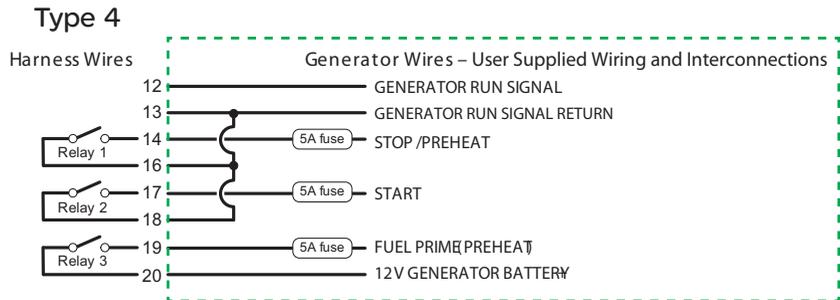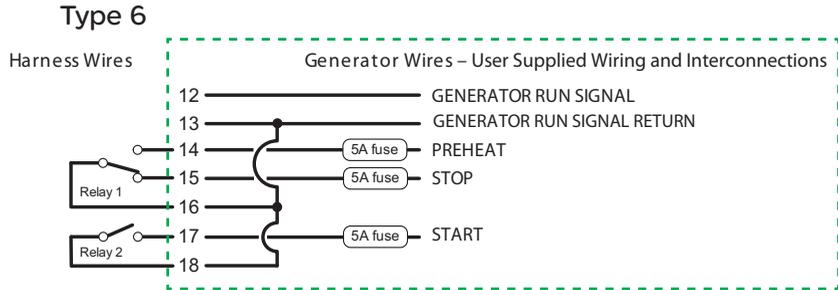For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-12 Type 6 Connection Diagram

Table 2-10 Type 6 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	GlowStop
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	10 s
Preheat to crank delay	1 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 7

Type 7 will work with both two-wire and three-wire run mode configurations that require a preheat signal before cranking. This Gen Type setting is suitable for generators with an automatic engine cranking control system (two-wire) and generators that require that the AGS control their starter separately (three-wire).
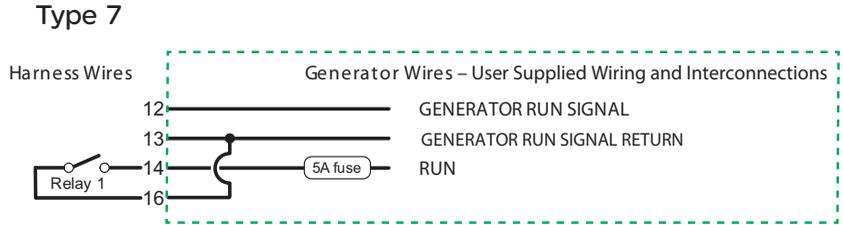
Type 7

Figure 2-13 Type 7 Connection Diagram (two-wire)

For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-14 Type 7 Connection Diagram (three-wire)

Table 2-11 Type 7 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	Run
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	20 s
Preheat to crank delay	1 s
Crank time	15 s

Table 2-11 Type 7 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 8

Type 8 will work with both two-wire and three-wire run mode configurations. Type 8 is identical to Type 7 except that it provides no preheat signal before cranking.
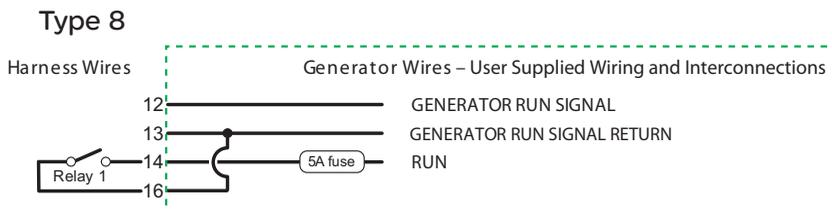
Figure 2-15 Type 8 Connection Diagram (two-wire)
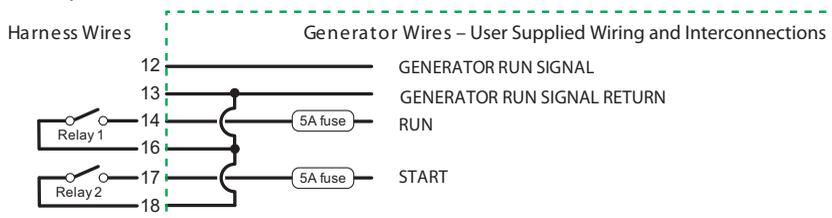
For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-16 Type 8 Connection Diagram (three-wire)

Table 2-12 Type 8 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	Run
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 9

Type 9 is a StartStop mode configuration with shutdown bypass functionality on relay 3.

Type 9

Harness Wires | Generator Wires – User Supplied Wiring and Interconnections

12	GENERATOR RUN SIGNAL
13	GENERATOR RUN SIGNAL RETURN
14 Relay 1	5A fuse — STOP
16	
17 Relay 2	5A fuse — START
18	
19 Relay 3	5A fuse — FUEL PRIME(PREHEAT)
20	12V GENERATOR BATTERY+

For additional information, see "Circuit Limitations" on page 2–6.
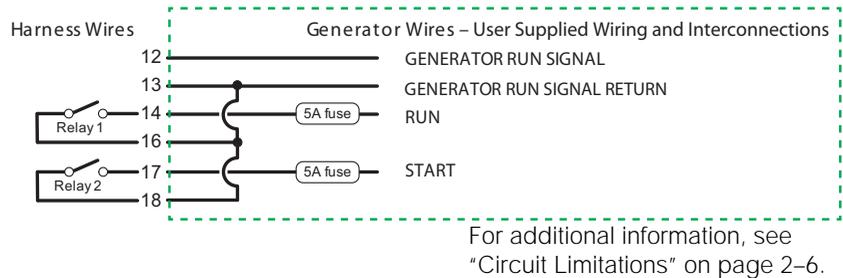
Figure 2-17 Type 9 Connection Diagram

Table 2-13 Type 9 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	StartStop
Relay 3 mode	Shutdown Bypass
Gen Run signal hold time	0.5 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	5 s
Start tries	3

Type 10

Type 10 is a StartStop mode configuration with no preheat signal or shutdown bypass functionality.

Type 10

Harness Wires   Generator Wires – User Supplied Wiring and Interconnections

12 ——————————————— GENERATOR RUN SIGNAL
13 ——————————————— GENERATOR RUN SIGNAL RETURN
14 ———— 5A fuse — STOP
Relay 1
16
17 ———— 5A fuse — START
Relay 2
18

For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-18 Type 10 Connection Diagram

Table 2-14 Type 10 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	StartStop
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	15 s
Crank retry time	30 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 11

Type 11 is a two-wire run mode configuration. It requires only two wires and one relay to control the generator. Relay 1 closes momentarily once to start the generator, and closes momentarily again to stop the generator.

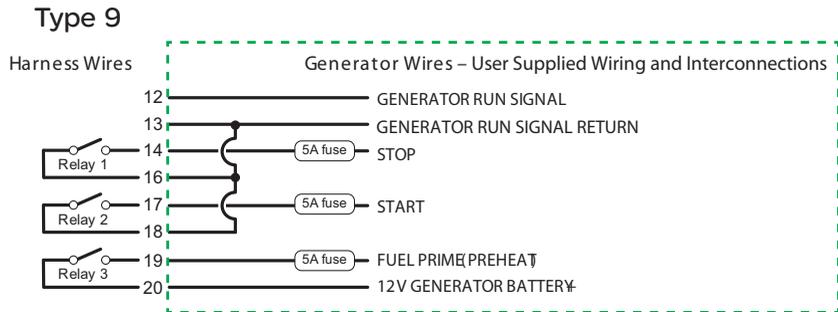For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-19 Type 11 Connection Diagram

Table 2-15 Type 11 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	MomentaryRun
Relay 3 mode	No function
Gen Run signal hold time	0.5 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	10 s
Crank retry time	15 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 12

Type 12 is a three-wire GlowStop configuration recommended for "three-wire" generators that don't require a dedicated preheat signal. In this configuration, the start signal is applied for longer because the generator does its own preheat and cranking while the start signal is applied.

Type 12

Harness Wires   Generator Wires – User Supplied Wiring and Interconnections

```
12 ──────────────────── GENERATOR RUN SIGNAL
13 ──────────────────── GENERATOR RUN SIGNAL RETURN
     Relay 1  14 ──── [5A fuse] ── STOP
16
     Relay 2  17 ──── [5A fuse] ── START
18
```

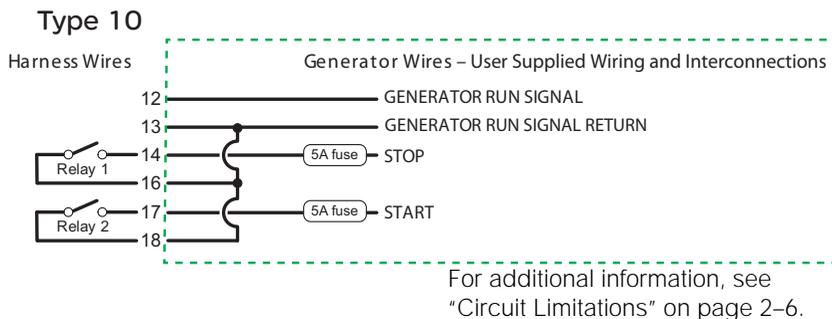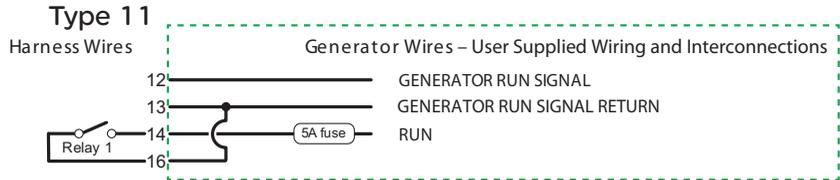For additional information, see "Circuit Limitations" on page 2–6.

Figure 2-20 Type 12 Connection Diagram

Table 2-16 Type 12Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	GlowStop
Relay 3 mode	No function
Gen Run signal hold time	4 s
Preheat time	0 s
Preheat to crank delay	0 s
Crank time	30 s
Crank retry time	40 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 13

Type 13 is a three-wire PulseStop configuration that uses relay 3 to provide the preheat signal. With this generator type, there will be a delay between the generator turning off and the AGS recognizing that the generator is off.

Type 13

For additional information, see "Circuit Limitations" on page 2–6.
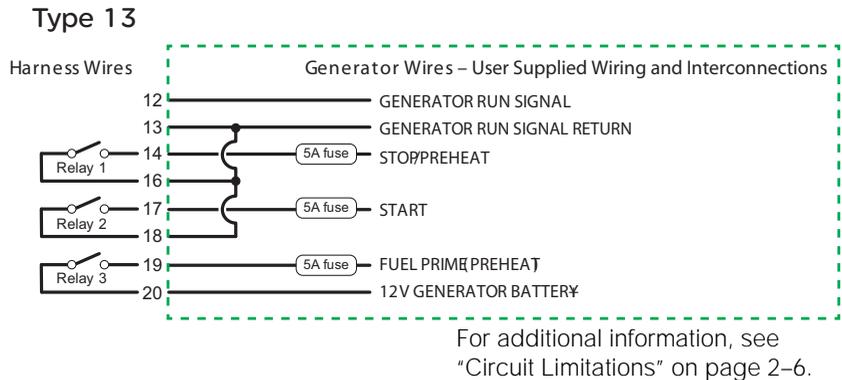
Figure 2-21 Type 13 Connection Diagram

Table 2-17 Type 13 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	PulseStop
Relay 3 mode	Preheat
Gen Run signal hold time	5 s
Preheat time	15 s
Preheat to crank delay	2 s
Crank time	15 s
Crank retry time	15 s
Gen Cool Down	30 s
Gen Spin Down	3 s
Shutdown bypass time	0 s
Start tries	3

Type 14

Type 14 works with two-wire generators that use an integrated engine control module to perform the necessary relay cycles to start and stop the generator. This is similar to Type 8 but without the B+ signal requirement.   The AGS closes relay 1 to start the generator and illuminates the Generator On light to indicate the relay is closed. To stop the generator, relay 1 is opened and the Generator On light turned off.

Important: Since Type 14 does not monitor the generator run status, illumination of the Generator On light on the AGS does not necessarily indicate the generator is actually running. If this generator type is used, ensure the generator's integrated controller has the ability to monitor, control and report generator status and faults. With Type 14, no faults are raised if the generator fails to start or stop or is externally started or stopped.

Once the generator is stopped, there is a 10-minute delay before the generator can be re-started using the AGS. This is to allow the generator's integrated engine controller to completely and safely shut down the generator. This delay can be adjusted by changing the Gen Spin down setting.

Type 14

Harness Wires   Generator Wires – User Supplied Wiring and Interconnections

Relay 1 —14 [5A fuse] RUN
         —16   RELAY1 RETURN

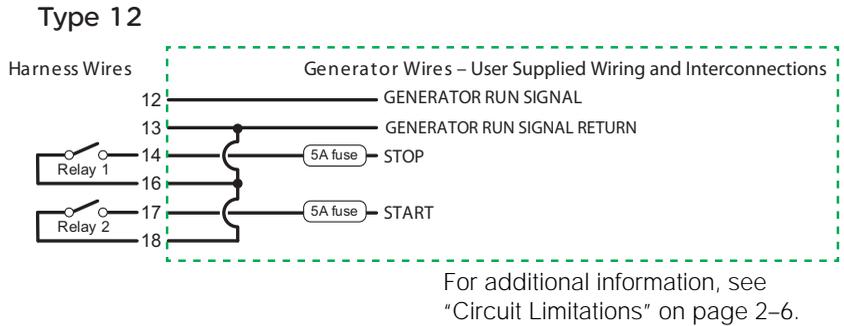For additional information, see "Circuit Limitations" on page 2–6.
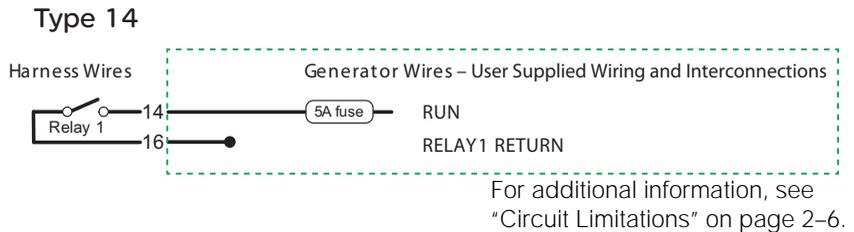
Figure 2-22 Type 14 Connection Diagram (two-wire)

Table 2-18 Type 14 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Relay 1 mode	RunStop
Relay 3 mode	Not used
Gen Run signal hold time	0 s
Preheat time	0 s
Preheat to crank delay	0 s

Table 2-18 Type 14 Relay and Timing Preset Configurations

Relay Function	Preset Configuration Setting
Crank time	0 s
Crank retry time	0 s
Gen Cool Down	30 s
Gen Spin Down	600 s
Shutdown bypass time	0 s
Start tries	1

Connecting the Thermostats (optional)

Wires 1, 2, 3, and 4 on the wiring harness can be connected to two thermostats. Wires 1 (yellow) and 2 (gray) are intended for thermostat 1 and wires 3 (orange) and 4 (gray) are intended for thermostat 2.

Table 2-19 Wiring for Connecting Thermostats

Wire Number	Function	Wiring Harness Wire Color
1	Thermostat 1 input (12/24 V)	Yellow
2	Thermostat 1 return (ground)	Gray
3	Thermostat 2 input (12/24 V)	Orange
4	Thermostat 2 return (ground)	Gray

These wires connect to 12-volt/24-volt output signals from the thermostats, or any other contact closure. The AGS will start the generator in response to these signals. Thermostats can not be programmed using the AGS.

