INSTALLATION INSTRUCTIONS

Original Issue Date: **11/08**

Model: **Generator Sets** with Decision-Maker® 3+, Decision-Maker® 550, Decision-Maker® 3000, Decision-Maker® 6000, and KPC 1000 Controllers

Transfer Switches with MPAC™ 1000 and MPAC™ 1500 Controllers

Market: **Industrial and Marine**

Subject: **Remote Serial Annunciator (RSA II) Kits (Firmware Version 2.0)**

Introduction

RSA II is an annunciator panel offered in several kit configurations to support Kohler power equipment. The RSA II is a remote serial annunciator (Figure 1 and Figure 2) that monitors the condition of the generator set and/or ATS from a remote location. The RSA II alerts the operator through visual and audible signals using LED indication and a horn. An alarm silence and lamp test switch are included.

The RSA II meets NFPA 110, Level 1 (2005) applications that require remote controls and alarms be powered by a storage battery such as the engine starting battery. AC adaptor kit GM62466-KP1 is available when NFPA is not required.

The front panel decals include areas that can be used to identify user-selected fault inputs and identify associated power system equipment.

An RSA II annunciator can be used for a single generator set (Figure 1) or with a combination of a generator set and automatic transfer switch (Figure 2). In systems using more than a single RSA II, one must be designated as the master device to broadcast to additional RSA II annunciators, designated as slave devices. Up to five RSA II slave devices can be used with an RSA II master device. All RSA II annunciators are factory set as the master device, but can be changed to a slave device using a PC and SiteTech™ software that connects to the RSA II front panel via a universal serial bus (USB) connection.

The RSA 1000 can be connected with the RSA II provided that the master remote annunciator is an RSA II.

A PC with SiteTech™ software are required to make the RSA II functional. Use your SecurID to access KOHLERnet, click on the TechTools button, and follow the instructions to download the files. See SiteTech™ Software Settings on page 20 and refer to TP-6701 SiteTech™ Software Operation Manual for more information.

The RSA II kits include components for surface mounting or flush mounting.
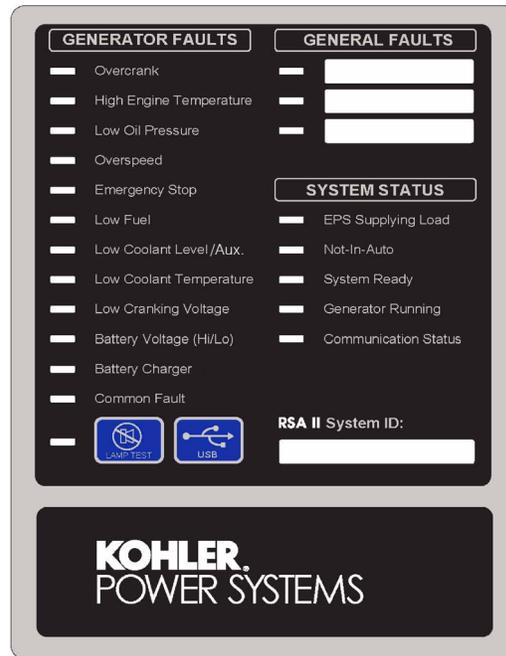
Figure 1 Remote Serial Annunciator (RSA II)
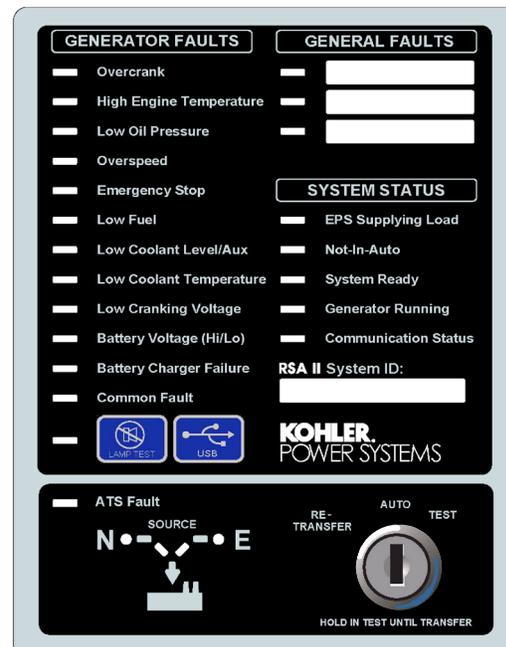
Figure 2 RSA II with ATS Controls

Controller	RSA II	RSA II with ATS Controls	
Decision-Maker® 3+ (DEC 3+)	**GM62516-KP4**	**GM62516-KP2**	Includes RSA II and communication module **GM32644-KP1 Comm. Module Kit (loose)**
Decision-Maker® 550 (DEC 550)	**GM62516-KP3**	**GM62516-KP1**	Includes RSA II only
Decision-Maker® 3000 (DEC 3000)	**GM62516-KP3**	**GM62516-KP1**	Includes RSA II only
Decision-Maker® 6000 (DEC 6000)	**GM62516-KP3**	**GM62516-KP1**	Includes RSA II only
KPC 1000	**GM62516-KP6**	**GM62516-KP5**	Includes RSA II and harness
ATS MPAC™ 1000	—	**GM62516-KP1**	—
MPAC™ 1500	—	**GM62516-KP1**	—
ATS (FAA)	—	**GM62516-KP8**	Includes RSA II only

Figure 3   RSA II Kit Selection

RSA II annunciators used with DEC 3+ controllers require a separate communication module that can be provided with RSA II kit selection (Figure 3).

If a fault occurs, the RSA II horn activates and the corresponding LED illuminates. The following paragraphs describe specific features of the RSA II.

If the RSA II is used with an Ethernet communication network, order Modbus® Ethernet converter GM41143-KP2 and refer to TT-1405 Converters, Connections, and Controller Setup for Network Communication for system installation.

If the RSA II is used with a DEC 3+ controller, it will require a communication module board; refer to TT-1285 Program Loader Software instructions for downloading firmware version 1.23 and higher.

The RSA II is compatible with the following controllers:

- DEC 550 controller firmware version 2.10 and higher.
- DEC 3+ controller with GM28725 (red) circuit board, firmware version 1.13 and higher with the GM47242 communication module board. The GM49791-1 communication module board requires controller firmware version 1.23 and higher.
- DEC 3+ controller with GM64497 (blue) circuit board, firmware version 2.03 and higher with all communication module boards.
- DEC 3000 controller firmware version 1.0 and higher.
- DEC 6000 controller firmware version 2.5.19 and higher.
- KPC 1000 controller firmware version 1.41 and higher.
- MPAC™ 1000 version 1.27 and higher.*
- MPAC™ 1500 version 1.00 and higher.*

* RSA II with ATS controls only.

The RSA II requires connection to the controller Modbus® RS-485 port. When other network functions are required, such as switchgear communication, the RSA II must use an Ethernet network. If the RS-485 port is unavailable and Ethernet conversion is not an option, please select an alternate remote annunciator kit. See Figure 4 for kit numbers.

DEC 3+ Controller	RSA Kit
20–400 kW	GM25955-KP1
450–2250 kW	GM27526-KP1
DEC 550 and DEC 6000 Controllers	**RSA Kit**
20–300 kW	GM27558-KP1
350/400 kW	GM27558-KP2
450–3250 kW	GM27558-KP3

Figure 4   Alternate Remote Annunciator Kits

Communication Module for DEC 3+ Controller

GM47242 Circuit Board. Communication module for all generator set models except 450/500REOZVB and 80–150REOZJD; superseded by GM49791-1.

GM49791-1 Circuit Board. Communication module for all generator set models. **Requires firmware version 1.23 or higher with red controller board or 2.03 or higher with blue controller board.**

When adding the RSA II to the 450/500REOZVB and 80–150REOZJD models, check the part number of the circuit board in the communication module location. See Figure 5. Circuit board GM49791-1 must be installed. GM49791-2 circuit board provides controller gauge drivers only and does not have a communication function. Remove GM49791-2 and order GM32644-KP1 communication module kit that includes the GM49791-1 circuit board.

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GM32644-B

1. Communication module or gauge driver board location (see Communication Module for DEC 3+ Controller section for variations)
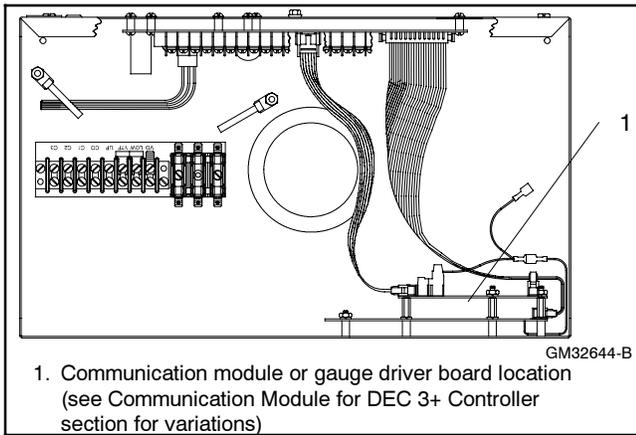
Figure 5 DEC 3+ Controller with Installed Comm. Module (Controller Top View)

Identifying the Communication Module in the DEC 3+ Controller

If connecting the RSA II to a generator set with a DEC 3+ controller, the communication module board must be installed. See Figure 5 for the location of communication module board. The communication module is included with RSA II kits GM62516-KP2 and GM62516-KP4. The communication module is also available as a separate kit GM32644-KP1.

RSA II Features

Horn

Alarm Horn. The alarm horn sounds giving a minimum 90 dB at 0.1 m (0.3 ft.) audible alarm when a warning or shutdown fault condition exists except on high/low battery voltage or EPS supplying load.

The horn sounds when RSA II user inputs 1–3 are activated with a 550 controller. The horn sounds when RSA II user inputs 1–2 are activated with a DEC 3+ controller. The horn will only sound if the RSA II user input is setup as a shutdown fault (not a warning).

Note: The alarm horn sound level may vary depending upon the mounting configuration.

External Alarm Horn Contacts. The RSA II circuit board provides a set of contacts to power an external 12 VDC user-supplied alarm horn.

Switches with Operating Information

Alarm Silence. Press the Alarm Silence/Lamp Test switch to quiet the alarm during servicing. The horn will reactivate upon additional faults. Red LED flashes slow.

Lamp Test. Press the Alarm Silence/Lamp Test switch to test the RSA II indicator LEDs, horn, and relays.

Keyswitch (RSA II with ATS controls model only). Use the keyswitch (RE-TRANSFER/AUTO/TEST) to initiate a *loaded* transfer switch remote test. The spring-loaded switch (kits GM62516-KP1, 2, and 5) will return to the center AUTO position when released. The keyswitch (kit GM62516-KP8) is not spring loaded. The key is only removable in the AUTO position.

When connected to an MPAC™ 1000 controller, DIP switch #1 must be set for a loaded exercise. See the MPAC™ 1000 controller operating instructions for details.

If multiple RSA II with ATS are connected, the *loaded* test can only occur when each RSA II with an ATS keyswitch is in the AUTO position and the ATS is currently not in the test mode. If one of the remote test switches is in an invalid state (fault condition), the invalid switch must re-establish the AUTO position before the RSA II will command a remote test.

To start a *loaded* remote test

Kits GM62516-KP1, 2, and 5. Place and hold the keyswitch in the TEST position for the duration of the test.

Kit GM62516-KP8. Place the keyswitch in the TEST position.

After the RSA II receives acknowledgement from the ATS that it is in the test mode, the RSA II indicates the test mode by slowly flashing the standby source light (a few seconds later). After the ATS contactor transfers to the Standby position, then the standby position light turns on and the emergency source light continues to slowly flash.

To stop a *loaded* remote test started by the RSA II

Kits GM62516-KP1, 2, and 5. RELEASE the keyswitch and it will return to the AUTO position.

Kit GM62516-KP8. Place the test switch in the AUTO position.

The ATS may not immediately retransfer back to the Normal position if the ATS has a programmed time delay for the standby-to-normal transfer or load sheds. The time delay will start timing out when the test switch is in the AUTO position and the standby source light will change from a slow flash to a fast flash. Any RSA II can restart a loaded remote test *while* a time delay is still active.

To end the first time delay for retransfer, place the test switch in the RE-TRANSFER position. Any RSA II test switch on the network can cancel the first active time delay present at the ATS. The RSA II cannot cancel any other time delays established by the ATS and/or generator set controller.

Communications

Network communication is available via the RS-485 port. A USB port located on the front panel allows user setup of the RSA II via the provided firmware.

