GTC
General Technologies Corp

CT8030

1. SAFETY RULES

- This meter is designed for indoor use at temperatures between 0°C to 40°C and altitudes up to 2,000m.
- To ensure that the meter is used safely, follow all safety and operating instructions in this operation manual. If the meter is not used as described in this operation manual, the safety features of this meter might be impaired.
- Do not use the meter if the meter or test leads look damaged ,or if you suspect that the meter is not operating properly.
- When using the instrument, keep your fingers behind the finger guards on the plastic casing and probes.
- Disconnect the live test lead before disconnecting the common test lead.
- Make sure power is off before cutting, desoldering, or breaking the circuit wires. Small amounts of current can be dangerous.
- Do not apply more than 1000 VDC or 750V AC rms between a terminal and ground.
- To avoid electrical shock, use CAUTION when working above 60V DC or 25V AC rms. Such voltages pose a shock hazard.
- Never make measurements with the battery cover off.
- To avoid electrical shock or damage to the meter, do not exceed the input limits.

2. INTERNATIONAL SYMBOLS

⚠ Important information see manual	⚠ Dangerous Voltages
~ AC	•)) Continuity
⎓ DC	⏚ Ground
	⧈ Double Insulation

3. TECHNICAL SPECIFICATIONS

3.1 General Specifications

Display:	LCD, 4¾ digits/40000 Counts (99999 for Hz function) + 4 Digits/9999 Counts dual display with 42 segments analog bargraph.
Polarity:	Automatic, (-) negative polarity indication
Zero adjustment:	Automatic
Sample rates	
3¾ Digits:	5 times per Sec.
4¾ Digits:	1.25 times per Sec.
43 Seg. bar graph:	128 times per Sec
Over range indication:	"OL" is displayed
Operating Temperature:	0 to 35°C, 0 to 80% RH
	0 to 50°C, 0 to 70% RH
Power Source:	9-volt battery type NEDA 1604, IEC6F22
Battery life:	Approx. 70 hours. (w/ alkaline batteries)
Safety:	Designed to comply with EN61010-1, UL3111-1, CSA C22.2 No.1010-1 and IEC1010-1 Installation category II, Pollution degree 1
E.M.C.:	Meets EN55011 and EN582-1
Dimension:	7.32"x3.42"x1.39" or 186x87x35.5mm without Holster
Weight:	Approx. 13.8 Oz. or 390g (without Holster).
Accesories:	User's Manual, Test Leads, Back Probes, Alligator Clips, Protective Holster, Hard Carriying Case, K-type Temperature Probe, Inductive pick-up and 9V battery.

3.2 Electrical Specifications

- Accuracies are ±(% of reading + number of least significant digits) at 23°C ±5°C, less than 75% RH. For DC/AC current measurement, the maximum current of 10 A is for 30 Sec. with 5 min. cool down between measurements.

Function	Range	Accuracy	Input Impedance	Remarks	Overload Protection
DC Voltage	40.00 mV	0.8%+6	10 MΩ, 30 pF nominal		600 Vrms
	400.0 mV, 4.000 mV, 40.00 V to 400.0 V	0.1%+2			
	1000 V	0.1%+4			
AC Voltage	40.00 mV	1%+10	10 MΩ, 30 pF nominal (100pF nominal in 40 mV and 400 mV Ranges)	50~60Hz	600 Vrms
	400.0 mV, 4.000 V, 40.00V, 400.0 V, 750V	0.8%+4			
	40.00 mV	3.5%+10		40 Hz to 1 kHz	
	400.0 mV, 4.000 V, 40.00V, 400.0 V, 750V	2.5%+5			
	40.00 mV	4%+10		1 kHz to 2 kHz	
	400.0 mV, 4.000 V, 40.00V, 400.0 V, 750V	3.6%+8			
DC Current	4000 mA	1.2%+6	0.03 V/A Voltage Burden		Fuse Protected
	10.00 A	0.8%+4			
AC Current	4000 mA	1.2%+6	0.03 V/A Voltage Burden		Fuse Protected
	10.00 A	1.0%+3			
	4000 mA	2.5%+10			
	10.00 A	1.2%+3			
	4000 mA	3.5%+10			
	10.00 A	1.5%+5			
Resistance	40.00Ω	0.5%+40	<1.3 V Test Voltage (<3.3 V in 40 Ω and 400 Ω range)		600 Vrms
	400.0Ω,	0.15%+4			
	4.000 kΩ, 40.00 kΩ 400.00 kΩ	0.15%+2			
	4.000 MΩ	0.3%+2			
	40.00 MΩ	1.5%+3			
Diode Test	2.000 V	-	< 3.2 V Test Voltage		600 Vrms
Frequency	99.999 Hz to 20.000 kHz	0.001%+4	1, 2, 20 and 200 Vrms Selectable threshold		600 Vrms
Multiport Fuel Injection	0.05 - 250 mS	0.05mS+1		Selectable +/- Slope, and Number of Cylinders	600 Vrms
	0.0 - 100 %	0.04%/krpm +2			
Single Port Fuel Injector	0.05 - 250 mS	0.05mS+1			
	0.0 - 100 %	0.04%/krpm/cyl +2			
Tachometer	120-20000 RPM	2 RPM		RPM 4	600 Vrms
	60-10000 RPM			RPM 2	
Dwell	0.0° - 360.0°	1.2°/krpm+1		1 to 12 Cyl.	600 Vrms
	0.0° - 100.0°	0.04°/krpm/cyl +2			
Temperature	-20.0° to 1000.0°C	02%+3°C	K-Type Thermocouple Probe		600 Vrms
	-4° to 1832°F	0.2%+6°F			