For specific information about thermostat wiring and where AGS connections should be made, please consult your thermostat documentation or contact the thermostat manufacturer.

Connecting an External Shutdown (optional)

The external shutdown input is a 12-volt/24-volt input used to assure that the AGS keeps the generator off under conditions that may be potentially hazardous. Wire 5 (white/black) and 6 (gray) on the wiring harness are intended for an external switch or sensor (such as a moisture detector, or carbon monoxide detector) that produces an active high 12-volt or 24-volt output.

Table 2-20 Wiring for Connecting an External Shutdown

Wire Number	Function	Wiring Harness Wire Color
5	External shutdown input (12/24 V)	White/Black
6	External shutdown return (ground)	Gray

Connecting an External Manual ON/OFF Switch (optional)

The external manual ON/OFF inputs (wires 7 and 8 on the wiring harness) are intended for wiring to one or more remote ON/OFF switches for starting and stopping the generator manually. Wire 7 (Start) and wire 8 (Stop) should each run to their own momentary-contact switch or push-button. The other contact on both switches (common) should be connected to wire 11 on the harness.

Note: Internally, wire 11 is connected to wire 13 so it may already be connected to the negative terminal on the generator battery.

In order for the AGS to be able to detect these switches, connect the fused positive of the generator battery to wire 10 on the harness (the constant 12-volt/24-volt wire). See Figure 2-23 on page 2–30. Ensure all circuits added to the system comply with Table 2-2, "Circuit Limitations" on page 2–6.

If the generator battery does not have the required voltage, any 12-volt or 24-volt power source meeting the limits on page 2–6, will suit this purpose. If an alternate power source is used, its positive terminal must be connected to wire 10. Its negative must be connected to wire 11.

Note: Internally, wire 11 is connected to wire 13, so in this configuration, the alternative power source negative may already be connected to the negative terminal on the generator battery.

> ⚠ **WARNING**
>
> ### FIRE AND SHOCK HAZARDS
>
> When making connections to a 12-volt or 24-volt power source that exceeds the class 2 power limitation of 100 VA (e.g., a battery) always use over-current protection as defined in Table 2-2. This also applies to thermostat and external manual ON/OFF connections. Locate the protection device at the power source in the positive wire.
>
> Do not connect the AGS to a 48-volt battery bank. The AGS is limited to a 30V open-circuit maximum by its regulatory approval and cannot be connected to a 48-volt power source.
>
> **Failure to follow these instructions can result in death or serious injury.**

> *NOTICE*
>
> ### EQUIPMENT DAMAGE
>
> Tapping 12-volts or 24-volts from a 48-volt battery bank will unevenly wear out the batteries and shortens the battery bank life.
>
> **Failure to follow these instructions can result in equipment damage**

Table 2-21 Wiring for Connecting an External Manual ON/OFF Switch

Wire Number	Function	Wiring Harness Wire Color
7	External manual on input	White/Green
8	External manual off input	White/Red
9	External On/Off LED Indicator output	White/Blue
10	Constant 12/24 V B+ for External On/Off/LED Indicator	Red
11	External On/Off/LED Indicator return	Black

Multiple generator control panels or simple contact closures can be wired to the external manual ON/OFF inputs. The AGS detects if any of the contacts close and will change its operating mode to External

Manual On or External Manual Off (for more information, see "GenMode" on page 3–34). The AGS turns the generator on or off according to these inputs and the resulting operating mode change.

The External Manual On and External Manual Off states are not affected by maximum generator run time (see "Max Run Time" on page 3–27).

Connecting an External ON/OFF LED

Wires 9 (White/Blue) and 11 (Black) on the wiring harness can be connected to an LED or other light to accompany a remote external ON/OFF switch. This light turns on when the generator run signal is active to visually indicate that the generator is running.

Important: With some generators, the generator run signal becomes active during the preheat stage, before the generator is actually running. In this case, the external ON/OFF LED (and the Generator On light on the AGS) will turn on during the preheat stage and remain on when the generator is running.

For some generators, these lights will also remain on for a period of time after the generator has stopped.
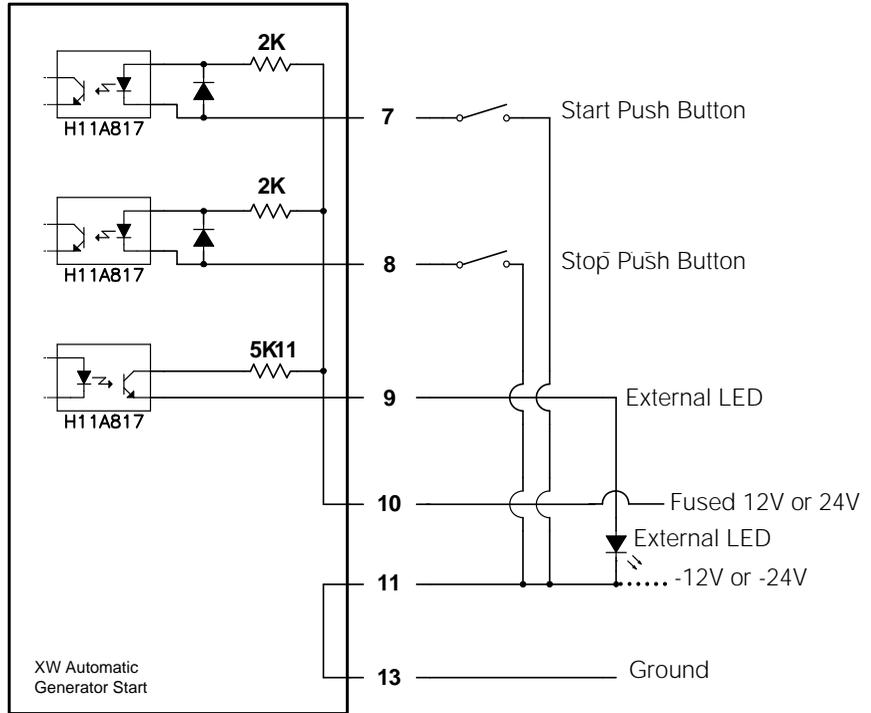
Figure 2-23 External ON/OFF Switch and LED Wiring Diagram

Connecting the Wiring Harness to the AGS

After all the external connections have been wired to the wiring harness, the connector on the wiring harness must be plugged into the 20-contact connector on the AGS.

To connect the wiring harness to the AGS:

u   With the click-tab on the wiring harness connector on top (away from the mounting surface), insert the wiring harness connector into the 20-contact connector on the AGS until the tab clicks into place.
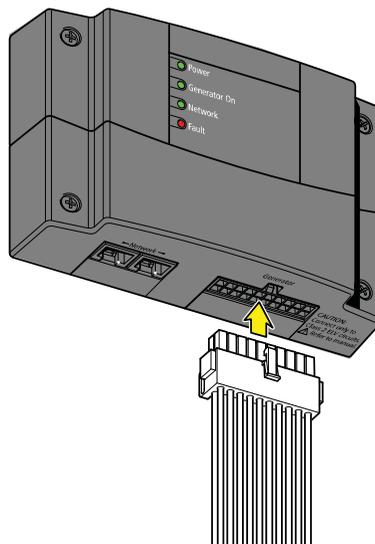
Figure 2-24 AGS External Connections

Connecting the AGS to the Xanbus Network

NOTICE
EQUIPMENT DAMAGE
Connect only to other Xanbus-enabled devices.
Although the cabling and connectors used in this network system are the same as those used for Ethernet, this network is not an Ethernet system. Equipment damage may result from attempting to connect a Xanbus-enabled device to an Ethernet system.
Failure to follow these instructions can result in equipment damage.

To connect the AGS to the Xanbus network, plug a Xanbus network cable (standard straight-through Ethernet cable—CAT 5e) into one of the network ports on the bottom panel of the AGS. Connect the other end of that same cable to the next Xanbus-enabled component in the chain. See Figure 2-25. For the location of the ports on the AGS, see Figure 2-5.
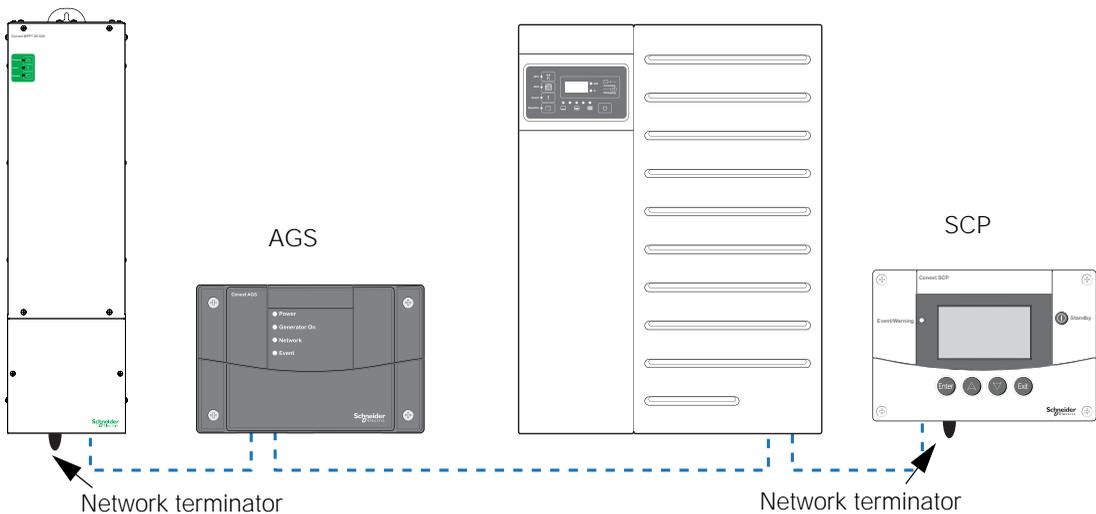
Figure 2-25 Xanbus Network Example

If the AGS is being installed on an existing Xanbus system, the system must first be put into Standby. See "Placing the AGS in Standby Mode" on page 4–6.

Depending on the layout of the Xanbus network, the following options are available for the other network connector on the AGS:

• A second network cable

• A network terminator (when the AGS is the last device at one end of the network).
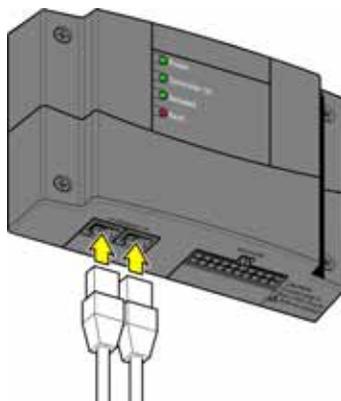
Connect one or two network cables as required by the installation configuration.

Figure 2-26 Connecting the Conext System Control Panel

Verifying Power Is Available

When the AGS has been installed properly, the Power and Network indicator lights illuminate.

If one or both lights are out, check the network connections. Check the inverter/charger to ensure it has battery power. Check to make sure the other devices in the network, such as the SCP, are responding to confirm the network is still active.

Verify Power and Network indicator lights are illuminated.
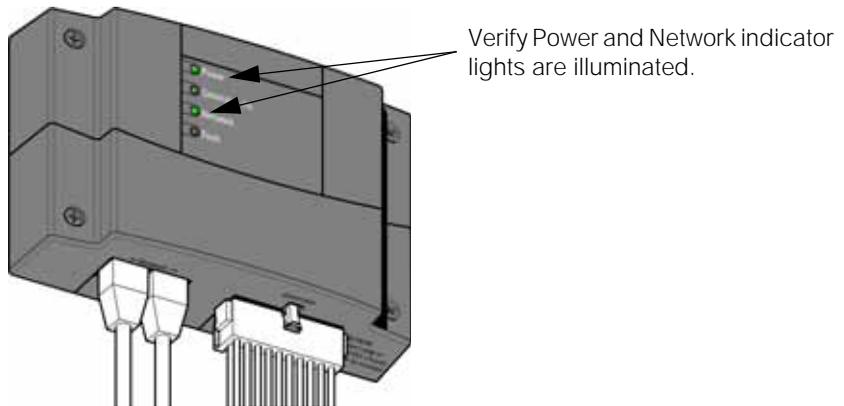
Figure 2-27 Verifying Power is Available

3

Configuration

Chapter 3, "Configuration" contains information and procedures for configuring the Conext Automatic Generator Start.

It includes:
- Overview
- Accessing the AGS Setup Menu
- Using the AGS Setup Menu
- Recording User Settings

Overview

The Conext Automatic Generator Start (AGS) can be configured to start and stop the generator under the appropriate conditions and at the appropriate time. The AGS is configured using the Conext System Control Panel (SCP) or Conext ComBox. The ComBox allows you to configure and monitor the AGS and other Xanbus-enabled devices through a web interface on a PC or laptop.

This chapter explains how to configure the AGS with the SCP. To use the ComBox, see the *Conext ComBox Owner's Guide* (Part Number 975-0679-01-01).

System Status Screen

The System Status screen on the SCP displays basic status information. In the bottom left corner of the screen, an arrow points to the **Enter** button below the display (see Figure 3-28).

To get started configuring or operating the AGS, press **Enter** to display a list of Xanbus-enabled devices connected to the SCP. Use the arrow buttons to scroll to the AGS device in the list and press **Enter** again to select it. The AGS Setup menu contains all configurable settings, generator mode, fault clearing, and device information.
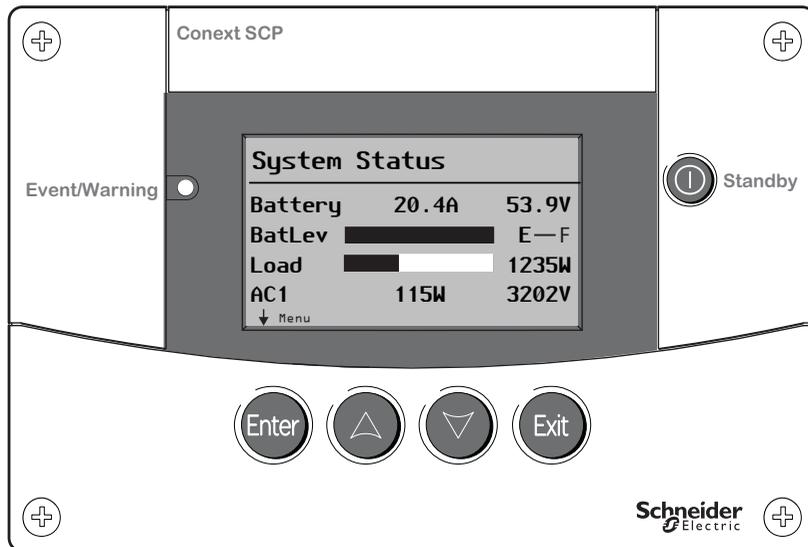
Figure 3-28 SCP System Status Screen and Navigation Buttons

Button	Function
(Enter)	• Confirms selection of a menu item • Displays the next screen
(△)	• Scrolls up one line of text • Increases a selected value • Displays the previous device home screen
(▽)	• Scrolls down one line of text • Decreases a selected value • Displays the next device home screen
(Exit)	• Cancels selection of a menu item • Displays the previous screen
(⊙) Standby	• Disables inverting and charging on all inverter/chargers in the system when pressed for one to two seconds.
Event/Warning	• Indicates a device has a fault or warning condition and requires attention. • Flashes red when a warning occurs, and turns solid red when a fault occurs.

Accessing the AGS Setup Menu

The AGS `Setup` menu lets you configure start and stop triggers and other parameters, select the generator's operating mode, clear fault warnings and view device information.

