

Operation

Residential/Commercial Generator Sets



OnCue® Plus

Generator Management System
for Kohler® Residential/Light Commercial Generator Sets
equipped with the following controllers:

RDC/DC
RDC2/DC2
VSC

KOHLER®
Power Systems _____

9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED

TP-6928 1/14

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Safety Precautions and Instructions

IMPORTANT SAFETY INSTRUCTIONS. Electromechanical equipment, including generator sets and accessories, can cause bodily harm and pose life-threatening danger when improperly installed, operated, or maintained. To prevent accidents be aware of potential dangers and act safely. Read and follow all safety precautions and instructions. **SAVE THESE INSTRUCTIONS.**

This manual has several types of safety precautions and instructions: Danger, Warning, Caution, and Notice.

DANGER

Danger indicates the presence of a hazard that **will cause severe personal injury, death, or substantial property damage.**

WARNING

Warning indicates the presence of a hazard that **can cause severe personal injury, death, or substantial property damage.**

CAUTION

Caution indicates the presence of a hazard that **will or can cause minor personal injury or property damage.**

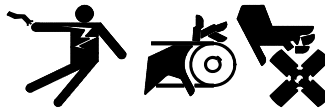
NOTICE

Notice communicates installation, operation, or maintenance information that is safety related but not hazard related.

Safety decals affixed to the equipment in prominent places alert the operator or service technician to potential hazards and explain how to act safely. The decals are shown throughout this publication to improve operator recognition. Replace missing or damaged decals.

Accidental Starting

WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set.
Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

Hazardous Voltage/ Moving Parts

DANGER



Hazardous voltage.
Will cause severe injury or death.

Disconnect all power sources before opening the enclosure.

Short circuits. **Hazardous voltage/current can cause severe injury or death.** Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove all jewelry before servicing the equipment.

NOTICE

Electrostatic discharge damage. Electrostatic discharge (ESD) damages electronic circuit boards. Prevent electrostatic discharge damage by wearing an approved grounding wrist strap when handling electronic circuit boards or integrated circuits. An approved grounding wrist strap provides a high resistance (about 1 megohm), *not a direct short*, to ground.

Notes

This manual provides operation instructions for the OnCue® Plus Generator Management System. OnCue Plus is a web application that does not require the installation of software on your computer. OnCue Plus allows remote monitoring and control of your generator set using a computer, tablet, or smart phone from any location that provides web access.

OnCue Plus applies to Kohler® Residential and Light Commercial generator sets equipped with the following controllers:

- RDC/DC
- RDC2/DC2
- VSC

Note: The RDC2, DC2, and VSC controllers require an activation code, which is supplied with the OnCue Plus kit.

Note: The RDC and DC controllers must be equipped with the Ethernet option board kit GM62465-KP1. See TT-1566, provided with the kit, for installation instructions.

Information in this publication represents data available at the time of print. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

Read this manual and carefully follow all procedures and safety precautions to ensure proper equipment operation and to avoid bodily injury. Read and follow the Safety Precautions and Instructions section at the beginning of this manual. Keep this manual with the equipment for future reference.

List of Related Literature

Figure 1 lists related literature.

Literature Type	Part Number
OnCue Plus Specification Sheet	G6-140
Ethernet Option Board Installation Instructions (RDC/DC only)	TT-1566

Figure 1 Related Literature

Service Assistance

For professional advice on generator set power requirements and conscientious service, please contact your nearest Kohler distributor or dealer.

- Consult the Yellow Pages under the heading Generators—Electric.
- Visit the Kohler Power Systems website at KOHLERPower.com.
- Look at the labels and stickers on your Kohler product or review the appropriate literature or documents included with the product.
- Call toll free in the US and Canada 1-800-544-2444.
- Outside the US and Canada, call the nearest regional office.

Headquarters Europe, Middle East, Africa (EMEA)

Kohler Power Systems Netherlands B.V.
Kristallaan 1
4761 ZC Zevenbergen
The Netherlands
Phone: (31) 168 331630
Fax: (31) 168 331631

Asia Pacific

Power Systems Asia Pacific Regional Office
Singapore, Republic of Singapore
Phone: (65) 6264-6422
Fax: (65) 6264-6455

China

North China Regional Office, Beijing
Phone: (86) 10 6518 7950
(86) 10 6518 7951
(86) 10 6518 7952
Fax: (86) 10 6518 7955

East China Regional Office, Shanghai
Phone: (86) 21 6288 0500
Fax: (86) 21 6288 0550

India, Bangladesh, Sri Lanka

India Regional Office
Bangalore, India
Phone: (91) 80 3366208
(91) 80 3366231
Fax: (91) 80 3315972

Japan, Korea

North Asia Regional Office
Tokyo, Japan
Phone: (813) 3440-4515
Fax: (813) 3440-2727

Latin America

Latin America Regional Office
Lakeland, Florida, USA
Phone: (863) 619-7568
Fax: (863) 701-7131

Section 1 System Information and Installation

1.1 Kohler OnCue Plus

A device such as a personal computer (PC), smart phone, or tablet running the Kohler® OnCue® Plus application can communicate with the generator set models listed in the Introduction section to monitor the generator set from any location with Internet access. You can also use your device to signal the generator set controller to start or stop the engine or to reset a fault.

Once OnCue Plus has been purchased and activated for a specific generator set, that generator can be monitored from multiple devices and locations. The Kohler OnCue Plus application can be used on one or more personal computers (PCs), smart phones, or tablets, allowing monitoring and control of your Kohler generator set from any location with Internet access. Use OnCue Plus to monitor your generator set from home, at work, or on vacation. The generator serial number, controller password, and OnCue Plus account password provide security and prevent unauthorized access to your generator set.

OnCue Plus also provides the ability to automatically send email or text messages to notify selected recipients of generator set activity and faults, maintenance reminders, and storm warnings.

1.1.1 Mobile Apps

OnCue Plus for iPhone®, iPad® and Android™ devices is available on the App StoreSM and Google Play[™]. Mobile app operation is similar to the web application operation described in this manual. For instructions to use the app, refer to the Quick Start guide for the app.

1.1.2 PIM and LCM

If the power system includes a programmable interface module (PIM), load control module (LCM) or load shed kit, OnCue Plus also allows remote control of electric items in your home. See Section 2.11 for more information.

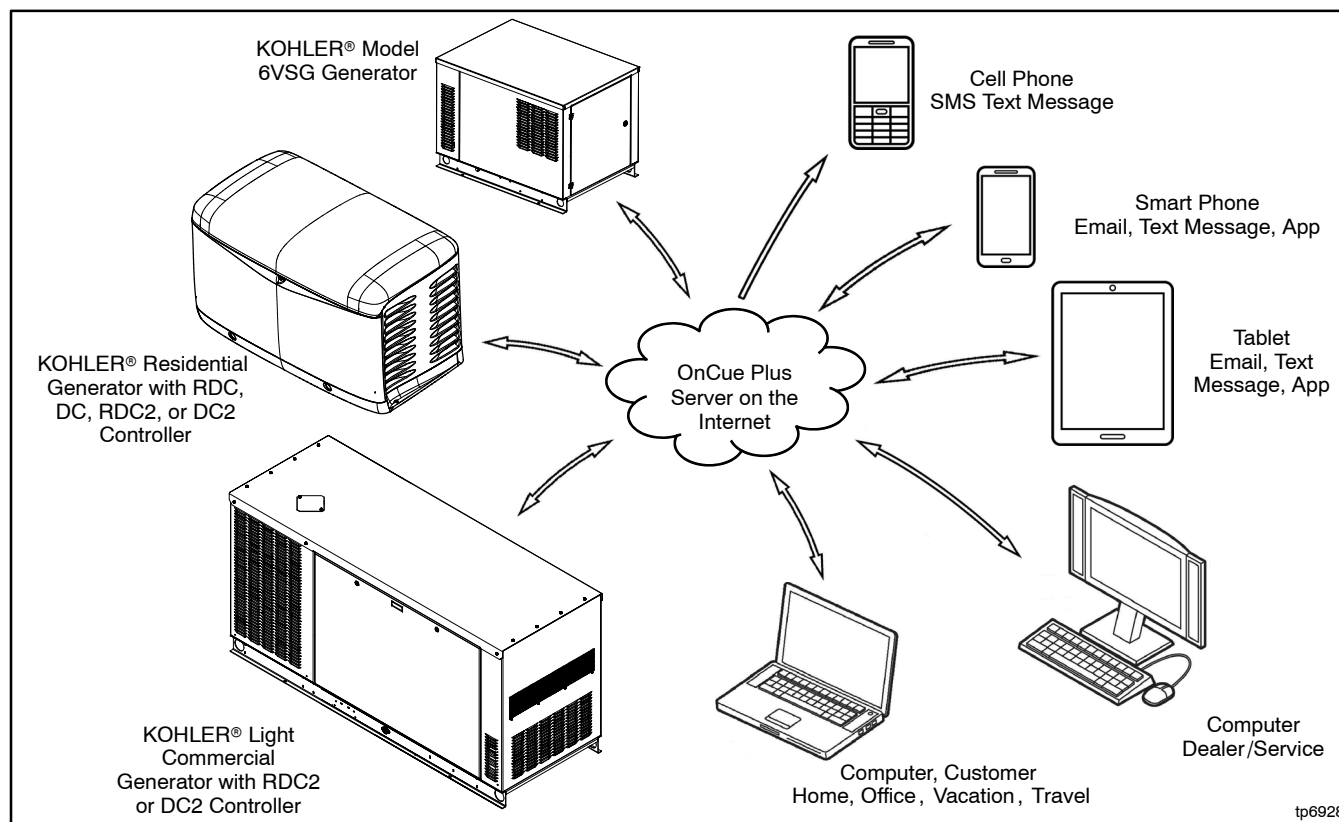


Figure 1-1 Kohler® OnCue® Plus Generator Management System

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Android and Google Play are trademarks of Google Inc.

1.2 Connect and Monitor Multiple Generator Sets

If you own more than one generator set, or if you are a dealer monitoring numerous customer systems, you may use Kohler OnCue® Plus to monitor multiple generator sets. To connect to each generator set, enter the serial number, password, and activation code (if required) for the generator set as described in Section 2.5. Each generator set needs to be added to your account only once.

Generator sets can also be removed from your account. See Section 2.14.8 for instructions to delete a generator from your account.

1.3 Kohler OnCue Plus Server

Kohler Power Systems operates an Internet server system used to connect Kohler generator sets to the Kohler® OnCue Plus application.

All connections to the Kohler OnCue Plus Server are fully encrypted for your protection. See Section 1.4, Privacy Statement.

1.4 Terms of Service

Click on the Terms of Service link and review the OnCue terms and conditions of use when you set up your OnCue Plus account. See Section 2.4. By accepting the OnCue terms and conditions of use, you are acknowledging that you have read the OnCue terms and conditions of use and agreeing to be bound by the OnCue terms and conditions of use.

If you have questions or concerns about the OnCue terms and conditions of use, please contact Kohler Co. by email at privacy@kohler.com, or call 1-800-544-2444. Kohler Co. may update the OnCue terms and conditions of use at any time.

1.5 System Requirements

The following items are the minimum requirements and recommendations for connecting your generator to the Internet.

- “Always-on” Internet service for generator set connection (for example, cable, DSL, or phone line modem connected 24 hours)
- Unused Ethernet port on a switch, router, or modem
- An uninterruptible power supply (UPS) for the modem and router is recommended.

- Network cable for connection to the Ethernet router (not included with the OnCue Plus kit)
- Controller firmware versions shown in Section 1.8. It may be necessary to use Kohler® SiteTech™ software to update the firmware on the controller. Contact your Kohler distributor or dealer.
- USB cable, male USB A to male mini-B, for updating the controller firmware.
- **RDC2, DC2, or VSC only:** The generator set serial number, password, RJ45 inline connector, and OnCue Activation Code found on the decal, included with the OnCue Plus kit.
- **RDC or DC only:** The generator set serial number, password, and Ethernet option board installed on the generator set controller, included with the OnCue Plus kit.

1.6 Internet Configuration and Security (Firewalls)

When the generator set is connected to an intranet network behind a firewall, for example in a commercial or industrial setting, it may be necessary to configure the firewall to open port 5253 to permit an outbound connection. Contact your network administrator for assistance if necessary.

1.7 OnCue Plus System Kits

Purchase one OnCue Plus kit for each generator set that you want to monitor and control remotely. The kit includes a one-year subscription to OnCue Plus. After the first year, an annual fee will be charged for continuing access to OnCue Plus.

1.7.1 RDC2/DC2/VSC Controller

The RDC2, DC2, and VSC generator set controllers are equipped with an Ethernet cable for connection to the Internet. Use the RJ45 inline connector included in the OnCue Plus kit to connect the controller to the customer-provided Ethernet cable connected to the router or modem after setting the controller password. See Figure 1-2 or Figure 1-3.

Note: The generator set controller requires a unique 12-digit activation code. The code is on the decal included with the OnCue Plus kit.

Kohler OnCue Plus will prompt the user to enter the activation code the first time the controller connects to Kohler OnCue Plus Server and a user attempts to connect to it.