Audible Continuity Tester

- Audible threshold : between 10Ω, and 60Ω.
- Response time: 200µs.

O_2 Sensor Tester

- Application : For O_2 Sensor dynamic test
- Main Display : Symbolic waveform display of O_2 Sensor dynamic output.
- Mini display : Cross count per second parameter. A beep sound will alert the user on each significant cross count edge
- Sweep Rate : 10 per second.

Alternator tester

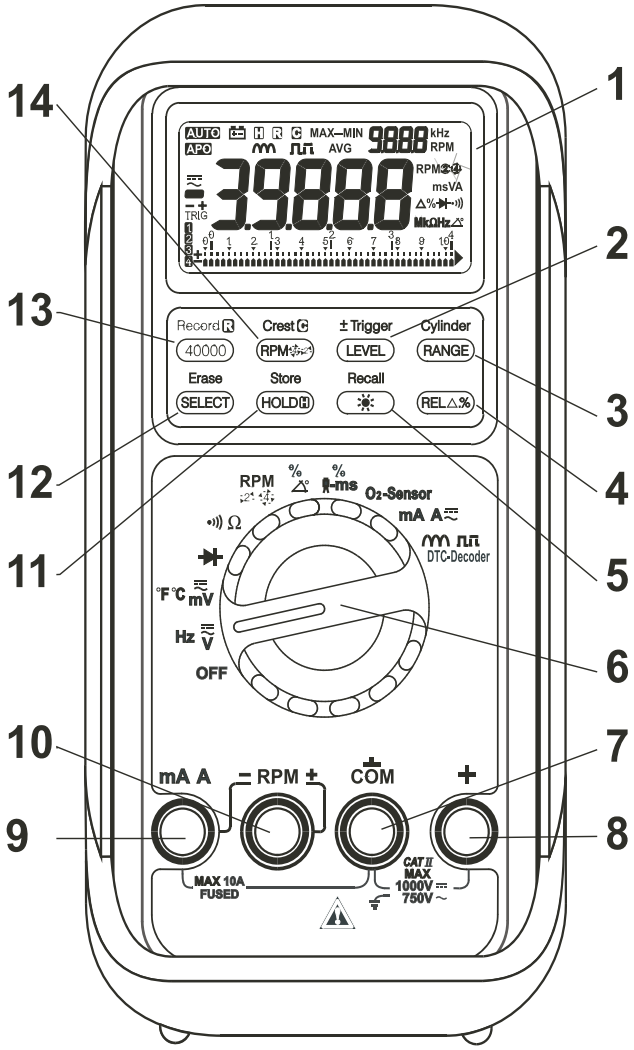
- Application : For quick go / no go test on alternators
- Threshold : The display indicates "bad" and the beeper turns on when the measured ripple voltage is greater than 0.45VAC.

Fault Code Detector

- Application : For blink type fault code detection
- Display : The display indicates a symbolic pulse and the beeper turns on when the blink code pulse is detected.
- Threshold : 4.5VDC with selectable positive or negative pulse trigger (by ±Trigger button).

DTC (Diagnostic Trouble Code) Decoder

- Application : A replacement of the Impulse Counter Scan Tool as specified in the Mercedes-Benz Diagnostic Trouble Code Reference Guide to scan the DTC Code readout automatically on the Mercedes-Benz car series.



4. OPERATION

4.1 Instrument Description

1- LCD Display: 4-3/4digit 40000 count 4 digits 9999 count dual display.

2- ± Trigger (LEVEL): Pushbutton, press momentarily to select trigger levels, or press and hold for 1 second to toggle between positive and negative trigger slopes.

3- Cylinder (RANGE): Pushbutton to select Auto/Manual ranging in most functions, or number of cylinders in Dwell function.

4- (REL△%): Pushbutton to select relative zero and relative percentage change.

5- Recall (☀): Pushbutton. Press momentarily to turn on the display backlight, or press and hold for 1 second to recall stored data.

6- Rotary Switch: Turns the power ON and OFF and selects measuring functions.

7- **COM** Input Socket: Common (Ground Reference) Input connector for all functions except TACH function.

8- **+**: Input Socket for all functions except Current and TACH functions.

9- **mA A/RPM − :** Input Jack (**+**) for current function, and ground reference (**−**) input Jack for **RPM** function.