To access the AGS Setup Menu:

1. Start from the `System Status` screen.
2. Press **Enter**.
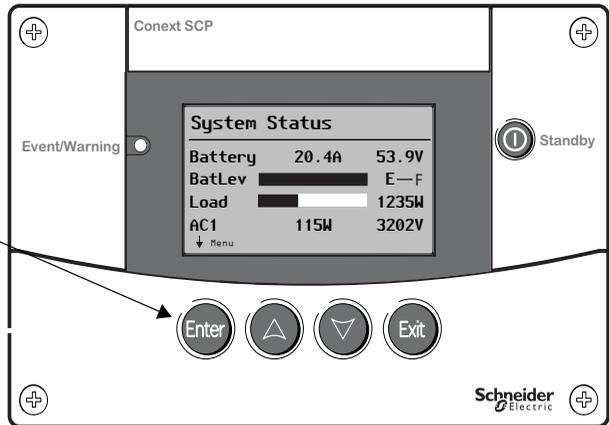
3. Use the arrow buttons to highlight `XW AGS`.
4. Press **Enter** to display the AGS `Setup` menu.
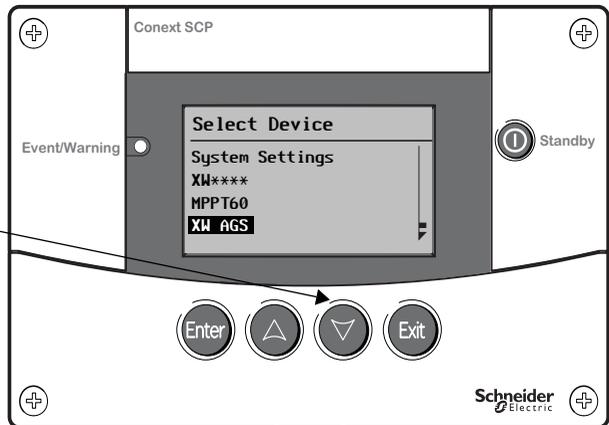
Figure 3-29 Accessing the AGS Setup Menu

To change basic AGS settings:

1. Use the arrow buttons to highlight the desired operation.

2. Press **Enter** to select the current value for that setting. Asterisks (*) indicate the last value set.

3. Use the arrow buttons to change the value. Holding an arrow button down without releasing it will scroll through the values quickly.

4. Press **Enter** to select the value.

5. Press **Exit** twice to return to the System Status screen.

See Figure 3-31.
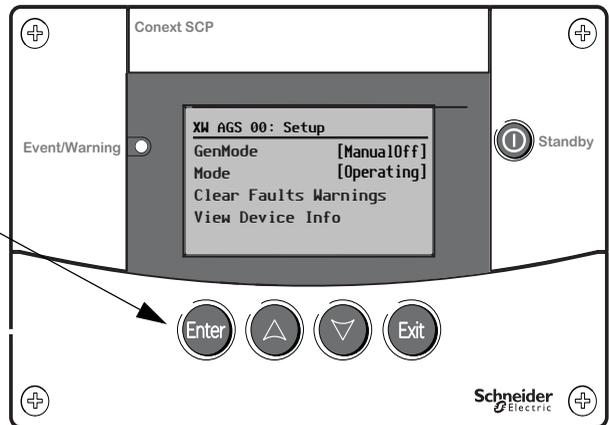
To access advanced settings:

1. Press the **Enter**, up arrow and down arrow buttons at the same time.

2. Highlight Advanced Settings and press **Enter**.

See Figure 3-32.
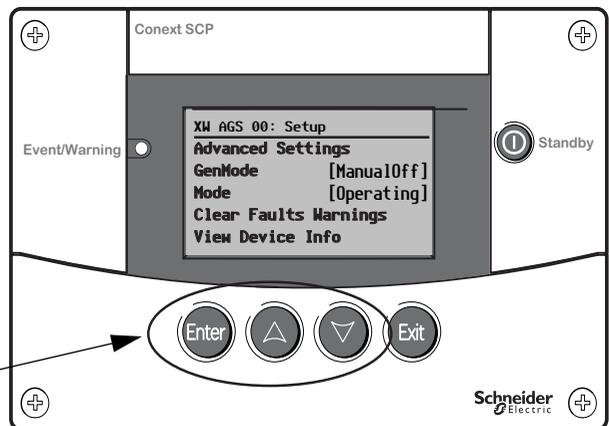
Figure 3-30 Changing Settings

Using the AGS Setup Menu

The AGS `Setup` menu contains the following options:

- `Advanced Settings`—displays the Configuration menu for setting generator start and stop triggers, quiet times, and other parameters.
- `GenMode`—sets the generator mode to Manual on, Manual off or Automatic
- `Mode` of Operation—sets the generator to Operating or Standby
- `Clear Fault Warnings`—displays generator faults
- `View Device Info`—displays the Fault, Warning and Event logs

When first displayed, the AGS `Setup` menu displays basic settings, beginning with `GenMode`. To display the `Advanced settings` option, press the **Enter**, up arrow, and down arrow buttons together. See Figure 3-32.

To change basic settings:

1. Use the arrow buttons to highlight the desired setting. For more information on the values for each option, see "GenMode" on page 3–34.
2. Press **Enter** to select the current value for that setting. Asterisks (*) indicate the last value set.
3. Use the arrow buttons to change the value. Holding an arrow button down without releasing it will scroll through the values quickly.
4. Press **Enter** to select the value.
5. Press **Exit** twice to return to the `System Status` screen.

For a menu map of all basic AGS settings, see Figure 3-31.

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ GenMode        [ManualOff]│ │
│ Mode           [Operating]   │
│ Clear Faults Warnings        │
│ View Device Info          ▼  │
└──────────────────────────────┘
```

Changing Basic Settings

- Press the arrow buttons to move up and down the list.
- Press **Enter** to select a menu item, press the arrow buttons to change the setting, and then **Enter** again to accept the new setting.
- Press **Exit** to go back to the previous screen.

GenMode selects the generator starting mode

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ GenMode        [ManualOff]│ │
│ Mode           [Operating]   │
│ Clear Faults Warnings        │
│ View Device Info          ▼  │
└──────────────────────────────┘
```

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ GenMode        [ManualOff]│ │
│ Mode           [Operating]   │
│ Clear Faults Warnings        │
│ View Device Info          ▼  │
└──────────────────────────────┘
```

Mode selects the device operating mode

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ GenMode        [ManualOff]   │
│ Mode           [Operating]   │
│ Clear Faults Warnings        │
│ View Device Info             │
└──────────────────────────────┘
```

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ GenMode        [ManualOff]   │
│ Mode           [Operating]   │
│ Clear Faults Warnings        │
│ View Device Info             │
└──────────────────────────────┘
```

Clears faults and warnings

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ Advanced Settings         │  │
│ GenMode      [ManualOff]     │
│ Clear Faults Warnings        │
│ View Device Info          ▼  │
└──────────────────────────────┘
```

Displays device information

```
┌──────────────────────────────┐
│ XW AGS   00:Setup            │
│                              │
│ Advanced Settings         │  │
│ GenMode      [ManualOff]     │
│ Clear Faults Warnings        │
│ View Device Info          ▼  │
└──────────────────────────────┘
```

Figure 3-31 AGS Basic Settings Menu Map

To display Advanced Settings:

1. Press the **Enter**, up arrow and down arrow buttons at same time.

2. Highlight `Advanced Settings` and press **Enter** to display the `Config` menu.

3. Use the arrow buttons to highlight the desired setting, and press **Enter** to select it.

4. Use the arrow buttons to change the value, and press **Enter** to accept the new setting.

5. Press **Exit** to return to the `Advanced settings` menu, or press **Enter**, up arrow and down arrow together to return to basic AGS `Setup` menu.

6. Press **Exit** again to return to the AGS `Home` screen.

For a menu map of all advanced configuration settings, see Figure 3-32.

```
XW AGS  00:Setup

GenMode      [ManualOff]
Mode         [Operating]
Clear Faults Warnings
View Device Info
```

Changing Advanced Settings

- Press **Enter**, up arrow, and down arrow buttons together to display `Advanced` settings.
- Press the arrow buttons to move up and down the list.
- Press **Enter** to select a menu item, press the arrow buttons to change the setting, and then **Enter** again to accept the new setting.
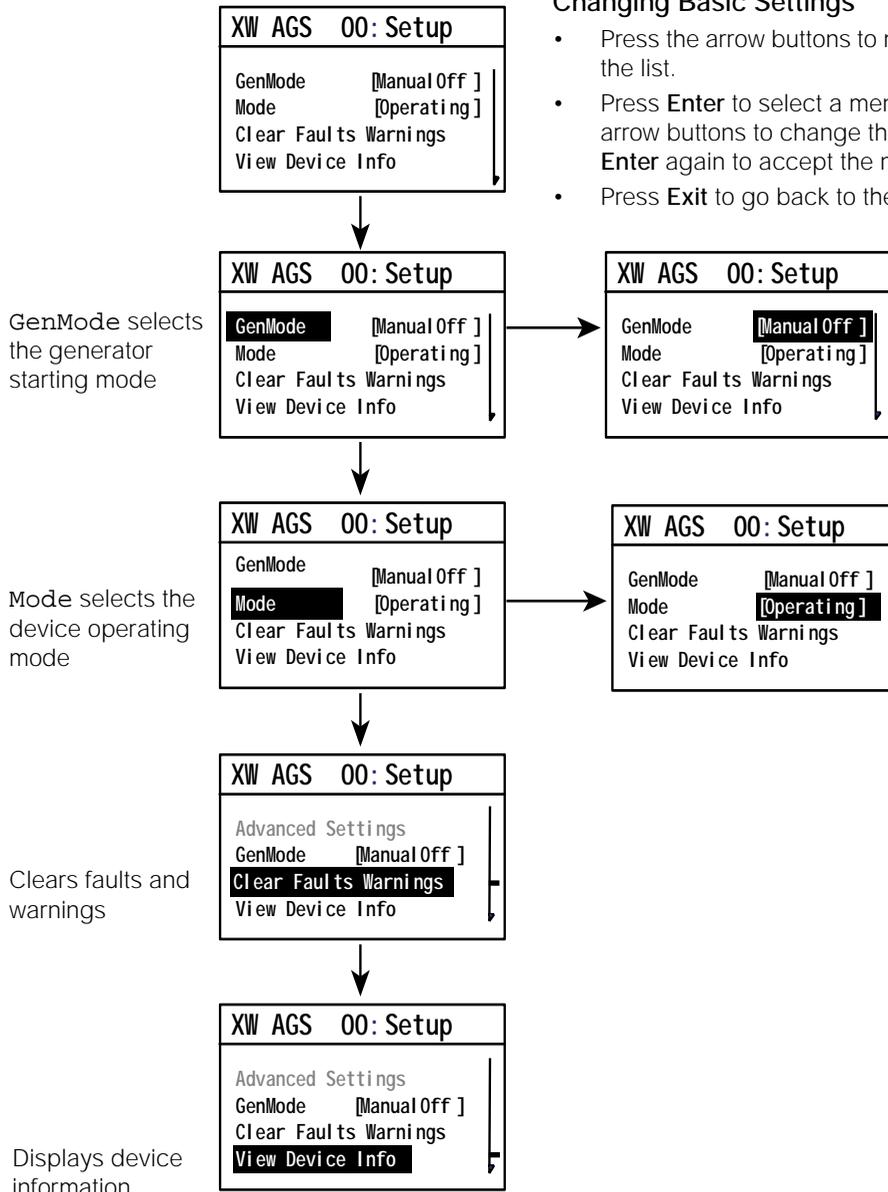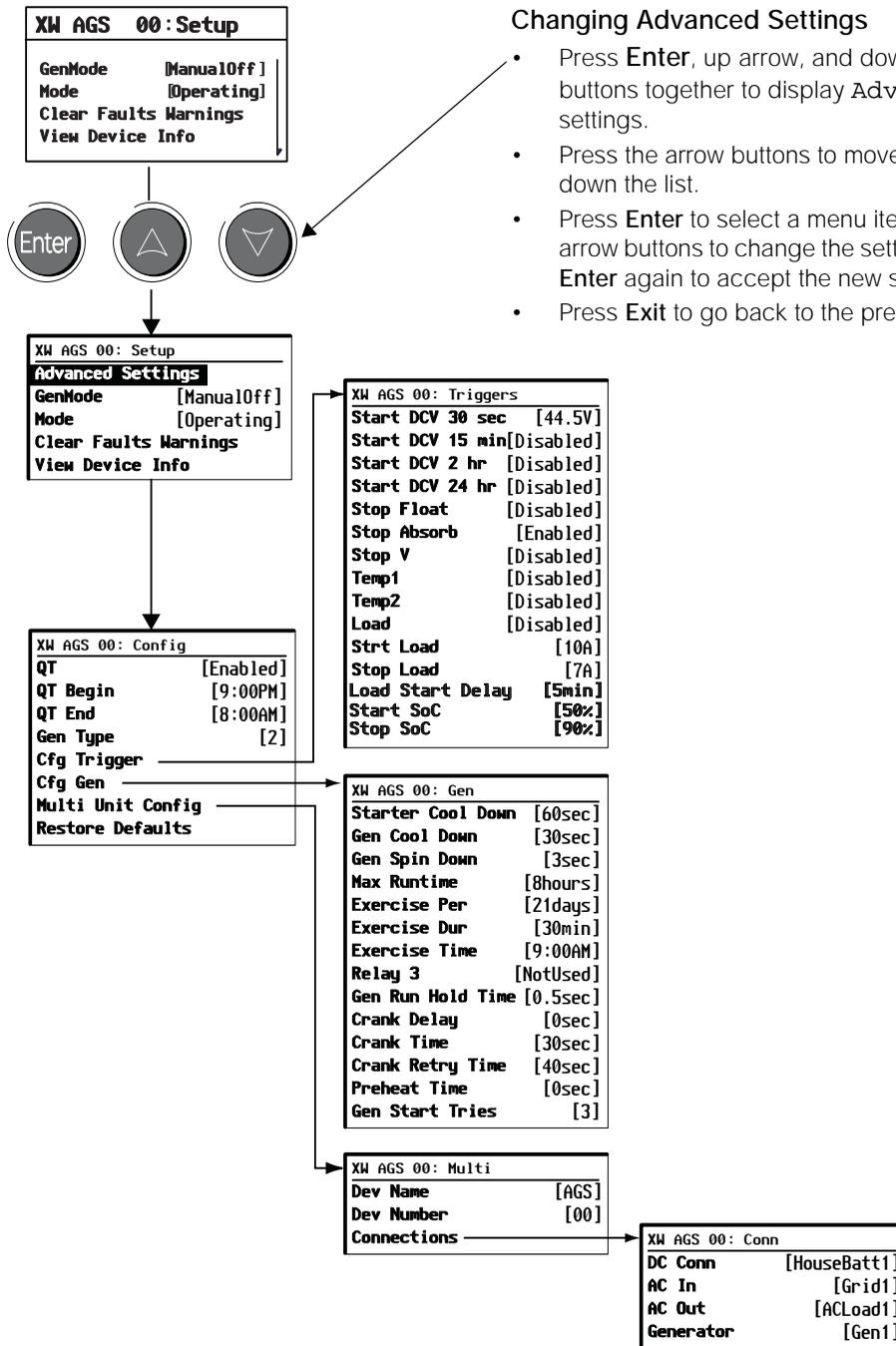- Press **Exit** to go back to the previous screen.