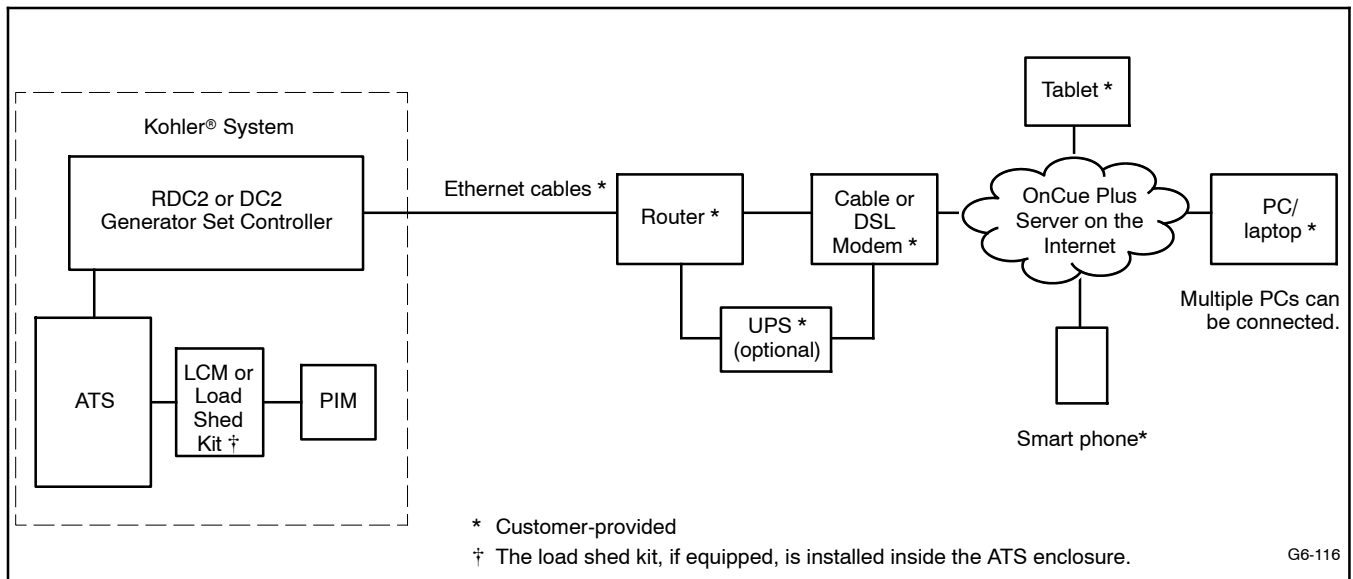


Figure 1-2 Typical Connections for RDC2/DC2 Controller

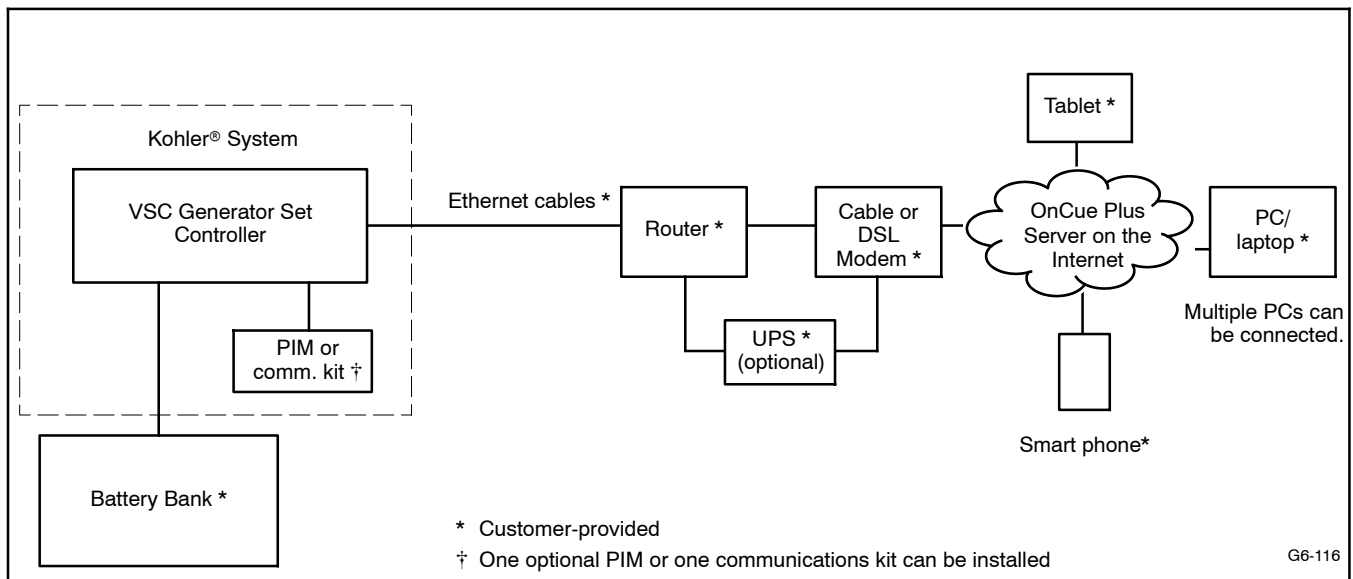


Figure 1-3 Typical Connections for VSC Controller

1.7.2 RDC2 with APM

The PowerSync® Automatic Paralleling Module (APM) includes two OnCue® Plus activation codes, one for each paralleled generator set. Each generator set must

be connected to the router or modem. A customer-provided hub may be used to connect the two generator sets to the router or modem, if necessary. See Figure 1-4. Also see Section 1.7.1.

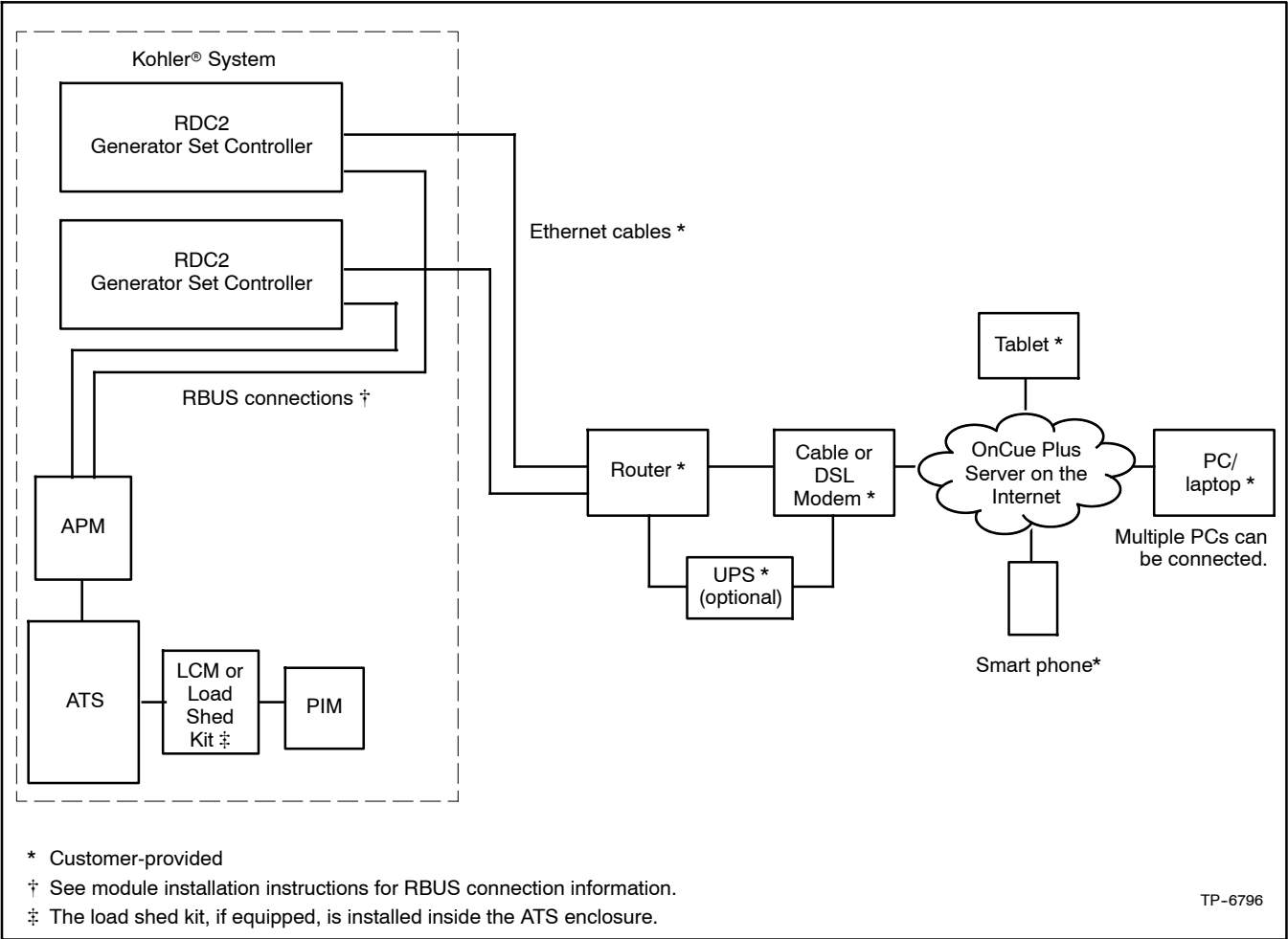


Figure 1-4 Two 14RESA or 20RESA Single-Phase Generator Sets with the PowerSync® Automatic Paralleling Module (APM)

1.7.3 RDC/DC Controller

The RDC/DC generator set controller must be equipped with the Ethernet option board, which allows connection of the generator set to the Internet through a broadband Internet connection. The Ethernet option board is included in the OnCue® Plus kit for the RDC/DC controller. See instruction sheet TT-1566, included with the OnCue Plus kit, for Ethernet option board installation and connection instructions. See Figure 1-5.

When the Ethernet board is installed, update the RDC/DC controller firmware and follow the instructions

in TT-1566 to record the controller password and generator set serial number for entry into the OnCue Plus application.

In most cases, once the new firmware is uploaded to the controller and the Ethernet board is connected to the customer's router or modem, the controller will automatically connect to the Kohler OnCue Plus server. Controller settings and network router adjustments are usually not required. The Internet connection between the controller and the Kohler OnCue Plus server is fully encrypted for your protection.

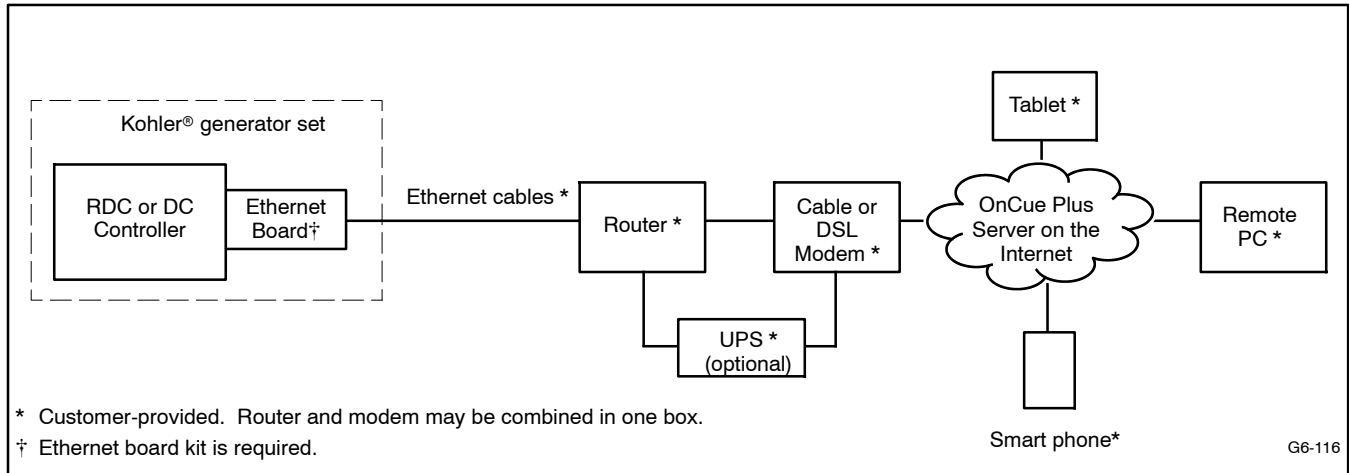


Figure 1-5 Typical Connections for RDC/DC Controller

1.8 Controller Firmware Download and Installation

It may be necessary to update the firmware on your generator set controller. See Figure 1-6 for the firmware version required for your device. Refer to the generator set documentation for instructions to find the version number installed on your controller.

Note: Controller firmware can be updated by a Kohler authorized distributor or dealer using a personal computer and Kohler® SiteTech™ software. The Kohler OnCue® Plus application cannot be used to update controller firmware.

Firmware Version Numbers

Software and firmware version numbers consist of three parts separated by periods (or dots) as follows:

[Major version number].[Minor version number].[Build number]

For example, if the version number is 2.3.17, the major version number is 2, the minor version number is 3 and the build number is 17. The build number is typically not shown on the controller display, but is included in the firmware file name.

Preceding zeros may be dropped from version numbers for software and firmware. For example, firmware version 2.3 is the same as version 2.03. However, version 2.1 (two point one) is *not* the same as 2.10 (two point ten).

Model	Controller	Firmware Version Number *	Firmware File Name †
6VSG	VSC	1.00	VSC_#_#_#.bin
6VSG w/comm. kit	VSC	1.02	VSC_#_#_#.bin
14/20RES	RDC	3.00	RDC_#_#_#.bin
14/20RESL	DC	3.00	RDC_#_#_#.bin
14/20RESA	RDC2	4.03	RDC2_#_#_#.bin
14/20RESA with APM	RDC2	105.04	RDC2_###_#_#.bin
14/20RESAL	DC2	4.03	RDC2_#_#_#.bin
38RCL	RDC2	4.10	RDC2_#_#_#.bin
48RCL	RDC2	4.03	RDC2_#_#_#.bin
* This firmware version number or higher is required.			
† #_#_# in the file name is the firmware version number.			

Figure 1-6 Controller Firmware Version Numbers and File Names

1.9 Controller Password and Serial Number

The generator serial number and the controller password for the RDC2 or VSC controller are required for the OnCue Plus application.