LEDs

There are up to 26 LED indicators for status, warning, and/or shutdown. For a summary of the LED descriptions, see Figure 6. Some items have two LEDs:

- Communication status (green functional, red fault).
- High engine temperature (yellow warning, red shutdown).
- Low oil pressure (yellow warning, red shutdown).
- System ready (green functional, red fault).
- (RSA II with ATS controls model only.) ATS fault (yellow warning/red shutdown), source (N–green/E–red), and position (N–green/E–red).

Some functions of the LED include flashing either fast or slow. The fast flash occurs at 200 ms intervals and the slow flash occurs at 1 second intervals.

Alarm Silenced. Red LED slowly flashes when alarm horn is deactivated by Alarm Silence/Lamp Test switch.

ATS Available Source N or E (RSA II with ATS controls model only). Green Normal and/or Red Emergency LEDs indicate the power source availability.

ATS Fault (RSA II with ATS controls model only). Red shutdown or Yellow warning LEDs indicate the type of fault.

ATS Position N or E (RSA II with ATS controls model only). Green Normal or Red Emergency LEDs indicate the transfer switch position regardless of the power source availability.

Aux. Fault. See Low Coolant Level/Aux. Fault. The Aux. Fault feature is only associated with DEC 3+ controller function.

Battery Charger Fault. Yellow LED slowly flashes when battery charger malfunctions. Requires battery charger with alarm contact.

Battery Voltage (Hi/Lo). The DEC 3+ controller requires battery charger with alarm contacts. See Figure 49 and Figure 50 relating to battery charger for additional information.

- Yellow LED flashes slowly when battery or charging voltage drops below preset level.
- Yellow LED is steady on if battery voltage exceeds preset level.

Common Fault. Red LED flashes slow when a single or multiple common fault #1 occurs. Yellow LED flashes slow when a single or multiple common fault #2 occurs. User Programmed Inputs #1, #2, and #3 are also discussed later in this section including Figure 8.

Common faults are selectable on the DEC 550 controller using the respective controller menu choices. The 550 controller offers two choices for common fault setup.

- Configure a programmable digital output on the DEC 550 as a common fault and wire that into one of the DEC 550's programmable user inputs 7, 8, or 10. Use SiteTech™ to configure the corresponding RSA user input source 1, 2, or 3 (P41-2, -4, or -6). This is the recommended approach since another line from the DEC 550 to the RSA is unnecessary.

- Configure a programmable digital output on the DEC 550 as a common fault and wire that into the RSA's user input source 1, 2, or 3 (P41-2, -4, or -6).

The DEC 3+ controller offers two choices for common faults using terminal 32 or 32A.

Terminal 32 provides the following ten common faults:
- Auxiliary Warning
- (Generator Switch) Not-In-Auto
- High Engine Temperature Shutdown
- High Engine Temperature Warning
- Low Water Temperature Warning
- Low Fuel Warning
- Low Oil Pressure Shutdown
- Low Oil Pressure Warning
- Overcrank Shutdown
- Overspeed Shutdown

Terminal 32A provides the following five common faults:
- Auxiliary Warning
- Emergency Stop
- High Engine Temperature Shutdown
- Low Oil Pressure Shutdown
- Overspeed Shutdown

Communication Status. The RSA II is shipped from the factory preset as a master device and communicating with a generator set controller on Modbus® address #1 and/or ATS controller on Modbus® address #2 with *ATS connected* set to False. The generator set controller is a slave device. Additional RSA II devices on the same network must be reset in the field as slave devices. See Figure 6 and Figure 7.

| Fault and Status Condition | Fault LED | System Monitoring LEDs and Functions | | | | | |
		System Ready LED	Generator Running LED	Communication Status LED	Common Fault LED	Common Fault Output	Horn
Overcrank Shutdown	Red	Red SF	Off	Green	Red SF	On	On
High Engine Temperature Warning *	Yellow	Red SF	Green	Green	Red SF	On	On
High Engine Temperature Shutdown	Red	Red SF	Off	Green	Red SF	On	On
Low Oil Pressure Warning *	Yellow	Red SF	Green	Green	Red SF	On	On
Low Oil Pressure Shutdown	Red	Red SF	Off	Green	Red SF	On	On
Overspeed Shutdown	Red	Red SF	Off	Green	Red SF	On	On
Emergency Stop *	Red	Red SF	Off	Green	Off	On	On
Low Coolant Level/Auxiliary Shutdown *	Red	Red SF	Off	Green	Red SF	On	On
Low Coolant Temperature *	Yellow	Red SF	Off	Green	Red SF	On	On
Low Fuel—Level or Pressure *	Yellow	Red SF	Off	Green	Red SF	On	On
EPS Supplying Load (RSA II)	Green	Green	Green or Off	Green	Off	Off	Off
System Ready	Green	Green	Green or Off	Green	Off	Off	Off
System Not Ready	Red	Red SF	Green or Off	Green	Off	On	On
Low Cranking Voltage	Yellow	Red SF	Off	Green	Red SF	On	On
(Loss of) Communication Status (Master RSA II)	Red	Off	Off	Red FF	Off	On	On
(Loss of) Communication Status (Slave RSA II)	Red	Off	Off	Red SF	Off	On	On
Not-In-Auto	Red	Red SF	Green or Off	Green	Red SF	On	On
Battery Charger Fault *	Yellow	Green	Green or Off	Green	Off	On	On
High Battery Voltage *	Yellow	Green	Green or Off	Green	Off	On	On
Low Battery Voltage *	Yellow	Green	Green or Off	Green	Off	Off	Off
User Input #1 (RSA II) Warning	Yellow	Green	Green or Off	Green	Off	On	On
User Input #1 (RSA II) Shutdown	Red	Green	Green or Off	Green	Off	On	On
User Input #2 (RSA II) Warning	Yellow	Green	Green or Off	Green	Off	On	On
User Input #2 (RSA II) Shutdown	Red	Green	Green or Off	Green	Off	On	On
User Input #3 (RSA II) Warning	Yellow	Green	Green or Off	Green	Off	On	On
User Input #3 (RSA II) Shutdown	Red	Green	Green or Off	Green	Off	On	On
Common Fault Warning	Yellow	Green	Green or Off	Green	Red SF	On	Off
Common Fault Shutdown	Red	Green	Green or Off	Green	Red SF	On	On
ATS Position N (RSA II with ATS only)	Green	Green	Green or Off	Green	Off	Off	Off
ATS Position E (RSA II with ATS only)	Red	Red SF	Green or Off	Green	Off	Off	On
ATS Available N (RSA II with ATS only)	Green	Green	Green or Off	Green	Off	Off	Off
ATS Available E (RSA II with ATS only)	Red	Red SF	Green or Off	Green	Off	Off	On
ATS Fault (RSA II with ATS only)	Yellow	Yellow	Green or Off	Green	Off	Off	On
ATS Fault (RSA II with ATS only)	Red	Red SF	Green or Off	Green	Off	Off	On

SF = Slow Flash (1 second intervals), FF = Fast Flash (200 ms intervals)
* May require optional kit or user-provided device to enable function and LED indication.

Figure 6   System Monitoring LEDs and Functions

LED	LED Status	Horn	Function
Green	Steady on	Off	Communication is okay
Green	Flashes slow	Off	When communication is being established
Green	Flashes fast	Off	When the master RSA II communication configuration does not match the device
Red	Flashes fast	On	When the master RSA II encounters a communication problem with a device
Red	Flashes slow	On	When the slave RSA II does not detect the master RSA II
Red	Steady on	On	When the master RSA II is set up to communicate with the slave RSA II and the slave RSA II does not respond to the master RSA II

Figure 7   Communication Status

Emergency Power System (EPS) Supplying Load. (RSA II with ATS only). Use the SiteTech™ software to select the EPS source from the following choices:

- Green LED is <u>steady on</u> when the generator set is supplying more than 5% of standby output current (or when transfer switch is in the emergency position with the DEC 3+ controller).
- The EPS can be configured to receive the ATS position using Modbus®. When the ATS is in the emergency position, the EPS Supplying Load LED is <u>steady on</u>.
- Local EPS supplying load. See Figure 8.

Emergency Stop. Red LED flashes and engine stops when emergency stop is made. May require an optional local emergency stop switch on the generator set controller.

Generator Running. Green LED is <u>steady on</u> when generator set is in operation. See System Ready note.

(Generator Switch) Not-In-Auto. Red LED <u>flashes at a faster rate</u> when generator set master switch is in the RUN or OFF/RESET position.

High Engine Temperature.

- Red LED flashes when engine has shut down because of high engine coolant temperature.
- Yellow LED flashes when engine coolant temperature approaches shutdown range. Requires warning sender on some generator set models.

Low Coolant Level/Aux. Fault. LED is <u>steady on</u> when engine coolant level is below acceptable range on radiator-mounted generator sets only. When used with a DEC 3+ controller, LED indicates low coolant level or auxiliary fault shutdown. Requires customer-supplied low coolant level switch on remote radiator models.

Low Coolant Temperature. Yellow LED flashes when optional engine block heater malfunctions and/or engine coolant temperature is too low. Requires prealarm sender on some generator set models.

Low Cranking Voltage. Yellow LED flashes when engine starting battery voltage drops below preset level.

Low Fuel (Level or Pressure). Yellow LED flashes when level in diesel fuel tank approaches empty or low pressure occurs with gas fuels. Requires customer-supplied level or pressure switch on some generator set models.

Low Oil Pressure.

- Red LED flashes when set shuts down because of insufficient oil pressure.
- Yellow LED flashes when engine oil pressure approaches shutdown range. Requires warning sender on some generator set models.

Not-In-Auto. See (Generator Switch) Not-In-Auto.

Overcrank (Locked Rotor). Red LED flashes and cranking stops when engine does not start in either continuous cranking or cyclic cranking modes.

Overspeed. Red LED flashes when engine shuts down because of an overspeed condition.

System Ready.

- Green LED is <u>steady on</u> when generator set master switch is in AUTO and the system senses no faults.
- Red LED flashes when a system fault occurs.

A System Ready red LED and/or a Generator Running LED off, without an associated LED shutdown indication on the RSA II, may represent a generator set fault initiated by the engine ECM warning or shutdown fault detection. Refer to the engine operation manual for ECM information.

User Programmed Inputs #1, #2, and #3. Monitors three digital inputs (status, warnings, and/or shutdowns). Use the SiteTech™ software to select the desired user input and assign a severity level (warning or shutdown fault). A separate yellow or red LED flashes for each input when a respective warning or shutdown fault occurs or the status changes. See Figure 8.

Controller	User Input 1	User Input 2	User Input 3
Master RSA	Local: User Input #1 (P41-2)	Local: User Input #2 (P41-4)	Local: User Input #3 (P41-6)
Slave RSA	Not applicable	Not applicable	Not applicable
Decision-Maker® 3+	Gen: User Input #1	Gen: User Input #2	Gen: User Input #3
Decision-Maker® 3000	Gen: DI1	Gen: DI2	Gen: DI3
Decision-Maker® 550	Gen: User Input #7	Gen: User Input #8	Gen: User Input #10
Decision-Maker® 6000	Gen: User Input #7	Gen: User Input #8	Gen: User Input #10
KPC 1000	Not applicable	Not applicable	Not applicable
MPAC™ 1000	ATS: Main logic board input #1	ATS: Main logic board input #2	ATS: Not applicable
MPAC™ 1500	ATS: Main logic board input #1	ATS: Main logic board input #2	ATS: Not applicable
User defined inputs are digital. SiteTech™ software is used to program digital inputs for the RSA II (master). Local is a hardwired connection to RSA II master. User inputs are assigned to D7, D8, and D10 when using the Decision-Maker® 550 or Decision-Maker® 6000 controller remote.			

Figure 8 RSA II User Defined Inputs and EPS Supplying Load Defaults

User-defined digital inputs #1, #2, and #3 are selected at the RSA II master only and annunciated to the RSA II slave(s). No user-defined digital input selection is available at the RSA II slave(s).

- **DEC 3+ Controller.** User-defined digital inputs are selected at the RSA II master using SiteTech™ software. User-defined digital inputs tied directly to the RSA II master are considered local. User-defined digital inputs connected to the controller communication module board are considered remote. User-defined digital input #3 is also used for high battery voltage and requires battery charger with alarms.

- **DEC 550, DEC 3000, and DEC 6000 Controllers.** User-defined digital inputs are selected at the RSA II master using SiteTech™ software. User-defined digital inputs tied directly to the RSA II master are considered local.

Figure 6 shows the status of the system ready LED, generator running LED, communication status LED, common fault LED, common fault output, and horn for each fault or status condition.

Mounting

Surface Mounting or Flush Mounting capability is standard.