Enter (△) (▽)

```
XW AGS 00: Setup
Advanced Settings
GenMode      [ManualOff]
Mode         [Operating]
Clear Faults Warnings
View Device Info
```

```
XW AGS 00: Triggers
Start DCV 30 sec   [44.5V]
Start DCV 15 min[Disabled]
Start DCV 2 hr  [Disabled]
Start DCV 24 hr [Disabled]
Stop Float      [Disabled]
Stop Absorb      [Enabled]
Stop V          [Disabled]
Temp1           [Disabled]
Temp2           [Disabled]
Load            [Disabled]
Strt Load           [10A]
Stop Load            [7A]
Load Start Delay   [5min]
Start SoC           [50%]
Stop SoC            [90%]
```

```
XW AGS 00: Config
QT              [Enabled]
QT Begin        [9:00PM]
QT End          [8:00AM]
Gen Type            [2]
Cfg Trigger
Cfg Gen
Multi Unit Config
Restore Defaults
```

```
XW AGS 00: Gen
Starter Cool Down [60sec]
Gen Cool Down     [30sec]
Gen Spin Down      [3sec]
Max Runtime      [8hours]
Exercise Per     [21days]
Exercise Dur      [30min]
Exercise Time    [9:00AM]
Relay 3          [NotUsed]
Gen Run Hold Time [0.5sec]
Crank Delay        [0sec]
Crank Time        [30sec]
Crank Retry Time  [40sec]
Preheat Time       [0sec]
Gen Start Tries       [3]
```

```
XW AGS 00: Multi
Dev Name           [AGS]
Dev Number          [00]
Connections
```

```
XW AGS 00: Conn
DC Conn      [HouseBatt1]
AC In            [Grid1]
AC Out        [ACLoad1]
Generator        [Gen1]
```

Figure 3-32 AGS Advanced Settings Menu Map

Configuration Menu

The Configuration (`Config`) menu is where specific start-stop parameters are set. This menu contains the following settings:

- Quiet Time Enable (`QT En`)
- Quiet Time Begin (`QT Begin`)
- Quiet Time End (`QT End`)
- Generator Type (`Gen Type`)
- Configure Trigger (`Cfg Trigger`)
- Configure Generator (`Cfg Gen`)
- Multi-unit Configuration (`Multi-unit Config`)
- Restore Defaults (`Restore Defaults`)

QT En

Full name   Quiet Time Enable

Purpose   `QT En` enables or disables the Quiet Time functionality of the AGS. Quiet time refers to a period of time when the generator should not run.

Dependencies   `QT En` requires the AGS to be in Automatic mode. Setting `QT En` to [`Enable`] requires that parameters be set for the `QT Begin` and `QT End`.

Value	Description
Enabled/Disabled	Enables or disables the Quiet Time functionality.

When to use   Set `QT En` to [`Enabled`] when there is a period of time when it is not desired for the generator to run. The AGS will ignore all automatic start triggers during the time set in `QT Begin` and `QT Begin`.

When there are no preferences or restrictions for when the generator should run, set `QT En` to [`Disabled`]. When [`Disabled`] is selected, the AGS will ignore the times set for `QT Begin` and `QT End`.

Considerations   Quiet Time prevents the automatic starting of the generator regardless of battery condition.

Important: If quiet time is set for overnight, be aware that overnight battery drain can be significant because it may be necessary to use the inverter and batteries to supply AC Power without the help of a generator. Therefore, it is important to conserve battery power during this time. Minimize the use of interior lights and set thermostat temperature lower to prevent the furnace from coming on at night during cool weather. Set thermostats higher to prevent air conditioning coming on at night during warm weather.

Sometimes automatic start or automatic stop triggers may overlap with the beginning and end of quiet time. Three different quiet time scenarios affect when the generator stops and starts.

1. If quiet time begins after the AGS has started the generator, the generator will stop. If the condition that started the generator is still present when quiet time ends, the generator will restart.

2. If a condition that requires starting the generator occurs during quiet time, the AGS will ignore it until quiet time ends. If the condition still exists at the end of quiet time, the AGS will start the generator.

3. If the running generator stops when quiet time begins and a condition that requires stopping the generator occurs during quiet time, the generator will not restart when quiet time ends.

QT Begin

Full name   Quiet Time Begin

Purpose   `QT Begin` defines the start of quiet time.

Dependencies   `QT Begin` functions only if the AGS is in Automatic mode. This setting requires `QT En` be set to [Enabled].

Ensure the clock on the SCP is set to the correct local time.

Value	Description
12:00AM to 11:59PM (12-hour clock) 00:00 to 23:59 (24-hour clock)	At the time set for `QT Begin`, the generator will stop (if it is running) and not be able to start again until the time set for `QT End`. It ignores all automatic start triggers during the time period between `QT Begin` and `QT End`.

QT End

Full name

Quiet Time End

Purpose `QT End` is a changeable setting that defines the end of quiet time. This setting also requires a setting for `QT Begin`.

Dependencies `QT End` functions only if the AGS is in Automatic mode. This setting requires `QT En` be set to `[Enabled]` and also requires a setting for `QT Begin`.

Ensure the clock on the SCP is set to the correct local time.

Value	Description
12:00AM to 11:59PM (12-hour clock) 00:00 to 23:59 (24-hour clock)	At the time set for `QT End` the AGS will be able to automatically start the generator again. If a start trigger has occurred during quiet time and is still active, the generator will start immediately after quiet time ends.

Gen Type

Full name Generator Type

Purpose `Gen Type` selects the starting requirements of the generator. The starting requirements determine how the AGS must be wired to the generator's starting system. For more information, see "Connecting the Generator" on page 2–9 or Appendix B.

Important: `Gen Type` can only be changed after the system is put into Standby. See "Placing the AGS in Standby Mode" on page 4–6.

Table 3-22 Generator Type Descriptions

Option	Description	
	Mode	For Technical Details, see...[1]
Type 1	GlowStop	page 2–11
Type 2	GlowStop with no preheat	page 2–12
Type 3	GlowStop with shutdown bypass	page 2–13

Table 3-22 Generator Type Descriptions

Option	Description	
	Mode	**For Technical Details, see...**[1]
Type 4	StartStop with Relay 3 prime	page 2–14
Type 5	StartStop with Relay 3 preheat	page 2–15
Type 6	GlowStop with normally closed RunStop contact	page 2–16
Type 7	Run with preheat	page 2–17
Type 8	Run with no preheat	page 2–19
Type 9	StartStop with Relay 3 preheat and shutdown bypass	page 2–20
Type 10	StartStop	page 2–21
Type 11	MomentaryRun	page 2–22
Type 12	GlowStop with no preheat	page 2–23
Type 13	PulseStop with Relay 3 preheat	page 2–24
Type 14	Run with no preheat and no switched B+ requirement	page 2–25

1.See Appendix C, "Relay Timing" for additional information.

When to use   Use this setting after installing the AGS hardware. Selecting a suitable `Gen Type` automatically configures the AGS to work with the ignition system and starting requirements of the generator. Consult the generator manual or contact the generator's manufacturer for specific generator starting requirements.

Outcomes   Selecting a `Gen Type` from the list automatically configures the following settings:

- Preheat time
- Preheat end to crank delay time
- Crank time
- Crank retry time
- Starter cool down time
- Generator cool down
- Generator spin down time

- Generator run signal hold time
- Start tries

If the presets will not work with the desired generator, it may be necessary to manually configure some of the settings listed above using information from the generator manufacturer. These settings can be changed in the CfgGen Menu on page 3–25.

Cfg Trigger Menu

The `Cfg Trigger` menu contains the settings for automatically starting and stopping the generator. This menu allows the adjustment of the default settings for battery voltage, state of charge (SOC), thermostat ON/OFF signals, inverter load, and battery charging stage.

There are three classes of triggers: charger-based, thermostat-based, and inverter load-based. If the generator is started by a trigger in one class, a stop condition must also be set in order for the generator to stop.

For example for charger triggers, if the generator is started by the `Start DCV 30 sec` condition, any of the accompanying stop triggers `Stop Float`, `Stop Absorb` and `Stop V` can be used to stop it.

Trigger Priority   If at least one start trigger is enabled in two or all three trigger classes, the first trigger to be true will start the generator. Conversely, the last stop trigger to be met will stop the generator.

Changing the default settings is advised for experienced users or users who have consulted service personnel.

Important: In the AGS `Setup` menu, `GenMode` must be set to `ManualOff` before any start trigger parameters are set.

The `Cfg Trigger` menu contains the following items:

Charger Triggers:

- Starting Battery Voltage - 30 seconds (`Start DCV 30 sec`)
- Starting Battery Voltage - 15 minutes (`Start DCV 15 min`)
- Starting Battery Voltage - 2 hours (`Start DCV 2 hr`)
- Starting Battery Voltage - 24 hours (`Start DCV 24 hr`)
- Stop at Float Charge Stage (`Stop Float`)
- Stop at Absorption Charge Stage (`Stop Absorb`)
- Stopping Battery Voltage (`Stop V`)

Thermostat Triggers:

- Thermostat 1 (`Temp1`)
- Thermostat 2 (`Temp2`)

Inverter Load Triggers:

- Enable Inverter Load Start and Stop Triggers (`Load`)
- Start on Inverter Load Current (`Start Load`)
- Stop on Inverter Load Current (`Stop Load`)
- Load Start Amp Delay (`Load Start Delay`)
- Start at Low State of Charge (`Start Soc`)
- Stop at High State of Charge (`Stop Soc`)

Start DCV 30 sec

Full Name   Starting Battery Voltage—30 seconds

Purpose   The `Start DCV 30 sec` trigger enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 30 seconds.

The AGS will stop the generator when the stop trigger is provided (`Stop V`, `Stop Absorb`, or `Stop Float`).

Dependencies   The `Start DCV 30 sec` trigger requires the AGS to be in Automatic mode and needs the `Stop Absorb` or `Stop Float` trigger be enabled or a parameter to be set for the `Stop V` trigger.

Values	Default
Disabled, 4.0 V to 65.0 V (increments of 0.1 V)	44.5 V

Considerations   If the voltage trigger is set too high, the generator will start more frequently than is convenient.

If the voltage trigger is set too low, the batteries may be damaged by repeated cycles of excessive discharge. The generator running time necessary to charge the batteries may exceed `Max Run Time` and use too much fuel in the process.

If using the Conext XW+ `Low Batt Cut Out` (LBCO) voltage setting to trigger a start-on-voltage setting on the AGS, be sure to set the AGS voltage trigger higher than the Conext XW+ LBCO voltage. Otherwise the inverter/charger output turns off and then back on when the generator auto-starts.

If using an automatic generator starting system with the start trigger set to the same voltage as the LBCO voltage, do not set the LBCO Delay for less than the amount of time it takes the generator to start and connect. Otherwise, inverter output turns off and then back on when the generator auto-starts.

| **Battery Voltage Information** | Battery voltage can be monitored from the `System Status` screen or the inverter/charger menu. |

If `Stop Float` or `Stop Absorb` has been enabled, the generator will stop when the Float or Absorption stages of the battery charging have begun.

If the `Stop V` is used, the generator will stop when the battery voltage reaches the parameter set in this trigger, regardless of whether the batteries are charged.

Start DCV 15 min

Full Name Starting Battery Voltage—15 minutes

Purpose The `Start DCV 15 min` trigger enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 15 minutes.

The AGS will stop the generator when the battery voltage has risen to the `Stop V`, or when the batteries have been recharged to the Absorption or Float stage.

Dependencies The `Start DCV 15 min` trigger requires the AGS to be in Automatic mode and needs the `Stop Absorb` or `Stop Float` trigger be enabled or a parameter to be set for the `Stop V` trigger.

Values	Default
Disabled, 4.0V to 120.0V	Disabled

Considerations If the voltage trigger is set too high, the generator will start more frequently than is convenient.

If the voltage trigger is set too low, the batteries may be damaged by repeated cycles of excessive discharge. The generator running time necessary to charge the batteries may exceed `Max Run Time` and use too much fuel in the process.

Battery Voltage Information

Battery voltage can be monitored from the `System Status` screen or the inverter/charger menu.

If `Stop Float` or `Stop Absorb` has been enabled, the generator will stop when the Float or Absorption stages of the battery charging have begun.

If the `Stop V` is used, the generator will stop when the battery voltage reaches the parameter set in this trigger, regardless of whether the batteries are charged.

Start DCV 2 hr

Full name

Starting Battery Voltage—2 hours

Purpose

The `Start DCV 2 hr` trigger enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 2 hours.

Dependencies

The `Start DCV 2 hr` trigger requires the AGS to be in Automatic mode and needs the `Stop Absorb` or `Stop Float` trigger be enabled or a parameter to be set for the `Stop V` trigger.

Values	Default
Disabled, 4.0 V to 120.0 V	Disabled

Considerations

If the voltage trigger is set too high, the generator will start more frequently than is convenient.

If the voltage trigger is set too low, the batteries may be damaged by repeated cycles of excessive discharge. The generator running time necessary to charge the batteries may exceed `Max Run Time` and use too much fuel in the process.

Battery Voltage Information

Battery voltage can be monitored from the `System Status` screen or the inverter/charger menu.

If `Stop Float` or `Stop Absorb` has been enabled, the generator will stop when the Float or Absorption stages of the battery charging have begun.

If the `Stop V` is used, the generator will stop when the battery voltage reaches the parameter set in this trigger, regardless of whether the batteries are charged.

Start DCV 24 hr

Full name   Starting Battery Voltage—24 hours

Purpose   The `Start DCV 24 hr` trigger enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 24 hours.

Dependencies The `Start DCV 24 hr` trigger requires the AGS to be in Automatic mode and needs the `Stop Absorb` or `Stop Float` trigger be enabled or a parameter to be set for the `Stop V` trigger.

Values	Default
Disabled, 4.0 V to 120.0 V	Disabled

Considerations If the voltage trigger is set too high, the generator will start more frequently than is convenient.

If the voltage trigger is set too low, the batteries may be damaged by repeated cycles of excessive discharge. The generator running time necessary to charge the batteries may exceed `Max Run Time` and use too much fuel in the process.

Battery Voltage Information Battery voltage can be monitored from the System screen or the inverter/charger menu.

If `Stop Float` or `Stop Absorb` has been enabled, the generator will stop when the Float or Absorption stages of the battery charging have begun.

If the `Stop V` is used, the generator will stop when the battery voltage reaches the parameter set in this trigger, regardless of whether the batteries are charged.

Stop Float

Full name   Stop at Float Charge Stage

Purpose   The `Stop Float` trigger allows the AGS to stop the generator when the inverter/charger has recharged the batteries to the Float stage.

Values	Default
Disabled, Enabled	Disabled

Considerations   `Stop Float` or `Stop Absorb` would typically be used if the generator was started due to a low-battery voltage setting.

`Stop Float` is the recommended setting if it is desired that the generator charge the batteries completely. This will result in somewhat longer run times. However, if the generator is the primary charging source, charging them to the Float stage every time will provide longer battery life.

For more information on battery charging, see the *Conext XW+ Inverter/ Charger Owner's Guide*.

Stop Absorb

Full name   Stop at Absorption Charge Stage

Purpose   The `Stop Absorb` triggers enables the AGS to stop the generator when the inverter/charger has recharged the batteries to the Absorption stage.

Values	Default
Disabled, Enabled	Enabled

Considerations   Set `Stop Absorb` to deliver only a partial charge to the batteries. The AGS will start and run the generator until the inverter/charger charges the batteries through the Bulk charge stage (restoring the batteries between roughly 75% and 90% of their full charge). The AGS stops the generator when the inverter/charger determines the batteries have reached the Absorption charge stage.

Because `Stop Absorb` will shut down the generator before the batteries are fully charged, it is recommended to use it only if there is an alternate charging source, such as wind or PV, which can complete the charge. If the generator is the only charging source, `Stop Absorb` will leave the batteries consistently undercharged and may shorten the

battery life. Alternately, `Stop Absorb` can be useful during utility outages, when it is desired to keep the generator run time to a minimum, but are expecting a full recharge once the power is restored.