Perform the password reset procedure before connecting the generator set's Ethernet cable to the router. If the generator set is connected to the Internet before the password is set at the controller, you will need to cycle power to the controller after setting the password.

Note: A new password is generated each time the reset password procedure is performed.

If the password is reset after the OnCue Plus system has been set up, the connection will be lost. Disconnect the battery power to the controller, wait a minute, and then reconnect the power. Re-enter the time, date, and exercise schedule on the controller after the power is reconnected.

1.9.1 RDC2 and VSC Controller Password and Serial Number

Be ready to write down the serial number and password. The serial number (S/N) and password are displayed for 10 seconds. Follow this procedure to obtain the serial number and password:

1. Press the controller's down arrow button to navigate to the Networking Information menu.
2. Follow the reset password procedure shown in Figure 1-7. See the generator set operation manual for more information, if necessary.
3. Write down the serial number (S/N) and password.

1.9.2 DC2 Controller Password and Serial Number

Be ready to write down the serial number and password. The serial number (S/N) and password are displayed for

10 seconds. Follow this procedure to set the OnCue Plus password on the DC2 controller:

1. Press the OFF button and verify that the generator set is not running.
2. Press and hold the Exercise button until Press Again to Reset OnCue Plus PW is displayed.
3. Release the Exercise button and press it again within 5 seconds.

Note: If the Exercise button is not pressed within 5 seconds, the controller exits the password reset mode.

4. Write down the serial number (S/N) and password.

1.9.3 RDC/DC Controller Password

The password may have been recorded during the installation of the Ethernet option board on the generator set controller. See TT-1566 or the procedure below.

Be ready to write down the password. The four-digit password will be displayed for 10 seconds. Follow this procedure to obtain the serial number and password:

1. Press the OFF button to place the controller into OFF mode.
2. Press the down arrow button (RDC) or exercise button (DC) 5 times. Note the four-digit code displayed on the controller. This is the controller password.
3. Write down the password to enter into OnCue Plus.
4. Press OFF to clear the display.

Note: Do not repeat this procedure after the password has been entered into OnCue Plus.

The controller password changes each time this procedure is performed. If the controller is connected to OnCue Plus and this procedure is performed again, the connection will be lost.

1.10 Connect the Generator to the Internet

Note: Record the controller password and serial number from the controller as described in Section 1.9 before connecting the generator to the Internet..

1.10.1 RDC2/DC2/VSC Controller

Use the RJ45 connector (provided in the kit) to connect the Ethernet cable from the router to the cable in the generator set's customer connection box. See Figure 1-9 or the generator set installation manual.

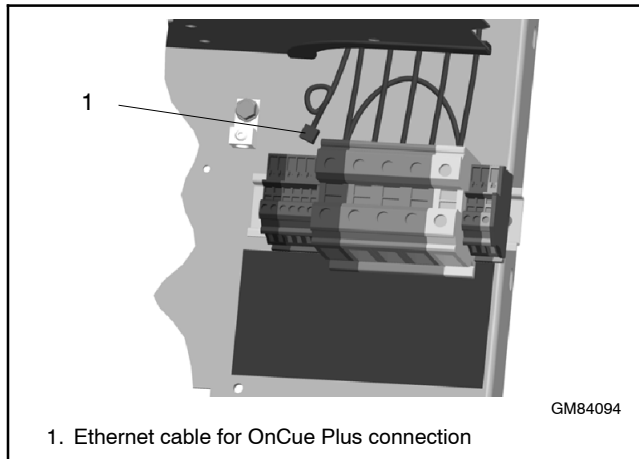


Figure 1-9 Ethernet Connection, RDC2/DC2 (Model 20RESA Shown)

1.10.2 RDC/DC Controller

1. Install the Ethernet option board on the generator set controller. See TT-1566, provided with the OnCue® Plus kit, for instructions.
2. Connect the generator set to the Internet using a network cable connected from the Ethernet board to your router or modem.

1.11 OnCue Plus Startup

- To use the OnCue Plus web application, use your computer to navigate to the OnCue Plus website. Proceed to Section 2 for instructions to set up an account and add your generator to OnCue Plus.
- For smart phones or tablets, obtain the Kohler OnCue Plus app from the Apple Store (for Apple devices) or Google Play (for Android devices). Follow the Quick Start instructions in the app to set up an account and add your generator to OnCue Plus. Operation of the app is similar to using the web application as described in Section 2 of this manual.

Note: The activation code is only required the first time you connect a generator set to the OnCue Plus system. See Section 2.6.

OnCue Plus will remember your generator set and connect to it each time you use OnCue Plus.

Notes

Section 2 OnCue Plus Operation

2.1 Introduction

Kohler® OnCue® Plus monitors the generator set and generates messages continually. After the application has been configured to send email and/or text messages, the OnCue Plus server will continue to send messages when the PC is turned off or disconnected from the Internet.

The generator set controller must be in AUTO mode to communicate with OnCue Plus.

Note: Sample screens are shown in this document.

The actual screens may vary.

2.2 Information Required

You will need to enter some information when you create your OnCue Plus account and connect to your generator set. Create a user name, account password, and display name for your generator set, and provide the generator location. Obtain other information from the generator set and the OnCue Plus kit. Required information is listed in Figure 2-1.

Item	Description	Can Change in Settings View?
User name	Create your user name when setting up your account.	NO
Password	Create your password when setting up your account.	NO
Serial Number	For adding new generator, get from genset controller nameplate or controller. See Section 1.9.	NO
Genset Password	For adding new generator, get from genset controller. See Section 1.9.	YES
OnCue Plus Activation Code	From OnCue decal, provided with OnCue Plus kit. See Section 2.6.	NO
Genset Displayname	Create a name that identifies the generator set.	YES
Genset Location	Enter address or other location information for the generator set.	YES

Figure 2-1 Required Information

2.3 Start OnCue Plus

When you start OnCue Plus for the first time, click on Create Account.

Start OnCue® Plus by navigating to the website www.kohlergenerators.com/oncue. The OnCue Plus login window opens. See Figure 2-2.

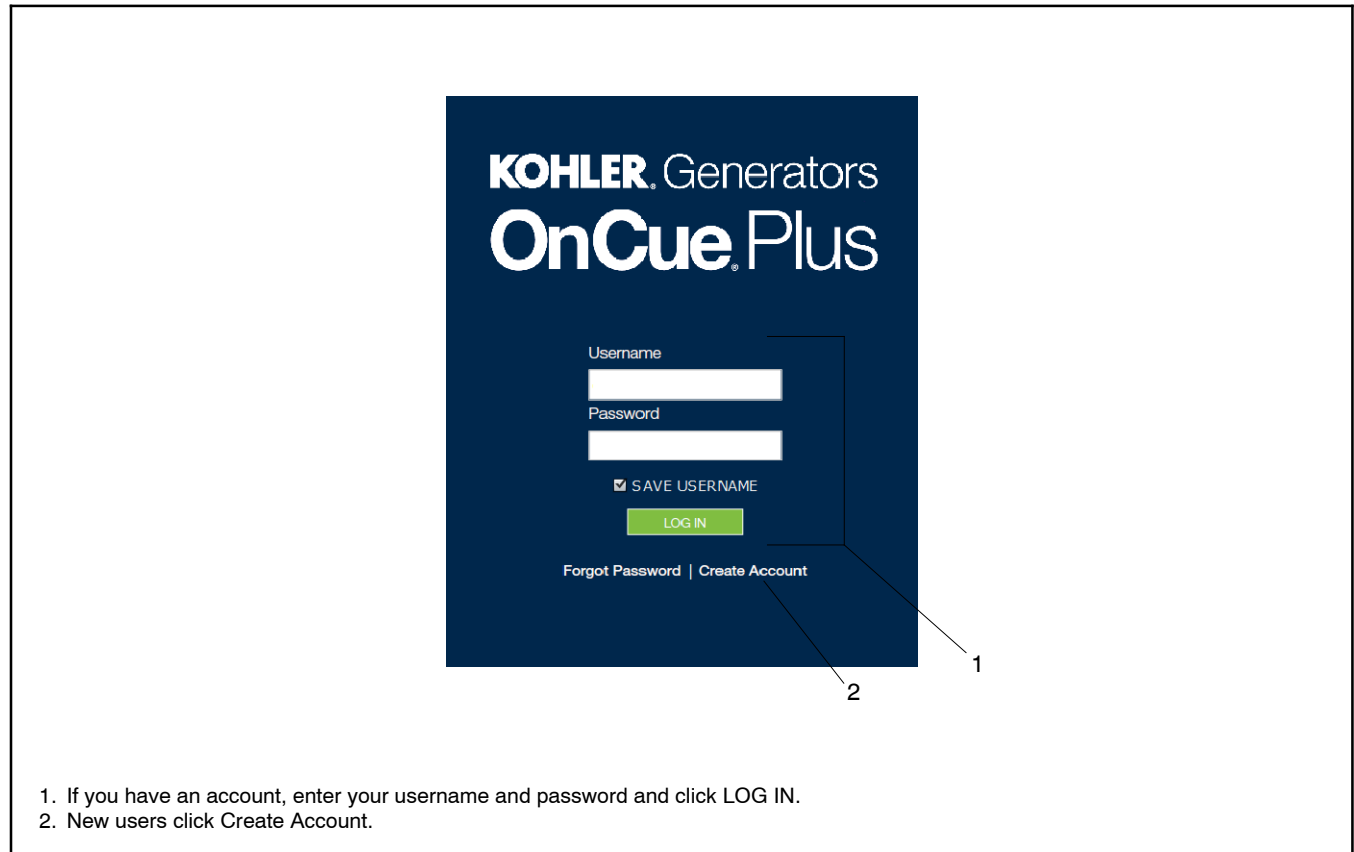


Figure 2-2 OnCue Plus Sign In Screen

2.4 Create an Account

The first time that you use OnCue Plus, you will need to set up an account. A user name, email address and password will be required. Create a username with 6 to 25 characters (no spaces) and a password for your account, and keep them in a safe place.

Click on Terms of Service near the bottom of the screen and read the OnCue terms and conditions of use. Then

click on the box next to “I accept the OnCue Plus terms and conditions of use” to indicate your acceptance of the OnCue terms and conditions of use.

Click on Create Account.

An email will be sent to the email address given for the account. Follow the instructions in the email to activate your account. Internet access is required to activate your account.

< CREATE ACCOUNT

Full Name*

Username*

Email Address*

Password*

Confirm Password*

Address

City

State

Zip Code

Terms of Service

☐ I accept the OnCue Plus terms and conditions of use.

CREATE ACCOUNT

Figure 2-3 Create an Account

2.5 Add Your Generator

In order to monitor and control a generator using OnCue Plus, you must add the generator to your OnCue Plus account. Multiple generators can be added to one account. If you own more than one generator set, or if you are a dealer monitoring numerous customer

systems, you may add them to your account using this screen.

The generator set serial number and controller password are required. See Section 1.9 for instructions to obtain the serial number and password.

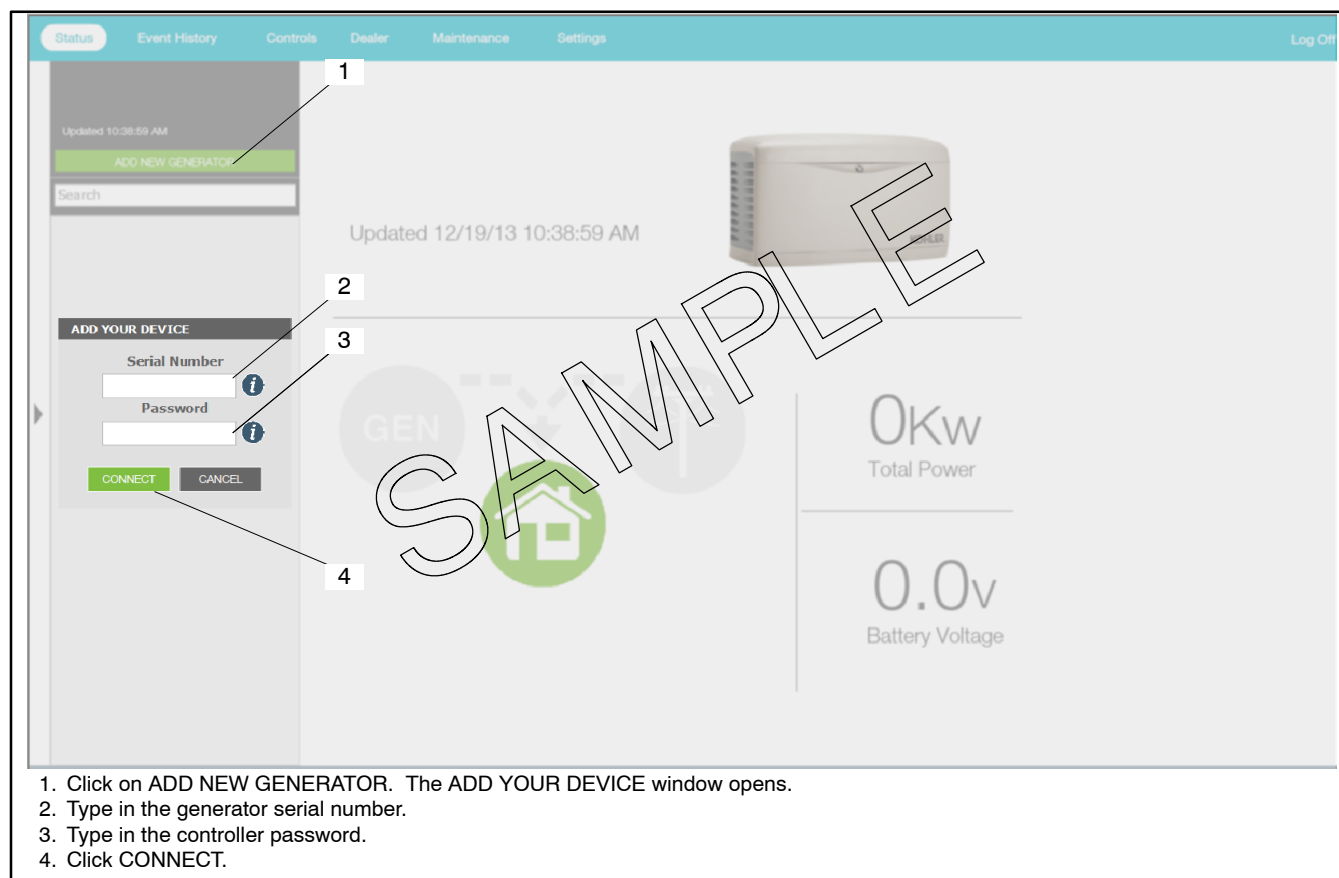


Figure 2-4 Add Your Generator

2.6 Activate Your Device

To activate your account, you will need the generator set serial number, OnCue activation code (not required for RDC/DC controllers), and controller password. Obtain the serial number from the controller when setting the controller password as described in Section 1.9, or find the serial number on the generator set's nameplate.

