MIDTRONICS

October 2017
167-000842EN-A

HYUNDAI

GRX-5100

⚠ DANGER

Hazardous voltage.
An improper connection can result in serious injury or death.

To avoid electrical shock or burn, never alter the GRX-5100 Hyundai's original AC cord and plug. Disconnect plug from outlet when GRX-5100 Hyundai is idle.

Instruction Manual

This page intentionally left blank.

Contents

General Safety Guidelines 5

Maintenance 5
Personal Precautions 6
Grounding & Power Cord Connections 6
Grounding 7
GRX-5100 Hyundai Location 7
DC Connection Precautions 7

Chapter 1: Introduction & Overview 8

Safety Precautions 8
Front View 9
Right End Panel 9
Connection Panel 9
Display and Keypad 10
Data Entry Methods 11
Menu Icons 11
Option Buttons 11
Scrolling Lists 11
Alphanumeric Entry 11
Main Menu 11
Tool Info Menu 12
Utility Menu 12
Connecting to AC Power 12
Initial Startup 12
Changing User Preferences 12

Chapter 2: Module Balance 13

Parameters 13
Procedure 13
Results 13

Chapter 3: Module Info 14

Procedure 14

Chapter 4: Tool Info 15

Totals 15
Life Time Totals 15
Version 15

Chapter 5: Utility Menu 16

Clock 16
Mode 16
Time 16
Format 16
Date 16
Users 16
Entering A New User ID 16
Deleting A User ID 17
Editing A User ID 17
Display 17
Temperature 17
Capacity 17
Language 17
Admin 18
Options 18
Clear Test Totals 18
Reset Defaults 18
Change Admin Pin 18
Update 18
Buzzer 18

Chapter 6: Error Messages 19

Possible Error Messages 19
Hardware Error 19
Communication Error 19
Internal Temperature Sensor Failure 19
Incorrect Voltage Detected 19
Voltage Matches Target Voltage 19

This page intentionally left blank.

General Safety Guidelines

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

IT IS OF UTMOST IMPORTANCE THAT BEFORE USING YOUR GRX-5100 Hyundai, YOU READ THIS MANUAL AND FOLLOW THE SAFETY AND OPERATING INSTRUCTIONS EXACTLY.

⚠ DANGER

Hazardous voltage.
Can result in electric shock when the protective covers are removed.

Circuit boards, test points, and output voltages also may be floating above (below) chassis ground.

⚠ WARNING

This GRX-5100 Hyundai is designed for indoor use only.

1. Maintenance

- Periodic inspection and care are highly recommended, especially if the GRX-5100 Hyundai is operating in a harsh environment.
- Inspect signs of overheating, rust paint deterioration, and general condition of the unit. Corrective measures should be taken if necessary.
- Removal of dust, dirt, and debris from the external enclosure surfaces is encouraged and may be performed while the unit is in operation.

IMPORTANT: There are no user-serviceable parts inside the GRX-5100 Hyundai. At no time should personnel remove any cover.

- Ensure that the AC power line ground is connected properly to the GRX-5100 Hyundai input connector or chassis. Similarly, other power ground lines including those to application and maintenance equipment must be grounded properly for both personnel and equipment safety.
- Always ensure that AC input power is de-energized prior to connecting or disconnecting any cable.
- In normal operation, the operator does not have access to hazardous voltages within the chassis. However, depending on the user's application configuration, HIGH VOLTAGES HAZARDOUS TO HUMAN SAFETY may be normally generated on the output terminals. The customer/user must ensure that the output power lines are labeled properly as to the safety hazards and that any inadvertent contact with hazardous voltages is eliminated.
- This GRX-5100 Hyundai is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the GRX-5100 Hyundai by a person responsible for their safety.

⚠ CAUTION

Risk of explosive gases

Batteries generate explosive gases during normal operation, and when discharged or charged.

1.1 To reduce risk of battery explosion, follow these safety instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of a battery. Review cautionary marking on these products and on the engine, and on the vehicle or equipment containing the battery.

⚠ DANGER

Charging a non-rechargeable battery may cause the battery to burst.

To reduce the risk of injury, only charge rechargeable type batteries.

If you are uncertain as to the type of battery you are attempting to charge, or the correct procedure for checking the battery's state of charge, contact the seller or battery manufacturer.

1.2 Use of an attachment not recommended or sold by the GRX-5100 Hyundai manufacturer may result in a risk of fire, electric shock, or injury to persons.

1.3 To reduce risk of damage to the electric plug and cord, pull by the plug rather than by the cord when disconnecting the GRX-5100 Hyundai.

1.4 Do not operate the GRX-5100 Hyundai if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service center.

1.5 Do not disassemble the GRX-5100 Hyundai; when repair is required, contact local sales/service distributor to return the unit to Midtronics Inc. (see back cover for more information). Incorrect reassembly may result in a risk of electric shock or fire.

1.6 To reduce risk of electric shock, unplug the GRX-5100 Hyundai from the AC outlet and auxiliary 12 VDC power cord before attempting any maintenance or cleaning. Turning off the controls will not reduce this risk.

1.7 Connect and disconnect the battery leads only when the AC supply cord has been disconnected.

1.8 Do not overcharge the battery (See Section 3).

1.9 Charge the battery in a dry, well-ventilated area.

1.10 Never place articles on or around the GRX-5100 Hyundai, or locate the GRX-5100 Hyundai in a way that will restrict the flow of cooling air through the cabinet.