For more information on battery charging, see *Conext XW+ Inverter/ Charger Owner's Guide*.

Stop V

Full name	Stopping Battery Voltage

Purpose   The `Stop V` trigger enables the AGS to stop the generator whenever the battery voltage reaches a pre-set DC voltage. Whenever the generator starts automatically based on the Starting Battery Voltage, it will shut off once the Stopping Battery Voltage has been reached.

Dependencies   The `Stop V` trigger requires the AGS to be in Automatic mode and needs a parameter to be set for one of the Start DCV triggers.

Values	Default
Disabled, 14.5 V to 120.0 V (increments of 0.1 V)	Disabled

Considerations   The `Stop V` setting is most useful when you want the inverter/charger to give the batteries a quick, basic charge. If using this mode, it is recommended to run a complete charge or equalize cycle once in a while to restore the battery. To give the batteries a more complete, consistent charge, use the `Stop Float` setting. This will result in longer generator run times.

If `Stop V` is set too high, the generator may run for too long.

If `Stop V` is set too low, the AGS will stop the generator before the inverter/charger has charged the batteries.

If `Stop Float` or `Stop Absorb` have been enabled, the AGS will stop the generator if the Float or Absorption stages of the battery charging have begun.

Actual battery voltage can be monitored from the Home screen on the SCP.

For more information on battery charging, see the *Conext XW+ Inverter/ Charger Owner's Guide*.

Temp1

Full name   Thermostat 1

Purpose   The `Temp1` trigger enables the generator to start in response to a signal from a thermostat or other contact closure. With `Temp1` set to [`Enabled`], the AGS will start the generator to help power the item controlled by that thermostat.

Values	Default
Disabled, Enabled	Disabled

When to use   Enable `Temp1` if a thermostat is available that controls a component that has a high-power requirement such as a furnace or an air conditioning system.

Considerations   If `Temp1` is enabled, the generator will start in response to a signal from the thermostat. Everything related to setting the thermostat must be done on the thermostat. For example: setting the temperature at which the furnace or air conditioning system comes on must be done on the thermostat. There are no thermostat temperature settings on the AGS or the SCP.

                       If `Temp1` is disabled, the component connected to that thermostat will require that the generator be started manually in order for that component to have power. Otherwise, the component will need to be connected to another AC input source.

Temp2

Full name   Thermostat 2

Purpose   `Temp2` is intended to be used when the AGS is connected to a second thermostat or contact closure. All information and procedures for `Temp1` also apply for `Temp2`.

Values	Default
Disabled, Enabled	Disabled

Load

Full name   Enable Inverter Load Start and Load Stop Triggers

Purpose   The `Load` trigger enables or disables the Start on Inverter Load Current and Stop on Inverter Load Current functionality of the AGS. This function enables the generator to start and stop based on the current being drawn on the inverter by the loads. See "Start Load" and "Stop Load" on page 3–23.

Dependencies   The `Load` trigger requires the AGS to be in Automatic mode and needs parameters to be set for both the `Start Load` and `Stop Load` triggers.

Value	Default
Disabled, Enabled	Disabled

Important: This function is intended to protect the batteries from rapid drain. It is not intended to protect the inverter against overload.

Start Load

Full name   Start on Inverter Load Current

Purpose   The `Start Load` trigger enables the generator to start at a specified AC load (current draw) on the inverter. This current draw must be present for 5 minutes before the generator will start. The generator will assist the inverter with powering the AC load.

Dependencies   The `Start Load` trigger requires the AGS to be in Automatic mode and the `Load` trigger to be set to ON. It also needs to have a stopping value set in the `Stop Load` trigger.

Values	Default
10.0 A to 33.0 A (increments of 1A)	10.0 A

Considerations   Change this setting if there are certain "peak" times of power usage or if power demands consistently exceed the output of the inverter.

If `Load` is set to [`Enabled`], the generator will start in response to the `Start Load` setting unless the AGS is in a Quiet Time period.

The inverter load current can be monitored on the System screen.

If `Start Load` is set too high, the AGS may not start the generator in time to recharge the batteries before the batteries are drained by the AC load. In addition, if `Start Load` is set too high, the inverter may shut down due to an overload condition.

If `Start Load` is set too low, the AGS may start the generator too frequently, wasting fuel in the process.

Stop Load

Full name   Stop on Inverter Load Current

Purpose   The `Stop Load` trigger enables the AGS to stop the generator when the AC load falls below a specific level for 1 minute. The `Stop Load` setting applies to situations when the AGS has started the generator to assist the inverter with powering the AC load.

Dependencies   The `Stop Load` trigger requires the `Load` trigger to be set to [Enabled]. It also needs to have a value starting value set in the `Start Load` trigger.

Values	Default
7.0 A to 28.0 A (increments of 1 A)	7.0 A

Load Start Delay

Full name   Load Start Amp Delay

Purpose   The `Load Start Delay` trigger configures the delay used in the `Start Load` trigger. The `Start Load` trigger enables the generator to start at a specified AC load (current draw) on the inverter. The default delay period is 5 minutes. In other words, the current draw must be present for 5 minutes before the generator will start.

Dependencies   The `Load Start Delay` trigger requires the `Load` trigger to be enabled. It also needs to have a stopping value set in the `Stop Load` trigger.

Values	Default
0.0s to 25s (increments of 1s)	5 min

Start Soc

Full name   Start at Low State of Charge

Purpose   The `Start Soc` trigger starts the generator when the battery State of Charge (SOC) falls below the defined value.

When to use   The `Start Soc` trigger is valid only when a Conext Battery Monitor is installed. Use this trigger in systems with multiple battery banks.

The `Start Soc` trigger uses SOC information broadcast by the inverter/chargers and charge controllers as an indicator of battery energy levels. SOC is often a better indicator than voltage because batteries at different voltages may be in different charge states.

Dependencies

Values	Default
40% to 90% (increments of 1%)	50%

Considerations For information about configuring systems with multiple battery banks, visit **www.SESolar.com**.

Stop Soc

Full name   Stop at High State of Charge

Purpose   The `Stop Soc` trigger stops the generator when the SOC rises above the defined value.

When to use   The `Stop Soc` trigger is valid only when a Conext Battery Monitor is installed. Use this trigger in systems with multiple battery banks.

The `Stop Soc` trigger uses SOC information broadcast by the inverter/chargers and charge controllers as an indicator of battery energy levels. SOC is often a better indicator than voltage because batteries at different voltages may be in different charge states.

Dependencies

Values	Default
50% to 95% (increments of 1%)	90%

Considerations For information about configuring systems with multiple battery banks, visit **www.SESolar.com**.

Cfg Gen Menu

The Generator Configuration menu (`Cfg Gen`) provides the means to customize the following settings if the generator being used doesn't conform to one of the preset generator types or if an exercise period needs to be scheduled.

The `Cfg Gen` menu contains the following items:

- Starter Cool Down (`Starter Cool Down`)
- Generator Cool Down (`Gen Cool Down`)
- Generator Spin Down (`Gen Spin Down`)
- Maximum Generator Run Time (`Max Run Time`)
- Exercise Period (`Exercise Per`)
- Exercise Duration (`Exercise Dur`)
- Exercise Time (`Exercise Time`)
- Relay 3 (`Relay3`)
- Generator Run Signal Hold Time (`Gen Run Hold Time`)
- Crank Delay (`Crank Delay`)
- Crank Time (`Crank Time`)
- Crank Retry Time (`Crank Retry Time`)
- Preheat Time (`Preheat Time`)
- Generator Start Tries (`Gen Start Tries`)

Starter Cool Down

Purpose

The `Starter Cool Down` setting allows an interval to be set between start attempts if the generator fails to start on the first attempt. This time period allows the start motor to cool sufficiently before the AGS signals it to begin cranking again.

Values	Default
1s to 250s (increments of 1s)	60s

When to use

This setting is automatically configured when a `Gen Type` is selected for the generator. Customize the `Starter Cool Down` trigger on the advice of the generator manufacturer or authorized service personnel.

Gen Cool Down

Purpose   The `Gen Cool Down` setting allows an interval to be set between a generator stop trigger occurring and the AGS actually stopping the generator. This setting is used in Conext system to unload the generator before the AGS shuts it down.

When a stop trigger occurs, the AGS enters a generator cool down state where it continues to run the generator for the specified time period. At the same time the Conext XW+ Inverter/Charger will disconnect the generator when it detects the AGS in Generator Cool Down, allowing the generator operate unloaded and cool down before it is shut down.

This helps improves reliability of the generator by reducing temperature peaking due to abrupt shut down of a loaded generator. It also reduces the probability of the generator backfiring that typically happens when the generator is abruptly shutdown while under heavy load. `Gen Cool Down` applies to all stop triggers namely `Stop V`, `Stop Load`, `Stop Float`, `Stop Absorb`, `Stop Load`, and `Manual Off`.

Values	Default
0s to 600s (increments of 1s)	30s

When to use   This setting is automatically configured when a "`Gen Type`" is selected for the generator. Customize the "`Gen Cool Down`" trigger on the advice of the generator manufacturer or authorized service personnel.

Gen Spin Down

Purpose The `Gen Spin Down` setting allows an interval to be set between a generator stop signal being sent at the end of a Gen Cool Down cycle and the AGS changing the Generator State to "stopped." This setting is used in the Conext system to allow the generator to completely stop, thereby reducing its output voltage to zero and pulling the B+ signal low before the Conext XW+ Inverter/Charger can qualify and transfer the generator.

This helps the system operate properly in cases where the generator does not immediately stop when the stop signal is sent to the AGS. `Gen Spin Down` applies to all stop triggers—`Stop V`, `Stop Load`, `Stop Float`, `Stop Absorb`, `Stop Load`, and `Manual Off`.

Values	Default
1s to 30 min (increments of 1s)	2 min

When to use This setting is automatically configured when a "`Gen Type`" is selected for the generator. Customize the "`Gen Spin Down`" trigger on the advice of the generator manufacturer or authorized service personnel.

Max Run Time

Full name Maximum Generator Run Time

Purpose `Max Run Time` allows a limit to be set on how long the generator will run. This setting overrides any automatic start triggers. For example, if the generator starts in response to low battery voltage, and the batteries are not fully charged before `Max Run Time` is reached, the generator will stop. In addition, when the generator is started manually from the SCP, the generator will stop when `Max Run Time` is reached.

When started with an external manual ON/OFF switch, the generator will not stop when it reaches `Max Run Time`. The generator must be stopped with the external manual ON/OFF switch, or by using the SCP to change the `GenMode` to `ManualOff`.

If the AGS reaches `Max Run Time`, a warning message will appear on the SCP. The AGS will stop operating until the warning is acknowledged by pressing **Enter** on the SCP.

Values	Default
0 hours to 24 hours (increments of 1hour)	8 hours

Considerations   Adjust the `Max Run Time` if the maximum generator run time:

- exceeds the fuel capacity of the generator, or
- is not long enough to fully recharge the batteries under optimum conditions.

Exercise Per

Full name   Set Exercise Period (in days).

Purpose   `Exercise Per` sets the minimum time interval between each running of the generator. If the generator has not been run within this time frame, the AGS will start the generator to "exercise" it. If the generator is started for any reason during the time frame, the exercise timer resets.

For example, if you set the exercise period to 30 days, the generator will start at the appropriate time if it has not been run at all for 30 days. However, if the generator started for any reason during that time, the timer resets to zero.

Dependencies   The `Exercise Per` trigger requires parameters to be set in the `Exercise Dur` and `Exercise Time` menu items.

Values	Default
0 (Off), 1day to 250days (increments of 1day)	21days

Considerations   Generators need to run regularly in order to maintain mechanical health and performance. If the generator isn't needed and doesn't run, it is recommended that an Exercise period be set to keep the generator in good working condition.

If the generator runs frequently throughout the year, it may not need to be exercised. In that case, set the `Exercise Per` trigger to 0.

Important: Consult the generator manual or a service representative from the generator's manufacturer for the recommended exercise period.

Exercise Dur

Full name   Exercise Duration (in minutes)

Purpose   `Exercise Dur` sets how long the generator will run when it is exercised.

Dependencies   The `Exercise Dur` trigger requires that any parameter other than "0" be set in `Exercise Per` and a time of day be set in the `Exercise Time` trigger.

Values	Default
1min to 250min	30min

Important: Ensure that the Exercise Duration is not set for longer than the `Max Run Time` setting. Attempting to do so will generate a warning on the System Control Panel.

Important: Consult the generator manual or a service representative from the generator's manufacturer for the recommended exercise duration.

Exercise Time

Purpose   `Exercise Time` sets the time of day that the AGS exercises the generator.

The `Exercise Time` trigger requires that any parameter other than "0" be set in `Exercise Per` and a value be set in the `Exercise Dur` trigger.

Values	Default
12:00AM to 11:50PM (12-hour clock)	9:00AM
00:00 to 23:50 (24-hour clock)	
(increments of 10 minutes)	

Considerations   If the `Exercise Time` is set, the generator will start at that time after being inactive for the exercise period. (`Exercise Per`).

If the `Exercise Time` occurs during Quiet Time (`QT`), the generator will start when Quiet Time is over and run for the full amount of time set for `Exercise Dur`.

Relay3

Purpose   `Relay3` sets the function of Relay 3 of the AGS. The function of Relay 3 affects contacts 19 and 20 of the 20-contact connector and external wiring harness.

Values	Default
NotUsed, Preheat, PreheatSDByp, WrmUpCoolDn	NotUsed

Considerations   Selecting a value for `Gen Type` automatically configures `Relay3`.

It might be necessary to manually set `Relay3` according to the make and type of generator being used.

Some diesel generators require preheating of their glow plugs before start cranking. Setting `Relay3` to Preheat enables Relay 3 to perform this function in addition to Relay 1.

Some generators require Relay 3 to switch 12 volts to the glow plugs, while some generators require ground to be switched to the glow plugs.

"PreheatSDByp" stands for Preheat with Shutdown Bypass. Some generators require preheat on relay 3 to remain high for crank time and shutdown bypass period. See "GlowStop Mode" on page C–4 for more details.

Gen Run Hold Time

Full name   Generator Run Signal Hold Time

Purpose   `Gen Run Hold Time` specifies the length of time the generator run signal (or B+ or hour meter signal) must be active before the AGS considers the generator to be running and cranking can be stopped.

Some generators assert their run signal when they are being cranked, but before they have started. They also have varying delays from when cranking begins or ends to when the run signal is asserted or unasserted. The `Gen Run Hold Time is` designed to accommodate these generators.

Values	Default
0.0s to 20.0s (increments of 0.5s)	0.5s

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

If the installation is made without a B+ connection, it might be necessary to adjust the `Gen Run Hold Time` for the AGS to successfully start the generator. When the B+ signal is not connected, the AGS requests generator status from the Inverter/Charger, which might take longer that if the B+ signal was connected.

Crank Delay

Purpose   `Crank Delay` specifies the delay time from when the preheat relay is de-energized to when the Start Relay is energized (and cranking the starter motor). This is also referred to as the preheat-to-crank delay.

Values	Default
0s to 60s	0s

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Crank Time

Purpose   `Crank Time` specifies the maximum length of time the Start relay is engaged (and cranking the starter motor) for the first attempt to start the generator.

Values	Default
0s to 250s (increments of 1s)	30s

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Crank Retry Time

Purpose   `Crank Retry Time` specifies the length of time the Start relay is engaged (and cranking the starter motor) for the second and subsequent attempts to start the generator, in cases when the generator fails to start on the first attempt.