Find the activation code on the decal provided with OnCue Plus. See Figure 2-5. Attach the OnCue activation code decal to the generator set.

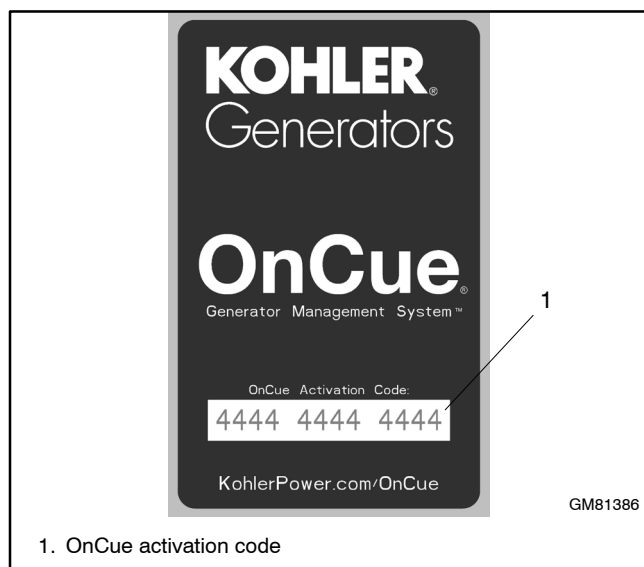


Figure 2-5 OnCue Activation Code Decal

In the generator selection list on the left side of the screen, click on Activate your Device. See Figure 2-7. Then type your activation code into the Activate Device window shown in Figure 2-6 and click on Activate.

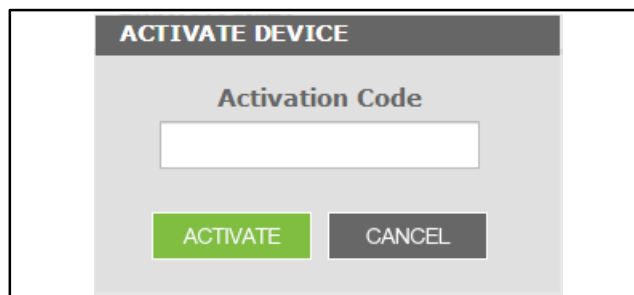


Figure 2-6 Activate Device

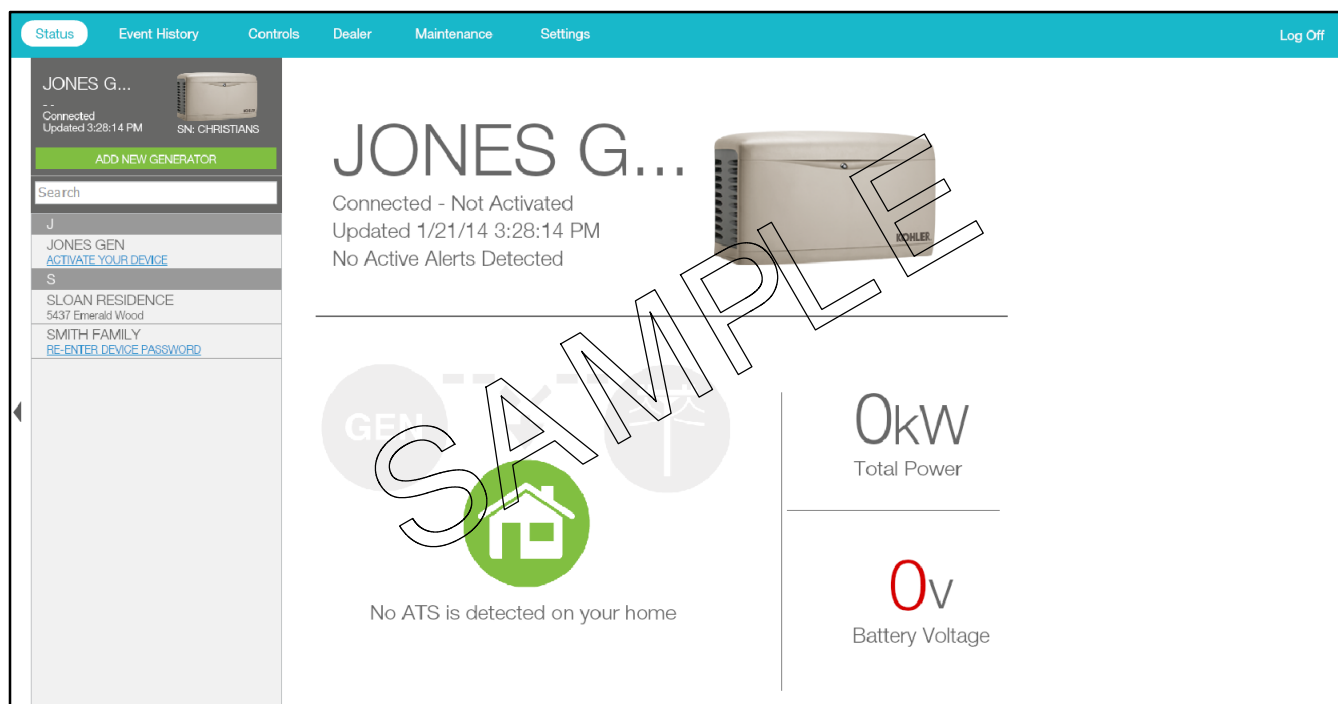


Figure 2-7 Activate Your Device

2.7 OnCue Plus Views

OnCue Plus opens in the Status view. The following views are available:

- Status
- Event History
- Controls
- Dealer
- Maintenance
- Settings

To select a view, click on the desired view in the toolbar near the top of the screen. The selected view is highlighted in the toolbar.

2.8 Status

The status screen is shown in Figure 2-8. See Figure 2-9 for an explanation of items displayed in the Status screen.

Note: Total power is displayed only if the power system includes a Load Control Module (LCM).

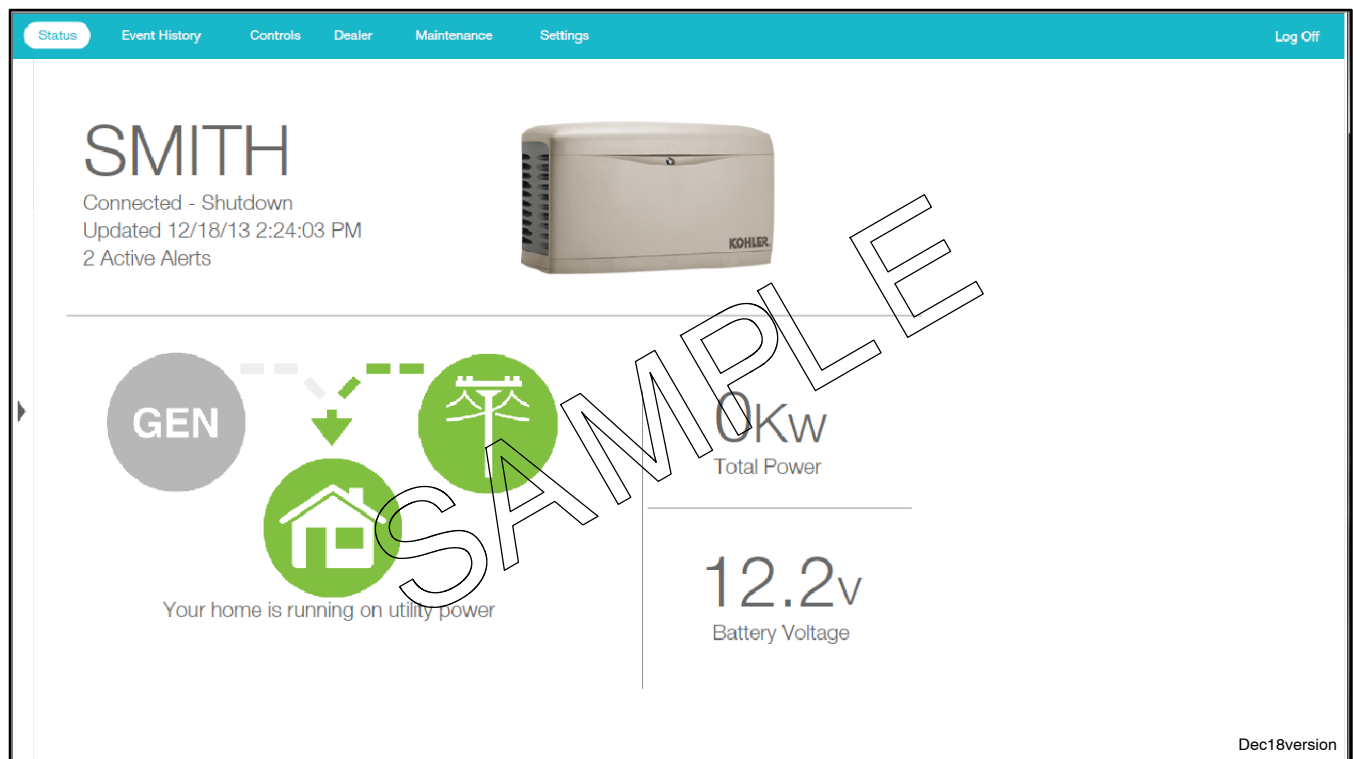


Figure 2-8 Power System Status

Status Screen Item	Indicates	Notes
Name	Name of generator that you are monitoring	Select the generator from the list on the left side of the screen. (Click on the arrow symbol to reveal the list.)
Generator status message	The status of the generator that you have selected	Examples of status messages are “Generator Running” and “Standby.” If a fault condition is indicated, check the Event History view or the controller display to identify the fault.
Time	Time of the last update	The frequency of updates can be changed through the Settings screen.
GEN Symbol	Generator Status	Green when active, gray when not available.
Power Line Symbol	Utility power status	Green when active, gray when not available.
Home Symbol and home status message	Home does or does not have power	Symbol is green when the home has power from either the generator or utility.
Total Power	Power being supplied to the home, in kW (LCM required)	Gives an indication of how much power is being used, allowing power management through OnCue Plus.
Battery Voltage	Generator engine starting battery voltage	Typically 12–15 volts DC. A voltage below 12.5 VDC will trigger a low battery voltage warning, indicating that the battery should be charged or replaced. A voltage less than 11 volts DC will be displayed in red.

Figure 2-9 Status Screen Displays

2.9 Select Generator

Kohler distributors and dealers may monitor more than one generator set for their customers. In the Status view, click on the arrow on the left side of the screen to reveal the list of generators that have been added to your account. All generator sets that you have added to your account will appear in a list on the left side of the screen. Scroll down if necessary and click on the

generator that you want to monitor. The selected generator set is displayed at the top of the list and also displayed in the Status view.

If you have multiple generator sets in your account, keep the list open to identify the selected generator set.