1.11 An extension cord should not be used unless absolutely necessary. (See paragraph 3.3.)

1.12 Have a damaged cord or plug replaced immediately.

⚠ WARNING

Do not expose the GRX-5100 Hyundai to rain or snow.

2. Personal Precautions

2.1 Always have someone within range of your voice, or close enough to come to your aid, when working around batteries.

2.2 Have plenty of fresh water and soap nearby in case battery electrolyte contacts skin, clothing or eyes.

2.3 Wear complete eye protection, clothing protection, and wear rubber soled shoes. When ground is very wet or covered with snow, wear rubber boots. Avoid touching eyes while working near battery.

2.4 If battery electrolyte contacts skin or clothing, wash immediately with soap and water. If electrolyte enters the eye, immediately flush with cold running water for at least 10 minutes, and seek medical attention.

2.5 NEVER smoke or allow a spark or flame in vicinity of a battery or engine.

2.6 Be extra cautious to reduce risk of dropping a metal tool onto the battery. It might spark or short circuit the battery or other electrical part that may cause an explosion.

2.7 Before working with a battery, remove personal metal items such as rings, bracelets, necklaces, watches, etc. A battery can produce a short circuit current high enough to weld such items causing a severe burn.

⚠ CAUTION

Non-rechargeable batteries may burst when charging causing personal injury and damage.

To avoid electrical shock or burn, never alter the GRX-5100 Hyundai's original AC cord and plug. Disconnect plug from outlet when GRX-5100 Hyundai is idle.

The GRX-5100 Hyundai is not intended to supply power to a low-voltage electrical system other than applications using rechargeable batteries.

2.8 **NEVER** charge a frozen battery; thaw it out first.

3. Grounding & Power Cord Connections

3.1 The GRX-5100 Hyundai must be grounded to reduce risk of electric shock. The GRX-5100 Hyundai is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠ DANGER

Hazardous voltage.
An improper connection can result in electric shock

To avoid electrical shock or burn, never alter the GRX-5100 Hyundai's original AC cord and plug. Disconnect plug from outlet when GRX-5100 Hyundai is idle.

IF THE PLUG DOES NOT FIT THE OUTLET, HAVE A PROPER OUTLET INSTALLED BY A QUALIFIED ELECTRICIAN.

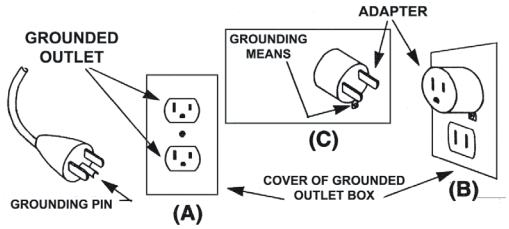
3.2 This GRX-5100 Hyundai is for use on a nominal 120-volt circuit and has a grounding plug that looks like the plug illustrated in *Figure A*. A temporary adapter, which looks like the adapter illustrated in *Figures B* and *C*, may be used to connect this plug to a two-pole receptacle as shown in *Figure B*, if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

⚠ DANGER

Hazardous voltage.
An improper connection can result in electric shock

Before using an adapter be certain the center screw of the outlet plate is grounded. The rigid ear or lug extending from the adapter must be connected to a properly grounded outlet. Make certain it is grounded. If necessary, replace the original screw that secures the adapter ear or lug to the cover plate and make the ground connection to the grounded outlet.

USE OF AN ADAPTER IS NOT ALLOWED IN CANADA. IF A GROUNDING-TYPE RECEPTACLE IS NOT AVAILABLE, DO NOT USE THIS APPLIANCE UNTIL THE PROPER OUTLET IS INSTALLED BY A QUALIFIED ELECTRICIAN.



3.3 An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:

a. that the pins on plugs of the extension cord are the same number, size, and shape as those of the plug on the GRX-5100 Hyundai;

b. that the extension cord is properly wired and in good electrical condition;

c. that the wire size is large enough for the AC ampere rating of GRX-5100 Hyundai as specified in the table.

4. Grounding

4.1 The plugs and receptacles have dedicated grounding terminals and must be mated with plugs and receptacles having matching grounding terminals

5. GRX-5100 Hyundai Location

IMPORTANT: The GRX-5100 Hyundai is designed for indoor use only!.

It is the responsibility of the operator to provide a controlled environment for the equipment. Work tents are a common method of protecting equipment in adverse conditions.

The GRX-5100 Hyundai depends upon the surrounding air for cooling. The free flow of air is important as is the air temperature. The GRX-5100 Hyundai must be mounted so that air can freely circulate all around it.

5.1 Do not place combustible materials on or near the GRX-5100 Hyundai or mount the GRX-5100 Hyundai closer than 3 inches from any adjacent wall. The GRX-5100 Hyundai must never be mounted next to or above heat generating equipment.

5.2 Locate the GRX-5100 Hyundai as far away from the battery as the cables permit.

5.3 Never place the GRX-5100 Hyundai directly above the battery being charged; gases from the battery will corrode and damage the GRX-5100 Hyundai.

5.4 Only operate the GRX-5100 Hyundai in a well-ventilated area that is free of dangerous vapors.

5.5 Store the GRX-5100 Hyundai in safe, dry location.

6. DC Connection Precautions

6.1 All switches should be set in the OFF position and AC cord should be DISCONNECTED from electrical outlet before you connect the output cables.

⚠ DANGER

Hazardous voltage.
Can cause death or serious personal injury.

Setting the switches to "OFF" does not always disconnect the EV/HEV Battery Service Tool electrical circuit from the AC power cord.