This document includes installation information for both surface- and flush-mount models.

Safety Precautions

Observe the following safety precautions while installing the kit.

⚠ WARNING
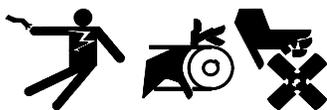
Accidental starting.
Can cause severe injury or death.

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 connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (−) lead first. Reconnect the negative (−) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Read the entire installation procedure and compare kit parts with parts list in this publication before beginning installation. Perform the steps in the order shown.

Note: Observe applicable local and national electrical codes when installing the wiring system.

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.

Installation Procedure

1. Remove the generator set from service.

1.1 Place the generator set master switch in the OFF/ RESET position.

1.2 Disconnect the power to the battery charger, if equipped.

1.3 Disconnect the generator set engine starting battery(ies), negative (−) lead first.

1.4 Remove the controller cover and hardware.

2. Remove the gauge driver board in the DEC 3+ controller (if equipped).

If the unit is an 80–150REOZJD or 450/500REOZVB model, the controller may contain a gauge driver circuit board GM49791-2. Information regarding identifying the circuit board is shown in the Communication Module for DEC 3+ Controller section on page 2 of this document.

Note: If the unit is not an 80–150REOZJD or 450/ 500REOZVB model, go to step 3.

Note: If the communication module board GM49791-1 is already installed because GM62516-KP2 or -KP4 kits were ordered *installed*, go to step 5.

Otherwise, remove GM49791-2 interface with gauge driver circuit board and replace with GM49791-1 communication interface with gauge driver circuit board. Use the following procedure and refer to Figure 9.

2.1 Disconnect the 10-pin cable at the P8 connector on the circuit board.

2.2 Disconnect the 8-pin cable at the P10 connector on the circuit board.
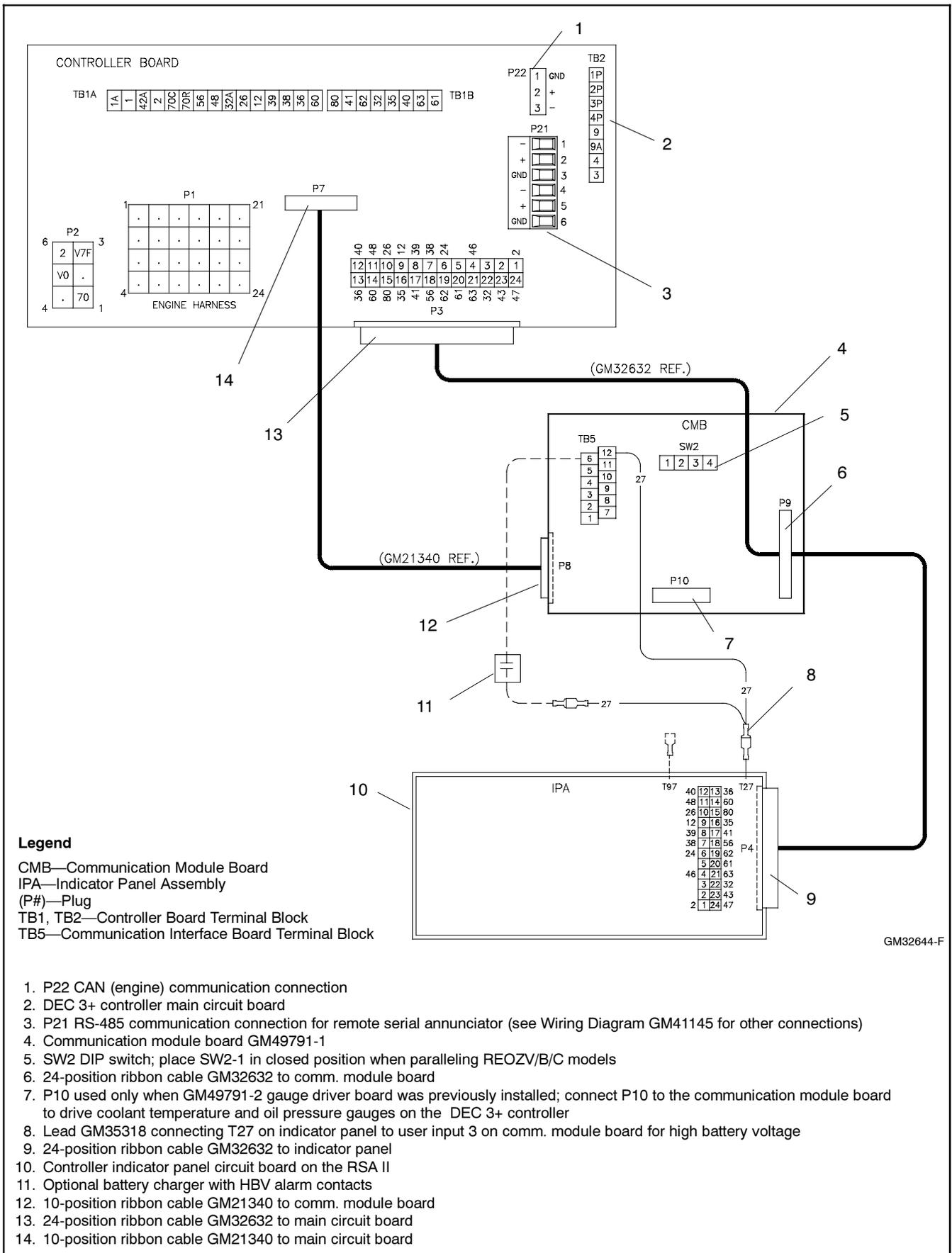
Figure 9 Communication Module Schematic, DEC 3+ Controller

Legend

CMB—Communication Module Board
IPA—Indicator Panel Assembly
(P#)—Plug
TB1, TB2—Controller Board Terminal Block
TB5—Communication Interface Board Terminal Block

GM32644-F

1. P22 CAN (engine) communication connection
2. DEC 3+ controller main circuit board
3. P21 RS-485 communication connection for remote serial annunciator (see Wiring Diagram GM41145 for other connections)
4. Communication module board GM49791-1
5. SW2 DIP switch; place SW2-1 in closed position when paralleling REOZV/B/C models
6. 24-position ribbon cable GM32632 to comm. module board
7. P10 used only when GM49791-2 gauge driver board was previously installed; connect P10 to the communication module board to drive coolant temperature and oil pressure gauges on the DEC 3+ controller
8. Lead GM35318 connecting T27 on indicator panel to user input 3 on comm. module board for high battery voltage
9. 24-position ribbon cable GM32632 to indicator panel
10. Controller indicator panel circuit board on the RSA II
11. Optional battery charger with HBV alarm contacts
12. 10-position ribbon cable GM21340 to comm. module board
13. 24-position ribbon cable GM32632 to main circuit board
14. 10-position ribbon cable GM21340 to main circuit board

2.3 Remove the existing three nuts and lock washers attaching the gauge drive circuit board to the indicator panel circuit board. Leave the existing washers in place. The nuts and lock washers will be reused.

2.4 Remove existing 24-position ribbon cable 336428 between the indicator panel circuit board and the main circuit board. This ribbon cable will not be reused.

2.5 The new 24-position ribbon cable GM32632 has three connectors—one at each end and an inline connector. Attach the end connector (nearest to inline connector) to the indicator panel circuit board P4 connector. The connector is polarized and mates in one position only.

2.6 Attach the other end connector of the 24-position ribbon cable GM32632 to the main circuit board P3 connector. The connector is polarized and mates in one position only.

3. Mount the communication module board in the DEC 3+ controller.

Note: Requires DEC 3+ controller logic (red) circuit board GM28725.

Note: Perform step 3 with GM62516-KP2 or -KP4 and GM32644-KP1 kit.

3.1 Remove the existing three nuts attaching the indicator panel circuit board. Leave the existing washers in place. The nuts will be reused.

3.2 Attach the three spacers to the indicator panel circuit board studs. See Figure 10.

3.3 Position communication module board GM49791-1 on the spacers.

Note: If procedure requires installing a communication module board, refer to TT-1285 Program Loader Software instructions for downloading firmware version **1.23 or higher with red controller board or 2.03 or higher with blue controller board.** The download should be performed in step 8. Configure the DEC 3+ controller for the remote serial annunciator.

3.4 Install three lock washers (X-22-7) from the kit or from step 2.3 and the existing three nuts on the spacers to secure the communication module board. Do not overtighten the nuts.

4. Wire the communication module board in the DEC 3+ controller.

4.1 Attach the 24-position ribbon cable GM32632 inline connector to the communication module board P9 connector. The connector is polarized and mates in one position only.

1. Ribbon cable, 10 position GM21340
2. DEC 3+ controller main circuit board
3. Ribbon cable, 24 position GM32632
4. Existing nuts (3)
5. Lock washers (3), X-22-7
6. Spacers (3) GM32633
7. Existing washers (3)
8. Existing indicator panel circuit board
9. Communication module board GM49791-1

GM32644-B
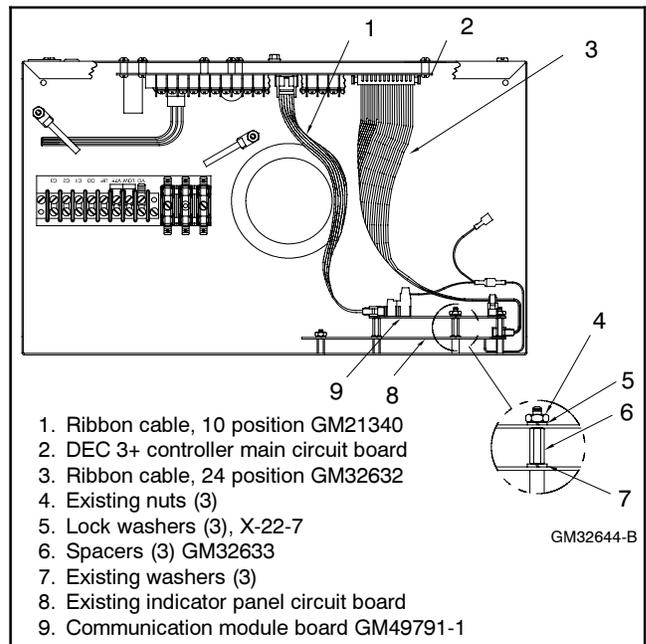
Figure 10 Mounting Communication Module Board in the DEC 3+ Controller

4.2 Attach the 10-position ribbon cable GM21340 to the communication module board P8 connector and the main circuit board P7 connector. The connectors are polarized and mate in one position only.

4.3 If the unit previously had the GM49791-2 gauge drive circuit board installed, reconnect cable P10 to the communication module board.

4.4 **High Battery Voltage.** Locate T27 lead on the indicator panel assembly and connect communication board HBV harness GM35318. Use the terminal connector on GM35318 with the two leads together. Verify that the stripped end of the harness is securely connected to communication module board terminal TB5-12. See Figure 9 for an illustration of the wiring connection. See Figure 11 and Figure 12 for the communication module board terminal strip location and terminal designations.

GM32644-F
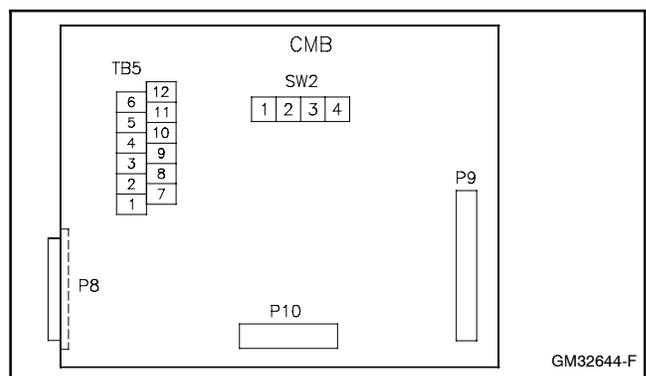
Figure 11 Communication Module Board

Connector Designation	Circuit Board Designation
1	Not used
2	Not used
3	ATS Position Input Return
4	User 1 Input Return
5	User 2 Input Return
6	User 3 Input Return *
7	Not used
8	Not used
9	ATS Position Input
10	User 1 Input
11	User 2 Input
12	User 3 Input *
* Reserved for high battery volts (HBV) on DEC 3+ controllers.	

Figure 12 Communication Module TB5 Terminal Strip Connections

4.5 Connect wiring from the user-supplied battery charger high battery voltage contacts to the remaining terminal on harness GM35318 and TB5-6 for RSA II annunciation of *(high) Battery Voltage*. See Figure 13 for wire sizes.