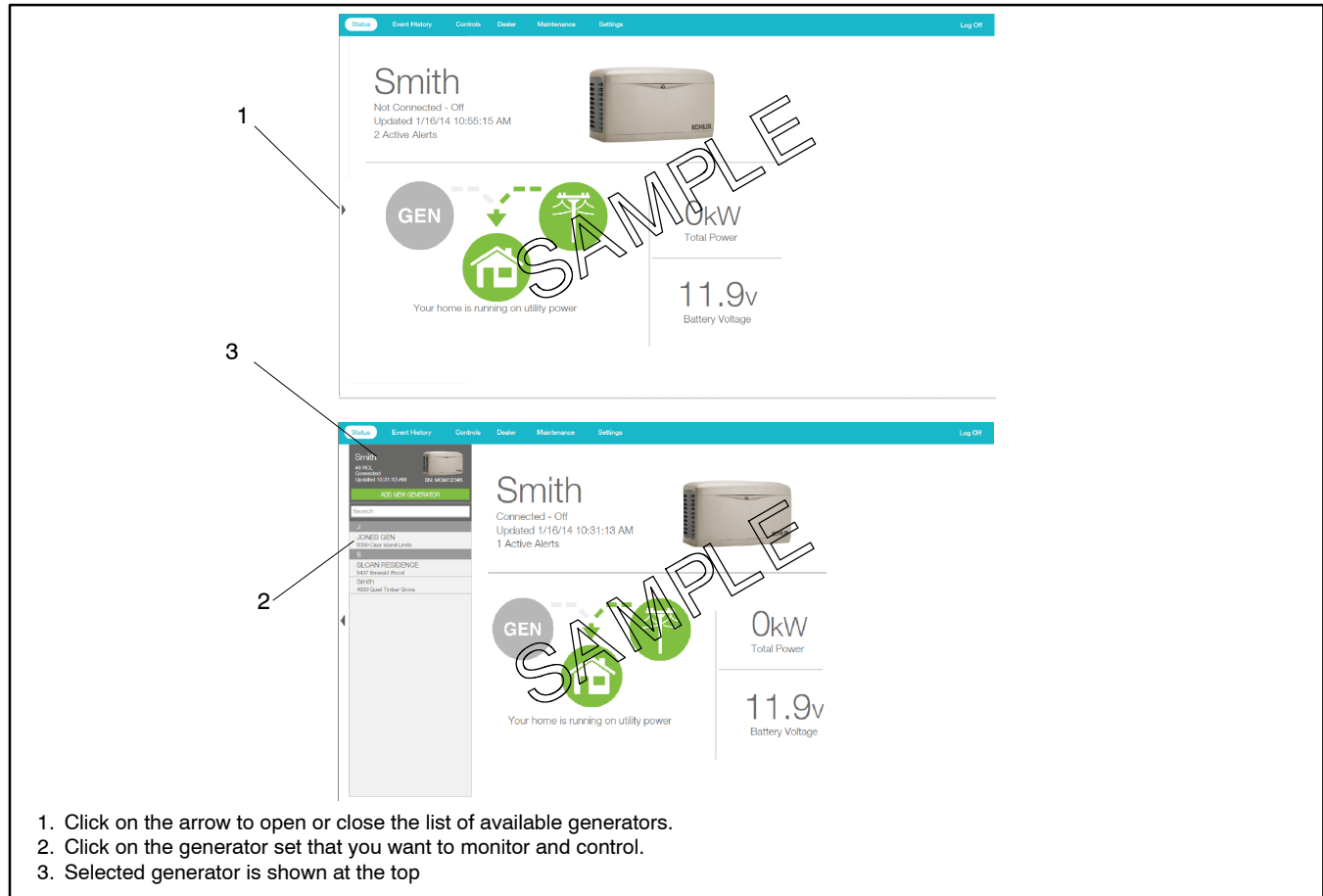


Figure 2-10 Select Generator

2.10 Event History

Click on Event history to view recent activity on your generator. The time and date for recent generator operation including exercise runs or other generator set starts and stops are displayed. Generator fault conditions, including warnings and shutdowns, are also displayed.

Click on Reset Faults to clear the active fault conditions. Contact your local dealer or distributor for service if fault conditions continue to appear.

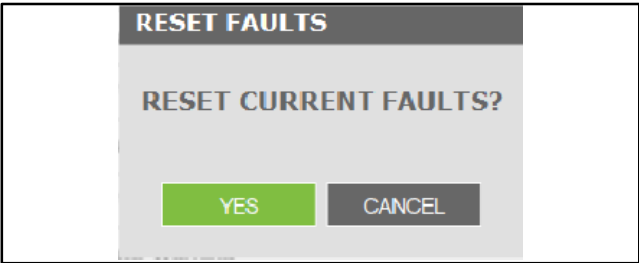


Figure 2-11 Reset Faults Confirmation

The screenshot shows the "EVENT HISTORY" page in a web application. On the left is a sidebar with a generator list including "SMITH FA...", "JONSSSES", "SLOAN RESIDENCE", and "SMITH FAMILY". The main area contains a table with two columns: "DATE/TIME" and "DESCRIPTION". The first two rows of the table have a red circle with an exclamation mark in the "DATE/TIME" column. A large "SAMPLE" watermark is diagonally across the table. In the top right corner of the table area, there is a green button labeled "RESET FAULTS".

1. Red symbol indicates an active fault condition

2. Click RESET FAULTS to clear active fault conditions

DATE/TIME	DESCRIPTION
01-09 3:07 AM	Not In Auto Warning
01-09 3:07 AM	Verify Date Time Setting Warning
01-09 3:07 AM	Not In Auto Warning
01-09 3:07 AM	Verify Date Time Setting Warning
01-08 7:37 PM	Not In Auto Warning
01-08 7:37 PM	Verify Date Time Setting Warning
01-08 11:28 AM	Not In Auto Warning
01-08 11:28 AM	Verify Date Time Setting Warning
01-08 10:03 AM	Not In Auto Warning
01-08 10:03 AM	Verify Date Time Setting Warning
01-08 7:03 AM	Not In Auto Warning
01-08 7:03 AM	Verify Date Time Setting Warning
01-07 7:36 AM	Not In Auto Warning
01-07 7:36 AM	Verify Date Time Setting Warning
01-07 12:27 AM	Not In Auto Warning
01-07 12:27 AM	Verify Date Time Setting Warning
01-06 1:28 PM	Not In Auto Warning
01-06 1:28 PM	Verify Date Time Setting Warning
01-06 1:28 PM	Not In Auto Warning

Figure 2-12 Event History

2.11 Controls

From the Controls view, you can:

- Start and stop a generator exercise
- View the status of outputs connected to the PIM or LCM
- Turn outputs connected to the PIM on and off.

The generator set controller must be in AUTO mode for remote start/stop using OnCue Plus.

2.11.1 Start Exercise

An unloaded cycle exercise or an unloaded full speed exercise can be started remotely.

- **Unloaded Full-Speed Exercise.** Runs the generator set at full speed without transferring the load from utility. The model VSG generator set runs at rated no-load speed.
- **Unloaded Cycle Exercise.** Runs the unloaded cycle exercise with complete system diagnostics. See generator set Operation Manual for information about the unloaded cycle exercise and diagnostics.

Click Start to start the generator set. The dialog box shown in Figure 2-13 opens. Select the exercise type and click on START.

The exercise runs for 20 minutes (default setting) and then stops. Use the Stop Exercise command to stop the engine earlier, if necessary.

The Start Exercise options are unscheduled. Starting and stopping the engine using these commands does not change the exercise schedule on the generator set.

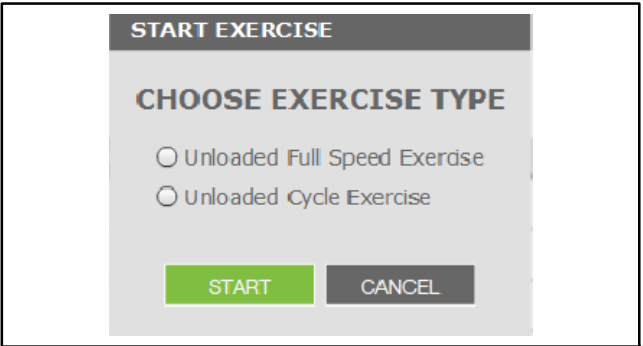


Figure 2-13 Select Exercise Type

	MANUAL MANAGEMENT	AUTOMATIC MANAGEMENT
1	Run	OFF
2	Common Fault	OFF
3	Hot Tub	OFF
4	Electric Heat	ON
5	Output 6	ON
6	Output 7	ON

1. Click to start an exercise.

Figure 2-14 Controls, Start Exercise

2.11.2 Stop Exercise

After starting the engine using the Start button, click on Stop to stop the engine before the programmed stop time, if necessary. The generator set controller must be in AUTO mode for remote start/stop using OnCue Plus.

Note: The Stop Exercise command will not stop the generator set if it was started at the controller by pressing RUN, by a remote start command from an ATS, or by a scheduled exercise set at the controller.

1

STOP

Exercise

Exercise Type

Loaded Full Speed

Next Exercise

01-09 5:27 AM

RPM

3600

Voltage

12.5

MANUAL MANAGEMENT

AUTOMATIC MANAGEMENT

1	Run	ON
2	Common Fault	ON
3	Output 3	OFF
4	Digital Output B4 Value	OFF
5	Digital Output B5 Value	OFF
6	Digital Output B6	OFF

1. Click Stop to shut down the generator before the exercise time expires. This only stops an exercise that was initiated by clicking the START button in OnCue Plus.

Figure 2-15 Controls, Stop Exercise

2.11.3 Manual Management

OnCue® Plus allows remote control of items in your home. Electrical items such as appliances, outdoor lighting, storm shutters, etc. can be connected to outputs on the generator set's programmable interface module (PIM) and then turned on and off using OnCue Plus through your personal computer, smart phone, or tablet with Internet access.

Controlling items remotely requires an installed and properly connected Programmable Interface Module (PIM). The programmable interface module (PIM) is available for purchase as an optional kit.

The PIM provides two programmable inputs and six programmable outputs for connection to customer-supplied equipment. The PIM operates only with generator sets equipped with the Kohler RDC2, DC2, or VSC controller. See TT-1584 for PIM installation and setup instructions.

Note: PIM outputs 1 and 2 are factory-set to Generator Running and Common Fault. Outputs 1 and 2 cannot be controlled remotely through OnCue® Plus.

Use the Controls screen to remotely control items in your home connected to outputs 3 through 6.

1. Select the Controls screen in the OnCue Plus Toolbar.
2. Click on the name of the output to turn it on or off. The status indicator (ON/OFF) flashes for approximately 5 seconds before changing to the new status.

Once OnCue Plus is used to turn a PIM output on or off, the output will no longer be controlled by the generator set. For example, output 4 may initially be set to the generator function Not in Auto. If OnCue Plus is used to turn that output on or off, the output will no longer operate when the generator's Not in Auto function operates. The output must be operated through OnCue Plus.

Use OnCue Plus to rename the output functions to identify the equipment connected to each output. See Section 2.14, Settings, for label renaming instructions.

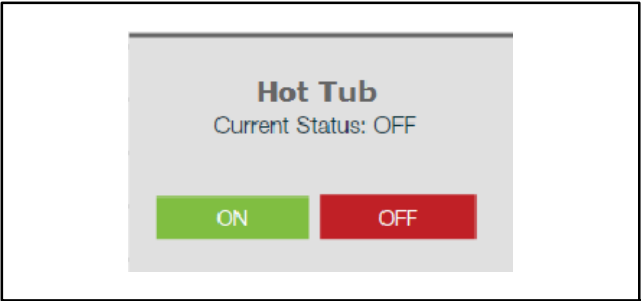


Figure 2-16 Manual Management

2.11.4 Automatic Management

Automatic management displays the status of items connected to the load control module (LCM) or load shed kit. Non-essential loads connected to the load control relays are disconnected automatically when essential equipment is running to prevent generator set overload. The item descriptions can be edited through the Settings view. See Section 2.14.



Figure 2-17 Controls, Automatic Management

2.12 Dealer Communication

2.12.1 Enter Dealer Information

Use the Settings view to enter your dealer's information before using the Dealer feature. See Section 2.14, Settings.

addressed to your dealer. Type in your message and send.

The OnCue Plus App on your smart phone or tablet will also allow you to call your dealer from this screen.

2.12.2 Email Your Dealer

Clicking on the EMAIL command will open the email application on your device and open a new email

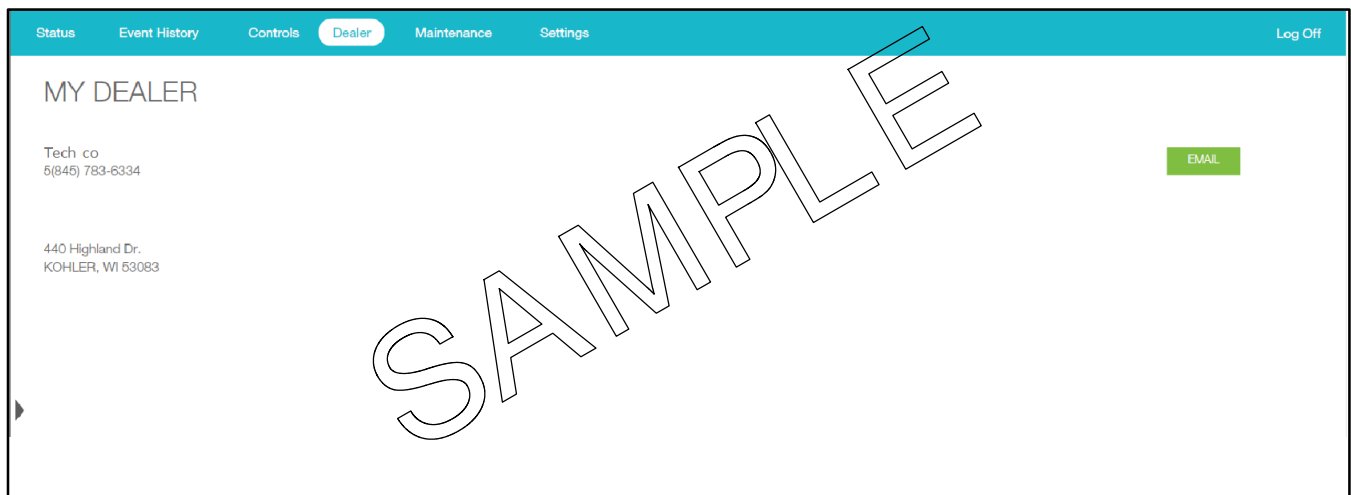


Figure 2-18 Dealer

2.13 Maintenance

Click on Maintenance to see the last time your generator was serviced, and when the next service is due. This screen also allows you to check the dates of the last and next exercise.