10- **RPM + :** INPUT JACK (**+**) FOR **RPM** FUNCTION

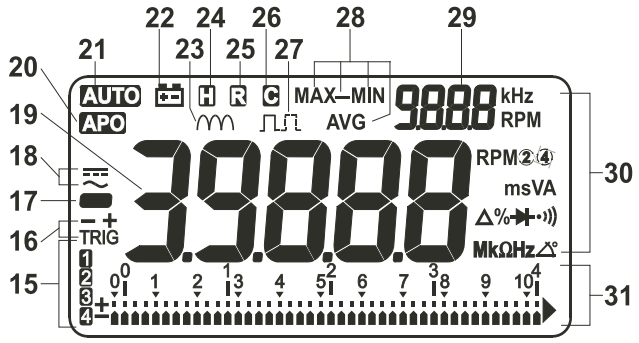
11- Store (HOLD) : Pushbutton. Press momentarily to activate hold, or press and hold for 1 second to store the data displayed for later recall

12- Erase (SELECT) **:** Pushbutton. press momentarily to select secondary functions, or press and hold for 1 second to erase all stored datas

13- Record (40000) **:** Pushbutton. press momentarily to toggle between 40,000 and 4000 counts modes, or press and hold for 1 second to activate record function

14- Crest (RPM) **:** Pushbutton. press momentarily to toggle between ↻ and ↻ in **RPM** function, or press and hold for 1 second to activate Crest function

4.2 Display Description



15. TRIG 1234 : These annunciators indicate trigger level status.

16. TRIG : These annunciators indicate positive (+) or negative (−) Trigger Slope is selected.

17. − : Negative polarity symbol.

18. ⎓ : annunciator indicates direct current (DC) is selected.
~ annunciator indicates alternating current (AC) is selected.

19. DATA : Main digital readings of data being measured.

20. APO : This annunciator indicates Auto Power Off is enabled.

21. AUTO : This annunciator indicates Autoranging.

22. : Low Battery alert, replace the battery as soon as possible to ensure accuracy.

23. : This annunciator indicates the Alternator tester function is selected.

24. H : This annunciator indicates data HOLD function is activated.

25. R : This annunciator indicates the Record function is activated.

26. C : This annunciator indicates the Crest function is activated.

27. : This annunciator indicates the Fault Code Detector function is activated.

28. MAX—MIN / AVG : This annunciators indicate MAX (Maximum), MIN (Minimum), MAX-MIN (Maximum minus Minimum), or AVG (Average) reading is being displayed.

29. **DATA** : Secondary display for Dual Display data.

30. kHz : These annunciators indicate the function being selected and/or the appropriate measurement units.

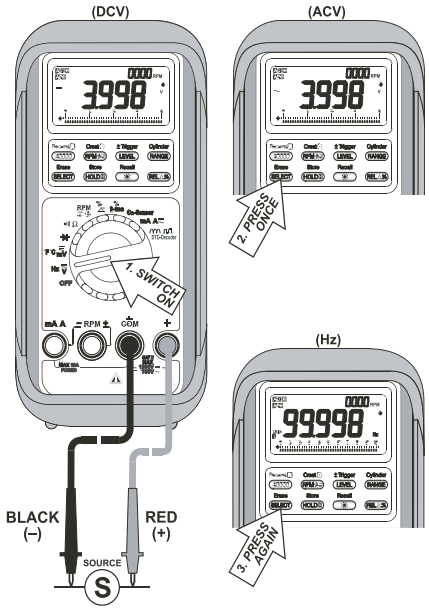
31. : Analog bar graph with overload flag, polarity and scale.

4.3 Measurement Procedures

⚠ **CAUTION**: Maximum Input Voltage is 750Vrms,do not exceed this rating to avoid personal injuries or damage to the instrument. The FUNCTION switch should be set to the range you want to test before the operation.

⚠ **CAUTION**: Always ensure that the correct terminals are used for the type of measurement to be made. Avoid making connections to “live” circuits whenever possible.When making current measurements ensure that the circuit is not “live” before opening it in order to connect the test leads.

4.3.1 DC/AC Voltage Measurement

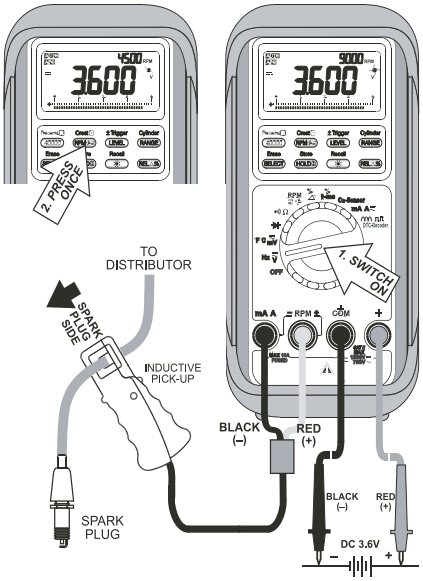


- Set rotary switch to Hz V position.
- Default at **DC**. Press **SELECT** button momentarily to select **AC**, and press again to select **Hz** if required.
- Insert red (+) test lead into + jack and black (−) test lead into **COM** input jack.
- Connect test leads to voltage source and observe the digital display for the readout.
- Set rotary switch to mV position for voltage application below 0.4V with similar operation procedures.
- Refer (4-2) for enabling dual display **RPM** function.