Length, m (ft.)		Wire Gauge
0–137	(0–450)	22
137–213	(450–700)	20
213–343	(700–1125)	18
343–549	(1125–1800)	16
549–853	(1800–2800)	14

Figure 13 Wire Specifications for Communication Module Connections

4.6 **EPS Supplying Load.** Connect wiring from the user-supplied transfer switch (ATS) emergency position auxiliary contacts to terminals TB5-3 and TB5-9 for RSA II annunciation of *EPS Supplying Load*. See Figure 13 for wire sizes.

4.7 **User Input 1 and User Input 2.** Make additional user-selected connections to the communication module board TB5 terminal block. See Figure 13 for wire sizes. The user-selected connections are defined in Figure 12 and include:
- User Input 1 (remote).
- User Input 2 (remote).

Note: User input 3 is reserved for high battery voltage as outlined in step 4.4.

Document the user-selected inputs for future reference. If user-selected inputs 1–2 (remote) are used, the user may add the identification on the RSA II front panel strip. This procedure is further explained in step 6.13 of this instruction.

5. Select a mounting location for the RSAII.

Note: Use step 5 for mounting the RSA II master and the RSA II slaves as needed. The recommended maximum total is three RSA II slaves. The RSA II wiring information is covered in step 6.

5.1 Select a visible location for mounting the RSA II up to 853 m (2800 ft.) from the controller. Install the RSA II, either surface- or flush-mounted, in a location easily observable by operating personnel at their work stations. See Figure 14 for RSA II overall dimensions. Refer to Figure 15 for the dimension print.

Note: Locate all RSA II within 853 m (2800 ft.) of the controller.

ADV-6935A-B

Surface Mounted   **Flush Mounted**

Dimensions—W x H x D, mm (in.)

Surface Mounted: 203 x 203 x 51.5 (8.0 x 8.0 x 2.0)

Flush Mounted: 203 x 203 x 53.0 (8.0 x 8.0 x 2.1)
Flush-mounting plate W1: 229 (9.0)

Flush Mounted*: 203 x 203 x 103 (8.0 x 8.0 x 4.1)
Flush-mounting plate W1: 229 (9.0)

* Requires user-supplied Hoffman box 203 x 203 x 102 mm (8 x 8 x 4 in.)
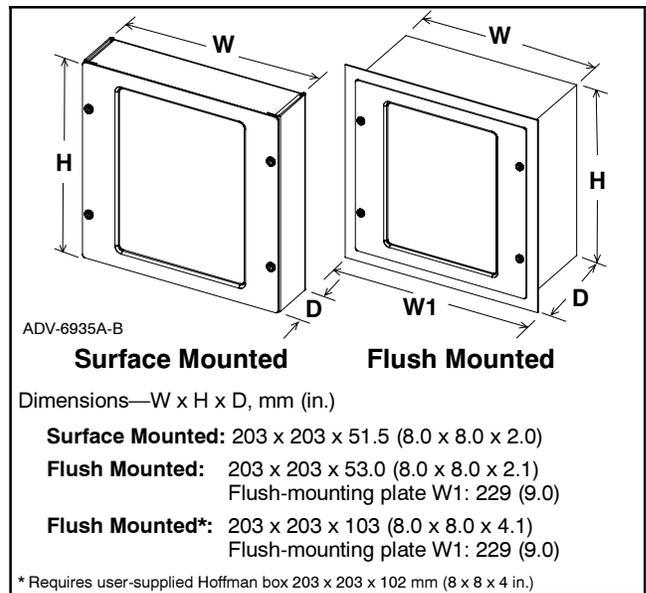
Figure 14 RSA II Box Dimensions
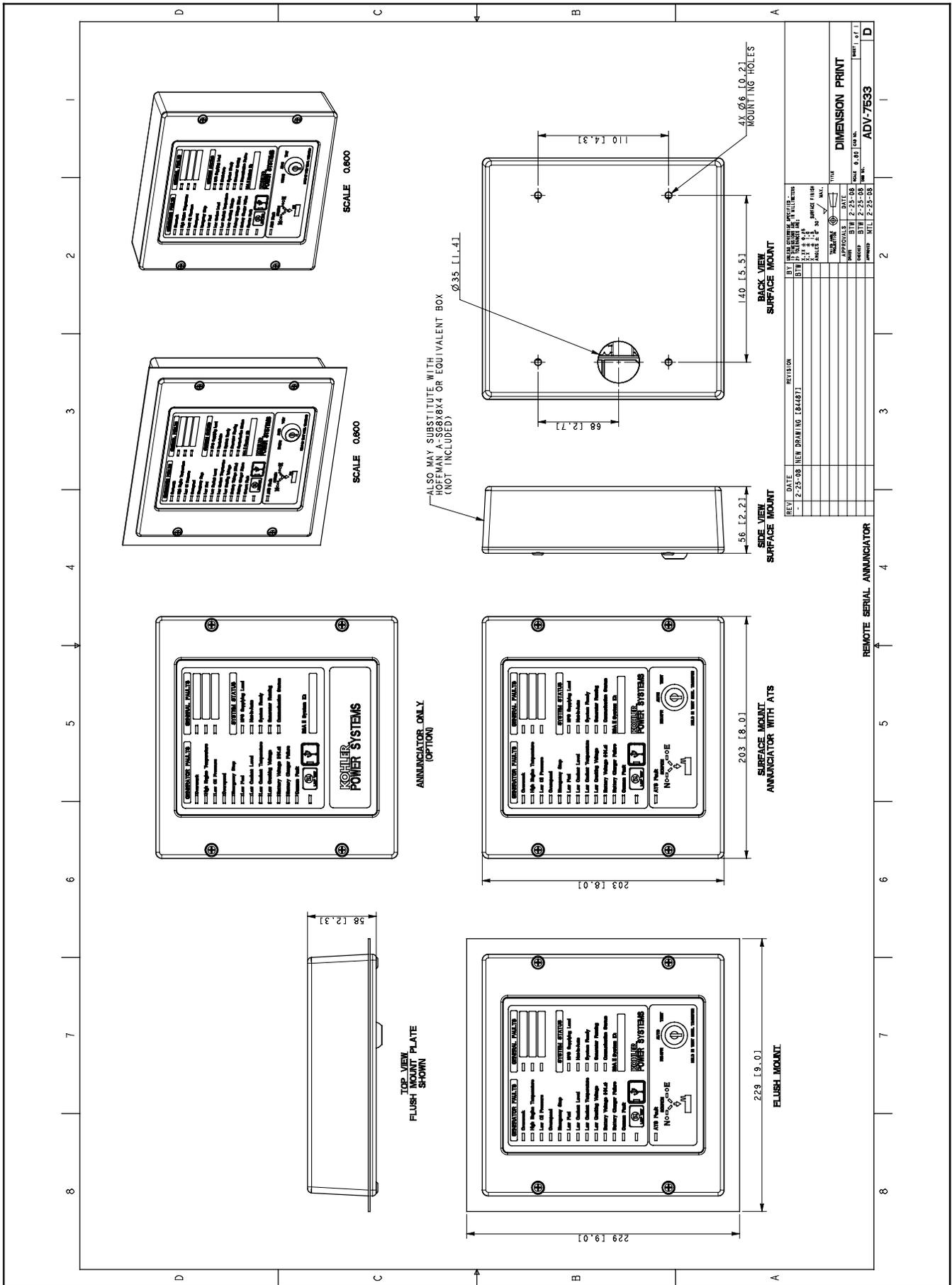
Figure 15 Remote Serial Annunciator Dimension Print ADV-7533-

Note: Dimensions shown are in mm.
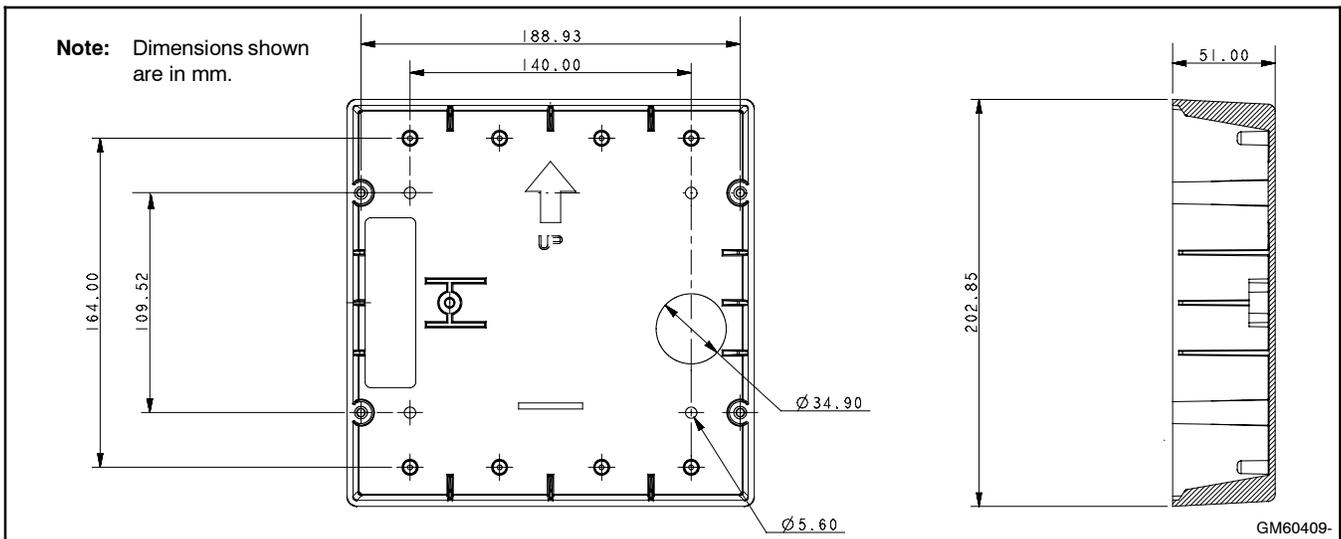
GM60409-

Figure 16 RSA II Mounting Hole Dimensions in Supplied Box GM60409

5.2 Remove four screws X-67-154 from the RSA II bezel GM60400 and remove bezel from the RSA II box GM60409. See Figure 16 for RSA II supplied box mounting hole information.

The installation instructions describe three RSA II mounting scenarios:

● Surface mount with supplied box (step 5.3).

● Flush mount with supplied box (step 5.4).

● Flush mount using a user-supplied Hoffman box (step 5.5).

5.3 **Surface mount RSA II initial installation.**

5.3.1 Prepare the mounting site by drilling pilot holes for anchors, if used.

Note: Mount the RSA II box to a standard 10 cm (4 in.) square electrical box installed in the wall.

5.3.2 Create an opening in the wall for the electrical wiring from the master RSA II to the controller communications and power supply. The wall opening must allow for the wiring of the RSA II slave, if used. Protect the RSA II front panel assembly from dust and debris when drilling the holes.

5.3.3 Drill an appropriate size hole in box GM60409 if a user-supplied conduit connector is required. Install the user-supplied connector.

5.3.4 Temporarily mount the RSA II box to the wall or to the electrical box in the wall and check for proper hole alignment. Adjust as needed. Remove RSA II box.

Note: Use mounting hardware suitable for the wall composition and thickness.

5.3.5 Repeat step 3 for RSA II slaves, as needed.

5.3.6 Proceed to step 6, Wire the RSA II.

5.4 **Flush mount RSA II initial installation with box GM60409 (Part of RSA II kit).**

5.4.1 Prepare mounting site by creating an opening in wall for flush-mounting RSA II box.

5.4.2 Drill an appropriate size hole in box GM60409 if a user-supplied conduit connector is required. Install the user-supplied connector.

Size the flexible conduit for the electrical wiring from master RSA II to the controller communications and power supply. The flexible conduit size must allow for the wiring of a RSA II slave, if used.

5.4.3 Attach the RSA II box to the wall with user-supplied hardware. Protect the RSA II front panel assembly from dust and debris when drilling the mounting holes.

5.4.4 Repeat step 3 for RSA II slaves, as needed.

5.4.5 Proceed to step 6, Wire the RSA II.

5.5 **Flush mount RSA II initial installation with a user-supplied Hoffman box.**

5.5.1 Prepare the mounting site by creating an opening in the wall for flush mounting the RSA II using a user-supplied 203 x 203 x 102 mm (8 x 8 x 4 in.) Hoffman box (part no. A-SG8X8X4) or equivalent.

