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LINEAR MEASUREMENT INSTRUMENTS, Corp.

Research, Development and Manufacturing of Precision Measuring Systems

SK5547 G-Whiz Closing Effort System User's Manual

OVERVIEW:

The LMI SK5477 G-Whiz Closing Effort System is designed and manufactured to be used as a portable, compact, durable precision gage to measure the force required to close a door as well as the velocity of the closing effort, as well as the velocity of the door just prior to latching. A vacuum cup is used to hold the G-Whiz Closing Effort System in place on the door or Lift Gate. The G-Whiz is capable of storing the force and velocity specifications for up to five doors in 10 different models.

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Warranty Information

In the USA, this unit is warranted by LMI against defects in materials and workmanship for 1 year from date of original purchase. If you transfer ownership, the warranty is automatically transferred to the new owner and remains in effect for the original 1 year period. During the warranty period we will repair, or at our option, replace at no charge, product that proves to be defective, provided it is returned, shipping prepaid to LMI.

This warranty does not apply if the product has been damaged by accident or misuse or as a result of service or modification by other than LMI, or by hardware, software, interfacing or peripherals not provided by LMI.

Please retain this document for your records. No other express warranty is given. The repair or replacement of a product is your exclusive remedy. Any implied warranty of merchantability or fitness is limited to the 1 year duration of this written warranty. Some States do not allow the exclusion or limitations of incidental or consequential damages, so the above exclusion or limitations may not apply to you.

LMI Customer Service

LMI Customer Service can be reached at (810) 714-5811 Monday through Friday between 8:00 a.m. and 5:00 p.m. Eastern Standard Time.

Call LMI Customer Service to:

- Place orders
- Return LMI equipment for service
- Inquire about the status of an order or repair

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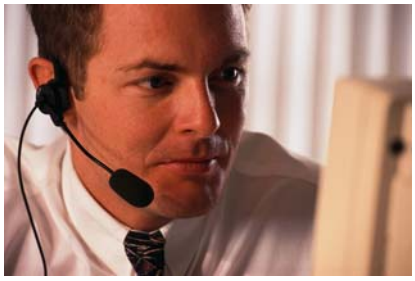
Returns for Service

- Contact Customer Service for a Return Material Authorization (RMA) number. Include a detailed description of the problem.
- Pack the equipment properly. Use the original shipping container, if possible. LMI cannot assume responsibility for damage caused by improper packaging.
- Send the equipment to the following address:

LMI Corporation
Attn: Repair Department
101 N. Alloy Drive
Fenton, MI 48430

LMI Technical Support



LMI Technical Support experts are only a phone call away. Contact Technical Support at 810-714-5811 Monday through Friday between 8:00 a.m. and 5:00 p.m. Eastern Standard Time for the following reasons:

- To assist in setup and configuring LMI equipment
- To help implement data collection applications
- To troubleshoot LMI equipment

You and also reach LMI Technical Support by Email at techsupport@lmicorporation.com. You can email your questions anytime. Please include your name, phone number, and a *detailed description* of the problem.

LMI On-Site Training

LMI Technical Support provides on-site training for all LMI products. Contact LMI Support Services at 810-714-5811 for pricing & scheduling information. Schedule a day at your facility or at LMI in Fenton, Michigan.

LMI Website

Please visit us on the web at www.lmicorporation.com for more information.

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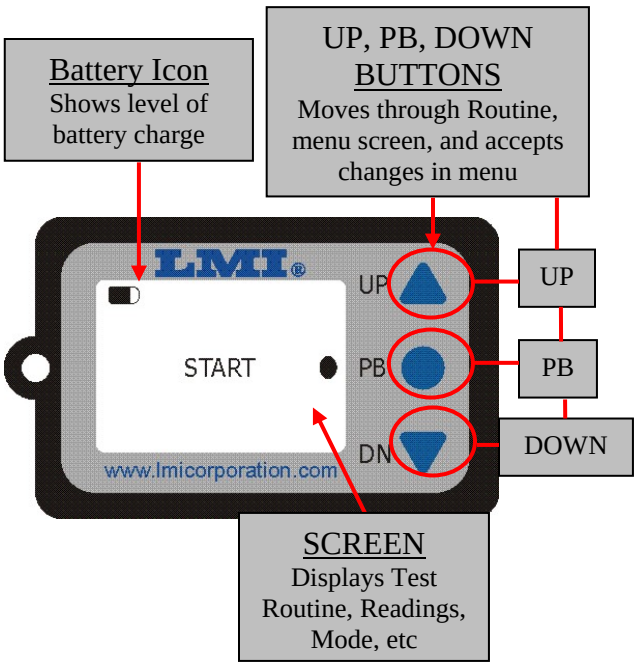
Gage Overview