Hz Function: 4 trigger levels selectable through the **LEVEL** push button for advanced applications in this function. Also refer to section 5.8 of this manuals for more details.

4.3.2 DUAL DISPLAY RPM Function

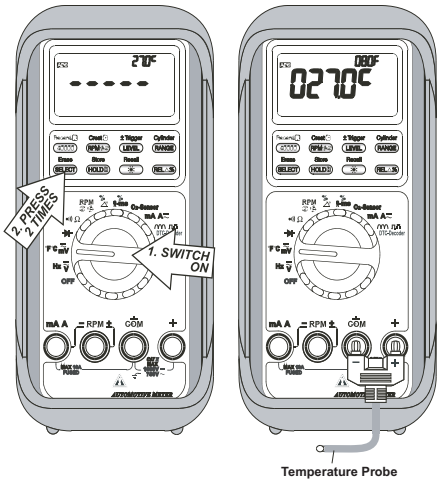
- Set the meter to the corresponding primary function. See note below for function availability.
- Press RPM②④ button to toggle to for 2-stroke and DIS engine, or to for 4-stroke engine.
- Insert output plug of inductive pick up with the positive (red) into RPM + jack and the negative (black) into the RPM − jack.
- Clamp the inductive pick up to a spark plug wire with the arrow sign facing the spark plug. Make sure that the pick up jaws are completely closed.
- Observe the secondary digital display for RPM readings.



Note: 1- This function is available to primary functions: DCV, ACV, Hz, Dwell, Fuel injection detector, & Duty cycle.

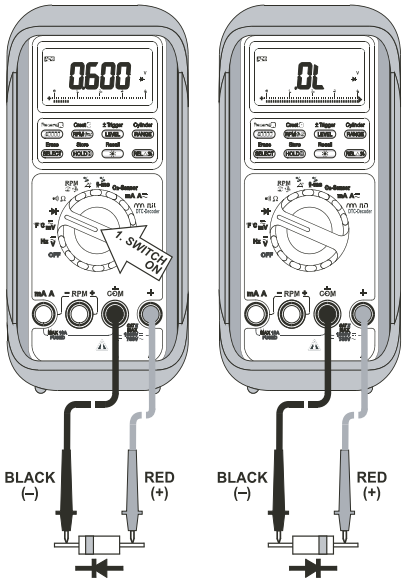
2- When trigger level selection is required for advanced applications, use main display RPM function. See (4.3.6) for more details.

4.3.3 TEMPERATURE Function



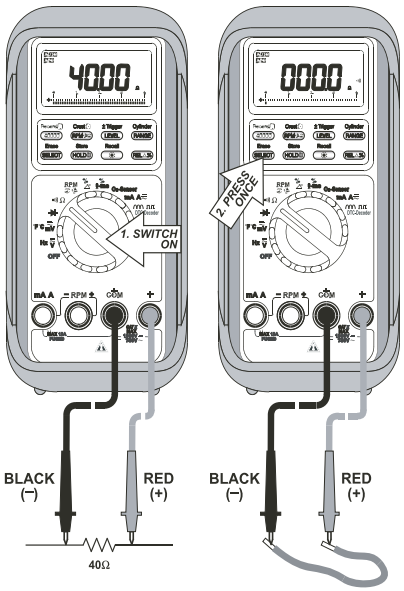
- Set rotary switch to °F°C ≂ mV position
- Press SELECT button momentarily two times to select temperature function.
- Without any temperature probe plugged into the input terminals (detect automatically by the meter), the secondary digital display displays the meter internal temperature reading in °C & °F alternatively.
- Insert the banana plug type-K temperature bead probe (standard accessory) with correct + − polarities. Positive (+) plugs into + jack where negative (−) plugs into COM input jack. You can also use a plug adapter (optional accessory) with banana pins to type-K socket to connect other standard type-K mini plug temperature probes.
- Touch the end of the thermo probe to the measurement surface and observe the digital display with °C in the main display, and °F in the second display.

4.3.4 ⊣◀ DIODE TEST function



- Set rotary switch to ⊣◀.
- Insert red (+) test lead into + jack and black (−) test lead into COM input jack.
- Connect the test leads as shown and observe the digital display.
- Normal forward voltage drop (forward biased) for a good silicon diode is between 0.400V to 0.900V. A reading higher than that indicates a leaky diode (defective). A zero reading indicates a shorted diode (defective). An '*OL*' indicates an open diode (defective).
- Reverse the test leads connections (reverse biased) across the diode.
- The digital display shows '*OL*' if the diode is good. Any other readings indicate the diode is resistive or shorted (defective).