Recommended minimum AWG* size for extension cords for the GRX-5100 Hyundai

AC input rating amperes		AWG* size of cord			
		Length of cord, feet (m)			
Equal or greater than:	But less than:	25 (7.6)	50 (15.2)	100 (30.5)	150 (45.6)
8	10	18	14	12	10
10	12	16	14	10	8
12	14	16	12	10	8
14	16	16	12	10	8
16	18	14	12	8	8

**American Wire Gauge*

Chapter 1: Introduction & Overview

Safety Precautions

For safe, efficient, and accurate charging and discharging, review the safety and operating instructions in this manual before using the EV/HEV Battery Service Tool. In addition, follow all manufacturers' instructions and SAE instructions.

Always use the necessary safety precautions when working with batteries to prevent severe injury or death. Follow all manufacturers' instructions and SAE safety recommendations, which include the following precautions:

⚠ DANGER

Risk of explosive gases.
Never smoke or allow a spark or flame in the vicinity of a battery.

Batteries can produce a highly explosive mix of gases, even when the battery is not in operation. Always work in a well-ventilated area..

⚠ CAUTION

Wash hands after handling.

REQUIRED BY CALIFORNIA PROP. 65: Battery posts, terminals, and related accessories can contain lead and lead compounds, chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

- Battery electrolyte is highly corrosive. If electrolyte enters your eyes, immediately flush them thoroughly with cold running water for at least 10 minutes and seek medical attention. If battery electrolyte gets on your skin or clothing, wash immediately with a mixture of water and baking soda.
- Always wear proper safety glasses or face shield when working with or around batteries.
- Keep hair, hands, and clothing as well as the analyzer cords and cables away from moving engine parts.
- Remove any jewelry or watches before you start servicing the battery.
- Use caution when working with metallic tools to prevent sparks or short circuits.
- Never lean over a battery when charging or discharging.
- Never charge a frozen battery. Gases may form, cracking the case, and spray out battery electrolyte.

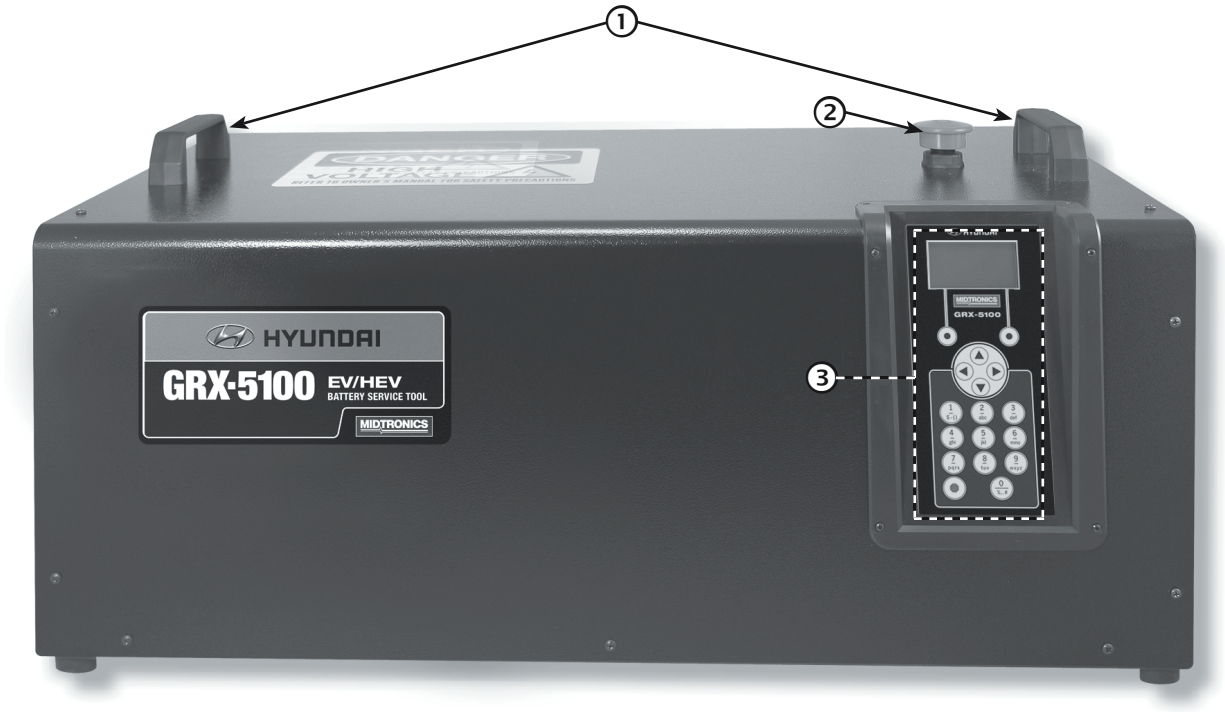
Conventions Used in This Manual

To help you learn how to use your GRX-5100 Hyundai, the manual uses these symbols and typographical conventions:

Symbols And Typographical Conventions

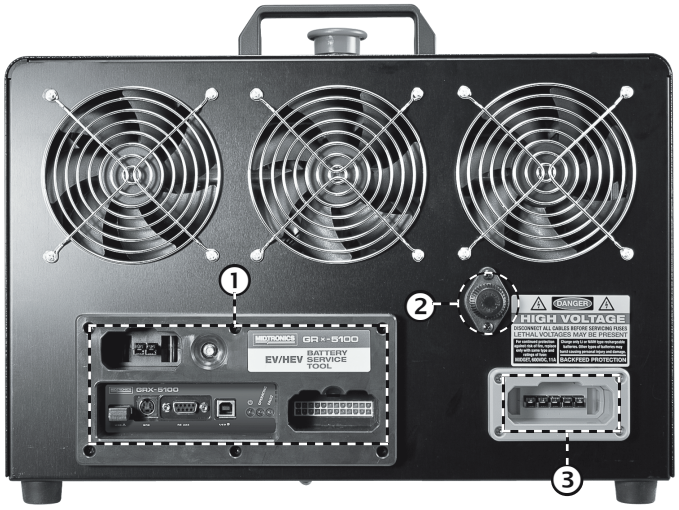
Convention	Description
	The safety symbol indicates instructions for avoiding hazardous conditions and personal injury.
	The safety symbol with the words **CAUTION**, **WARNING, or DANGER** indicates instructions for avoiding hazardous conditions and personal injury.
	The wrench symbol indicates procedural notes and helpful information.
CAPITAL LETTERS	The text for screen options are in regular capital letters.
NEXT	The text for soft keys are in **Bold** capital letters.

Front View



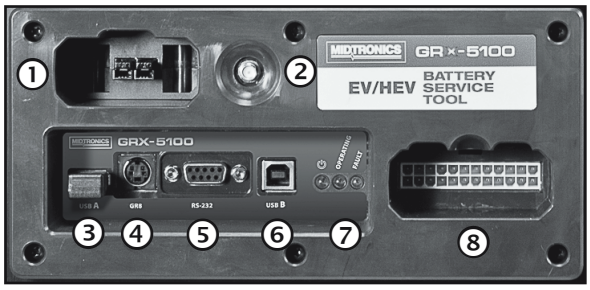
- **Lifting Handles**
- **Emergency STOP Button**
- **Keyboard & Display**

Right End Panel



- **Connection Panel**
- **11 A Midget Fuse**
- **High Voltage Cable Connection**

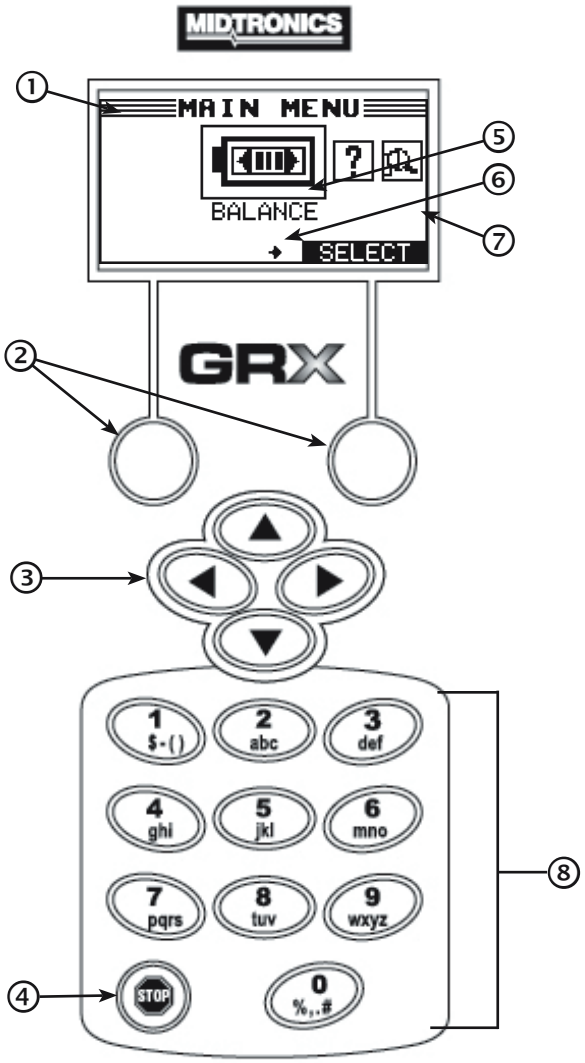
Connection Panel



- **External 12V Auxiliary Power**
- **Antenna Connector (not used)**
- **USB-A Port**
  For connecting an external USB-style jump drive.
- **GR-8**
  Not used.
- **RS-232**
  For future use.
- **USB-B**
  For future use.
- **Diagnostic Indicator LED Lights**
- **VIM Low Voltage Cable Connection**
  Used to connect to the low voltage battery electronic control unit based on the application.

Display and Keypad

The display and keypad work together to help you quickly find and use the right tools at the right time. The display also keeps you on track with onscreen navigation aids, directions and messages. The illustration shows how the elements on the screen relate to the keypad.



Title Bar
The title bar shows you the name of the current menu, utility, or function.

Soft Keys
Press the two soft keys linked to the bottom of the screen to perform the functions displayed above them. The functions change depending on the menu or test process. So it may be helpful to think of the words appearing above them as part of the keys.

ARROW (▲▼◀▶) Keys
Press the **ARROW** keys to scroll to numerical values and move to menus and icons.

POWER Key
Press the **POWER** key to turn the control module ON and OFF.

Selection Area
The selection area below the **Title Bar** contains selectable items or dialog boxes that display information or require a response.

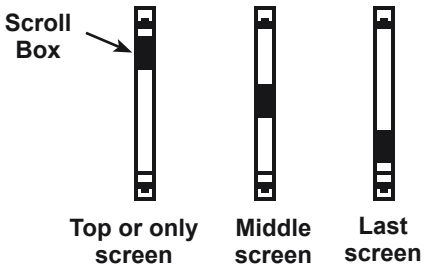
Menu Screen Arrows
When displayed in menu screens, the menu screen arrows show you which **ARROW** key on the keypad to press to display other icons or screens.