Measuring with the SK5477 G-Whiz Closing Effort Gage:

Attach the vacuum cup to the Door or Lift Gate in the desired location, and press the plunger in multiple times till the red ring is hidden and vacuum is secured to door/Lift Gate.

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Getting started

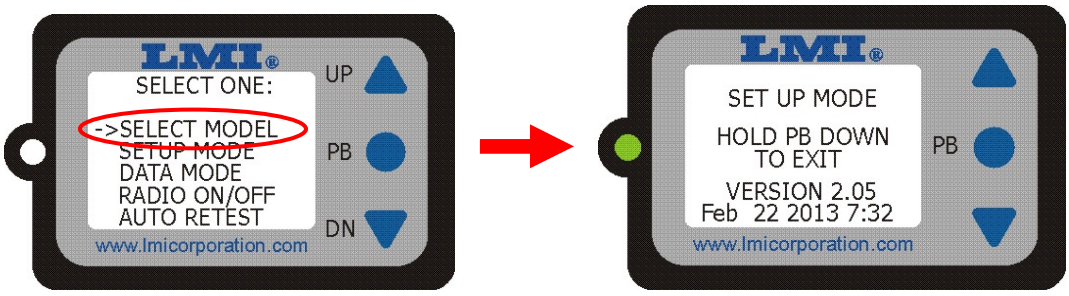
"Wake up" the gage by pressing the "PB" button (center round button) on the display.

If the gage is not associated with the particular base being used, continue with the steps below, otherwise skip down to "Using the SK5477" section below on page 8.

Note: Once an SK5477 Gage is Associated to a Base Station, these steps are not necessary.

SETUP MODE:

Enter the "Setup Mode" by pressing and holding the "PB" button down for 3 seconds until the LED stops flashing, then press the "Down" arrow at which time a menu will appear on the screen. Using the Arrow buttons select "Setup Mode" and press the "PB" button.



Selecting this mode starts the green LED flashing. This mode is used to associate a gage with a base, as well as reference the firmware version number. Press and hold the PB for 3 seconds to exit this mode.

ASSOCIATION TO A BASE:

While in the update mode press the reset button on the back of your base unit. The Green, Yellow, and Red LEDs will come on and stay on for 15 seconds. During this time press and release the PB to associate the tester to the base. If the gage associated with the base correctly, you will see between 1 and 3 Green LED's (depends on signal strength) on the base station turn on then off.

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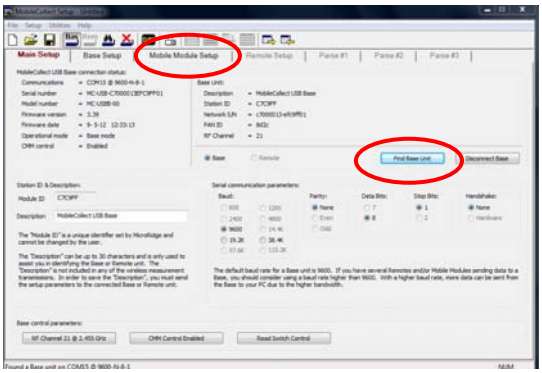
CHANGING RF CHANNEL NUMBERS:

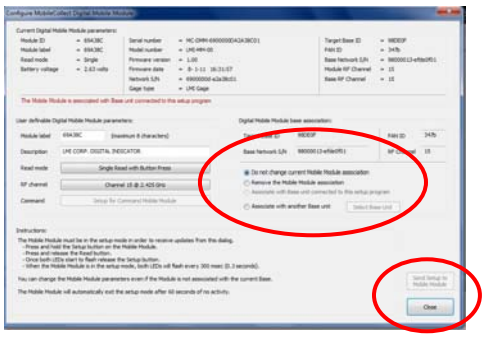
If multiple gages and bases are used within close proximity of each other, it is recommended the RF channel of the base and the gage be changed to different channels to eliminate cross talk and/or interference. You will need to use the MicroRidge Mobile Collect setup utility that came with your Wireless Mobile Collect Base Station to do this.