5.5.2 Use wall-mounting plate GM33031 as a template and drill four 4.4 mm (0.17 in.) diameter holes in the Hoffman box front edge for mounting the RSA II front panel assembly if not already done. See Figure 17.
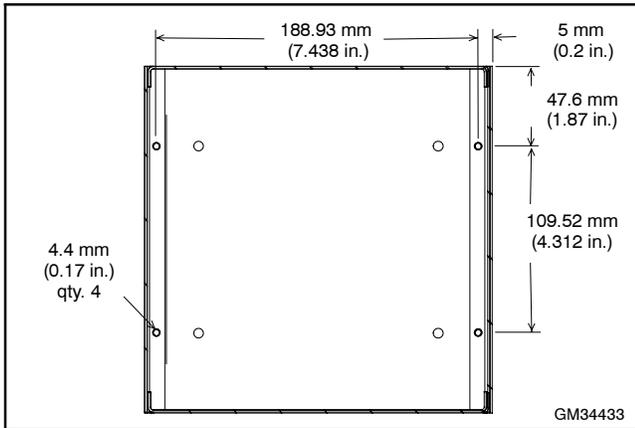
Figure 17 Drilling Mounting Holes in Hoffman Box for RSA II Front Panel Assembly

5.5.3 Select a location on the box and install a user-supplied conduit connector or bushing. Temporarily install the RSA II front panel assembly to be sure the hole location with bushing or conduit connector does not interfere with attaching the RSA II front panel assembly.

Size the flexible conduit for the electrical wiring from the master RSA II to the controller communications and power supply. The flexible conduit size must allow for the wiring of RSA II slave, if used.

5.5.4 Attach the RSA II box to the wall with user-supplied hardware. Protect the RSA II front panel assembly from dust and debris when drilling the mounting holes.

5.5.5 Repeat step 3 for RSA II slaves, as needed.

5.5.6 Proceed to step 6, Wire the RSA II.

6. Wire the RSA II.

The installer must supply all leads. Observe the following guidelines during installation:
- Isolate the RSA II leads from all other voltages.
- Use separate conduit.
- Use grounded metallic conduit for leads or use shielded cable in nonmetallic conduit.
- Use color-coded wire for easy identification.

- Make leads long enough to allow for walls, ductwork, and obstructions. Use Figure 18 to determine the wire gauge for DC power and signal wires.
- Use Belden #9841 or equivalent (shielded twisted-pair cable) for all communication wiring.

Length, m (ft.)		Wire Gauge
0–137	(0–450)	22
137–213	(450–700)	20
213–343	(700–1125)	18
343–549	(1125–1800)	16
549–853	(1800–2800)	14

Figure 18 Wire Specifications between RSA II and Generator Set Controller for DC Power and Signal Wiring

Use solid or stranded 14-22 gauge wire. To determine the wire gauge, measure the cable distance between the controller and master RSA II.

For example, if the cable distance between the controller and the master RSA II is 122 m (400 ft.), then the total wire length for each conductor is 122 m (400 ft.). According to the chart in Figure 18, this example requires 22-gauge wire.

Throughout step 6, refer to the following illustrations. See Figure 19 for RSA II circuit board connectors. See Figure 34 for RSA II circuit board terminal connections. See Figure 44, Figure 45, and Figure 46 for the RSA II wiring diagram and Figure 49 and Figure 50 for the RSA II interconnection diagram.

The RSA II has the following wiring and selections:
- P11, 24-pin Ethernet connections (future use). See step 6.3.
- P27, 6-pin RS-485 connections (communication between controller and RSA II master). See step 6.4.
- P27, 6-pin RS-485 connections (communication between RSA II master and RSA II slaves) See step 6.5.
- P34, 3-pin RS-485 termination resistor for last device. See step 6.5.
- P35, 3-pin CAN termination (in/out) (factory only).
- P36, 8-pin CAN (factory only).
- P37, 6-pin power/CAN connections. See step 6.6.
- P38, 2-pin DC power supply (+/−) connections. See step 6.7.
- P39, 3-pin isolated/non-isolated jumper. See step 6.8.
- P40, 6-pin common fault and horn dry contacts. See step 6.9.
- P41, 8-pin input (EPS/user) connections. See step 6.10.
- P42, 6-pin keyswitch (RSA II with ATS only).

Bottom View	Top View
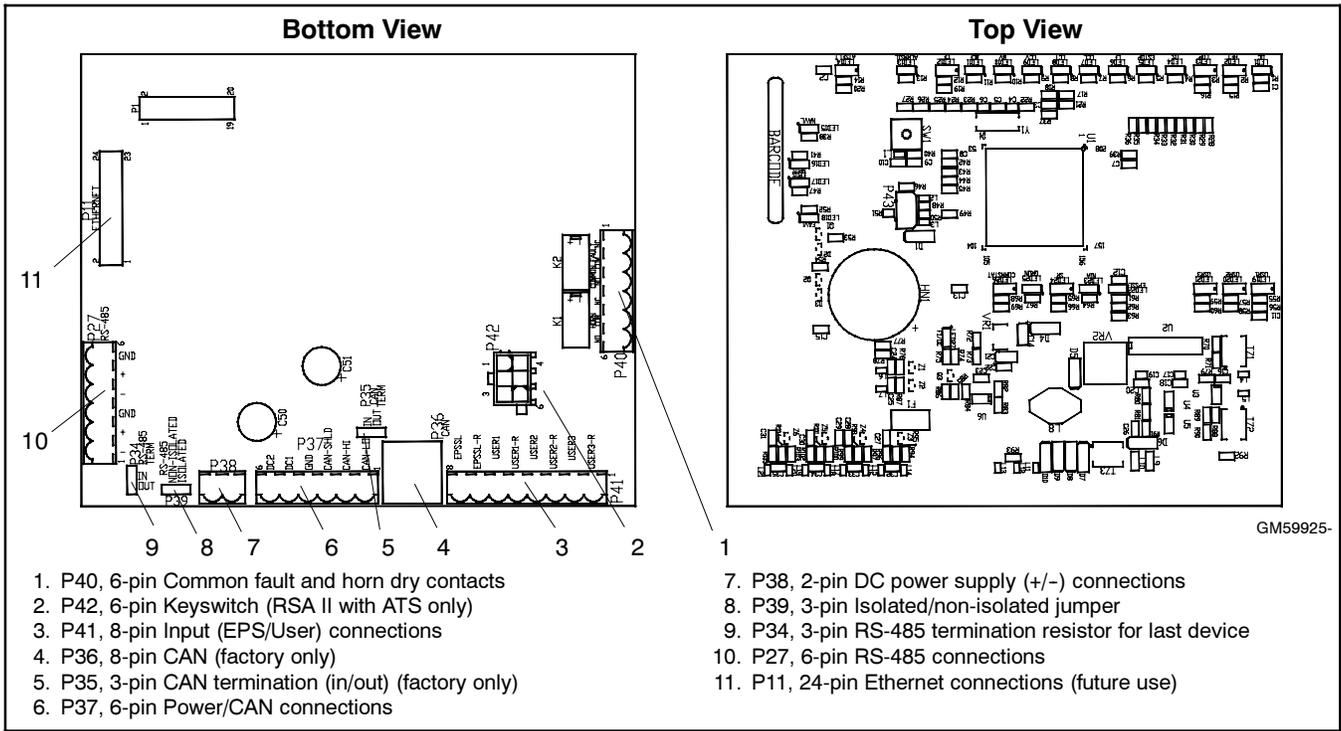
Figure 19 RSA II Circuit Board GM59925 Connectors

1. P40, 6-pin Common fault and horn dry contacts
2. P42, 6-pin Keyswitch (RSA II with ATS only)
3. P41, 8-pin Input (EPS/User) connections
4. P36, 8-pin CAN (factory only)
5. P35, 3-pin CAN termination (in/out) (factory only)
6. P37, 6-pin Power/CAN connections
7. P38, 2-pin DC power supply (+/−) connections
8. P39, 3-pin Isolated/non-isolated jumper
9. P34, 3-pin RS-485 termination resistor for last device
10. P27, 6-pin RS-485 connections
11. P11, 24-pin Ethernet connections (future use)

6.1   Deenergize the 12/24-volt DC power source to each RSA II, if not already done.

6.2   **Flush mount RSA II only.** When using a flush-mount RSA II box with a bushing, it is recommended to run all wiring to the RSA II box and then mount it to the wall or to the electrical box in the wall. Check that box is square to the wall; adjust as needed. After the RSA II box is mounted, make the individual electrical connections to the RSA II circuit board as described in the following steps.

Position wall-mounting plate GM33031 against the RSA II bezel GM60400 *prior* to attaching the wiring.

6.3   **P11, 24-pin Ethernet network connections (future use).** For Ethernet applications attach a mating 24-pin plug to the RSA II board P11 socket. The Ethernet controller board (user supplied) stores MAC addresses and uses an RJ45 connector. See Figure 19 for the location of P11 on RSA II.

6.4   **P27, 6-pin RS-485 connections (communication between controller and RSA II master).** For RS-485 connections see Figure 20.

P27 RS-485 Connections (from Controller to Master)	
P27-1	(−) Black (from controller)
P27-2	(+) White (from controller)
P27-3	Shield (from controller)
P27-4	(−) Black (to slave or terminating resistor)
P27-5	(+) White (to slave or terminating resistor)
P27-6	Shield (to slave or open)

Figure 20 P27 Connector on Master RSA II

Select and connect the RS-485 wiring from the controller to the RSA II master using Belden #9841 or equivalent. If there is only one RSA II, it is the master. If several RSA II are installed, choose either the RSA II closest to the generator set or determine which RSA II is more practical for use as a master and use a daisy chain wiring configuration for the remaining RSAs. The RSA II connected to controller MUST be assigned as the RSA II master.

Connect RS-485 wiring to 6-position Euroblock plug 294619 (included) and attach to the RSA II circuit board. The Euroblock connector is polarized and attaches in one position only. See Figure 21 for a typical RS-485 connection.

Communication between RSA II Master and RSA II Slave. Figure 22 shows the master/slave RS-485 connections and Figure 19 shows the RSA II with P27 location.
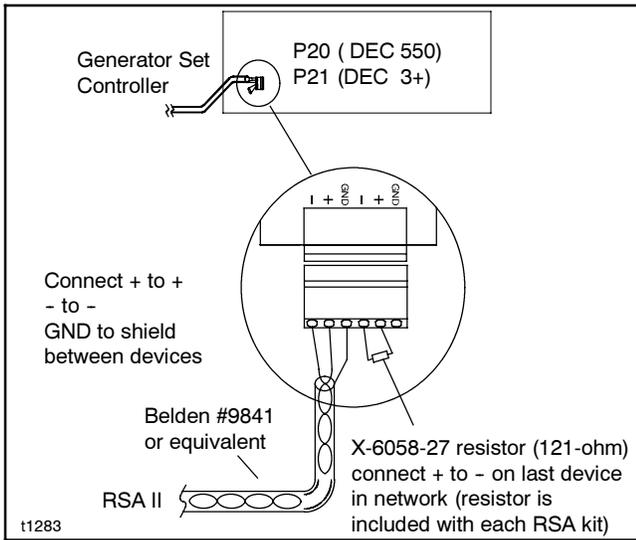
Figure 21 RS-485 Connector Details

P27 RS-485 Connections (from Master to Slave)	
P27-1	(–) Black (from master or previous slave)
P27-2	(+) White (from master or previous slave)
P27-3	Shield (from master or previous slave)
P27-4	(–) Black (to next slave or terminating resistor)
P27-5	(+) White (to next slave or terminating resistor)
P27-6	Shield (to next slave or open)

Figure 22 P27 Connection on RSA II Slave

DEC 3+ Controller. Figure 23 shows the DEC 3+ controller with P21 location and Figure 24 shows the RS-485 connections.

1. Main circuit board GM28725 (top view)
2. P21 for RSA II RS-485 communication connection
3. Main circuit board mounted on the controller rear panel
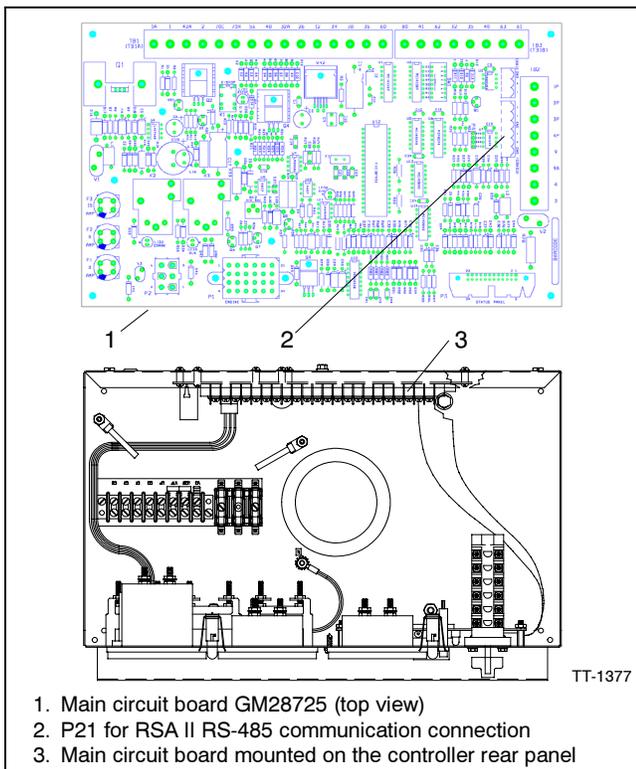
Figure 23 DEC 3+ Controller RS-485 Connections

P21 Connector	Circuit Board Designation	Wire Designation
P21-1	–	Black
P21-2	+	White
P21-3	GND	Shield

Figure 24 DEC 3+ Controller P21 RS-485 Connections

DEC 550 Controller. Figure 25 shows the RS-485 connections and Figure 26 shows the DEC 550 controller with P20 location.