For example, the up and down arrows indicate when to press ▲ or ▼ to display the screens above and below the current screen. The left and right menu screen arrows tell you when to use ◀ or ▶ to select an icon.

When displayed under a list of options, the menu screen arrows show you which keypad arrow to press to highlight a character or item in a list.

Scroll Bar
Another navigational aid is the scroll bar on the right side of the screen. The position of its scroll box shows you whether the screen is the top (or only screen), middle, or last in a series.

Some screens also indicate the page order with a notation such as P1/3 (page 1 of 3).



Alphanumeric Keypad
In some cases, you can use the alphanumeric keypad to enter numerical test parameters instead of scrolling to them with the **ARROW** keys.

You can also use the alphanumeric keys to create and edit customer coupons and your shop contact information on printed test results, and manage User IDs.

To add a space, press ▶. To erase a space and insert a character, press ◀.

Refer to the following table for the characters associated with each alphanumeric key.

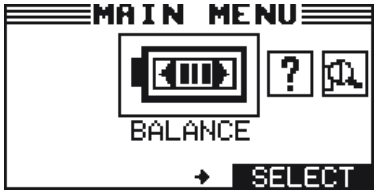
Key	Character
①	$ - ( ) 1
②	a b c 2
③	d e f 3
④	g h i 4
⑤	j k l 5
⑥	m n o 6
⑦	p q r s 7
⑧	t u v 8
⑨	w x y z 9
⓪	% , . # 0

Alphanumeric Keys and Associated Characters

Data Entry Methods

Typically, the soft key below the right half of the screen confirms your choice, although the command above it may vary. (Examples: **SELECT**, **NEXT**, and **SAVE**.) In a similar fashion, the soft key below the left half of the screen cancels your choice or returns you to the previous screen, although the word above it may also vary. (Examples: **BACK** and **CLEAR**.)

Menu Icons



A menu icon is a graphical representation of a function you can select, such as the Diagnostic Icon in the Main Menu. To select an icon, use ◀ or ▶ to highlight it. Highlighting changes the icon to a white picture on a black background. To confirm your selection, press the appropriate soft key.

Option Buttons

Some lists have option buttons before each item. To select an item, use ▲ or ▼ to move the dot to the button next to the item. To confirm your selection, press the appropriate soft key.

You can also use the alphanumeric keypad to enter the number preceding the option button of your choice. No additional keypress is needed to proceed.

Scrolling Lists

Scrolling lists contain items that extend above and below the screen. The first number above the right soft key indicates the position in the list of the highlighted item. The second number above the right soft key indicates the number of items in the list.

To select an item, use ▲ or ▼ to highlight the item, and press the appropriate soft key. To move the highlight bar up five lines at a time, press ◀**.** To move the highlight bar down five lines at a time, press ▶.

Alphanumeric Entry

Some selections require you to use the alpha-numeric keypad. These "user-defined" selections have a blinking horizontal line (cursor) to the right of the last character.

Use ▲ or ▼ to highlight a line for editing. Display the character, symbol, or number you want by rapidly pressing its key as many times as needed. If you pause, the cursor moves to the right. To backspace, press ◀. Use ▶ to add a space. Use ▲ or ▼ to highlight a line for editing. When finished, press the appropriate soft key to save your settings.

Main Menu

The Main Menu is the starting point for all tools and utilities, which are depicted as icons. Some icons lead directly to the function they represent, while others are menu icons that lead to two or more options.

Menu Icon	Description
BALANCE	Charge or discharge a module of a battery pack to a manually entered target voltage.
MODULE INFO	Displays battery module information including voltage, number of cells, minimum and maximum cell voltage, and voltage delta.
TOOL INFO	The Tool Info option lets you view lifetime test totals. Also use to access software version information.
UTILITY	Use this function to make modifications to the GRX-5100 Hyundai's administrative settings.

Tool Info Menu

The Info menu allows you to select and view lifetime Totals and view Software Version information.

Menu Icon	Description
TOTALS	This report displays the total number of charges and depowerings performed by the tool.
VERSION	Displays important information about the GRX-5100 Hyundai's internal software and serial number.

Utility Menu

The Setup Menu lets you customize your analyzer to suit your needs. Before testing, check default values to see what options you may want to change.

Menu Icon	Description
CLOCK	Settings to adjust the time.
USERS	Add, edit, or delete your User IDs.
DISPLAY	Settings to adjust the screen contrast and backlight time.
TEMPERATURE	Select degrees in C or F for temperature measurements.
CAPACITY	Select between Amp hours or Kilowatt hours displayed.
LANGUAGE	Sets the language of the display and printouts.
ADMIN	Clear test totals and change the Admin PIN.
UPDATE	Updates the tool software using a USB-style jump drive.
BUZZER	Allows you to turn the buzzer OFF. Default is ON.

Connecting to AC Power

Plug the GRX-5100 Hyundai into a dedicated, grounded nominal 15-amp or higher AC outlet. Press the power switch to the **ON** position.

Initial Startup

When you start the GRX-5100 Hyundai for the first time you are asked to enter a number of settings so you can already adapt the GRX-5100 Hyundai to your personal settings. Among these settings are the language, date, time, etc. This only needs to be done once; it can be changed afterwards in the Utility Menu.

After turning the GRX-5100 Hyundai on, following the logo screen, the LANGUAGE selection screen appears on the display.