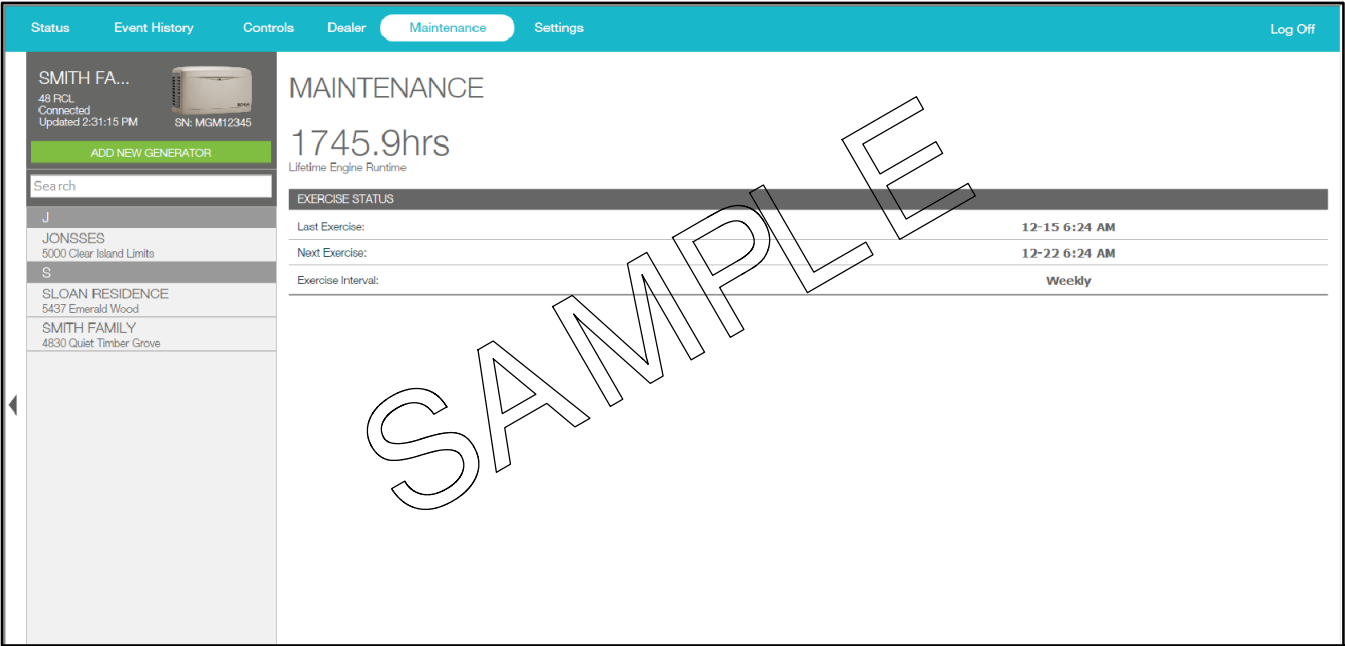


Figure 2-19 Maintenance

2.14 Settings

Use the Settings view to set up email and text notifications, and also to change system settings, including the frequency of generator data updates and the labels on the automatic and manually managed outputs. This view also contains a Delete command that allows you to remove a generator from your list of monitored generators.

2.14.1 Email Notifications

OnCue® Plus can be configured to send email or SMS text messages alerting the recipient of generator set faults, exercise updates, and maintenance reminders.

Email and text messages include:

- Device description (user-defined)

- Serial number
- Description of the event (see below)

The following events will generate a message to all addresses in the recipients list:

- Generator running
- Generator off
- Generator supplying power
- Generator not supplying power
- Any fault (warning or shutdown). See the generator set Operation Manual for a list of faults.
- Fault cleared

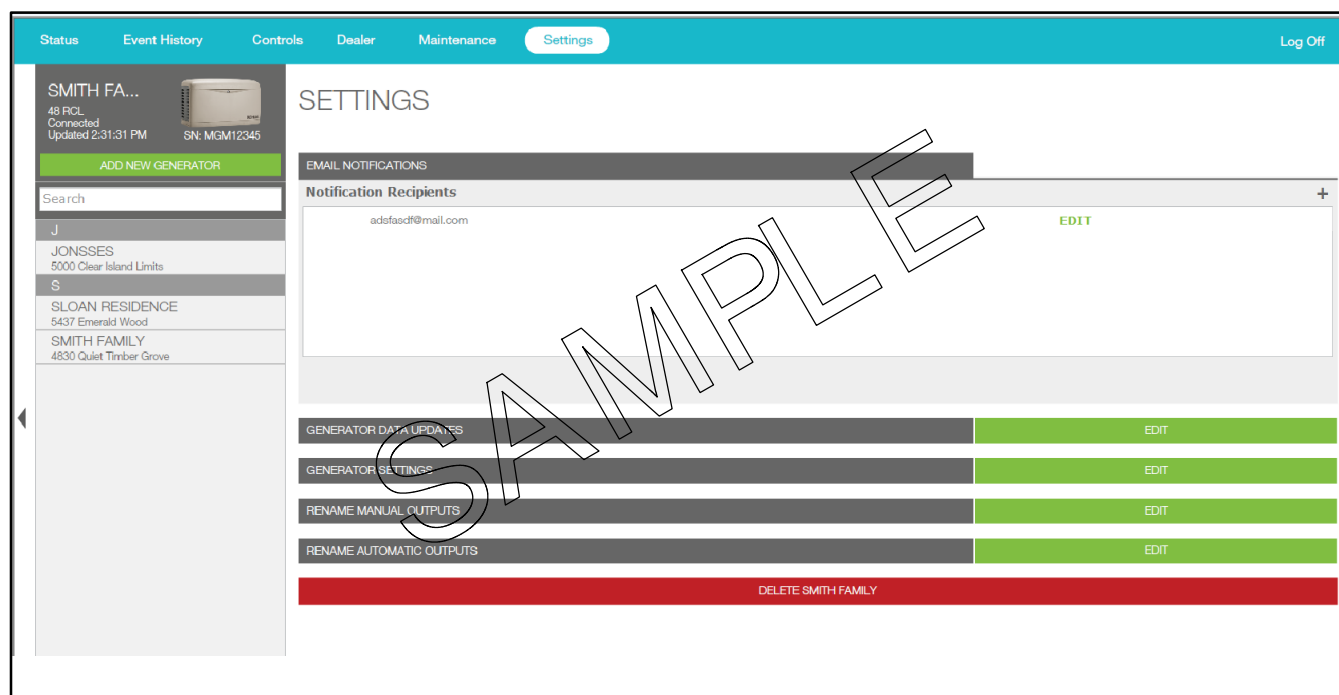


Figure 2-20 Settings

2.14.2 Add Email Recipients

To set up email notifications, click the plus sign (+) to the right of Email Notifications in the settings view. In the Add Email Recipient view, type the email address and click SAVE. See Figure 2-21.

2.14.3 Cellular Telephone SMS Text Message Configuration

Text messages can be sent by sending an email to your cell phone. Contact your cell service provider for the email address to use for SMS text messaging.

SMS text messaging to a cellular telephone or other device is accomplished by sending an email to the cellular provider's email-to-SMS system. For example, if the customer is a subscriber of Verizon Wireless with

the cellular telephone number 920-555-1212, a text message can be sent to their cell phone by sending an email to 9205551212@vtext.com.

Determine the customer's cellular telephone service provider and verify that their cell phone is equipped to receive SMS messages. Consult the cell phone provider or the provider's website for the email address configurations for text messaging. Make sure that the customer is aware of any text messaging charges the cellular telephone provider may charge for received text messages.

2.14.4 Disable Notification

To delete an email address in the list, click on the Edit box next to the recipient's name. In the pop-up window, click on the red DELETE box.

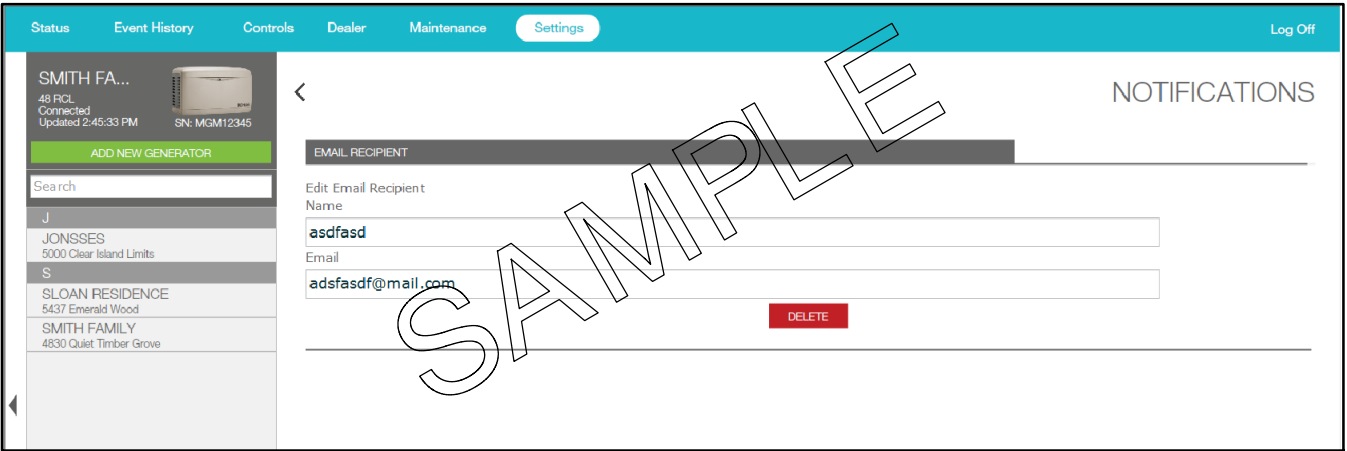


Figure 2-21 Add Email Recipient

2.14.5 Generator Data Updates

Generator data is updated in OnCue® Plus as soon as possible. In some cases, you may want to change the data updates to send data less often. For example:

- If you have a data plan that charges by the amount of data or limits the amount of data received, you may want to update less often.
- When the utility power is out and your generator set is supplying your home, you may want to select updates every 5 minutes until the utility power returns and the generator set shuts down.
- Selecting “On view change” will update the data only when you change your view in OnCue Plus.

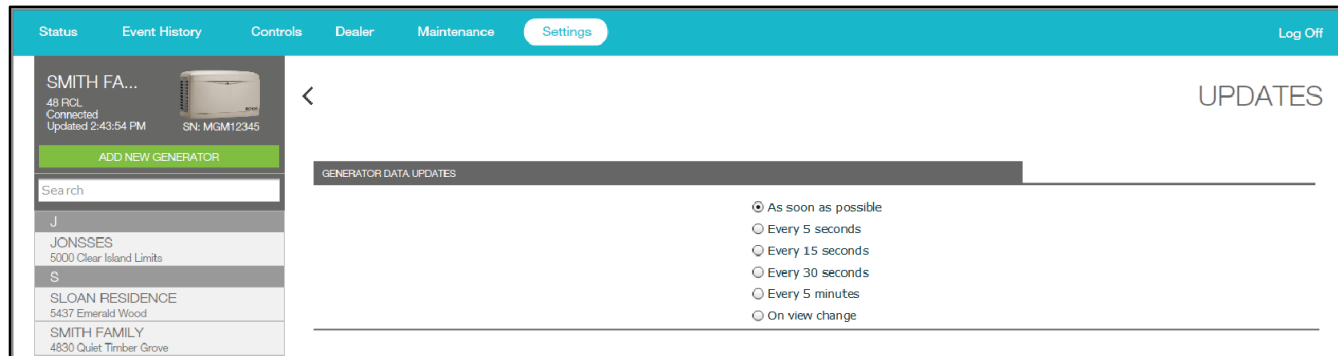


Figure 2-22 Generator Data Updates

2.14.6 Generator Settings

The Generator Settings view allows you to change the name and password for the generator.

Change Generator Display Name

When a generator is connected for the first time, the generator name displayed in OnCue® Plus will be the generator serial number. Use the Genset Name setting to change the name to something that identifies the generator. For example, you can rename the unit using your name or a location. If your dealer or distributor will be monitoring the generator, use a name that distinguishes your unit from other customers' equipment.

Names must contain at least four characters, and can use letters and numbers.

Change Generator Password

Change the generator password from the 4-digit controller password to a password of your choice. If the password is changed, other users will lose the OnCue Plus connection to that generator. If your dealer is monitoring your generator, be sure to give him/her the new password.

Generator Location

Click on Genset Location and type in the location of the generator set.

Generator Dealer

Enter your dealer's information, including their email address. This allows you to email your dealer using the Dealer view described earlier.

2.14.7 Rename Outputs (Manual and Automatic)

Use the Settings view to change the manual (PIM) and automatic (LCM or load shed kit) output labels. Change the label descriptions to show what is being controlled. For example, connect output 3 to the storm shutters on your vacation home and label it “Storm Shutters”. When

bad weather is forecast, you can use OnCue Plus to close the storm shutters from a remote location. See Section 2.11, Control.

Click on the label that you want to change. The RENAME screen appears. See Figure 2-23. Type in the new label and click RENAME.

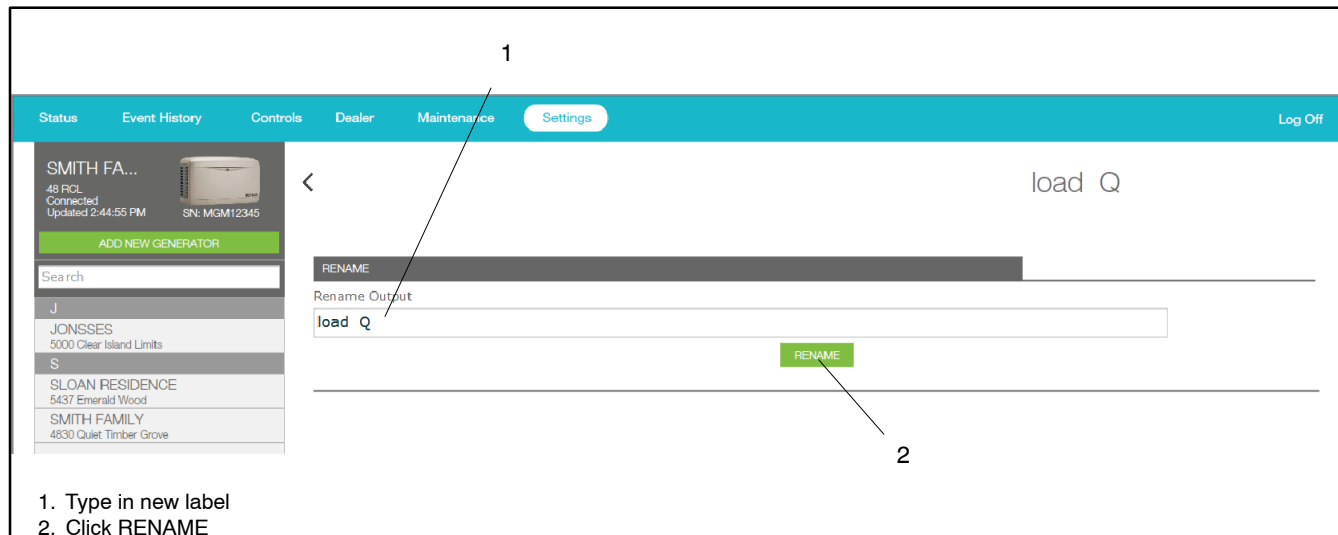


Figure 2-23 Editing Manual or Automatic Management Labels

2.14.8 Delete a Generator

The *Delete Generator* command, where *Generator* is replaced with the name of the currently selected generator, allows you to remove the generator from your list of monitored units.