4.3.5 Ω RESISTANCE, •)) CONTINUITY Functions

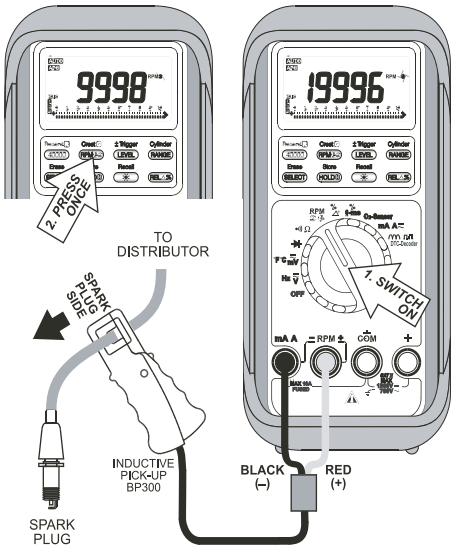


⚠ **CAUTION**: Maximum Input Voltage for this function is 600 Vrms do not exceed this rating to avoid personal injuries or damage to the instrument. Also ensure there is no power applied to the component or circuit and all capacitors are discharged.

- Set rotary switch to Ω
- Insert red (+) test lead into + jack and black (−) test lead into COM input jack

- Connect the test leads as shown and observe the digital display.
- Default at Ω. Press SELECT button momentarily to select Continuity function.
- A continuous beep tone indicates a complete wire. This is useful for checking wiring connections and operation of switches.

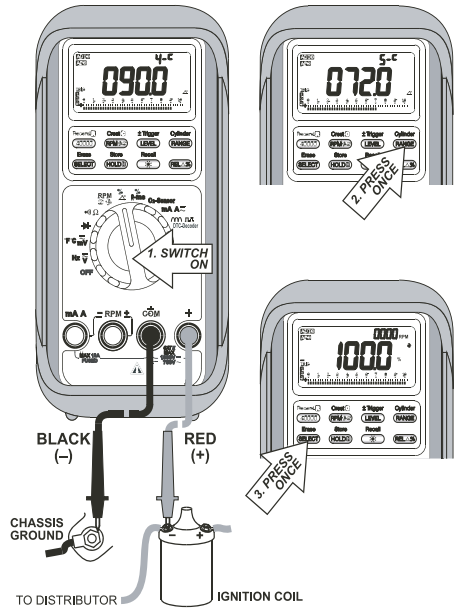
4.3.6 RPM function (main display)



- Set rotary switch to RPM 2 4 .
- Press button to toggle to for 2-stroke and DIS engine, or to for 4-stroke engine.
- Insert output plug of inductive pick up with the positive (red) into RPM + jack and the negative (black) into the RPM – jack.
- Clamp the inductive pick up to a spark plug wire with the arrow sign pointing the spark plug. Make sure that the pick up jaws are completely closed.
- Observe the digital display for RPM readings.

Note: 4 trigger levels selectable through **LEVEL** push button, for advanced applications in this function. Also refer (5.8) for more details.

4.3.7 DWELL Function

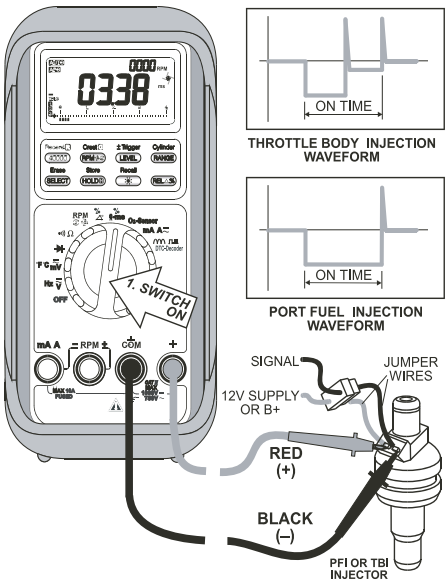


- Set rotary switch to .
- Default at 4 cylinders (4-C). Press cylinder (RANGE) button momentarily to display the cylinder setting on the secondary display, and press momentarily again within one second to select the number of cylinders from 1 through 12 to match the engine under test.
- Insert red (+) test lead into + jack and black (–) test lead into COM input jack.
- Connect the test leads as shown and observe the digital display.
- Press SELECT button momentarily to display DWELL reading in terms of percentage if required.
- Refer (4-2) for convenient dual display RPM function.
- Adjust the dwell angle according to the procedures outlined in your vehicle service manual.

Note: 1- Re-check the timing whenever the dwell angle has been adjusted.

2- 4 trigger levels selectable through LEVEL push button for advanced applications in this function. Also refer (5-8) for more details.