Values	Default
0s to 250s (increments of 1s)	40s

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Preheat Time

Purpose   `Preheat Time` specifies how long the Preheat relay is engaged during the start sequence. The preheat signal may be required for diesel generators with glow plugs or fuel priming for gas generators.

The Preheat relay may be Relay 1 or Relay 3, depending on the `Relay3` setting or the Gen Type selected.

Values	Default
0s to 250s (increments of 1s)	0s

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Gen Start Tries

`Gen Start Tries` specifies how many times the AGS will attempt to start the generator. On the first start try, the AGS cranks the starter motor for the Crank Time. If the generator does not start, on subsequent start tries, the AGS cranks the start motor for the Crank Retry Time.

Values	Default
1 to 10	3

Considerations   This setting is automatically configured when a `Gen Type` is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Multi-unit Config

`Multi-unit Config` provides the means to identify multiple units within the same configuration.

Dev Name

The Device Name (`Dev Name`) menu item gives each Xanbus-enabled device a unique identifiable name. This makes each device easier to identify when multiple Xanbus-enabled devices are connected together. The default device name for the AGS is "`XW AGS`."

See the *Conext XW+ Inverter/Charger Owner's Guide* for additional information.

Dev Number

The Device Number (`Dev Number`), menu item gives each Xanbus-enabled device a unique identifiable number in addition to the name. This provides the means to use the same name, but different numbers for similar devices (such as XW AGS 01 and XW AGS 02).

See the *Conext XW+ Inverter/Charger Owner's Guide* for additional information.

Connections

The `Connections` menu item identifies the AC and DC input and output sources that affect or control the system (AGS). Start and stop triggers such as DC Voltage, charge stage, and AC load current, are related to these settings.

DC Conn   The DC Connection (`DC Conn`) must be set to match that of the Conext XW+ Inverter/Charger(s) in the system. This tells the AGS which battery bank to use for the charger based triggers. Configuration of this parameter is only necessary for systems with more than one Conext XW+ Inverter/Charger and more than one battery bank.

AC In   The `AC In` connection tells the AGS what other AC source or grid the Conext XW+ Inverter/Charger is connected to. The AGS uses this setting to stop the generator once the Conext XW+ Inverter/Charger transfers

from the generator to the grid or alternative AC source. Configuration of this parameter is only necessary for larger systems with multiple Conext XW+ Inverter/Chargers and multiple grid connections.

AC Out The `AC Out` connection tells the AGS what load to monitor for AC load triggers. Configuration of this parameter is only necessary for systems with more than one Conext XW+ Inverter/Charger.

Generator This generator name is used by the Conext XW+ to identify which generator is connected to either of the two AC inputs, AC1 or AC2. It is only necessary to change this setting in installations with more than one AGS in a system. In this case, the `Generator` name on each AGS will have to be unique.

For example, if a generator is connected to AC2 on an Conext XW+, the generator name (e.g., `Gen1`, `Gen2` etc.) selected for AC2 under `Connections` on the Conext XW+ must match the generator name assigned here.

See the *Conext XW+ Inverter/Charger Owner's Guide* for additional information.

Restore Defaults

The `Restore Defaults` menu item returns the AGS to the factory default settings.

GenMode

Purpose The `GenMode` menu item controls the current operating mode of the AGS.

Value	Description
Automatic	Automatic mode
ManualOn	Manual on mode
ManualOff	Manual off mode (default mode)

Considerations Use `GenMode` when it is necessary to switch between automatic generator control and manual generator control.

When the Xanbus network powers up all network-enabled devices, the AGS is in `ManualOff` mode. To enable automatic generator starts, the AGS must be put in "`Automatic`" mode.

Automatic Mode

To have the AGS start and stop the generator automatically, select `Automatic`. The generator can start and stop automatically in response to low battery voltage, SOC triggers, AC loads on the inverter, thermostat triggers, or exercise time. Automatic mode also has a Quiet Time feature, which prevents the generator from starting during evening hours or other inconvenient times (see "QT Begin" on page 3–11, "QT End" on page 3–12, and "Using Quiet Time" on page 4–4).

Automatic Mode Overrides

When the AGS is in Automatic mode, several settings and conditions override automatic start and stop triggers. These overrides include, in order of priority:

- Faults—The AGS stops the generator when a fault occurs.

- External Shutdown—When the AGS is connected to a sensor or meter (a moisture detector, for example) wired to contacts 5 and 6 of the 20-contact connector, it stops the generator when the device is activated. See "Connecting an External Shutdown (optional)" on page 2–27.

- External On/Off—The generator is manually started or stopped with a switch wired to contacts 7 and 8 of the 20-contact connector. See "Connecting an External Manual ON/OFF Switch (optional)" on page 2–27. When started with an external manual ON/OFF switch, the generator will not stop when it reaches Max Run Time. The generator must be stopped using the external manual ON/OFF switch.

- Max Run Time—When the generator has exceeded its maximum run time, a warning message will appear on the SCP. The AGS will stop operating until the warning is acknowledged by pressing **Enter** on the SCP. See "Max Run Time" on page 3–27.

- Manual On—The generator is started by selecting `Manual On` mode.

- Manual Off—The generator is stopped by selecting `Manual Off` mode.

Manual On Mode

Selecting `Manual On mode` overrides the automatic start settings and manually starts the generator. The generator will run until it is manually stopped or until it reaches its AGS-defined Maximum Run Time (see "Max Run Time" on page 3–27).

Manual Off Mode

Selecting `Manual Off` mode overrides the automatic stop settings and manually stops the generator. `Manual Off` must be selected to stop the generator when the generator has been started manually. The AGS will not automatically start the generator again until "`Automatic`" is selected in the `GenMode` menu.

Important: The `GenMode` mode must be set to `ManualOff` before any start trigger settings can be changed.

Mode

The `Mode` menu item is a device operating mode and provides the means to put the AGS in Standby mode or return it from to Operating mode.

The AGS mode must be set to `Standby` before selecting a generator type. Selecting `Standby` stops the generator (if it is running).

While in Standby, the AGS "listens" to and reports its status to the network. It will not start the generator manual or automatically while in Standby.

View Device Info Menu

The `View Device Info` menu provides a means to view the Fault, Warning and Event logs. It is also where the settings can be restored to factory default settings.

View Fault Log

Purpose   The `Fault Log` displays the last 20 AGS faults for reference to assist the user in troubleshooting problems.

When to use   Consult the `Fault Log` when troubleshooting or before seeking technical assistance.

View Warning Log

Purpose   The `Warning Log` displays the last 20 AGS warnings for reference.

When to use   Consult the `Warning Log` when troubleshooting or before seeking technical assistance.

View Event Log

Purpose   The `Event Log` displays the last 20 AGS events for reference. Events can include:

- Starting and stopping the generator.
- Trigger events. See Table 3-23 for a detailed list of trigger events.
- Changing the system mode.
- Changing the system clock.
- Commands to restore the default settings.

Table 3-23 Trigger Event Descriptions

Event Displayed	Description of Event Trigger
NotOn	Generator is not running
LowBattV	Preset minimum battery voltage with associated time delay
CntctClosed	Activated thermostat 1 or 2
ACIHigh	Preset maximum inverter load current
Exercise	Preset exercise period, exercise time, and exercise duration
ManualOn	Started manually using System Control Panel
ExtOnviaAGS	Started by external switch connected to AGS
ExtOnviaGen	Started by switch connected to generator
UnableToStop	AGS has lost control of the running generator

Recording User Settings

Use this table to record any customized AGS settings for future reference.

Table 3-24 Generator Configuration Settings, Values, Defaults, and User Settings

Setting	Values	Default	User Setting
Main Menu:			
GenMode	ManualOn, ManualOff, Automatic	ManualOff	
Mode	Operating/Standby	Operating	
Configuration Menu:			
QT En	Enabled, Disabled	Enabled	
QT Begin	12:00AM–11:59PM (12-hour clock) 00:00–23:59 (24-hour clock)	9:00PM (12-hour clock) 21:00 (24-hour clock)	
QT End	12:00AM–11:59PM (12-hour clock) 00:00–23:59 (24-hour clock)	8:00AM (12-hour clock) 8:00 (24-hour clock)	
Gen Type	Type 1 to Type 14	Type 2	
Triggers Menu:			
Start DCV 30 sec	Disabled, 4.0 V–65.0 V	44.5 V	
Start DCV 15 min	Disabled, 4.0 V–120.0 V	Disabled	
Start DCV 2 hr	Disabled, 4.0 V–120.0 V	Disabled	
Start DCV 24 hr	Disabled, 4.0 V–120.0 V	Disabled	
Stop Float	Enabled, Disabled	Disabled	
Stop Absorb	Enabled, Disabled	Enabled	
Stop V	Disabled, 4.0 V–65.0 V	Disabled	
Temp1	Enabled, Disabled	Disabled	
Temp2	Enabled, Disabled	Disabled	

Table 3-24 Generator Configuration Settings, Values, Defaults, and User Settings

Setting	Values	Default	User Setting
Load	Enabled, Disabled	Disabled	
Start Load	10.0 A–33.0 A	10.0 A	
Stop Load	7.0 A–28.0 A	7.0 A	
Load Start Delay	0.0s to 25s	5s	
Start Soc	40% to 90%	50%	
Stop Soc	50% to 95%	90%	
Generator Menu:			
Starter Cool Down	1s to 250s (increments of 1s)	60s	
Gen Cool Down	0s to 600 s (increments of 1s)	30s	
Gen Spin Down	1s to 900s (increments of 1s)	3s	
Max Run Time	0 hours–24 hours	8hours	
Exercise Per	0 days (Off)–250days	21days	
Exercise Dur	1 min–250min	30min	
Exercise Time	12:00AM–11:50PM (12-hour clock) 00:00–23:50 (24-hour clock)	9:00AM (12-hour clock) 9:00 (24-hour clock)	
Relay3	Preheat, WrmupCoolDn, Preheat SDByp, NotUsed	NotUsed	
Gen Run Hold Time	0s to 20s (increments of 1s)	0.5s	
Crank Delay	0s to 60s (increments of 1s)	0s	
Crank Time	0s to 250s (increments of 1s)	30s	
Crank Retry Time	0s to 250s (increments of 1s)	40s	
Preheat Time	0s to 250s (increments of 1s)	0s	
Gen Start Tries	1 to 10	3	

Table 3-24 Generator Configuration Settings, Values, Defaults, and User Settings

Setting	Values	Default	User Setting
Multi-Unit Configuration:			
Dev Name	1-15 characters	AGS	
Dev Number	00 to 31	00	
Connections:			
DC Conn	None, HouseBatt1 to 6, StartBatt1 to 6	HouseBatt1	
AC In	None, Grid1to 10, Gen1 to 10	Grid1	
AC Out	None, ACLoad1 to 10	ACLoad1	
Generator	Gen1 to 10	Gen1	

4

Operation

Chapter 4, "Operation" describes the operation of the AGS and how to get the most from its features.

It includes:
- Accessing the AGS Home Screen
- Starting and Stopping the Generator
- Using Quiet Time
- Modes of Operation

Accessing the AGS Home Screen

Use the AGS `Home` screen to view the operational status information for the generator. The AGS `Home` screen displays the generator start settings (off, on or automatic), the generator state (running or stopped), the stop trigger, and the generator signal.

To display the AGS Home Screen:

1. Start from the `System Status` screen.

2. Press the down arrow button until the AGS `Home` screen is displayed.

3. Use the arrow buttons to scroll through the current settings.

4. Press the **Exit** button to return to the `System Status` screen.
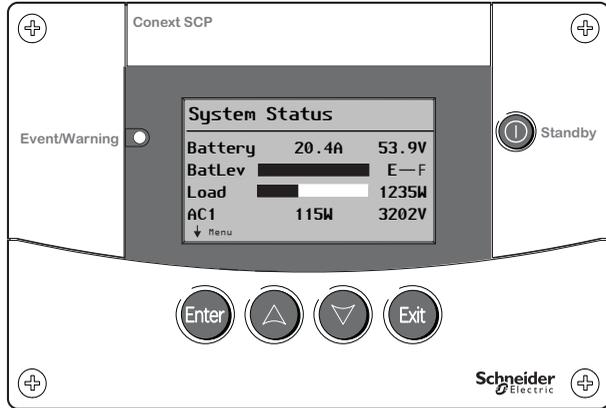
Important:

The AGS `Home` screen is view only. To change operational settings, use the AGS `Setup` menu. See "Starting and Stopping the Generator" on page 4–3
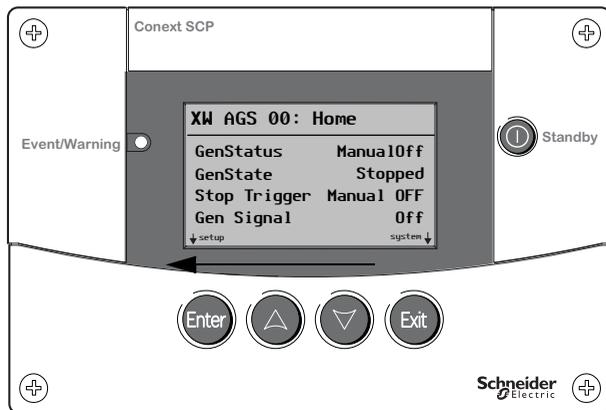
Figure 4-1 AGS Home Screen

Starting and Stopping the Generator

Through the SCP, you can program the AGS to start or stop the generator manually or automatically in response to an electrical system condition.

To start and stop the generator automatically:

1. On the AGS `Setup` menu, highlight `GenMode` and press **Enter**.
2. Use the arrow button to highlight `Automatic`.
3. Press **Enter**.

To start the generator manually:

1. On the AGS `Setup` menu, highlight `GenMode` and press **Enter**.
2. Use the arrow button to select `ManualOn`.
3. Press **Enter**.

To stop the generator manually:

1. On the AGS `Setup` menu, highlight `GenMode` and press **Enter**.
2. Use the arrow button to select `ManualOff`.
3. Press **Enter**.

Important: To avoid AGS faults, try not to combine automatic and external manual starts and stops.

When the generator has been started automatically, allow it to stop automatically unless a situation occurs that requires the generator to be stopped urgently.

Likewise, if the generator has been started manually, ensure that it is stopped manually. Only the `Max Run Time` setting can automatically stop the generator after it has been started manually.

System Status Screen   Select Device Menu   AGS Setup Menu
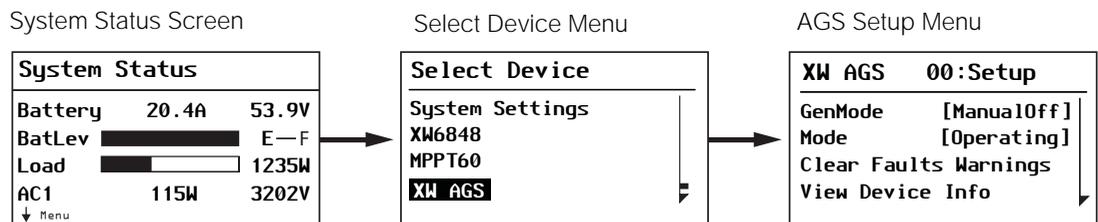
Figure 4-2 Starting and Stopping the Generator

Using Quiet Time

Use the Quiet Time feature to ensure that the AGS will not start the generator during the night or during times that conflict with local noise restrictions.

Using Quiet Time involves configuring three settings:

- `QT En` must be set to `Enabled`. The default setting is `Enabled`.
- `QT Begin` must have an appropriate time set for Quiet Time to start on schedule. The default setting for `QT Begin` is [9:00 PM] or 21:00 if using a 24-hour clock.
- `QT End` must have an appropriate time set for Quiet Time to stop on schedule. The default setting for `QT End` is [8:00 AM] or 8:00 on the 24-hour clock.