1. Select your LANGUAGE preference.

   1 ⦿ ENGLISH

2. Select date format.

   1 ⦿ DD/MM/YYYY (month/day/year)

   2 ○ MM/DD/YYYY (day/month/year)

3. Adjust the date and press **NEXT** to continue.

   Use ◀ or ▶ to highlight the hour, minutes, or AM or PM. Use ▲ or ▼ to adjust the digits.

   10 / 17 / 2017

4. Select 24-hour or 12-hour (AM/PM) clock.

   1 ⦿ 24 HOUR

   2 ○ AM/PM

5. Adjust the tester time setting and press **NEXT** to continue.

   Use ◀ or ▶ to select the hour, minutes, or AM or PM. Use ▲ or ▼ to adjust the digits.

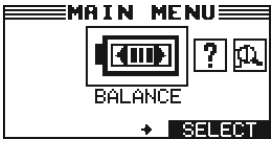
   9 : 07 AM

6. Select the default TEMPERATURE.

   1 ⦿ CELSIUS

   2 ○ FAHRENHEIT

7. The Main Menu is now displayed on the screen.



Changing User Preferences

Before using your GRX-5100 Hyundai, you may want to change some of the default settings. Setting preferences are located in Chapter 6: Utility Menu.

Chapter 2: Module Balance

Use this function to charge or discharge a module of a battery pack according to manually entered target voltage, to bring it in balance with the other modules of the pack.

⚠ DANGER

Hazardous voltage.
An improper connection can result in electric shock

To avoid electrical shock or burn, never alter the GRX-5100 Hyundai's original AC cord and plug. Disconnect plug from outlet when GRX-5100 Hyundai is idle.

IMPORTANT: Make sure to properly prepare the battery pack by following all required Hyundai guidelines Refer to your Hyundai documentation for complete information.

Before balancing a battery module, make sure all of the external components connected to the GRX-5100 Hyundai are in good working order.

Parameters

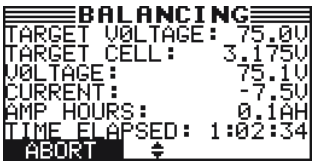
Discharge
– Discharge mode set to constant current – constant voltage
– Maximum discharge current is 7.5A or module max

Charge
– Charge mode set to constant current – constant voltage
– Charge current is 5.0A or module max
– Failsafe timer set to 12 hours

Procedure

1. Select the Module Balance icon.
2. Select the module classification.
   1 ⦿ AE MODULE
   2 ○ TEV MODULE
3. Select the module type.
   1 ⦿ EV
   2 ○ HEV
   3 ○ PHEV
4. Select the specific module to be balanced.
5. If you are wearing the appropriate personal protective equipment for high voltage service, select **YES**.
6. Select the correct TARGET VOLTAGE.

   The GRX-5100 Hyundai performs a Self-Test before advancing to the next step.
7. Connect the High Voltage cable from the GRX-5100 to the module.
8. Connect the Cell Voltage interface Cable from the BCU-64 to the Module.
9. For modules that have readable temperature sensors, connect the Temperature Sensors Interface Cable from the BCU-64 to the Module.
10. Press **NEXT** to continue. The BALANCING status screen is displayed.



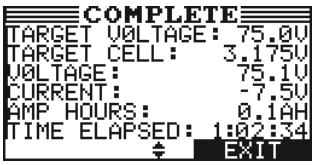
11. Use ▲ or ▼ to scroll to the Cell Voltage and Temp Sensors screens.

NOTE: For CELL VOLTAGE, depending on the battery type, 4 or 8 cell voltages will be displayed. For TEMP SENSORS, depending on the battery type, 3, 5 or 6 temperature sensors will be displayed.

Results

Following a successful Manual Balance session, the results are written to an inserted USB jump drive. The results are displayed on the GRX-5100 Hyundai using multiple screens.

1. Use ▲ or ▼ to scroll through the screens



2. Use ▲ or ▼ to scroll to the Cell Voltage and Temp Sensors screens.
3. Press **EXIT** to return to the Main Menu.

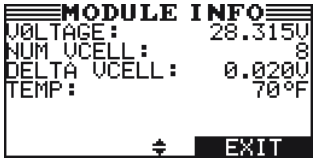
The GRX-5100 Hyundai can now be disconnected from the battery module.

Chapter 3: Module Info

The Module Info function displays general battery module and battery cell information on the GRX-5100 Hyundai display screen.

Procedure

1. Select the Module Balance icon.
2. Select the Battery Type.
   1 ⦿ AE MODULE
   2 ○ TEV MODULE
3. Select the HVB MODULE.
   1 ⦿ EV
   2 ○ HEV
   3 ○ PHEV
4. Select the MODULE TYPE.
5. If you are wearing the appropriate personal protective equipment for high voltage service, select **YES**.
6. Connect the High Voltage cable from the GRX-5100 to the module.
7. Connect the Cell Voltage interface Cable from the BCU-64 to the Module.
8. For modules that have readable temperature sensors, connect the Temperature Sensors Interface Cable from the BCU-64 to the Module.
9. Press **NEXT** to continue. The MODULE INFO status screen is displayed.



10. Use ▲ or ▼ to scroll to the Cell Voltage and Temp Sensors screens.

NOTE: For CELL VOLTAGE, depending on the battery type, 4 or 8 cell voltages will be displayed. For TEMP SENSORS, depending on the battery type, 3, 5 or 6 temperature sensors will be displayed.

Chapter 4: Tool Info

The Tool Info Menu has two (2) utilities to help you track the usage and history of your EL-50332.

Totals

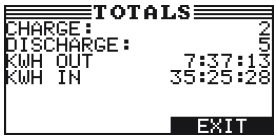
The TOTALS function counts the number of charges or de-powerings and tracks the results.