DEC 6000 Controller. Figure 25 shows the RS-485 connections and Figure 27 shows the DEC 6000 controller with P20 location.

DEC 3000 Controller. Figure 28 shows the 3000 controller with P21 location and Figure 29 shows the RS-485 connections.

P20 Connector	Circuit Board Designation	Wire Designation
P20-1	GND	Shield
P20-2	+	White
P20-3	–	Black

Figure 25 DEC 550 and DEC 6000 Controllers P20 RS-485 Connections

1. Main circuit board (top view)
2. P21 for KBus RS-485 communication connection
3. P20 for RSA II RS-485 communication connection
4. Main logic (microprocessor)/communication circuit board
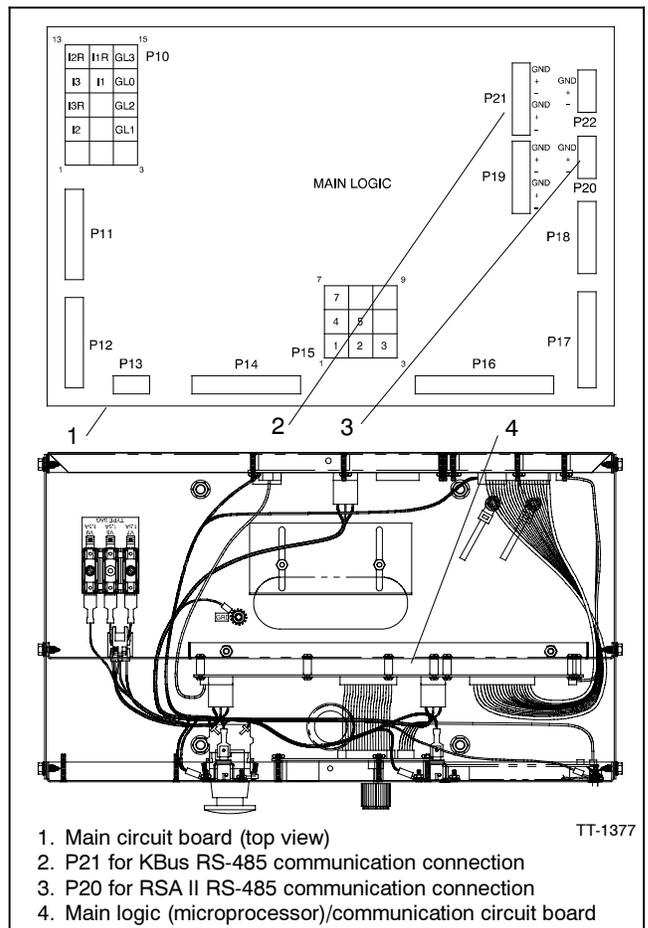
Figure 26 DEC 550 Controller RS-485 Connections

1. Interconnect circuit board (top view)
2. P21 for PGEN communication connection
3. P20 for RSA II RS-485 communication connection
4. Main logic (microprocessor)/communication circuit board
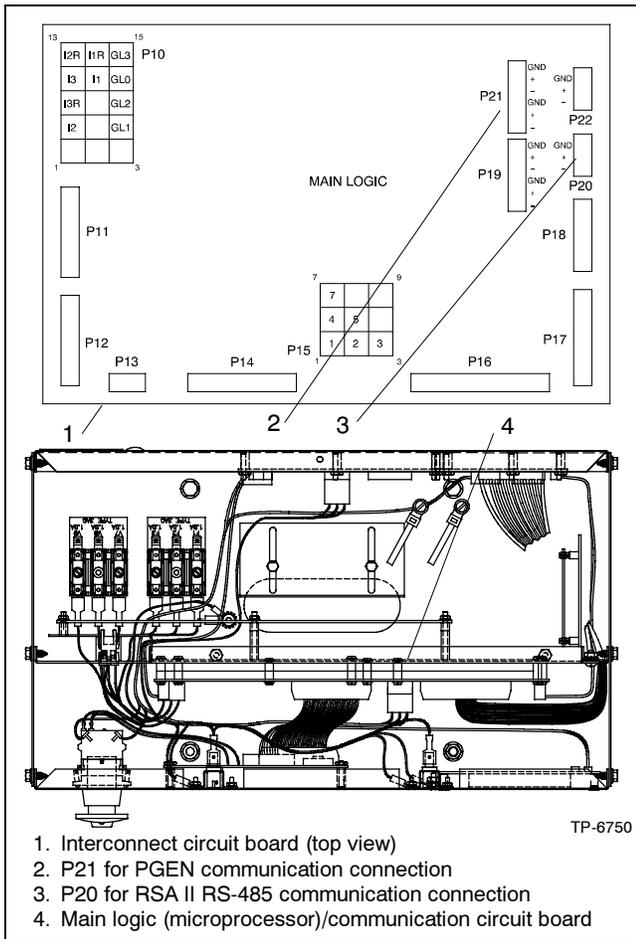
Figure 27 DEC 6000 Controller RS-485 Connections

1. Main logic circuit board
2. P21 for RSA II RS-485 communication connection
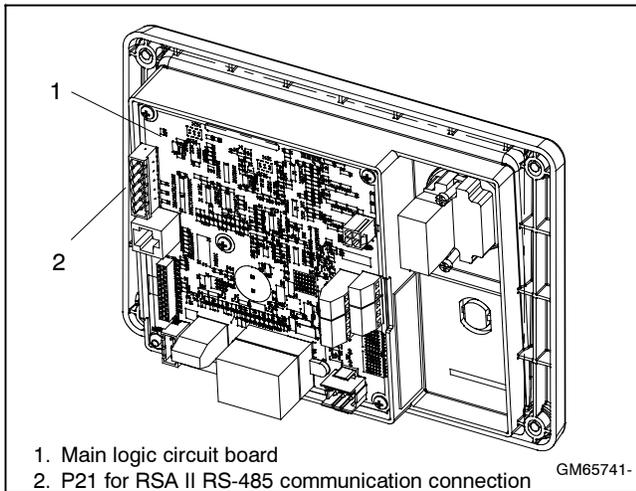
Figure 28 DEC 3000 Controller RS-485 Connectors

P21 Connector	Circuit Board Designation	Wire Designation
P21-1	GND	Shield
P21-2	(+)	White
P21-3	(–)	Black
P21-4	GND	Shield
P21-5	(+)	White
P21-6	(–)	Black

Figure 29 DEC 3000 P21 RS-485 Connections

6.5 **P27, 6-pin RS-485 connections (communication between RSA II master and RSA II slave.** Select and connect the RS-485 wiring from the RSA II master to the RSA II slave(s) in a daisy chain wiring configuration using Belden #9841 or equivalent. Figure 22 shows the master/slave RS-485 connections and Figure 19 shows the RSA II with P27 location. See the wiring diagrams in Figure 44, Figure 45, Figure 46, Figure 47, and Figure 48 for additional information regarding master/slave RSAs.

Connect RS-485 wiring to 6-position Euroblock plug 294619 (included) and plug into the RSA II circuit board. The Euroblock connector is polarized and attaches in one position only.

Each RSA II is shipped with a termination resistor in the IN position on P34 connector. Determine the position of the termination resistor in P34 connector based on the following two applications.

RSA II Master only. Verify that the termination resistor is in the IN position on P34 connector on the RSA II master.

RSA II Master with RSA II Slaves. Verify that the termination resistor is in the IN position on P34 connector on the last RSA II slave in the daisy chain connection. Place the termination resistor in the OUT position on P34 connector on the RSA II master and all RSA II slaves except the last RSA II slave.

6.6 **P37, 6-pin power/CAN connections.** Each RSA II requires a 12/24-volt, 200 mA (min.) DC power source. The RSA II voltage should match the generator set starting system. Provide an engine starting battery connection to P37. The 12- or 24-volt positive and negative wires can be connected to either P37-5 or P37-6 terminals as they are not polarity sensitive. See Figure 19 for location of P37 and Figure 30 for terminal identification.

Note: The RSA II requires a power source to either P37 (engine starting batteries) or P38 (120 VAC to 12 VDC converter).

Attach to the battery positive (+) connection at the starter solenoid and the battery negative (–) connection at the engine ground. Do not use terminals 42A and 2 on the controller connection kit terminal strip. The battery positive (+) lead should be fuse protected.

Note: Keep the power source deenergized at this time.

P37 Power/CAN Connections	
P37-1	CAN-LO (future use)
P37-2	CAN-HI (future use)
P37-3	CAN-Shield (future use)
P37-4	Ground
P37-5	12/24 VDC battery input1 (not polarity sensitive)
P37-6	12/24 VDC battery input2 (not polarity sensitive)

Figure 30 P37 Power/CAN Connections

6.7 **P38, 2-pin DC power supply (+/−) connections.** Each RSA II requires a 12/24-volt, 200 mA (min.) DC power source. See Figure 19 for the location of P38 on the RSA II.

The RSA II requires a power source to either P37 (engine starting batteries) or P38 (120 VAC to 12 VDC converter). The USB connection is not intended as a +5 V power source for the RSA II.

AC adapter kit GM62466-KP1 is available to supply 12 VDC power to a single RSA II. See Figure 31 for components of the kit and Figure 47 for electrical connections to P38.

When the power source is 120 VAC, the circuit must include fuse or circuit breaker protection and an independent circuit disconnect. The AC power connection must comply with local and national electrical codes.

Connect the DC positive lead to P38(+) and the DC negative lead to P38(−).

Note: Keep the power source deenergized at this time.

1. RSA II box
2. Rubber gasket
3. Power supply GM60407
4. Clamp GM60404
5. Screw X-67-113
6. Terminal block GM20930 (not shown)

GM60399-A
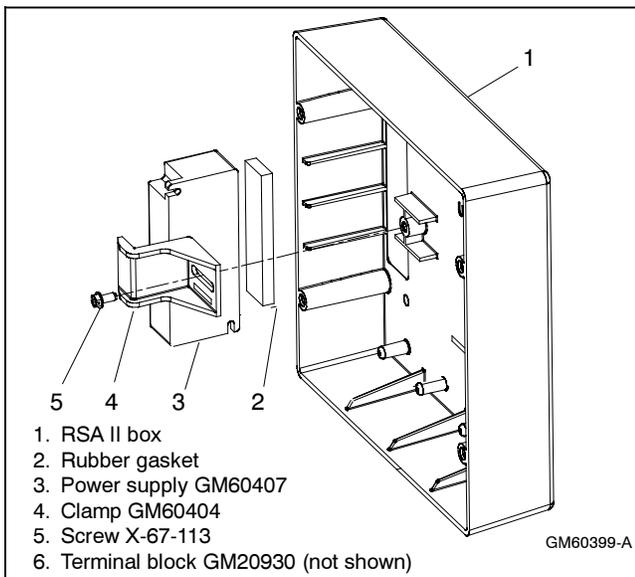
Figure 31 AC Adapter Kit GM62466-KP1

6.8 **P39, 3-pin isolated/non-isolated jumper**. See Figure 32 for P39 connections. See Figure 19 for the location of P39 on the RSA II.

Insulated	Isolated RS-485 (default setting)
Non-isolated	Non-isolated RS-485

Figure 32 P39 Isolation Jumper Connections

When using the **DEC 3+ controller**, choose the isolated connection on the master RSA II where the RS-485 cable shield and ground leads are connected at the master RSA II, but are not grounded to the RSA II circuit board.

Note: When using the **DEC 550 and DEC 6000 controllers**, choose the non- isolated connection on the master RSA II where the RS-485 cable shield and ground leads are connected at the master RSA II and grounded to the RSA II circuit board. The non-isolated connection ties the ground wire and shield (both of which are connected to the GND terminal of terminal block P27) to the same ground as the RSA II circuit board.