For more information about Quiet Time settings, see "QT En" on page 3–10, "QT Begin" on page 3–11, and "QT End" on page 3–12.

System Home Screen   Select Device Menu   AGS Setup Menu   Quiet Time Settings
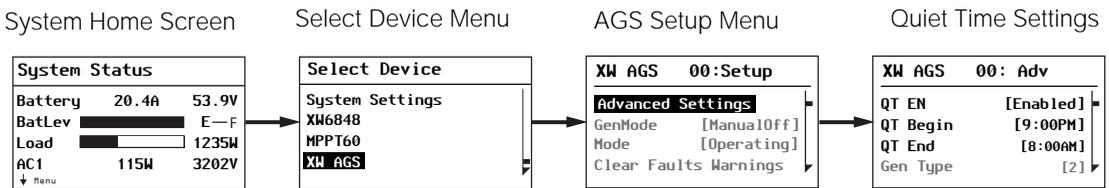
Figure 4-3 Using the Quiet Time Feature

To enable Quiet Time:

1. On the `Advanced Settings` menu, use the arrow buttons to highlight `QT En`.
2. Press **Enter**.
3. Use the arrow buttons to select `Enabled`.
4. Press **Enter**.

To set the beginning of Quiet Time:

1. On the `Advanced Settings` menu, use the arrow buttons to highlight `QT Begin`, then press **Enter**.
2. Use the arrow buttons to select the hour, then press **Enter**.
3. Use the arrow buttons to select the minutes, then press **Enter**. If the 24-hour clock is being used, go to step 5.

4. Use the arrow buttons to select `AM` or `PM`, then press **Enter**.

5. Press **Exit** twice to return to the `System Status` screen.

To set the end of Quiet Time:

1. On the `Advanced Settings` menu, use the arrow buttons to highlight `QT End`, then press **Enter**.

2. Use the arrow buttons to select the hour, then press **Enter**.

3. Use the arrow buttons to select the minute, then press **Enter**. If the 24-hour clock is being used, go to step 5.

4. Use the arrow buttons to select `AM` or `PM`, then press **Enter**.

5. Press **Exit** twice to return to the `System Status` screen.

Modes of Operation

The AGS supports two modes, Operating and Standby. The AGS mode of operation must be set to `Standby` before selecting a Generator Type. Selecting `Standby` stops the generator (if it is running).

While in Standby, the AGS listens to and reports its status to the network. However, it will not start the generator manually or automatically while in Standby.

If the AGS is powered off while in Standby, it will be in Standby when it is powered on again.

The AGS can also be put in System Mode Standby from the `System Settings` menu. Note that system settings affect the behavior of the entire Conext system.

To put every Xanbus-enabled device, including the AGS, into System Mode Standby, press **Enter** in the `System Status` screen, highlight `System Settings` and press **Enter**, highlight `System Mode` and press **Enter**, and then select `Standby`.

Important: If AGS Fault 201 "Unable to stop gen." is active, the AGS cannot be put into Standby. Before Standby can be established, the generator must be stopped by its external switch and the fault must be cleared.

Placing the AGS in Standby Mode

To place the AGS in Standby mode:

1. In the `System Status` screen, press **Enter**.
2. Use the arrow buttons to highlight AGS and press **Enter**.
3. Highlight `Mode` and press **Enter**.
4. Use the arrow buttons to change the setting from `Operating` to `Standby`, and then press **Enter**.

System Home Screen   Select Device Menu   AGS Setup Menus

```
System Status
Battery    20.4A    53.9V
BatLev  ▮▮▮▮▮▮▮      E—F
Load    ▮▮▮▮▮▯      1235W
AC1       115W     3202V
 ↓ Menu
```
```
Select Device
System Settings
XW6848
MPPT60
XW AGS
```
```
XW AGS    00:Setup
GenMode     [ManualOff]
Mode        [Operating]
Clear Faults Warnings
View Device Info
```
```
XW AGS    00:Setup
GenMode     [ManualOff]
Mode        [Standby]
Clear Faults Warnings
View Device Info
```
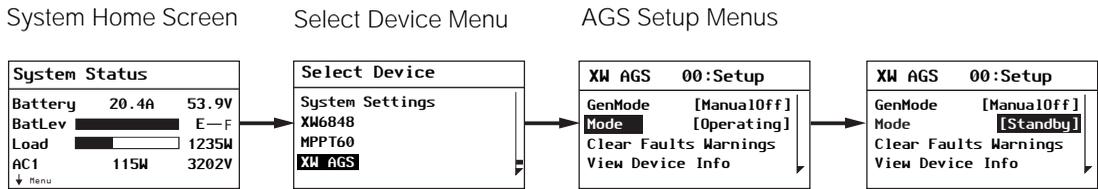
Figure 4-4 Putting the AGS in Standby Mode

Placing the AGS in Operating Mode

To return the AGS from Standby to Operating mode:

1. In the `System Status` screen, press **Enter**.
2. Use the arrow buttons to highlight `AGS`. Press **Enter**.
3. Highlight `Mode` and press **Enter**.
4. Use the arrow buttons to change the setting to `Operating`, and then press **Enter**.

System Home Screen   Select Device Menu   AGS Setup Menu

```
System Status
Battery    20.4A    53.9V
BatLev  ▮▮▮▮▮▮▮      E—F
Load    ▮▮▮▮▮▯      1235W
AC1       115W     3202V
 ↓ Menu
```
```
Select Device
System Settings
XW****
MPPT60
XW AGS
```
```
XW AGS    00:Setup
GenMode     [ManualOff]
Mode        [Standby]
Clear Faults Warnings
View Device Info
```
```
XW AGS    00:Setup
GenMode     [ManualOff]
Mode        [Operating]
Clear Faults Warnings
View Device Info
```
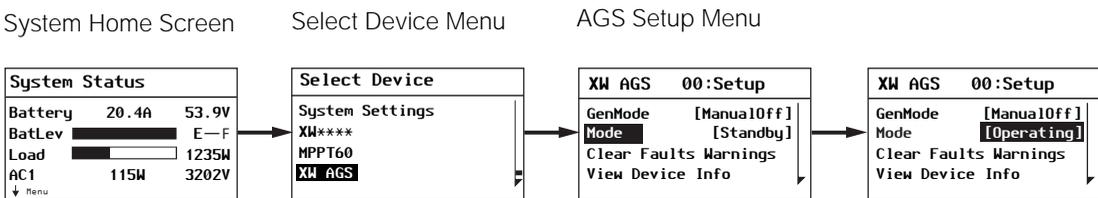
Figure 4-5 Returning the AGS to Operating Mode

5

Troubleshooting

Chapter 5, "Troubleshooting"
contains information and procedures
to troubleshoot the Conext
Automatic Generator Start.

It includes:
- Faults and Warnings
- Warning Messages
- Fault Messages

Faults and Warnings

Under certain conditions, the AGS generates a fault or warning message. These messages appear on the Conext System Control Panel (SCP).

Acknowledging messages

When a fault or warning message appears, it will remain on the screen until it is acknowledged by pressing **Enter** on the SCP. This action removes the message from the screen, but does not clear the condition that caused the fault or warning.

Consult Table 5-1 and Table 5-2 for recommendations for resolving the fault after it has been acknowledged.

Warnings that are in the form of a Yes/No question can be acknowledged by pressing **Enter** for Yes and **Exit** for No.

Self-clearing warnings

If unacknowledged, some warnings may clear themselves if the condition that generated the message goes away. For example, if the AGS fails to start the generator, warning message W202 appears. However, if the generator starts on the next start try, the message goes away.

Clearing faults

To clear active AGS faults, highlight `Clear Faults` on the `AGS Setup` menu and press **Enter**.

Multiple faults and warnings

If several fault or warning messages occur before they can be acknowledged or cleared, they are displayed together on a fault list or a warning list. These lists contain messages from every Xanbus-enabled device, not just the AGS. Message details can be selected and viewed from the fault list or warning list.

To view a message from a fault list or warning list:

1. On the list, use the arrow buttons to highlight the message to be viewed.
2. Press **Enter**. The complete message appears.

To return to the fault list or warning list, press **Exit**. To continue to the menu for the device that caused the fault or warning condition by pressing **Exit**.

Each time you return to the list after viewing a complete message, the viewed message is removed from the list.

If you have left the fault list or warning list, you can view them at any time from the `System Settings` menu.

To view a fault list or warning list:

1. On the `Select Device` menu, highlight `System` and press **Enter**.
2. On the `System Settings` menu, highlight `View Fault List` or `View Warning List`.
3. Press **Enter**.

Warning Messages

Table 5-1 provides details and suggests action for AGS warnings.

Table 5-1 AGS Warning Messages

Warning Number	Message	Self-clearing?	Cause	Action
W200	Generator was stopped manually.	No	Generator was stopped by an external Manual Off switch.	Acknowledge the warning. To resume automatic starts and stops, change the AGS mode to `Automatic`.
W201	Generator was started manually.	No	Generator was started by an external Manual On switch	Acknowledge the warning. To resume automatic starts and stops, change the AGS mode to `Automatic`.
W202	Unable to start generator. AGS will try again.	Yes	The AGS tried, but could not start the generator.	No action required. The AGS will try to start the generator again until it reaches the maximum number of start tries.
W203	Manual Off: Max generator run time reached. Reset GenMode.	No	The generator has run for its maximum allowable time. The AGS has stopped the generator and changed the `GenMode` option to `ManualOff`.	Acknowledge the warning. Return the AGS to the desired `GenMode` option (`Automatic` or `ManualOn`). Ensure generator has fuel and is supplying the required power for battery charging and loads.

Table 5-1 AGS Warning Messages(Continued)

Warning Number	Message	Self-clearing?	Cause	Action
W205	Generator started by its switch. Use its switch to stop.	Yes	The generator was started, but not by the AGS.	Check your generator. Stop it using the switch or control panel on the generator.
W206	Mismatched triggers. Enable stop trigger or disable start trigger.	No	You have set a start trigger, but not a corresponding stop trigger.	Acknowledge warning and set a stop trigger.
W207	Mismatched triggers. Enable start trigger or disable stop trigger.	No	You have set a stop trigger, but not a corresponding start trigger.	Acknowledge warning and set a start trigger.
W208	Automatic start and stop triggers not enabled. Configure triggers.	No	You are attempting to enter Automatic Mode without setting triggers.	Acknowledge warning and set start and stop triggers.
W209	Gen external stop. Start gen via its control panel.	Yes	The generator has stopped, but not by the AGS. The generator may have run out of gas, or may have been shut off by a switch on the generator.	Check the generator's fuel level and mechanical condition, then start the generator manually (using the switch or control panel on the generator) to clear the warning.

Table 5-1 AGS Warning Messages(Continued)

Warning Number	Message	Self-clearing?	Cause	Action
W250	The selected value failed to change. Try again.	No	You have tried to change the Gen Type without putting the system into Standby first.	Put the system into Standby, change the Gen Type, then return the system to `Operating` mode.
			You have tried to set the `Exercise Dur` for longer than `Max Run Time`, or `Max Run Time` for less than `Exercise Dur`.	Ensure that `Max Run Time` is set for longer than `Exercise Dur`.
W500	Network connection lost. Check connections.	Yes	The AGS has lost communications with the network because of a faulty connection or electronic signal disruption.	Check connection between the AGS and the network.
W501	AGS has fixed memory problem and restored default settings.	No	The AGS encountered an internal memory problem upon startup. To remain operational, the AGS restored its default settings.	Acknowledge the warning and reset configurable settings if necessary.

Fault Messages

When the AGS detects a fault condition, it stops the generator. The red Fault light also comes on, and the SCP displays a fault message.

The AGS remembers the GenMode that it was in at the time it detected the fault. After you have cleared the fault, the AGS returns to its last known GenMode.

Table 5-2 AGS Fault Messages

Fault Number	Message	Self-clearing?	Cause	Action
F200	Exceeded max number of start tries. Check gen, clear fault.	No	The AGS has tried and failed to start the generator. To prevent draining the start battery, the AGS will suspend further start attempts.	Check the generator's fuel level and start battery condition. Consult generator manual. Clear the fault on the SCP to allow retry.
F201	Unable to stop gen. Stop gen via its control panel.	No	The AGS has lost contact with the generator or the generator did not stop after the AGS sent it a stop signal.	Change the AGS mode to `ManualOff`. If this fails to work, stop the generator with the external stop switch. Check generator. Return AGS to automatic mode to resume automatic starts and stops.
F203	Manual Off: Gen stopped by ext sensor. Reset GenMode.	No	An external sensor connected to the AGS has stopped the generator and put the AGS into Manual Off mode.	After the sensor connected to the external shutdown has deactivated, clear the fault and reset the AGS to the desired mode.

Table 5-2 AGS Fault Messages

Fault Number	Message	Self-clearing?	Cause	Action
F500	Serial Number Failure, Service Required.	No	The silicon serial ID number has failed and the AGS has gone into Standby.	Call your dealer or Schneider Electric.
F501	Memory Failure. Service Required.	No	The AGS has suffered a non-volatile memory failure.	Call your dealer or Schneider Electric.
F505	Internal Failure. Service Required.	No	A controller fault has occurred and the AGS has gone into Standby.	Clear the fault. If the fault persists, call your dealer or Schneider Electric.

A Specifications

Appendix A contains the electrical, mechanical, and environmental specifications for the Conext Automatic Generator Start.

It includes:

- Electrical Specifications
- Mechanical Specifications
- Environmental Specifications
- Regulatory Compliance

All specifications are subject to change without notice.

Electrical Specifications

Nominal input network voltage	15 VDC
Maximum operating current	200 mA @ nominal input network voltage
Relay contact voltage rating	12 VDC, 30 VDC max.*
Maximum relay contact current	5 A DC*
Nominal 12/24 V thermostat input voltage	12 VDC/24 VDC* = On
Minimum 12/24 V thermostat input voltage	9.5 VDC*
Maximum 12/24 V thermostat input voltage	30 VDC*
Typical 12/24 V thermostat input current	14.6 mA @ 12 V
Nominal 12/24 V generator running B+ voltage	12 VDC/24 VDC*= On
Minimum 12/24 V generator running B+ voltage	9.5 VDC*
Maximum 12/24 V generator running B+ voltage	30 VDC*
Typical 12/24 V generator running B+ current	14.6 mA @ 12 V
Communication physical layer	2, CAN
Communication protocol	Xanbus
Maximum cable length	130 ft. (40 m)

*Limited to Class 2 levels (100 VA) as in Chapter 2, page 2–6.