1 ⊙ LIFE TIME TOTALS

Select the Totals option you want to see and press **NEXT** to continue.

Life Time Totals

LIFE TIME TOTALS show the total number of times the tool is used to determine health and charge of battery packs and battery sections.



Version

The VERSION utility displays software, tool serial number, WiFi, and BCU-64 information. Use ▲ or ▼ to scroll between the screens.

Chapter 5: Utility Menu

The Utility Menu has several functions that you can use to customize the GRX-5100 Hyundai user interface.

NOTE: If the PIN function is enabled, you will need to enter the 5-digit PIN when accessing the Utility function of the GRX-5100 Hyundai.

Clock

The CLOCK ADJUST utility has three settings. Use ▲ or ▼ to highlight the setting you want to change.

Although the date and time have been set at the factory, you may want to make adjustments based your time zone or Daylight Saving Time.

MODE :	**AM/PM**
TIME :	**9:07 AM**
FORMAT :	**DD/MM/YYYY**

Mode

1. Use ▲ or ▼ to select the MODE and press **NEXT** to continue.
2. Use ▲ or ▼ to select 24-hour or 12-hour (AM/PM) clock and press **NEXT** to continue, or press the corresponding number key.
   - 1 ⦿ 24 HOUR
   - 2 ○ AM/PM
3. If you used the **ARROW** keys, press **SAVE** to save your setting or **BACK** to return to the CLOCK/DATE screen without saving the changes.

Time

1. Use ▲ or ▼ to select the TIME and press **NEXT** to continue.
2. Use ◀ or ▶ to select the hour, minutes, or AM or PM. Use ▲ or ▼ to adjust the digits.

9 : 07 AM

3. Press **SAVE** to save your setting, or press **BACK** to return to the CLOCK/DATE screen.

Format

1. Use ▲ or ▼ to select the FORMAT and press **NEXT** to continue.
2. Use ▲ or ▼ to select date format and press **NEXT** to continue, or press the corresponding number key.
   - 1 ⦿ MM/DD/YYYY (month/day/year)
   - 2 ○ DD/MM/YYYY (day/month/year)
3. If you used the **ARROW** keys, press **SAVE** to save your setting or **BACK** to return to the CLOCK/DATE screen without saving the changes.

Date

Date setting is only allowed at the first time use and cannot be adjusted through the Utility Menu.

1. Use ▲ or ▼ to select the DATE and press **NEXT** to continue, and press **NEXT** to continue.
2. Use ◀ or ▶ to highlight the day, month, or year. Use ▲ or ▼ to adjust the digits.

9 / 14 / 2017

3. Press **SAVE** to save your settings.

Users

The USERS utility allows you to create and edit a USER ID with 1 to 7 alphanumeric characters and link it to a test counter. It also allows you to delete a USER ID and its associated test total.

Entering A New User ID

1. Use ▲ or ▼ to select ENTER NEW and press **NEXT** to continue, or press the corresponding number key.
   - 1 ⦿ ENTER NEW
   - 2 ○ DELETE
   - 3 ○ EDIT
2. Use ▲ or ▼ to scroll to the ID placeholder you want to use. To display more placeholders, continue scrolling or use ◀ or ▶ to jump up or down through the list five lines at a time.

1 TECH01
2 TECH02
3 TECH03
4 TECH04

3. Press **NEXT** to continue.
4. To clear the default characters, press ◀ as many times as necessary. To add a space, move the cursor forward by pressing ▶.

ENTER USER ID
TECH01

5. Insert a character by pressing the alphanumeric key associated with the character as many times as needed. Press **SAVE**.

ENTER USER ID
DAN

6. If USER PIN is enabled, after enter a User ID, you need to enter a corresponding new User PIN.

Deleting A User ID

NOTE: You cannot delete the default USER ID placeholders (i.e., TECH03).

1. Use ▲ or ▼ to select DELETE and press **NEXT** to display the list of IDs, or press the corresponding number key.

   1 ○ ENTER NEW

   2 ◉ DELETE

   3 ○ EDIT

2. Use the **ARROW** keys to select a USER ID as described in step 2 in "Entering a New User ID".

   1 DAN
   2 DAVID
   3 TECH03
   4 TECH04

3. Press **DELETE** to continue.
4. At the confirmation screen, press **YES** to confirm that you want to delete the user and return to the **DELETE** users screen.

Editing A User ID

1. Use ▲ or ▼ to select EDIT and press **NEXT** to continue, or press the corresponding number key.:

   1 ○ ENTER NEW

   2 ○ DELETE

   3 ◉ EDIT

2. Use the **ARROW** keys to select USER ID that you want to edit and press **NEXT** to continue.

   1 DAN
   2 DAVID
   3 ALEX
   4 TECH04

3. Use ▲ or ▼ to scroll to the ID placeholder you want to use. To display more placeholders, continue scrolling or use ◀ or ▶ to jump up or down through the list five lines at a time.
4. Press **NEXT** to continue.
5. To clear the default characters, press ◀ as many times as necessary. To add a space, move the cursor forward by pressing ▶.
6. Insert a character by pressing the alphanumeric key associated with the character as many times as needed.
7. Press **SAVE** to save your changes.
8. If USER PIN is enabled, after edit a User ID, you need to enter a corresponding User PIN.

Display

The DISPLAY utility allows you to adjust the contrast of the text on the display and the backlight time.