4.3.8 FUEL INJECTION DETECTOR Function



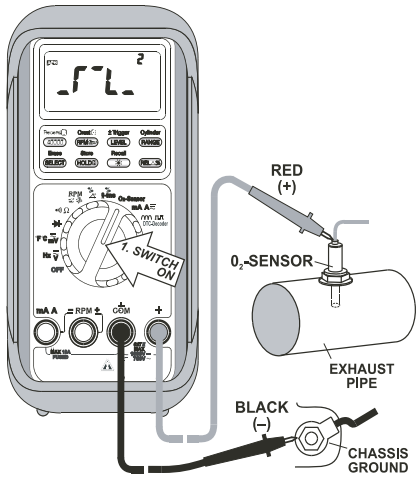
- Set rotary switch to -ms.
- Insert red (+) test lead into + jack and black (–) test lead into COM input jack.
- Connect the test leads as shown and observe the digital display.
- Press SELECT button momentarily to display ms reading in terms of percentage (%) if required.
- Refer (4-2) for convenient dual display RPM function.

Note: 1. This -ms function applies to both Port Fuel Injectors (PFI) which operate with a single on time pulse and Throttle Body Injectors (TBI) which operate with twin pulses.

2. 4 trigger levels selectable through LEVEL push button for advanced applications in this function. Also refer (5.8) for more details.

3. The fuel injection frequency can be displayed on the secondary display by pressing the RPM 4 2 button.

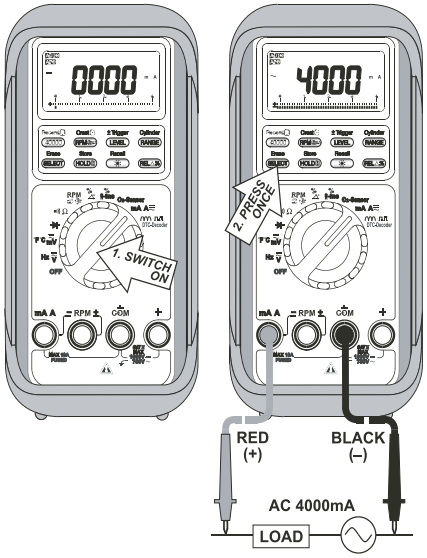
4.3.9 O_2-SENSOR TESTER Function



- Set rotary switch to O_2 -Sensor position.
- Insert red (+) test lead into + jack and black (–) test lead into COM input jack.
- Connect test leads to the O_2 sensor dynamic output and observe the digital display.
- The main digital display shows a symbolic waveform of the O_2 sensor dynamic output.
- The secondary digital display shows the cross count per second parameter, and a beep sound will alert the user on each cross count edge being detected. Nominal cross count number is 1 to 3 for a good O_2 sensor. The higher the cross count number, the more active the O_2 sensor is.

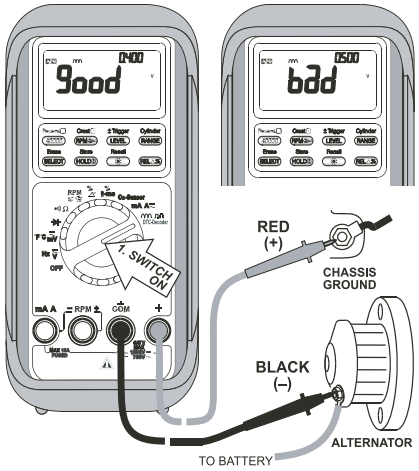
4.3.9 mA and A Functions

⚠ **CAUTION**: Do not measure any circuit that draws more than the current rating of the protection fuse. If the fuse blows, replace it with the proper fuse. Failure to do this may result in injury or damage to the meter. Do not attempt a current measurement where the open circuit voltage is above 600V. Suspected open circuit voltage must be checked with voltage functions. Voltage output current clamp adaptors are recommended to use with the meter voltage functions for making high current measurements.



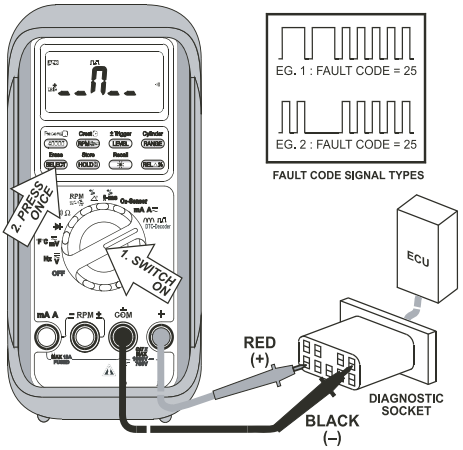
- Set rotary switch to **mA A** ⎓.
- Insert red (+) test lead into **mA A** ⎓ jack and black (–) test lead into COM input jack..
- Defaults at DC. Press SELECT button momentarily to select AC.
- Connect the test leads as shown and observe the digital display.

4.3.10 ALTERNATOR TESTER Function



- Set rotary switch to
- Insert red (+) test lead into + jack and black (–) test lead into COM input jack.
- Start the engine and operate it at about 2000 rpm.
- Connect the test leads as shown and observe the digital display.
- A reading of 0.45V (typical) or less indicates that the alternator and the associated rectifier diodes are in good condition, and 'good' will be displayed on the LCD. A display 'bad' together with continuous beep sound indicate any of the following faults may exist:
  - Defective rectifier diode(s).
  - Defective Alternator coils.
  - Opened coil or rectifier connections.
  - Neutral of 3-phase Y-connection alternator accidentally grounded to chassis.