Mechanical Specifications

Dimensions	3 ¾ × 5 ¾ x 1 ½" (95.5 × 146 × 37 mm)
Weight	0.5 lb. (225 g)
Mounting	4 × #6 screws (or M3)
Connectors	2 × Xanbus: RJ-45—8 pins 1 × 20-contact pluggable connector (Tyco Mate'n' Lok 2 connector)
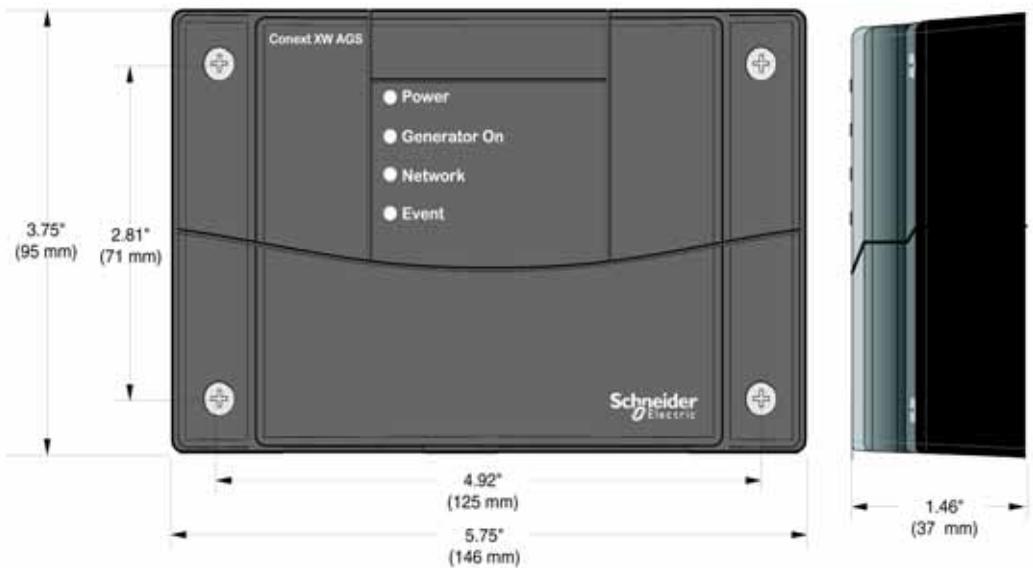
Figure A-6 AGS Dimensions

Environmental Specifications

Operating temperature	-20 to 50°C (-4 to 122°F)
Storage temperature	-40 to 85°C (-40 to 185°F)
Maximum case temperature	60°C (140°F)
Operating humidity	5 to 95%
Storage humidity	5 to 95%
Ignition protection	None

Regulatory Compliance

Safety	CSA certified to CSA107.1-01 and UL 458 4th Ed. including the Marine Supplement
EMC	FCC part 15B Class B
	Industry Canada ICES-0003 Class B
CE Marked under the EMC Directive 2004/108/EC	Complies with the following:
	EN61000-6-1:2007 Generic standards - Immunity for residential, commercial and light industrial environments
	EN61000-6-3:2007 Generic standards - Emissions for residential, commercial and light industrial environments

B

Generator Auto Start Requirements and Types

Appendix B describes the generator requirements and starting types that can be used with the Conext Automatic Generator Start.

It includes:
- Recommended Features
- Generator Starting Types

Recommended Features

In order for the generator to be automatically started by the Conext Automatic Generator Start (AGS), it must include electric start and an automatic choke. An automatic primer system may also be required on natural gas and propane powered generators.

The generator should also include remote start ability with accessible remote start terminals or a connector. Protective systems for low oil pressure, over temperature, starter lockout and over crank control are valuable features that will prevent generator damage and increase system reliability. "Two-wire" start generators are highly recommended because of the greater simplicity for automatic starting and because they are intended for remote/automatic/unattended operation.

Generator Starting Types

The AGS supports three major generator starting types:

- Two wire
- Three-wire "Onan"
- Three-wire automotive

Note: The terms "two-wire" and "three-wire" refer only to the minimum number of wires necessary to start the generator. Actual installations will require additional wires to connect to the generator, including the generator run signal (switched B+) wiring, and wiring to an optional external ON/OFF switch. For installation wiring diagrams, see page 2–11 to page 2–25.

Note: For overcurrent protection guidelines that apply to the wiring types discussed in this appendix, see page 2–5.

Two Wire

The two-wire type is suitable for generators that are fully automatic. This merely requires two wires to be connected together for the generator to start and run. Separating the wires stops the generator.

Some generators use a momentary two-wire connection for starting and stopping.

Identification

Generators of this type are usually operated with a simple toggle switch or key that turns to on, then off to shut the generator off.

Connection

For this type of generator, the two wires are connected to the normally open and common contacts of Relay 1 (wires 14 and 16). When the AGS receives a command to start the generator, it closes the contacts inside Relay 1, allowing the generator to start. The contacts remain closed for the duration of the generator run and open when the AGS needs the generator to stop.

Three-Wire Onan

The three-wire "Onan" starting type is suitable for generators that are not as automated as the two-wire type. It requires a minimum of three wires: a common wire, a start wire and a stop wire. You may also need to connect the glow plug wires to Relay 1 (wire 14) or Relay 3 (wire 19). If the generator requires independent control of the glow plugs, power may also need to be run to Relay 3 (wire 20).

Identification

Generators of this type are controlled with a three-position switch that is normally in a center (or neutral) position. To start the generator, the switch is pressed and held to the start position until the generator starts. The switch is then released, and it returns to the center position. To stop the generator, the switch is pressed and held to the stop position until the generator stops. Again, releasing the switch returns it to the center position.

Connection

The common wire from the generator should connect to the common connections of both Relay 1 and Relay 2 (wires 16 and 18 respectively). The start wire from the generator connects to the normally open contact of Relay 2 and the generator stop wire connects to the normally open contact of Relay 1.

Three-Wire Automotive

The third generator starting type that is supported by the AGS is similar to an automotive-style ignition. In this style, the generator uses a run circuit that is normally closed, which then receives a momentary start signal. The run circuit remains active throughout the run and then is opened in order for the generator to stop.

Identification

Generators of this type are controlled by a key or rotary switch that acts exactly as an automotive ignition. The switch is first turned to an "on" (or run) position, then further to a start position. After starting, the switch returns to the "on" (or run) position. Other variations are a toggle switch that gets turned on with a separate switch or push button for start. If glow plugs are used, you would turn the key or rotary switch to the left prior to starting. A separate momentary switch or button may be used for this purpose.

Connection

This generator starting type uses the most wires. The common wire from the generator should connect to the common connections of both Relay 1 and Relay 2 (wires 16 and 18 respectively). You may need an additional two wires if glow plugs are used. The start wire from the generator connects to the normally open contact of Relay 2 and the generator stop wire connects to the normally open contact of Relay 1.

C

Relay Timing

Appendix C contains information about relay configuration and timing for each major type of AGS starting mode. This information applies to each of the generator types described from page 2–11 to page 2–25.

It includes:
- RunMode
- Momentary RunMode
- GlowStop Mode
- StartStop Mode
- PulseStop Mode

RunMode

For generators with RunMode starting types (Types 7, 8, and 14):

- Relay 1 (RunStop relay) can be used for two-wire configured generators.
- Relay 1 (RunStop) and Relay 2 (Start) can be used with a common ground for three-wire configured generators.
- The Preheat will never overlap the Crank Time.
- The "Delay" refers to the "Preheat to Crank Delay" and may be zero.
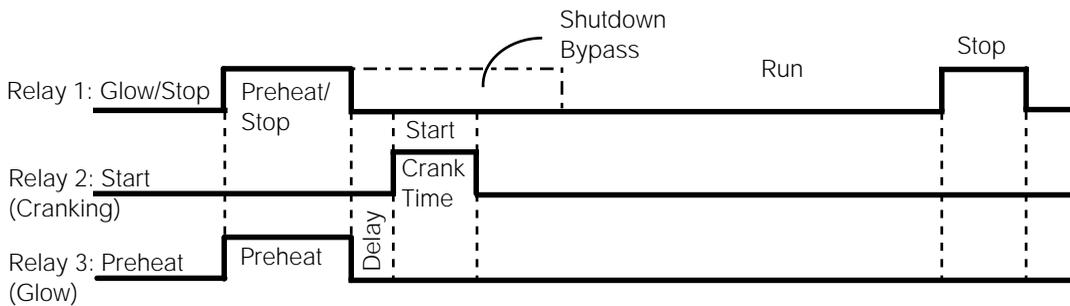- Cranking will cease when the generator run signal goes high for the specified hold time or when the crank time has elapsed.
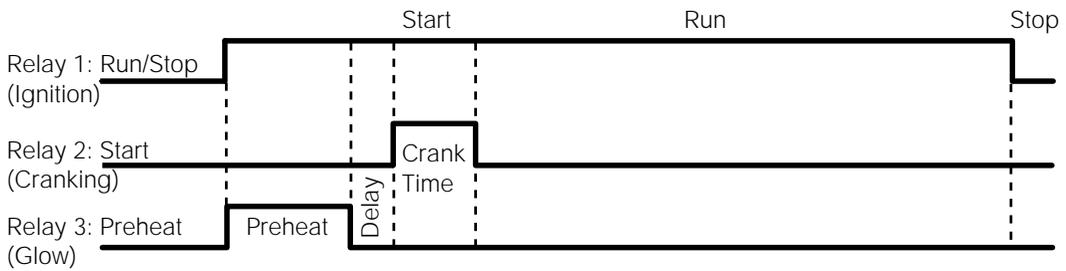
Figure C-7 RunMode Timing Diagram

MomentaryRun Mode

For generators with MomentaryRun mode starting types (Type 11):

- Relay 1 (Run/Stop relay) can be used for two-wire configured generators.
- Relay 2 has no unique function in this configuration, but it is easiest to leave it doing the cranking so that another configuration is not required for it.
- Preheat will generally not be used in this configuration.
- The Preheat will never overlap the Crank Time.
- The "Delay" refers to the "Preheat to Crank Delay" and may be zero.
- Cranking will cease when the generator run signal goes high for the specified hold time or when the crank time has elapsed.
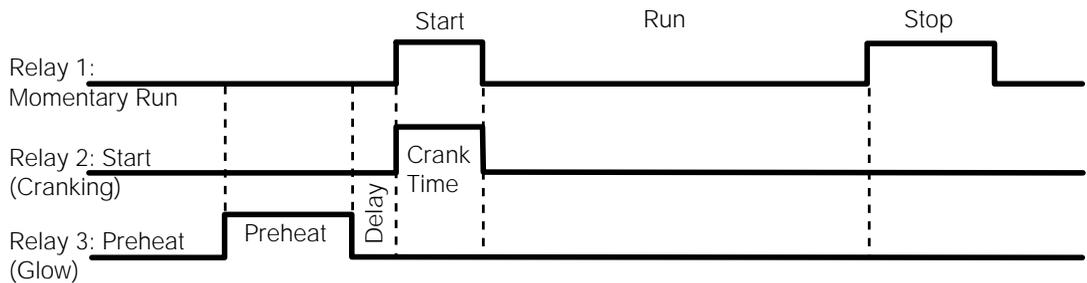
Figure C-8 MomentaryRun Mode Timing Diagram

GlowStop Mode

For generators with GlowStop mode starting types (Types 1, 2, 3, 6, 12):

- Relay 1 (Stop) and Relay 2 (Start) can be used with a common ground for three-wire configured generators.

- The Preheat signal shows up on Relay 1 and also Relay 3 (if enabled) so that Relay 1 can be used for both Preheat and Stop.

- If the ShutDown Bypass is enabled, the Preheat on Relay 1 will remain high for the Crank Time and for the ShutDown Bypass period after cranking.

- The Preheat on Relay 3 will only overlap the Crank Time and perform ShutDown Bypass if Relay 3 is configured for Preheat with ShutDown Bypass.

- The "Delay" refers to the "Preheat to Crank Delay" and may be zero.

- Cranking will cease when the generator run signal goes high for the specified hold time or when the crank time has elapsed.

Figure C-9 GlowStop Mode Timing Diagram

StartStop Mode

For generators with StartStop mode starting types (Types 4, 5, 9, 10):

- Relay 1 (Stop) and Relay 2 (Start) can be used with a common ground for three-wire configured generators.

- If Relay 3 is configured for preheat, the signal only shows up on Relay 3.

- The Preheat on Relay 3 will not overlap the Crank Time if ShutDown Bypass is not enabled.

- If the ShutDown Bypass is enabled, the Preheat on Relay 3 will remain high for the Crank Time and for the ShutDown Bypass period after cranking.

- The "Delay" refers to the "Preheat to Crank Delay" and may be zero.

- Cranking will cease when the generator run signal goes high for the specified hold time or when the crank time has elapsed.

- To get the ShutDown Bypass on Relay 3 with no preheat, Relay 3 must be configured for Preheat with ShutDown Bypass and have the Preheat time set to zero.

- StartStop mode is essentially the same as GlowStop mode with no preheat on Relay 1.
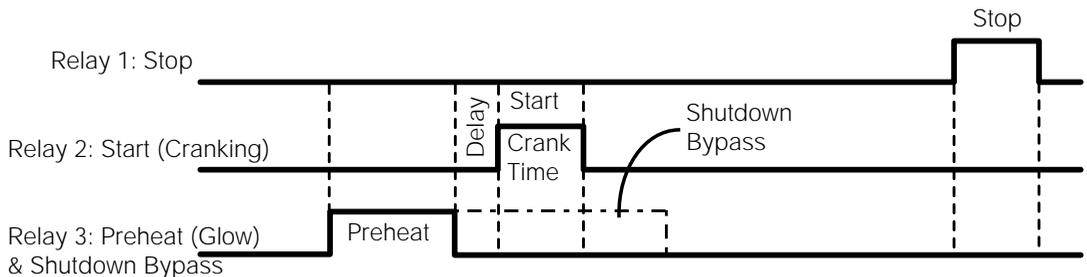
Figure C-10 StartStop Mode Timing Diagram

PulseStop Mode

For generators with PulseStop mode starting types (Type 13):

- Relay 1 (Stop) and Relay 2 (Start) can be used with a common ground for three-wire configured generators.
- If Relay 3 is configured for Preheat, the signal only shows up on Relay 3.
- The Preheat on Relay 3 will not overlap the Crank Time if ShutDown Bypass is not enabled.
- If the ShutDown Bypass is enabled, the Preheat on Relay 3 will remain high for the Crank Time and for the ShutDown Bypass period after cranking.
- The "Delay" refers to the "Preheat to Crank Delay" and may be zero.
- Cranking will cease when the generator run signal goes high for the specified hold time or when the crank time has elapsed.
- To get the ShutDown Bypass on Relay 3 with no preheat, Relay 3 must be configured for Preheat with ShutDown Bypass and have the Preheat time set to zero.
- The AGS will make three attempts to stop the generator. If the generator has still not stopped at the end of the third attempt, the appropriate Fault will be generated.
- Each stop attempt will consist of engaging the stop relay for 5 seconds and then waiting 20 seconds before checking the state of the Gen Run Signal to see if the stop attempt was successful.
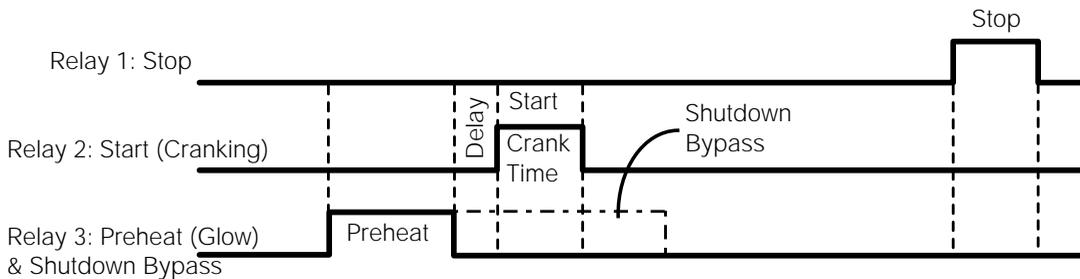
Figure C-11 PulseStop Mode Timing Diagram
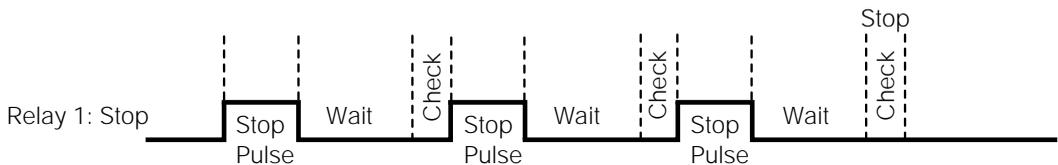
Figure C-12 PulseStop Mode Relay 1 Behavior

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