The gage must first be de-associated from the wireless base station. To do this:

- Connect Base to PC via USB Cable
- Click on “Find Base”



- When base is found, click on the “Mobile Module Setup Tab”
- Turn the gage on, and press and hold “PB” button to enter menu, then select “Setup Mode” and press the PB button.
- Press and release the “PB” button
- Click on “Remove the Mobile Module Association” then click “Send Setup to Mobile Module”.



- If message appears stating it did not get a complete response, click ok and repeat above steps.
- When Association has been removed, click ok, and then click “Close”.

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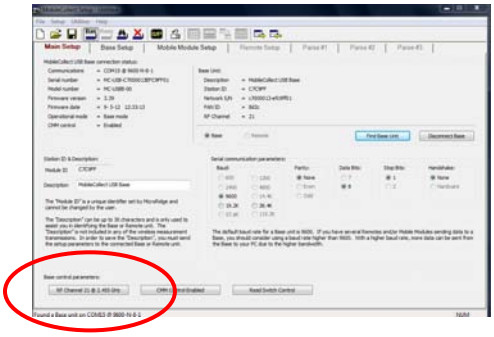
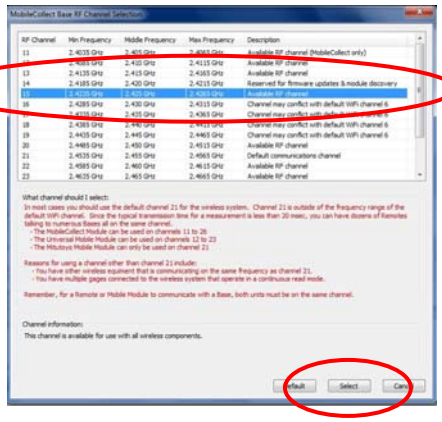
To change the channel number:

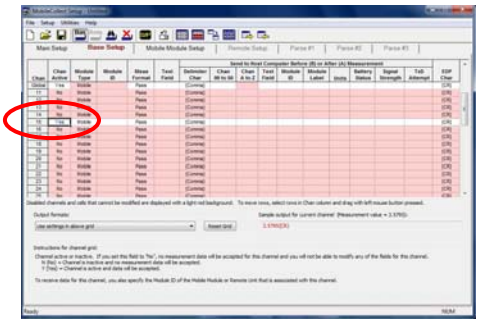
- Click on “RF Channel xxxx” in the lower right corner of the Main Setup Window.



- Select the next available channel, then click on “Select”



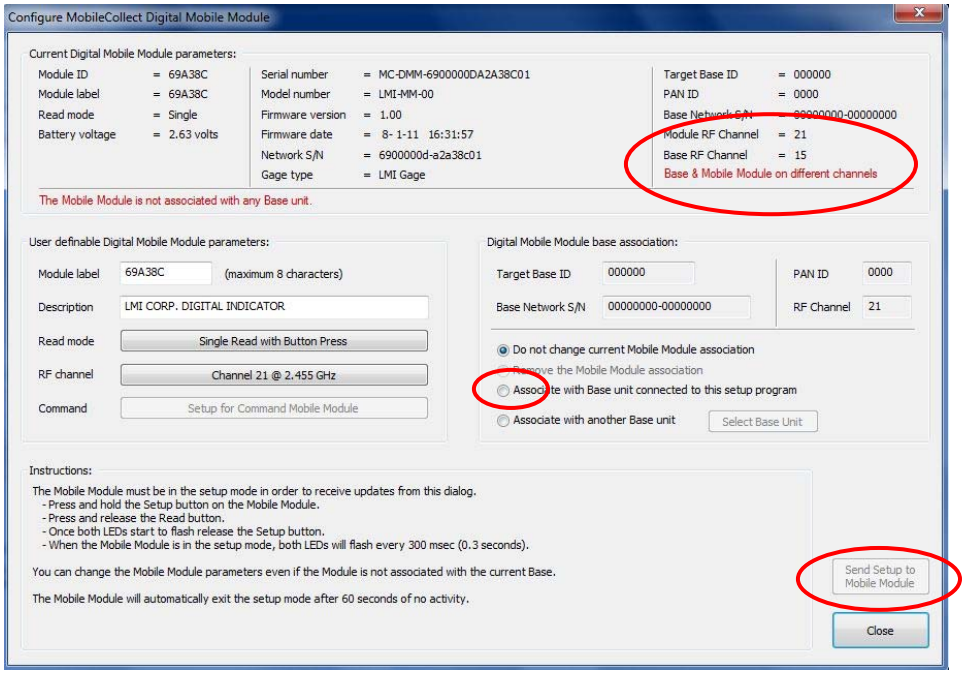
- Click on the “Base Setup” Tab and look for the channel number you just selected.
- If it’s red, click in the cell next to the channel number and type “Y”, then click any other cell….entire line should turn white.