Go to the Add Generator view on the left and select the unit that you want to delete. Then go to Settings, and check that the Delete command shows the name of the unit that you want to remove. Touch *Delete Generator* to remove the unit from your list. A confirmation box appears to make sure you want to delete the generator. Click Delete or Cancel.

Note: Once deleted, the generator no longer appears on the list in the Add Generator view.

After a unit has been removed, you will need to follow the Add Generator procedure to add it again if you want to put it back on your list.

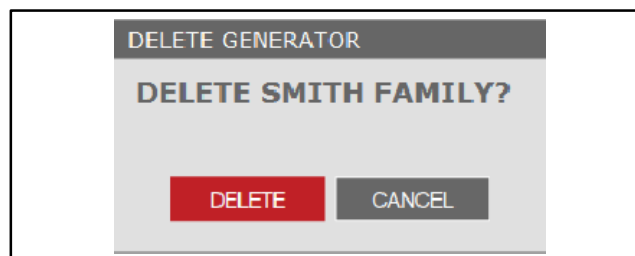
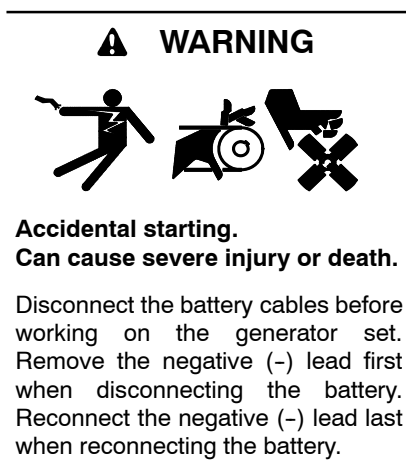
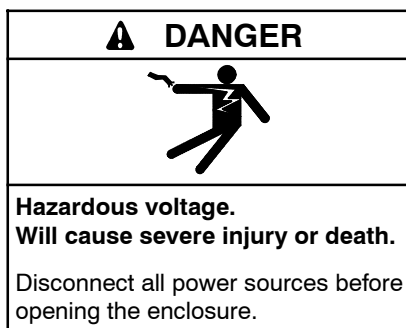


Figure 2-24 Delete a Generator

3.1 Introduction

Observe the following safety precautions and the instructions in the generator set service manual when troubleshooting the generator set and connected equipment.



Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

Short circuits. Hazardous voltage/current can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove all jewelry before servicing the equipment.

NOTICE

Electrostatic discharge damage. Electrostatic discharge (ESD) damages electronic circuit boards. Prevent electrostatic discharge damage by wearing an approved grounding wrist strap when handling electronic circuit boards or integrated circuits. An approved grounding wrist strap provides a high resistance (about 1 megohm), *not a direct short*, to ground.

3.2 Check for Server Connection

3.2.1 RDC or DC Controllers

Check for a dot in the lower right corner of the RDC or DC controller display to verify that the controller is connected to the Kohler® OnCue® Plus server. See Figure 3-1.

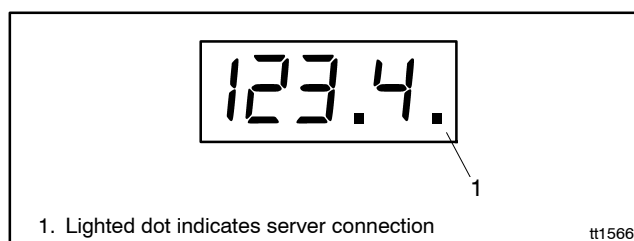


Figure 3-1 Controller Display with Server Connection Indicator

3.2.2 RDC2, DC2, or VSC Controller

If it is necessary to check the server connection to an RDC2, DC2, or VSC controller, follow these instructions to use telnet on your PC.

Telnet is not activated by default on the Microsoft® Windows® 7 operating system. To activate Telnet on the PC, open the Control Panel, select Programs, and then select Programs and Features. Select Turn Windows Features On or Off. Find the Telnet Client and click on the box so that the box is checked. See Figure 3-2. Click OK and wait while Windows makes the adjustments.

Now use telnet to check the server connection to OnCue Plus.

Telnet Procedure

1. Open a command prompt window on the PC by selecting Start, All Programs, Accessories, Command Prompt. See Figure 3-3.

2. Using the command prompt window: Try to telnet to the OnCue Plus server by using the entering the following:

```
c:\> telnet devices.kohler.com 5253
```

3. If the connection was successfully established, you will see the symbols shown in Figure 3-4.

Microsoft® and Windows® are registered trademarks of Microsoft Corporation.

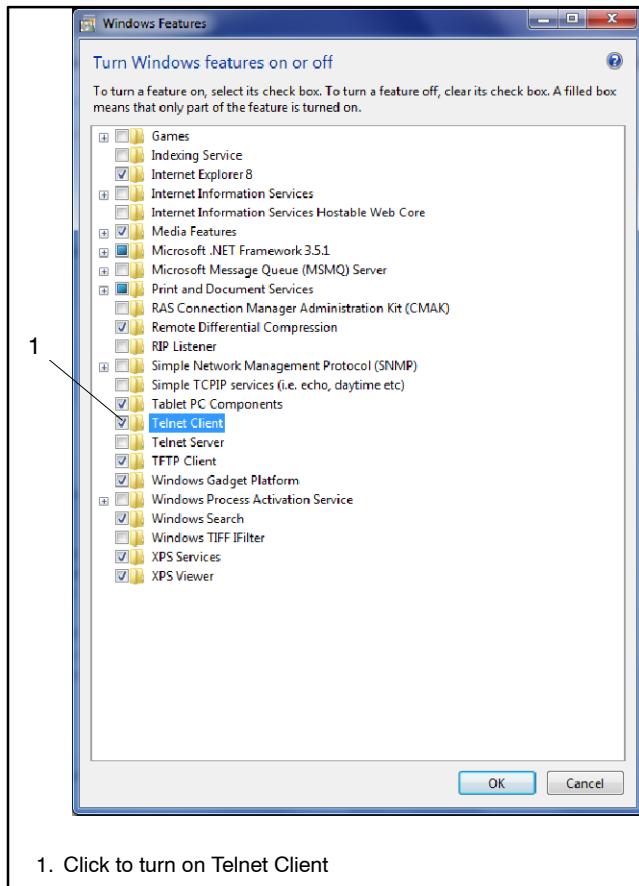


Figure 3-2 Telnet Activation, Microsoft® Windows® 7

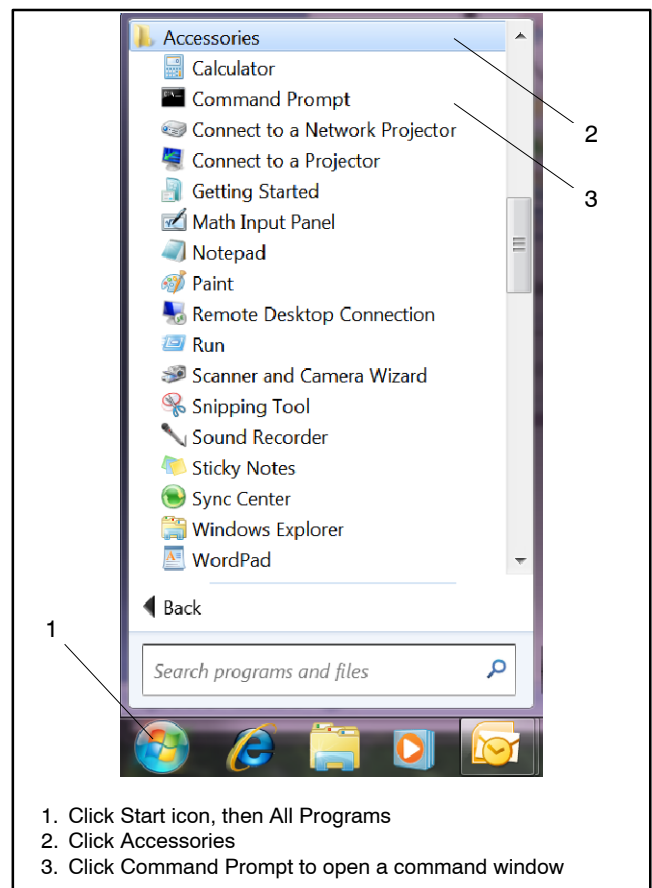


Figure 3-3 Opening a Command Prompt Window

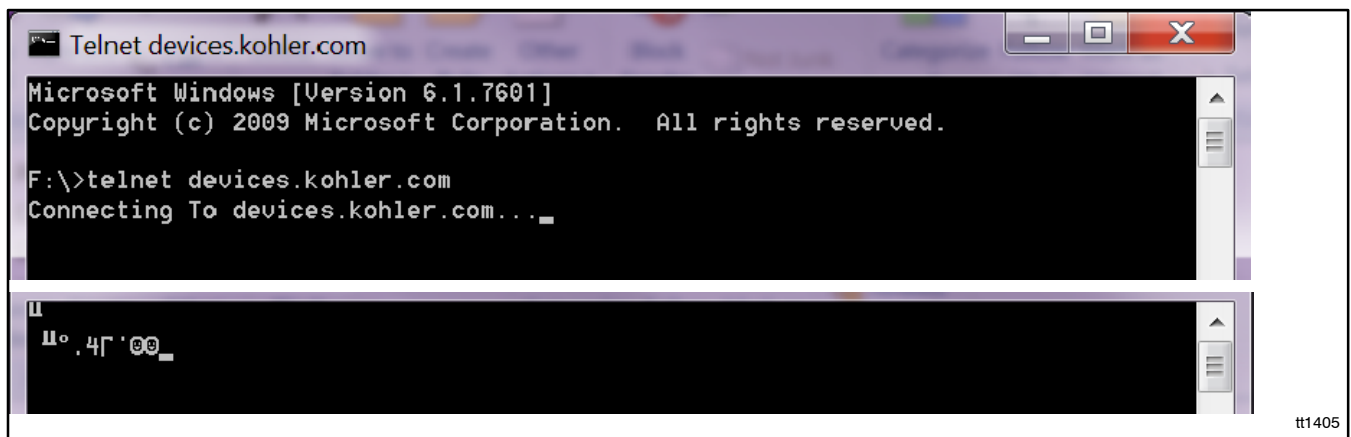


Figure 3-4 Telnet Command to Confirm OnCue® Plus Server Connection

3.3 Generator Set Serial Number

Incorrect serial numbers will prevent connection to the OnCue® Plus server. Compare the genset serial number programmed into the controller with the serial number on the generator set nameplate. See Section 1.9 for instructions to find the serial number in the controller. If the S/Ns do not match, Kohler® SiteTech™ software is required to change the genset serial number programmed in the controller to match the nameplate. SiteTech software is only available to Kohler-authorized distributors and dealers. Contact a Kohler-authorized distributor/dealer for service.

3.4 Check Controller's Ethernet Connection

RDC2/DC2 or VSC Controller. Check the Ethernet cable and RJ45 inline connector to the controller.

RDC/DC Controller. Make sure that the Ethernet board is installed correctly with the board-to-board connector in place. See TT-1566, Installation Instructions.

Check the firewall on the local router. Verify that router firewall port 5253 is configured to permit an outbound connection. Refer to the instructions provided with the router.

3.5 Troubleshooting Connection Problems

Use the following procedure to troubleshoot problems connecting OnCue Plus to your generator set.

1. **Check the controller password and generator set serial number.** See Section 3.3.
2. **Confirm that your Internet connection is working.** Navigate to www.KOHLERPower.com or any website to verify that your PC can access the Internet.
3. **Verify power to the controller.** Check that the controller display is on or at least one LED on the controller is lit.
4. **Check the server connection on the generator set controller.** See Section 3.2.
 - **RDC2/DC2 or VSC Controller.** Use telnet to check the server connection. See Section 3.2.2 for instructions.

- **RDC/DC Controller.** Check the server connection LED on the generator set controller. See Figure 3-1.
 - a. If the LED is not lit, there may be a problem with the generator set connection to the router or modem. Proceed to step 5.
- 5. **Check the generator set connection to the modem/router.**

Note: RDC2/DC2 or VSC controller. Disconnect utility power to the generator set before disconnecting the Ethernet cable. Follow the safety precautions in this document and in the generator set service manual.

Note: RDC/DC controller. Remove the controller's F3 fuse and disconnect power to the generator set before disconnecting the Ethernet cable. Follow the safety precautions in this document and in the generator set service manual. See TT-1566, Ethernet Board Installation Instructions, for connection details.

Isolate the problem by disconnecting the Ethernet cable from the generator controller and plugging it into a laptop PC.

Disable wireless on the laptop. Check Internet access by trying to connect to www.KOHLERPower.com or any other known website.