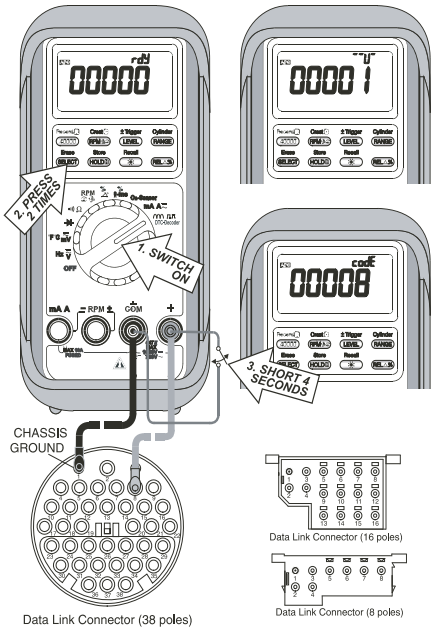
4.3.11 FAULT CODE DETECTOR Function



- Set rotary switch to DTC-Decoder.
- Default at . Press SELECT button momentarily to select
- Insert red (+) test lead into + jack and black (–) test lead into COM input jack.

- Connect the test leads to the fault code signal pins of the diagnostic socket and then trigger the fault code output.
- Typical fault code output triggering procedure is to short (close circuit) the two trigger pins of the diagnostic socket and then turn the ignition key to the ON position. DO NOT start the engine.
- Location of the diagnostic socket, signal pins assignment, signal type, and procedures of triggering & clearing the fault code may be varied with car models. Consult your vehicle service manual for manufacturer's specifications. The display indicates a symbolic pulse and the beeper turns on when the blink code pulse is detected.
- Time interval between pulse signals and duration of pulse signal represent the blink type fault code numbers.
- As an example, some car manufacturers use long pulse for the first code digit, and short pulse for the second code digit. In this case, 2 long 'Beeps' followed by 5 short 'Beeps' represented fault code number 25. As another example, some car manufacturers use same time interval between pulse signals on the same code digit, and with longer time interval to separate the code digits. In this case 2 short 'Beeps' followed by a quiet interval and then followed by 5 short 'Beeps' represented fault code number 25.
- Please note that in some car models, fault code signal output is preceded by leading pulse signals.
- As a typical procedure for clearing the fault code stored in the memory. Turn the ignition key to the OFF position. Disconnect the negative (−) battery terminal from the car electrical system for about 1 minute, and the fault code will be cleared from memory. Some car models require specific procedure to clear the fault code stored, consult your vehicle service manual for details.

4.3.12 DTC-DECODER Function



1- Set rotary switch to DTC-Decoder

2- Default at . Press SELECT button two times to select DTC-Decoder

3- Insert Red (+) test lead into + jack and black (−) test lead into COM input jack

4- *Connect the test leads to the signal pins of the data link connector. This function is a replacement of the impulse counter scan tool with wire connections COM for black (bk), and + for yellow (yw) as specified in the Mercedes-Benz Diagnostic Trouble Code Reference Guide. Since the meter is powered by internal battery, connection of the impulse counter red (rd) wire (to B+) for external power is not required

5- *Set Engine at idle

6- Trigger the DTC readout by Shorting (close circuit) the 2 signal pins of the data link connector for about 4 seconds until the secondary LCD shows "rdy ". Then the meter is ready to scan the DTC readout automatically.

7- During scanning the meter secondary display indicates a pulse symbol "-U-", and the beeper turns on when a DTC pulse is detected.

If the DTC scanning is not successful, the meter secondary display will indicate "----" to alert the user. Re-check the wire connections, and start the trigger process again.

If the DTC scanning is successful, the meter secondary display will indicate code "codE" with 4 beep sounds, and the main display indicates the correct DTC readout.

8- Read and note DTC readout displayed on the LCD Display "1" = no fault stored, Greater than "1" = fault in system.

9- Repeat procedure in step 6. If there are no further faults in the system, the previously displayed DTC will be displayed.

10- Repeat procedure in step 9 until the first **DTC** displayed is repeated.

11- Eliminate (repair) all noted faults (**DTC** readout) of the car according to troubleshooting chart and diagnostic tests.

12- After eliminating a fault, the respective **DTC** may be cleared by repeating procedure on step 6 to get the **DTC** readout, and then short the 2 signal pins for another 6 to 10 seconds, then the **DTC** displayed is cleared. Please note that each **DTC** displayed must be cleared individually.

*Note: Consult your Mercedes Benz Diagnostic Trouble Code Reference Guide for signal pins assignments and engine precondition procedures before triggering the **DTC** readout. They might be different from car model to model, and function to function.

5. ADVANCED OPERATION

See table below for feature availability on each function.