- Click on the “Send the Base Setup to the Base Unit” icon in the toolbar.

Associate Gage to Base Configuration:

- Click on the “Mobile Module Setup Tab”
- Turn the gage on, and press and hold “PB” button to enter menu, then select “Setup Mode” and press the PB button.
- Press and release the “PB” button
- Click on “Associate the base unit connected to this setup program” then click “Send Setup to Mobile Module”.
    - You will notice a difference in RF Channels in upper right hand corner.



- If message appears stating it did not get a complete response, click ok and repeat above steps.
- When Association has been removed, click ok, and then click “Close”.

Auto Shutdown

If a test is not sampled for 5 minutes, the unit will go into a low power mode and the screen will go blank, to conserve battery power. To “Wake up” the gage, press the PB button.

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CALIBRATION:

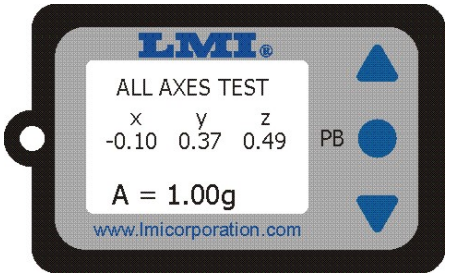
Calibration is done from the factory, and requires no further calibration. The accelerometer within the gage was calibrated at LMI, in Fenton MI, at an elevation of 899ft above sea level.

The Accelerometer used is certificated from the manufacture to be accurate within +/- .5% of full scale nonlinearity and its sensitivity is 4mg/lsb.

Calibration Verification:

Calibration can be checked, when in the main screen, by pressing the "UP" arrow for 3 seconds until the LED stops flashing, then press the "PB" button. A self-test routine is entered which shows the amount of the earth's gravity that each axis is axis is experiencing, plus the vector sum of all 3 axes. This result should always be 1.00*g* (+/- .01) no matter the orientation, when at rest. The value will change briefly when the gage is moved but will settle to 1.00*g* (+/- .01*g)* when motion stops.

Pressing the "UP" arrow one time will exit the calibration verification.



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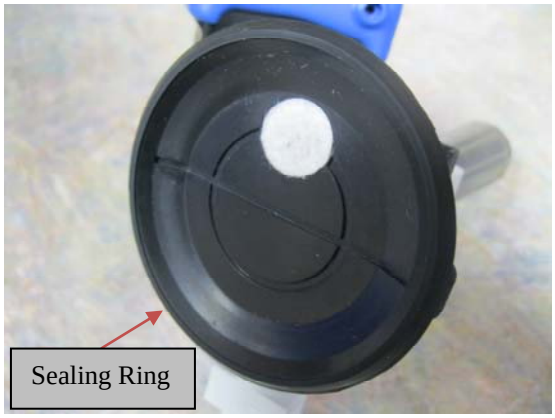
Using the SK5477

ATTACHING TO THE VEHICLE

Choose a spot on the door close to the edge or the lift gate. Push the vacuum cup firmly against the vehicle and pump the vacuum plunger. This operation is complete when the unit draws down against the panel and the red band on the plunger disappears.

The narrow sealing ring surface on the contact side of the vacuum cup needs to be kept clean and no cuts, or gouges present. Any imperfections present around the perimeter can keep the unit from sealing properly. As mentioned above, the red ring on the vacuum plunger should stay hidden through the entire test. If it does not, inspect the surface and clean it with soap, or alcohol. Harsh chemicals capable of eating rubber cannot be used. There is a seal inside the plunger also. If the sealing ring is inspected and appears to have no issues, the plunger may be failing and would need replacement.