When the slave RSA II is not the only item on the network, use the isolated connection where the RS-485 cable shield and ground leads are connected but not grounded to the RSA II circuit board.

Note: When the slave RSA II is the only item on the network (connects only to a Modbus® to Ethernet converter), use the non-isolated connection where the RS-485 cable shield and ground leads are connected and grounded to RSA II circuit board.

6.9 **P40, 6-pin common fault output and horn dry contacts.** These dry contact relays energize when the alarm horn sounds and activate user-supplied devices. See Figure 33 for P40 connections. See Figure 19 for the location of P40 on the RSA II. The dry contacts are rated at 220 VAC @ 0.8 amps and 30 VDC @ 2 amps.

GM59925-
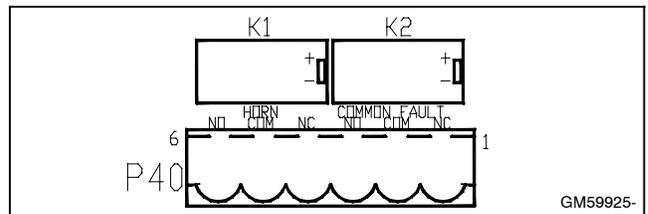
P40 Output Connections	
P40-1	Common fault relay normally closed
P40-2	Common fault relay common
P40-3	Common fault relay normally open
P40-4	Horn relay normally closed
P40-5	Horn relay common
P40-6	Horn relay normally open

Figure 33 P40 Common Fault Output and Alarm Horn Dry Contacts

6.10 **P41, 8-pin input (EPS/user) connections.** See Figure 19 for location of P41 on the RSA II. See Figure 34 for P41 Connections.

P41 Input/Connections	
P41-1	User Input 3 return
P41-2	User Input 3
P41-3	User Input 2 return
P41-4	User Input 2
P41-5	User input 1 return
P41-6	User input 1
P41-7	Local ATS emergency on input return *
P41-8	Local ATS emergency on input *
* Applies to Decision-Maker® 3+ controller only. Supplied via Modbus® RS-485 on the Decision-Maker® 550 and Decision-Maker® 3000 controllers.	

Figure 34 RSA II Circuit Board Terminal Connections

6.11 Make any additional *local* user-selected connections to the RSA II P41 connector. User-defined inputs can be used for any status, warning, or shutdown including open circuit breaker, air damper, etc. The user-selection connections are defined in Figure 36 and include:

● User Input 1 (local).

● User Input 2 (local).

● User Input 3 (local).

● ATS emergency input (local). Connect wiring from the user-supplied transfer switch (ATS) emergency position auxiliary contacts. See the respective ATS wiring diagram(s).

Note: User-defined digital inputs #1, #2, and #3 are selected at the RSA II master only and annunciated to the RSA II slave(s). No user-defined digital input selection is available at the RSA II slave(s).

6.12 **DEC 550 and DEC 6000 Controllers only.** The RSA II user inputs 1–3, when in the remote connection, are tied to the controller digital inputs. See Figure 35.

If required, the user-input selection tied to digital inputs D7, D8, and/or D10 can be changed using Menu 9, Input Setup. Refer to the DEC 550 (TP-6200) or DEC 6000 (TP-6750) controller operation manual as needed.

RSA II User Inputs (Remote)	Tied to DEC 550 Controller Digital Inputs
1	D7
2	D8
3	D10

Figure 35 RSA II Remote User Inputs with DEC 550 and DEC 6000 Controllers

6.13 Document the user-selected inputs for future reference. If user-selected inputs 1–3 (remote) are used, the user may add the identification on the RSA II front panel strip. Use a black permanent marker on the respective white blank box to identity the user input. The user can also fill in the generator ID location information if needed. Allow the marker ink to dry before handling the RSA II front panel.

Another method to add the information to the identification strip would be to use a PC and print the information on an adhesive label. The print font on the RSA II front panel is Myriad bold 10 point. Attach the printed label(s) to the white blank boxes on the RSA II front panel.

Controller	User Input 1		User Input 2		User Input 3		ATS Emergency Aux. Contacts for EPS Supplying Load Input	
Master RSA II (Local)	P41-6 user-selectable	P41-5 (ground)	P41-4 user-selectable	P41-3 (ground)	P41-2 user-selectable	P41-1 (ground)	P41-8 on RSA II	P41-7 (ground) on RSA II
DEC 3+	TB5-10 on comm. module, user- selectable	TB5-4 (ground)	TB5-11 on comm. module, user- selectable	TB5-5 (ground)	TB5-12 on comm. module, user- selectable / Also used for high battery voltage on comm. module	TB5-6 (ground)	TB5-9 on comm. module and then to P41-8 on RSA II	TB5-3 on comm. module and then to P41-7 (ground) on RSA II
DEC 550	TB4-7 (D7) user-selectable using Menu 9	TB4-28 (ground)	TB4-8 (D8) user-selectable using Menu 9	TB4-29 (ground)	TB4-10 (D10) user-selectable using Menu 9	TB4-31 (ground)	via RS-485	via RS-485
DEC 3000	TB1-DI 1	TB1-GND or ground	TB1-DI 2	TB1-GND or ground	TB1-DI 3	TB1-GND or ground	via RS-485	via RS-485
DEC 6000	TB4-7 (D7) user-selectable using Menu 9	TB4-28 (ground)	TB4-8 (D8) user-selectable using Menu 9	TB4-29 (ground)	TB4-10 (D10) user-selectable using Menu 9	TB4-31 (ground)	via RS-485	via RS-485
MPAC™ 1000	Main logic board input #1		Main logic board input #2		—		via RS-485	via RS-485
MPAC™ 1500	Main logic board input #1		Main logic board input #2		—			

Figure 36 RSA II Local P41 Input Connections

6.14 The RSA II connected to the controller MUST be assigned as the RSA II master. See Figure 37 for a summary of the EPS Supplying Load (ATS) annunciation sources.

Note: Does not apply to DEC 3000 controllers.

Source	DEC 3+ Controller	DEC 550/DEC 6000 Controllers
Local (hard wired)	RSA II connection to the ATS	
Remote (RS-485)	Communication module board connection to ATS	Controller connection to ATS

Figure 37 EPS Supplying Load (ATS) Annunciation Sources

Use the SiteTech™ software to select either that the generator set controller activates EPS Supplying Load LED or the transfer switch activates LED or local EPS supplying load.

Use the SiteTech™ software to select for high speed mode for direct connection to the DEC 550 and DEC 6000 controllers. Select lower speed for network connection with the Modbus®/ Ethernet converter. The lower speed allows network functionality reducing loss of communication faults.

6.15 Replace the controller cover and hardware on the DEC 550 and DEC 6000 controllers only.

7. Complete the RSA II final installation.

Proceed to either Step 7.1, Surface mount RSA II final installation, or Step 7.2, Flush mount RSA II final installation.

7.1 Surface mount RSA II final installation.

7.1.1 Mount the RSA II box to the wall or to the electrical box in the wall if not already done. Check that the box is square to the wall; adjust as needed.

7.1.2 Position the RSA II front panel assembly to the surface-mount box and install four self-tapping screws X-67-154. Do not tighten the screws.

7.1.3 Center the remote annunciator in the box and square with the wall. Tighten the screws.

7.1.4 Proceed to step 8.

7.2 Flush mount RSA II final installation.

7.2.1 Place wall-mounting plate GM33031 *behind* the RSA II front panel assembly flange if not already done. See Figure 38.

Note: The wall-mounting plate can be installed behind the RSA II front panel assembly flange even if RSA II front panel assembly is already wired.

7.2.2 Align the holes of the wall-mounting plate with the RSA II front panel assembly to the surface-mount box and install four self-tapping screws X-67-154. Do not tighten the screws.

1. Wall-mounting plate GM33031   ADV-6935A-B-
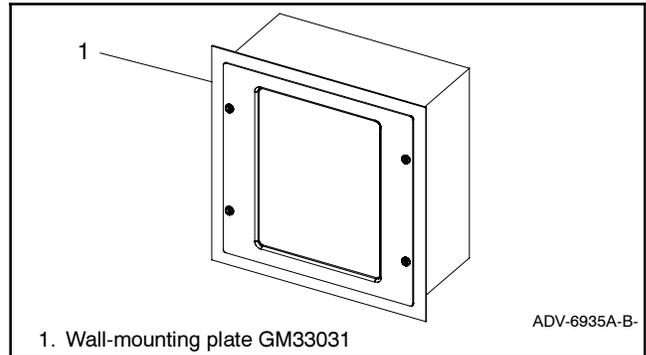
Figure 38 RSA II Wall-Mounting Plate

7.2.3 Center the remote annunciator in the box and position wall-mounting plate square with the wall. Tighten the screws.

7.2.4 Proceed to step 8.

8. Configure the DEC 3+ controller for the remote serial annunciator.

Note: After setting DIP switches to the generator set application, be sure to *power down* and then *power up* the controller; either disconnect the battery and then reconnect the battery of the generator set, use the prime power switch (if equipped), or remove and then replace the F2 controller fuse. The controller will NOT acknowledge the DIP switch change until after generator set controller is *powered up*.

8.1 Set the controller Modbus® address to #1 by placing DIP switches 6, 7, and 8 to the open position. See Figure 39.

1. Push this side down to open circuit.   6126
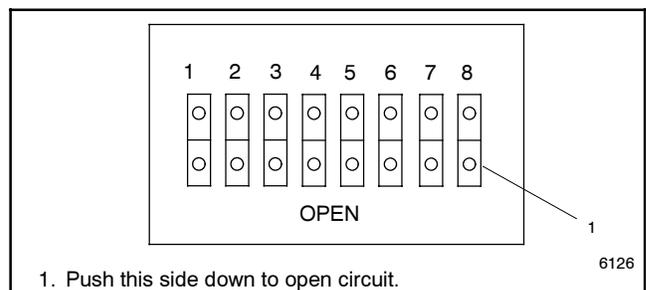
Figure 39 DEC 3+ Controller DIP Switches

8.2 The DEC 3+ controller baud rate is fixed at 19200. No change is required.

8.3 If the RSA II is used with a <u>DEC 3+ controller and it required installing a communication module board</u>, refer to TT-1285 Program Loader Software instructions for downloading **firmware version 1.23 or higher with red controller board or 2.03 or higher with blue controller board.**

8.4 Replace the controller cover and hardware.

9. Restore the generator set to service.

9.1 Check that the generator set master switch is in the OFF position.

9.2 Reconnect the generator set engine starting battery, negative (–) lead last.

9.3 Reconnect power to the battery charger, if equipped.

9.4 Energize the RSA II(s).

9.5 Move the generator set master switch to the AUTO position for startup by a remote transfer switch or remote start/stop switch.

9.6 Reset alarm horns as needed.

10. Configure the DEC 550 and DEC 6000 controllers for the remote serial annunciator.

Note: Refer to the DEC 550 (TP-6200) or DEC 6000 (TP-6750) controller operation manual as needed.

10.1 Replace the controller cover and hardware.

10.2 Press the Reset Menu key on the controller keypad.

10.3 Go to Menu 14, Programming Mode, and press the down arrow key to Programming Mode.

If Programming Mode—Local is shown, go to step 10.8.

If Programming Mode—Local is NOT shown, press the right arrow key to select Local. Press YES and the Enter key.

10.4 Enter the access code. The factory default access code is the number 0. Press the Enter key.

10.5 Press the Reset Menu key on the controller keypad.

10.6 Go to Menu 6, Time and Date, and set the correct time and date.

10.7 Press the Reset Menu key on the controller keypad.

10.8 Go to Menu 13, Communications, and press the right arrow key to Protocol—Modbus®.

10.9 Set the controller Modbus® address to #1 by pressing the down arrow key to Address. Enter number 1 and the Enter key.

10.10 Press the down arrow key to Baud Rate.

If 19200 is shown, go to step 10.12.

If 19200 is NOT shown, press the right arrow key to select 19200. Press YES and the Enter key.

10.11 Press the Reset Menu key on the controller keypad.

10.12 Go to Menu 14, Programming Mode, and press the down arrow key to Programming Mode—Local.

10.13 Press the right arrow key to Programing Mode-Off. Press YES and the Enter key,

10.14 Enter the access code. The factory default access code is the number 0. Press the Enter key.

11. Configure the DEC 3000 controller for the remote serial annunciator.

The DEC 3000 defaults to a 19200 baud rate and to a Modbus® address #1. If the Modbus® settings need to be altered, use SiteTech™ software to make the configuration changes.