- a. If the computer cannot connect to the Internet, use a different cable to connect the laptop PC to the modem/router and try again.
- b. If there is no connection with either cable, the problem may be with the modem/router.
 - Verify that the modem/router has power and is on.
 - Contact your Internet Server Provider (ISP) for assistance.
- c. If the network cable is longer than 100 meters (328 ft.), install a repeater or switch.

If these procedures do not identify and correct the problem, contact the Generator Service Department for assistance.

3.6 Troubleshooting Chart

Figure 3-5 lists some common problems and suggested solutions.

Problem	Possible Cause	Suggested Solution
Connection problem (Also refer to the troubleshooting procedure in Section 3.5.)	Internet service is down	Verify that Internet service is available by navigating to www.KOHLERPower.com or any website.
	No power to controller	Verify power to the generator set controller by checking that the controller display is on or one LED is illuminated or flashing on the controller. Check the connection to the generator set's engine starting battery. RDC/DC controller. Check the condition of the controller's F3 fuse, and replace the fuse if necessary.
	No connection to the server	RDC2/DC2/VSC controller. Test server connection using telnet. See Section 3.2.2. RDC/DC controller. Check that the server connection indicating LED on the controller is lit. See Sections 3.2 and 3.5.
	Cable or modem/router problem	Note: RDC2/DC2/VSC controller. Disconnect the utility power to the generator set before disconnecting the Ethernet cable. Follow the safety precautions in this document and in the generator set service manual. Note: RDC/DC controller. Remove the controller's F3 fuse and disconnect power to the generator set before disconnecting the Ethernet cable. Follow the safety precautions in this document and in the generator set service manual. See TT-1566, Ethernet Board Installation Instructions, for connection details. Isolate the problem by disconnecting the Ethernet cable from the generator controller and plugging it into a laptop PC. Disable wireless on the laptop. Check Internet access by trying to connect to www.KOHLERPower.com or any website. • If no connection, try to connect the laptop PC to the modem/router using a different cable. • If there is no connection with either cable, the problem may be with the modem/router. Contact your Internet Server Provider for assistance.
	Long network cables may cause excessive signal loss	If the network cable is longer than 100 meters (328 ft.), install a repeater or switch.
	Password error	Reset the password at the controller, if necessary, and enter the new password in OnCue Plus. See Section 2.5.
	Generator set serial number mismatch	See Section 3.3.
	Firewall blocking access	On the generator set side, configure the router firewall to open port 5253 to permit an outbound connection. Contact your system administrator or Internet service provider for assistance, if necessary.
	Other	Contact your Internet Server Provider for assistance.

Figure 3-5 Troubleshooting

Appendix A Abbreviations

The following list contains abbreviations that may appear in this publication.

A, amp	ampere	cfm	cubic feet per minute	exh.	exhaust
ABDC	after bottom dead center	CG	center of gravity	ext.	external
AC	alternating current	CID	cubic inch displacement	F	Fahrenheit, female
A/D	analog to digital	CL	centerline	FHM	flat head machine (screw)
ADC	advanced digital control; analog to digital converter	cm	centimeter	fl. oz.	fluid ounce
adj.	adjust, adjustment	CMOS	complementary metal oxide substrate (semiconductor)	flex.	flexible
ADV	advertising dimensional drawing	com	communications (port)	freq.	frequency
Ah	amp-hour	coml	commercial	FS	full scale
AHWT	anticipatory high water temperature	Coml/Rec	Commercial/Recreational	ft.	foot, feet
AISI	American Iron and Steel Institute	conn.	connection	ft. lb.	foot pounds (torque)
ALOP	anticipatory low oil pressure	cont.	continued	ft./min.	feet per minute
alt.	alternator	CPVC	chlorinated polyvinyl chloride	ftp	file transfer protocol
Al	aluminum	crit.	critical	g	gram
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	CSA	Canadian Standards Association	ga.	gauge (meters, wire size)
AO	anticipatory only	CT	current transformer	gal.	gallon
APDC	Air Pollution Control District	Cu	copper	gen.	generator
API	American Petroleum Institute	cUL	Canadian Underwriter's Laboratories	genset	generator set
approx.	approximate, approximately	CUL	Canadian Underwriter's Laboratories	GFI	ground fault interrupter
APU	Auxiliary Power Unit	cu. in.	cubic inch	GND, ⊕	ground
AQMD	Air Quality Management District	cw.	clockwise	gov.	governor
AR	as required, as requested	CWC	city water-cooled	gph	gallons per hour
AS	as supplied, as stated, as suggested	cyl.	cylinder	gpm	gallons per minute
ASE	American Society of Engineers	D/A	digital to analog	gr.	grade, gross
ASME	American Society of Mechanical Engineers	DAC	digital to analog converter	GRD	equipment ground
assy.	assembly	dB	decibel	gr. wt.	gross weight
ASTM	American Society for Testing Materials	dB(A)	decibel (A weighted)	H x W x D	height by width by depth
ATDC	after top dead center	DC	direct current	HC	hex cap
ATS	automatic transfer switch	DCR	direct current resistance	HCHT	high cylinder head temperature
auto.	automatic	deg., °	degree	HD	heavy duty
aux.	auxiliary	dept.	department	HET	high exhaust temp., high engine temp.
avg.	average	dia.	diameter	hex	hexagon
AVR	automatic voltage regulator	DI/EO	dual inlet/end outlet	Hg	mercury (element)
AWG	American Wire Gauge	DIN	Deutsches Institut für Normung e. V. (also Deutsche Industrie Normenausschuss)	HH	hex head
AWM	appliance wiring material	DIP	dual inline package	HHC	hex head cap
bat.	battery	DPDT	double-pole, double-throw	HP	horsepower
BBDC	before bottom dead center	DPST	double-pole, single-throw	hr.	hour
BC	battery charger, battery charging	DS	disconnect switch	HS	heat shrink
BCA	battery charging alternator	DVR	digital voltage regulator	hsg.	housing
BCI	Battery Council International	E ² PROM, EEPROM	electrically-erasable programmable read-only memory	HVAC	heating, ventilation, and air conditioning
BDC	before dead center	E, emer.	emergency (power source)	HWT	high water temperature
BHP	brake horsepower	ECM	electronic control module, engine control module	Hz	hertz (cycles per second)
blk.	black (paint color), block (engine)	EDI	electronic data interchange	IBC	International Building Code
blk. htr.	block heater	EFR	emergency frequency relay	IC	integrated circuit
BMEP	brake mean effective pressure	e.g.	for example (<i>exempli gratia</i>)	ID	inside diameter, identification
bps	bits per second	EG	electronic governor	IEC	International Electrotechnical Commission
br.	brass	EGSA	Electrical Generating Systems Association	IEEE	Institute of Electrical and Electronics Engineers
BTDC	before top dead center	EIA	Electronic Industries Association	IMS	improved motor starting
Btu	British thermal unit	EI/EO	end inlet/end outlet	in.	inch
Btu/min.	British thermal units per minute	EMI	electromagnetic interference	in. H ₂ O	inches of water
C	Celsius, centigrade	emiss.	emission	in. Hg	inches of mercury
cal.	calorie	eng.	engine	in. lb.	inch pounds
CAN	controller area network	EPA	Environmental Protection Agency	Inc.	incorporated
CARB	California Air Resources Board	EPS	emergency power system	ind.	industrial
CAT5	Category 5 (network cable)	ER	emergency relay	int.	internal
CB	circuit breaker	ES	engineering special, engineered special	int./ext.	internal/external
CC	crank cycle	ESD	electrostatic discharge	I/O	input/output
cc	cubic centimeter	est.	estimated	IP	internet protocol
CCA	cold cranking amps	E-Stop	emergency stop	ISO	International Organization for Standardization
ccw.	counterclockwise	etc.	et cetera (and so forth)	J	joule
CEC	Canadian Electrical Code			JIS	Japanese Industry Standard
cert.	certificate, certification, certified			k	kilo (1000)
cfh	cubic feet per hour			K	kelvin
				kA	kiloampere
				KB	kilobyte (2 ¹⁰ bytes)
				KBus	Kohler communication protocol
				kg	kilogram

kg/cm ²	kilograms per square centimeter	NC	normally closed	RTU	remote terminal unit
kgm	kilogram-meter	NEC	National Electrical Code	RTV	room temperature vulcanization
kg/m ³	kilograms per cubic meter	NEMA	National Electrical Manufacturers Association	RW	read/write
kHz	kilohertz	NFPA	National Fire Protection Association	SAE	Society of Automotive Engineers
kJ	kilojoule	Nm	newton meter	scfm	standard cubic feet per minute
km	kilometer	NO	normally open	SCR	silicon controlled rectifier
kOhm, kΩ	kilo-ohm	no., nos.	number, numbers	s, sec.	second
kPa	kilopascal	NPS	National Pipe, Straight	SI	<i>Système international d'unités</i> , International System of Units
kph	kilometers per hour	NPSC	National Pipe, Straight-coupling	SI/EO	side in/end out
kV	kilovolt	NPT	National Standard taper pipe thread per general use	sil.	silencer
kVA	kilovolt ampere	NPTF	National Pipe, Taper-Fine	SMTP	simple mail transfer protocol
kVAR	kilovolt ampere reactive	NR	not required, normal relay	SN	serial number
kW	kilowatt	ns	nanosecond	SNMP	simple network management protocol
kWh	kilowatt-hour	OC	overcrank	SPDT	single-pole, double-throw
kWm	kilowatt mechanical	OD	outside diameter	SPST	single-pole, single-throw
kWth	kilowatt-thermal	OEM	original equipment manufacturer	spec	specification
L	liter	OF	overfrequency	specs	specification(s)
LAN	local area network	opt.	option, optional	sq.	square
L x W x H	length by width by height	OS	oversize, overspeed	sq. cm	square centimeter
lb.	pound, pounds	OSHA	Occupational Safety and Health Administration	sq. in.	square inch
lbm/ft ³	pounds mass per cubic feet	OV	overvoltage	SMS	short message service
LCB	line circuit breaker	oz.	ounce	SS	stainless steel
LCD	liquid crystal display	p., pp.	page, pages	std.	standard
LED	light emitting diode	PC	personal computer	stl.	steel
Lph	liters per hour	PCB	printed circuit board	tach.	tachometer
Lpm	liters per minute	pF	picofarad	TB	terminal block
LOP	low oil pressure	PF	power factor	TCP	transmission control protocol
LP	liquefied petroleum	ph., ∅	phase	TD	time delay
LPG	liquefied petroleum gas	PHC	Phillips® head CrimpTite® (screw)	TDC	top dead center
LS	left side	PHH	Phillips® hex head (screw)	TDEC	time delay engine cooldown
L _{wa}	sound power level, A weighted	PHM	pan head machine (screw)	TDEN	time delay emergency to normal
LWL	low water level	PLC	programmable logic control	TDES	time delay engine start
LWT	low water temperature	PMG	permanent magnet generator	TDNE	time delay normal to emergency
m	meter, milli (1/1000)	pot	potentiometer, potential	TDOE	time delay off to emergency
M	mega (10 ⁶ when used with SI units), male	ppm	parts per million	TDON	time delay off to normal
m ³	cubic meter	PROM	programmable read-only memory	temp.	temperature
m ³ /hr.	cubic meters per hour	psi	pounds per square inch	term.	terminal
m ³ /min.	cubic meters per minute	psig	pounds per square inch gauge	THD	total harmonic distortion
mA	milliampere	pt.	pint	TIF	telephone influence factor
man.	manual	PTC	positive temperature coefficient	tol.	tolerance
max.	maximum	PTO	power takeoff	turbo.	turbocharger
MB	megabyte (2 ²⁰ bytes)	PVC	polyvinyl chloride	typ.	typical (same in multiple locations)
MCCB	molded-case circuit breaker	qt.	quart, quarts	UF	underfrequency
MCM	one thousand circular mils	qty.	quantity	UHF	ultrahigh frequency
megggar	megohmmeter	R	replacement (emergency)	UIF	user interface
MHz	megahertz	rad.	power source	UL	Underwriter's Laboratories, Inc.
mi.	mile	RAM	radiator, radius	UNC	unified coarse thread (was NC)
mil	one one-thousandth of an inch	RBUS	random access memory	UNF	unified fine thread (was NF)
min.	minimum, minute	RDO	RS-485 proprietary communications	univ.	universal
misc.	miscellaneous	ref.	relay driver output	URL	uniform resource locator (web address)
MJ	megajoule	rem.	reference	US	undersize, underspeed
mJ	millijoule	Res/Coml	remote	UV	ultraviolet, undervoltage
mm	millimeter	RFI	Residential/Commercial	V	volt
mOhm, mΩ	milliohm	RH	radio frequency interference	VAC	volts alternating current
MOhm, MΩ	megohm	RHM	round head	VAR	voltampere reactive
MOV	metal oxide varistor	rly.	round head machine (screw)	VDC	volts direct current
MPa	megapascal	rms	relay	VFD	vacuum fluorescent display
mpg	miles per gallon	rnd.	root mean square	VGA	video graphics adapter
mph	miles per hour	RO	round	VHF	very high frequency
MS	military standard	ROM	read only	W	watt
ms	millisecond	rot.	read only memory	WCR	withstand and closing rating
m/sec.	meters per second	rpm	rotate, rotating	w/	with
mtg.	mounting	RS	revolutions per minute	WO	write only
MTU	Motoren-und Turbinen-Union	RTDs	right side	w/o	without
MW	megawatt		Resistance Temperature Detectors	wt.	weight
mW	milliwatt			xfmr	transformer
μF	microfarad				
N, norm.	normal (power source)				
NA	not available, not applicable				
nat. gas	natural gas				
NBS	National Bureau of Standards				

KOHLER[®] Power Systems

KOHLER CO. Kohler, Wisconsin 53044
Phone 920-457-4441, Fax 920-459-1646

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

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installation, service, and sales dealer in
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