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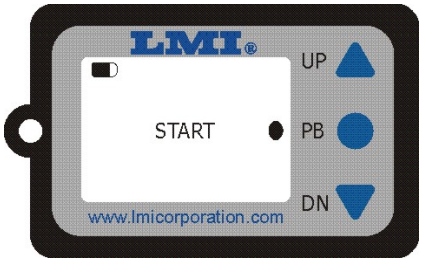
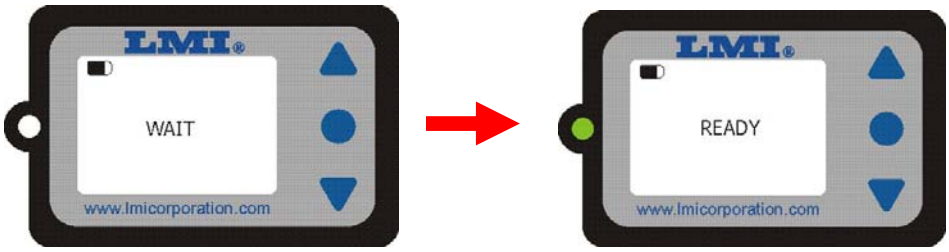
STARTING AND PERFORMING A TEST

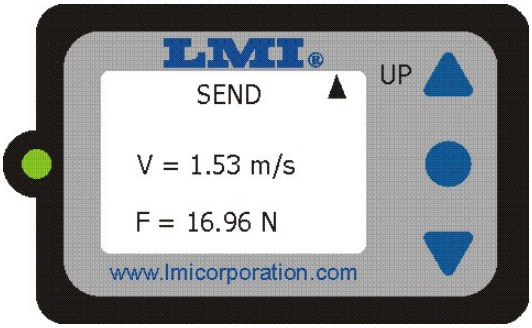
With the door at the desired starting position press the PB to start a test.



The unit will spend about 1 second determining its orientation and waiting for motion to stop. The green LED will come on and “WAIT” will be displayed on the screen, followed by “READY” displayed when the gage is ready to take a reading.



At this time give the door a push to close it. Be sure your hand comes off the door before the door starts to engage the latch. The velocity in meters per second (this is the default) will appear on the display.



The user can then Send the reading to the PC or Re-Test the door. If AUTO RETEST is on this decision must be done prior to reopening the door or removing the unit. If the reading should be sent, press the “Up” Arrow, if a Re-Test is required, press the DOWN arrow and repeat above steps.

Note: If the AUTO RETEST feature is ON reopening the door will also typically initiate a retest.

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INVALID TESTS

Under certain conditions the unit will display INVALID TEST after a test is run. This can be the result of several things. The main reason for an invalid test is closing the door before the READY message appears. Another reason is that a velocity below .25 meters per second (.82 feet per second) is calculated. This usually means the door was closed too slowly and the internal data buffers were overwritten giving a false velocity.

Manual Reset Option

While in use, if the screen "locks" up, the radio does not appear to be sending data to the wireless base properly, or the LED appears to be not functioning properly, you can manually reset the firmware and radio by pressing and holding the Down button for 3 seconds until the LED stops flashing, then press the "PB" button. This is the same option for the "Data Mode" (see description on page 14), at which time you will see various displays on the screen. After all this data is sent to the PC, the firmware and radio will then reset and the LMI wireless logo will flash on the screen.

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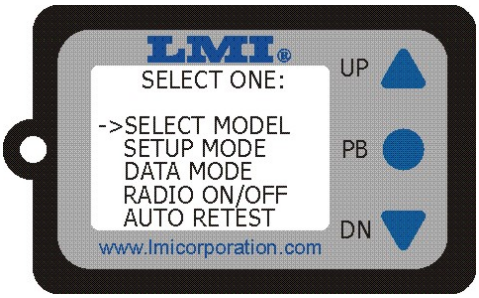
MENU

Holding in the "PB" button for 3 seconds until the LED stops flashing, then pressing the "DN" button will display the Menu Screen:



The "UP" and "DN" buttons will move the arrow to the various selections.