SiteTech™ Software Settings

After the RSA II master and RSA II slaves are installed, use the SiteTech™ software to set up each RSA II.

Note: The RSA II requires a power source to either P37 (engine starting batteries) or P38 (120 VAC to 12 VDC converter) when programming changes.

The following information assumes the technician has downloaded the SiteTech™ software from Tech Tools onto a PC laptop and is connected to the respective RSA II using a USB 2.0 cable, A Male to Mini B Male, 5 pin.

See Figure 40 for SiteTech™ software sample screen. The shaded entries are read only. The top of the screen provides the user with the ability to update firmware and reset to factory defaults. There is a pull down screen for showing parameters with expand all and collapse all features. The user can cut, copy, and/or paste entries and then either apply or discard the changes.

Figure 40 RSA II Setup on SiteTech™ (Sample Screen)

The Menu List Summary indicates the various displays within the SiteTech™ software screens. Some displays are read only while other fields require user input to set up the RSA II. See Figure 41.

The User-Defined Settings (Figure 42) indicate the ranges and default values for each selection. Value entries outside the setting range are not accepted by the firmware. Use the table to record user-defined settings during the setup. The RSA II default settings and ranges provide guidelines. Non-adjustable user-defined settings are factory-set or firmware controlled.

The SiteTech™ software has four fields of information (Identity, Modbus®, Product Connections, and Product Connection Inputs). The following information provides a summary of the purpose of the four fields.

Identity *(Read only)*	Modbus *(Read/Write)*	Product Connections *(Read/Write)*	Product Connection Inputs *(Read/Write)*

• Vendor
• Product
• Firmware Version
	• Modbus Baud Rate
	• Is Modbus Master?
	• Modbus Slave Address
	• Modbus Timeout Factor
	• Received Modbus * Message Count *
	• Modbus Error Count *
	
	* Read only
		• Connected GenSet
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected ATS
		  ○ Connected
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected Annunciator 1
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected Annunciator 2
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected Annunciator 3
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected Annunciator 4
		  ○ Product
		  ○ Address
		  ○ Timeout
		• Connected Annunciator 5
		  ○ Product
		  ○ Address
		  ○ Timeout
			• EPS Supplying Load Indicator
			• Digital Input 1
			  ○ Source
			  ○ Event Level
			• Digital Input 2
			  ○ Source
			  ○ Event Level
			• Digital Input 3
			  ○ Source
			  ○ Event Level

Figure 41 Menu List Summary

Selection Description	Display or Default Selection	Setting Range	Lamp	Alarm Horn	User-Defined Settings
Identity					
Vendor	Kohler Company				Not adjustable
Product	RSA II				Not adjustable
Firmware Version	1.0.0				Not adjustable
Modbus					
Modbus Baud Rate (kbps)	19.2	9.6, 19.2, 38.4, or 57.6			
Is Modbus Master?	True	True or False			
Modbus Slave Address	246	1–247			
Modbus Timeout Factor (1–fast, 10 slow)	5	1–10			
Received Modbus Message Count	#				Not adjustable
Modbus Error Count	#				Not adjustable
Product Connections					
Connected GenSet Product	none	See Controller List *			
Connected GenSet Address	1	1–247			
Connected GenSet Timeout	45 seconds §	1–120 seconds			
Connected ATS Product	none	See ATS List †			
Connected ATS Address	2	1–247			
Connected ATS Timeout	45 seconds §	1–120 seconds			
Connected (Slave) Annunciator 1 Product	none	See Annunciator List ‡			
Connected (Slave) Annunciator 1 Address	3 (If RSA 1000, then 247)	1–247			
Connected (Slave) Annunciator 1 Timeout	45 seconds §	1–120 seconds			
Connected (Slave) Annunciator 2 Product	none	See Annunciator List ‡			
Connected (Slave) Annunciator 2 Address	4 (If RSA 1000, then 247)	1–247			
Connected (Slave) Annunciator 2 Timeout	45 seconds §	1–120 seconds			
Connected (Slave) Annunciator 3 Product	none	See Annunciator List ‡			
Connected (Slave) Annunciator 3 Address	5 (If RSA 1000, then 247)	1–247			
Connected (Slave) Annunciator 3 Timeout	45 seconds §	1–120 seconds			
Connected (Slave) Annunciator 4 Product	none	See Annunciator List ‡			
Connected (Slave) Annunciator 4 Address	6 (If RSA 1000, then 247)	1–247			
Connected (Slave) Annunciator 4 Timeout	45 seconds §	1–120 seconds			
Connected (Slave) Annunciator 5 Product	none	See Annunciator List ‡			
Connected (Slave) Annunciator 5 Address	7 (If RSA 1000, then 247)	1–247			
Connected (Slave) Annunciator 5 Timeout	45 seconds §	1–120 seconds			
Product Connections Inputs					
EPS Supplying Load Indicator	Generator	Local (hardwired), Generator, or ATS			
Digital Input 1 Source	Local	Local (hardwired), Generator, or ATS			
Digital Input 1 Event Level	Warning	Warning or Fault	Warning–Yellow, Fault–Red	Yes (if Fault)	
Digital Input 2 Source	Local	Local (hardwired), Generator, or ATS			
Digital Input 2 Event Level	Warning	Warning or Fault	Warning–Yellow, Fault–Red	Yes (if Fault)	
Digital Input 3 Source	Local	Local (hardwired), Generator, or ATS			
Digital Input 3 Event Level	Warning	Warning or Fault	Warning–Yellow, Fault–Red	Yes (if Fault	

* Controller List includes: Decision-Maker® 3+, Decision-Maker® 550, Decision-Maker® 3000, or KPC 1000.
† ATS List includes: None, MPAC 1000, or MPAC 1500.
‡ Annunciator List includes: None, RSA 1000, or RSA II.
§ The SiteTech™ software may have a different default setting for selected devices.

Figure 42 User-Defined Settings

Identity

The identity field provides the user read only information including the **Firmware (Software) Version**. Record this number for upgrading firmware when troubleshooting.

Modbus®

The **Modbus® Baud Rate** is selectable and must be the same for all connected devices. The Modbus® field establishes the RSA II as a master or slave. Enter true or false to the **Is Modbus Master?** line item. When used as a slave, create a **Modbus® Slave Address** to identify this RSA II on the Modbus® network.

The **Modbus® Timeout Factor** is a user-selectable entry of 1 (fast)–10 (slow) with the default setting of 5. Typically the default setting will provide adequate system performance. The user may increase/decrease the timeout factor as needed to optimize the RSA II with the network system.

Line items **Received Modbus® Message Count** and **Modbus® Error Count** indicate the performance of the network. Showing Modbus® Error Count instances is typical of some network communications and not a reason for concern.

Product Connections

The generator set and ATS product IDs are no longer user configurable. The IDs are recognized by the RSA II at the specified Modbus address. See Figure 40.

The product connection field requires three entries (Product, Address, and Timeout).

The device description or **Product** identifies what type of device is connected to the RSA II master such as a generator set, transfer switch (ATS), or RSA II slave(s).

Each connection requires a unique **Address**. Change the default setting as needed to create different addresses based on the range of 1–247. In addition, each field creates addresses for each of the RSA II slaves. Up to five slaves can be driven by one RSA II master.

The Modbus® **Timeout** period is separately assignable for each device. The timeout period is a user-selectable entry of 1–120 seconds with the default setting of 15 seconds. Increase the timeout factor as needed when working with a slow or unstable network to prevent interruption or nuisance timeouts.

The **Connected ATS** parameter indicates if the RSA II should expect an ATS on the network at the address specified. When set to True, the RSA II notifies the user when it can not communicate with the ATS. If the RSA II auto-detection logic finds an ATS on the network, the RSA II sets the ATS connected parameter to True and saves the setting. Should the ATS be removed from the network for some reason, the user can then set this parameter back to False.

Product Connection Inputs

The product connection input field provides the user with choices to show selected status, warning, or shutdown faults. EPS supplying load and three digital inputs are available for monitoring.

For **EPS Supplying Load Indicator** connections, refer to Figure 43 to select the EPS source.

The **Source** can be from the generator set, ATS, or (local) hardwired directly to the RSA II. Refer to Figure 43.

Select the **Event Level** as either a warning (yellow light) or fault shutdown (red light).

This field also provides an **Events Log** which is a history of faults that the RSA II encounters while energized. The generator set may or may not be running at the time of the event. Review the Events Log for a summary of the performance of the network communication.

Connection Type	Controller	Step	Operation Manual	Other Information
EPS Supplying Load		6.10		ATS emergency aux. contact connections
(Local) hardwired	Decision-Maker® 3+	6.11	TP-6161	Wiring diagram for the respective generator set
(Local) hardwired	KPC 1000	6.11	TP-6427 and TP-6471 (Software)	Wiring diagram for the respective generator set
(Local) hardwired	Decision-Maker® 3000	6.11	TP-6694	Wiring diagram for the respective generator set
Remote (Generator Set)	Decision-Maker® 550	6.12	TP-6200	
Remote (Generator Set)	Decision-Maker® 6000	6.12	TP-6750	
Remote (ATS)	MPAC™ 1000	6.11	TP-6126	Model KCT/KCP ATS
Remote (ATS)	MPAC™ 1500	6.11	TP-6446 or TP-6447	Model KCS/KCP ATS or Model KSS/KSP ATS
Remote (ATS)	MPAC™ 1500	6.11	TP-6448 or TP-6449 (Bypass-Isolation)	Model KBS/KBP ATS or Model KGS/KGP ATS

Figure 43 Product Connection Input Instructions

Modbus® is a registered trademark of Schneider Electric.

Figure 44 RSA II Wiring Diagram GM62554A-G

Figure 45 RSA II Wiring Diagram GM62554B-G

Figure 46 RSA II Wiring Diagram GM62554C-G

Figure 47 RSA II Wiring Diagram GM62554D-G

Figure 48 RSA II Wiring Diagram GM62554E-G

Figure 49 RSA II Interconnection Diagram ADV-6990A-F

Figure 50 RSA II Interconnection Diagram ADV-6990B-F

Parts List

Remote Serial Annunciator Kits and Communication Module Kit

Qty.	Description	Remote Serial Annunciator Kits GM62516						
		-KP1	-KP2	-KP3	-KP4	-KP5	-KP6	-KP8
1	Ribbon cable, 10-position		GM21340		GM21340			
1	Ribbon cable, 24-position		GM32632		GM32632			
3	Spacer, 8-32 x 5/8 male-female		GM32633		GM32633			
1	Communication module board		GM49791-1		GM49791-1			
1	Harness, comm. HBV wiring		GM35318		GM35318			
1	Remote serial annunciator	GM60399-1	GM60399-1	GM60399-2	GM60399-2	GM60399-1	GM60399-2	GM60399-4
5	Screw, plastic tapping	GM23307	GM23307	GM23307	GM23307	GM23307	GM23307	GM23307
1	Board, main logic	GM59925	GM59925	GM59925	GM59925	GM59925	GM59925	GM59925
2	Euroblock plug, 6-position	294619	294619	294619	294619	294619	294619	294619
1	Euroblock plug, 8-position	GM62699	GM62699	GM62699	GM62699	GM62699	GM62699	GM62699
1	Bezel	GM60400	GM60400	GM60400	GM60400	GM60400	GM60400	GM60400
1	Box, RSA II	GM60409	GM60409	GM60409	GM60409	GM60409	GM60409	GM60409
1	Harness, keyswitch	GM62693	GM62693			GM62693		GM83961
1	Connector plug, 6-position	337131	337131			337131		337131
1	Keyswitch	GM60408	GM60408			GM60408		GM83960
4	Screw, tapping	X-6071-7	X-6071-7	X-6071-7	X-6071-7	X-6071-7	X-6071-7	X-6071-7
3	Washer, #8 lock		X-22-7		X-22-7			
1	Harness, pigtail					GM60452	GM60452	
1	Connector plug, 15-pos.					320712	320712	
1	Plate, wall-mounting	GM33031	GM33031	GM33031	GM33031	GM33031	GM33031	GM33031

Communication Module Kit

Qty.	Description	GM32644-KP1
1	Ribbon cable, 10-position	GM21340
1	Communication module board	GM49791-1
1	Ribbon cable, 24-position	GM32632
3	Spacer, 8-32 x 5/8 male-female	GM32633
3	Washer, #8 lock	X-22-7
1	Harness, communication HBV wiring	GM35318

AC Adapter Kit

Qty.	Description	GM62466-KP1
1	Clamp, power supply	GM60404
1	Supply, power	GM60407
1	Screw, hex	X-67-113
1	Block, terminal	GM20930
1	Gasket, rubber	—