The contrast level is 0 (lightest) to 10 (darkest). To change it:

1. Press ▲ or ▼ to adjust the LCD contrast, or use the corresponding number keys.

   8 ▲▼ **(1-10)**

2. Press **SAVE** to save your setting or **BACK** to return to the LCD OPTIONS screen without saving the changes.

Temperature

The TEMPERATURE utility allows you to set the units of measurement to either Fahrenheit or Celsius. To set your preference:

1. Select the TEMPERATURE units.

   1 ◉ DEGREES F

   2 ○ DEGREES C

2. If you used the **ARROW** keys, press **SAVE** to save your setting or **BACK** to return to the Utility Menu without saving the changes.

Capacity

Use the CAPACITY function to select the units of battery capacity between Kilowatt hours and Amp hours.

1. Select the battery CAPACITY units.

   1 ◉ AMP HOURS

   2 ○ KILOWATT HOURS

2. Press **SAVE** or **BACK** to return to the Utility Menu without saving any changes.

Language

The LANGUAGE utility allows you to select a language for the display and printouts. You can override the selection when the GRX-5100 Hyundai displays the language option after you turn it on or print results.

1. Select the LANGUAGE.

   1 ◉ ENGLISH

2. If you used the **ARROW** keys, press **SAVE** to save your setting or **BACK** to return to the Utility Menu without saving the changes.

Admin

Select the ADMIN icon to display a list of administrative functions:

1 ◉ OPTIONS

2 ○ CLEAR TEST TOTALS

3 ○ RESET DEFAULTS

4 ○ CHANGE ADMIN PIN

Options

In the OPTIONS section there are three functions that allow you to control user access to the Main Menu and Admin Menu.

1 – USER ID
Select this setting to enable (ON) or disable (OFF) the USER ID login screen.

2 – UNREG. USER
Select this setting to enable (ON) or disable (OFF) unregistered login access to the GRX-5100 Hyundai.

3 – PIN
Select this setting to enable or disable the ADMIN PIN number.

Each option is easily enabled or disabled by turning it ON or OFF. To save your settings after each selection, press **SAVE**.

To return to the administrative functions list without saving, press **BACK**.

Clear Test Totals

This function allows you to clear the test totals by User ID and battery test decision. The GRX-5100 Hyundai verifies that you want the counter reset to 0 before it continues.

NOTE: This will not clear the lifetime test total available in the VERSION information screen.

Reset Defaults

This function allows you to reset Administrative options to their original settings. It will clear all registered users.

Option	Default Settings
1 – USER ID	ON
2 – UNREG. USER	OFF
3 – PIN	Not Available

Change Admin Pin

This function allows you to enter a new 5-digit Admin Pin.

Update

When software updates become available, use this utility to update the GRX-5100 Hyundai using a USB-style jump drive inserted into the USB-A port.

When performing an update, the GRX-5100 Hyundai will first check the inserted USB drive. Next the version information of the currently loaded software and the new version information found on the drive is displayed on the screen.

IMPORTANT: The BSU must be connected when updating the GRX-5100 Hyundai software.

Buzzer

The BUZZER utility allows you to enable or disable the warning tone that alerts you if the clamps are connected improperly and or there are other errors.

1. Select the BUZZER.

   1 ○ OFF

   2 ◉ ON

2. If you used the **ARROW** keys, press **SAVE** to save your setting or **BACK** to return to the Utility Menu without saving the changes.

Chapter 6: Error Messages

The table below will help you troubleshoot test messages. If troubleshooting does not solve the problem, call your local sales/service distributor.

Possible Error Messages

Hardware Error

This error can be generated by damaged or improperly connected cables. To clear the error, turn off the GRX-5100 Hyundai, re-seat the cable connections, and power the GRX-5100 Hyundai back up.

If the error message reappears contact your local sales/service distributor for service.

Communication Error

Indicates an internal communication problem in the GRX-5100 Hyundai.

Internal Temperature Sensor Failure

Contact your local sales/service distributor for service.

Incorrect Voltage Detected

The voltage of the battery is out of range.

Voltage Matches Target Voltage

The measured voltage of the battery module is already at the entered Target Voltage. No additional conditioning is required.

PATENTS

The GRX Battery Diagnostic Station is made by Midtronics, Inc., and is protected by one or more U.S. and foreign patents. For specific patent information, contact Midtronics, Inc. at +1 630 323-2800.

LIMITED WARRANTY

The GRX Battery Diagnostic Station is warranted to be free of defects in materials and workmanship for a period of two years from date of purchase. The cables are excluded from this warranty.

Midtronics will, at our option, repair or replace the equipment with a remanufactured equipment. This limited warranty applies only to the specified equipment, and does not cover any other equipment, static damage, water damage, over-voltage damage, dropping the units, or damage resulting from extraneous causes including owner misuse. Midtronics is not liable for any incidental or consequential damages for breach of this warranty. The warranty is void if owner attempts to disassemble the Battery Diagnostic Station.

MIDTRONICS

www.midtronics.com

Corporate Headquarters
Willowbrook, IL USA
Phone: 1.630.323.2800
Canadian Inquiries
Toll Free: 1.866.592.8052

Midtronics B.V.
European Headquarters
Houten, The Netherlands
Serving Europe and Africa
Phone: +31 30 68 68 150

Midtronics China Office
China Operations
Shenzhen, China
Phone: +86 755 23741010

Midtronics India
Mumbai, India
Phone.: +91 22 27564103/1513

Asia/Pacific (excludingChina)
Contact Corporate Headquarters
Tel.: +1 630 323 2800

167-000842EN-A 10/17 ©2017 Midtronics, Inc. Alle Rechte vorbehalten.