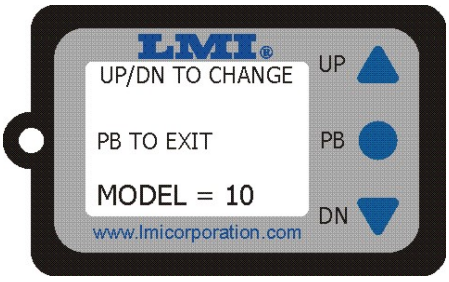
Press the Center Button (PB) to select any option in the menu.

Select Model

This allows the operator to manually select 1 of 10 different models, and is used in conjunction with the G-Whiz Wireless Utility. The G-Whiz gage can be set up to be used with 10 different vehicle model structures, which will have the control limits preset, which in turn gives the user a Red or Green LED based on the data taken.

Using the "UP" or "DN" buttons will move the user through the different models. Press the "PB" button when the model needed is displayed.

Model 10 is a "standard" model that will work with any vechile. This model has no Routine or Spec Limits and is intended for a "normal use" application. When no Utility is available, this model will allow user to still check the closing effort.



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Setup Mode

This option is used in conjunction with the G-Whiz Wireless Utility to change a vehicles specifications (model), and to read out the internal gage information. The G-Whiz also needs to be placed into this mode in order to associate the gage with a MobileColllect USB Base Station. See page 5 of this manual for information on this. When in this mode, the LED will blink Green.

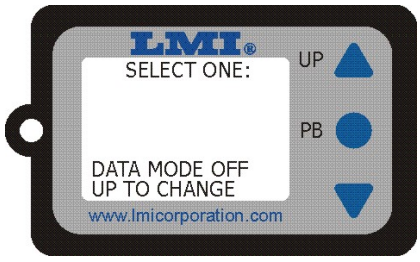
This screen will also show you the firmware version and date/time of the build.

Press and hold the "PB" button for 3 seconds to return the gage to the main testing screen, which will also save any changes made to memory.

Data Mode – Note: This setting is not typically selected by user

This selection will either turn the Data Mode On or Off. Press the "UP" arrow to change the selection, then press the "PB" button to save the changes and return to the main testing screen. The Letter "D" will display at the far left side of the testing screen, if turned on.

This mode takes the raw acceleration data during the entire door closure process. The data is stored within the gage and can then be sent to a PC, via the wireless Mobile Collect Base Station, by holding the "Down" arrow for 3 seconds. This mode is used to determine the latching characteristics of a door, and rarely ever used by an operator.



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AUTO RETEST

Turning this feature on will allow the opening of a door, after a test has been completed, to typically restart a test automatically. If this option is turned off, the user must always press the "PB" button to restart a test. If turned on, the letter "A" will appear at the far left hand side of the testing screen. The Default setting is "OFF".

Proper technique must be followed using Auto Retest. The door should be reopened and quickly brought to the test start position. If the user hesitates after reopening the door, the data buffers can fill with bad data, causing erroneous readings.

To change the setting, press the "UP" button, then press the "PB" button to save the changes and return to the main testing window.

RADIO ON/OFF

For applications that require the gage to test several models on the same line, the radio must remain "ON" so the gage can receive the correct vehicle identifier from UGI. When the Radio is "ON", the letter "R" will be displayed on the left hand side of the testing screen.

- Radio must be "ON" for testing vehicles on the line to communicate with UGI
- Radio can be turned off for spot checking vehicles off line.

Follow the on screen instructions to turn the radio ON or OFF at any time. Press the "PB" button to exit this menu after you make your changes.

This option uses more battery power so remember to leave your gauge on the charger when not in use, to keep a battery from going dead during a routine. Reference the Battery information at the end of this manual.

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BATTERY

For maximum battery life keep charged whenever possible. The gage is powered with a rechargeable Li-Ion Battery. This battery lasts longer if it is kept charged so it best to leave it on the charger when not in use. When the battery is getting low, the screen will display "BATTERY IS LOW". If the battery is too low for reliable testing, further testing is disabled and "RECHARGE NOW" appears on the display.

Use the supplied LMI Wireless Gauge Charger to charge the battery.

- A RED LED on the Charger indicates a charging Battery
- A GREEN LED indicates a fully charged battery.

Note: The SK5477 G-Whiz Gage does not have an On/Off button. The gage will go into a low power "sleep" mode after 5 minutes of no activity, but will continue to draw a minimal current. Due to this low current draw, gages not used for a period of time or not left on a charger when not in use, will draw the battery down & require a full charge before being used.