Function	Data Hold	Range Lock	40,000 Count	Relative	Record	Crest (Peak)	+/- Trigger	Trigger Level	No. of Cylinders	Dual Display	Store Recall
DC Voltage	•	•	•	•	•	•				•	•
AC Voltage	•	•	•	•	•	•				•	•
Temperature			•	•	•					•	•
DC Current	•	•	•	•	•	•					•
AC Current	•	•	•	•	•	•					•
Resistance	•	•	•	•	•						•
RPM	•			•	•			•			•
Frequency	•			•	•			•		•	•
Duty Cycle	•			•	•		•	•		•	•
ms	•			•	•		•	•		•	•
Dwell	•			•	•			•	•	•	•
O2 Sensor	•									•	•
Continuity	•		•	•	•						•
Diode	•		•	•	•						•
Alternator Test	•									•	•
Fault Code	•						•				•
DTC Decoder	•									•	•

5.1 40,000 COUNTS HIGH RESOLUTION Mode

Press the Record 40000 button momentarily to enter the 4-3/4 digit high resolution slow mode with a maximum display at 40,000 counts. Press the button momentarily again to return to 3-3/4 digit fast mode. In 3-3/4 digit fast mode, the digital display updates 5 times per second nominal to give you the maximum measuring speed. In 4-3/4 digit slow mode, the digit display updates 1.25 times per second nominal to give you smooth readings as well as the full accuracy of the meter.

5.1 SECONDARY FUNCTION Selection

Press the Erase (SELECT) button momentarily to select the secondary functions of a selected rotary switch position.

5.1 BACK LIGHT

Press and hold the Recall (☀) button momentarily to toggle the backlight on and off. The backlight will also be off 55 seconds after each activation automatically to extend battery life.

5.4 RPM Selection

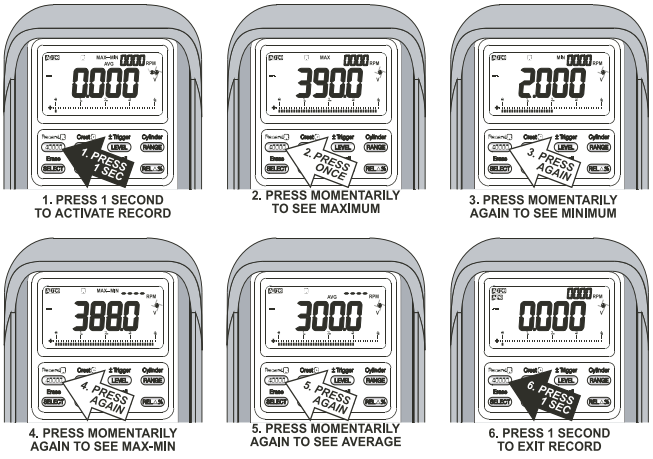
In the RPM function, the meter defaults to ↻ for conventional 4-stroke engine. Press Crest (RPM) button momentarily to toggle to ↻ for DIS or 2-stroke engine.

5.5 RECORD R Mode

Perform measurements as described in **BASIC OPERATION**.

Press and hold the Record R (40000) button for 1 second or more to activate **Record** mode, the R MAX MIN AVG LCD annunciators turn on. The meter beeps when new maximum or minimum reading is detected. Press the button momentarily to read throughout the Maximum (MAX), Minimum (MIN), Maximum minus Minimum (MAX-MIN), and Average (AVG) readings. Press the button for 1 second or more to exit **Record** mode.

With the Auto-Ranging Record mode, you can easily track intermittent signals, capture turn-on/ turn-off surges, and monitor line voltage changes over a much wider dynamic range with the best resolution. It largely surpasses single range recording which is easily over-flowed, or with insufficient resolution. The meter features a fast single range sampling speed of 50ms for MAX, MIN, MAX-MIN and AVG readings. The faster the sampling speed, the more accurate the measurement of surges, spikes and sags will be. The true average AVG feature calculates all readings taken over time continually.



Notes: 1- Auto Power Off feature will be disabled automatically in this mode

2- To retain the readings after measurements, use **HOLD** H function to stop updating the measurements before disconnecting the test leads. Use similar pushbutton procedures described above to read throughout the locked readings

5.6 CREST C (Instantaneous Peak Value) Mode

Perform measurements as described in **BASIC OPERATION**.

Press and hold the Crest (RPM) button for 1 second or more to activate **Crest** mode with LCD annunciators MAX turn on. Press the button momentarily to read throughout the Maximum (MAX), Minimum (MIN), and Maximum minus Minimum (MAX-MIN) readings. Press the button for 1 second or more to exit Crest mode. With the Crest mode, you can capture transient signal crest voltage (instantaneous peak value) as short as 1ms.

Note: 1- Auto Power Off feature will be disable automatically in this mode.

2- To retain the readings after measurements, use **HOLD** H function to stop updating the measurements before disconnecting the test leads. Use similar pushbutton procedures described above to read throughout the locked readings.

5.7 HOLD Function

Press the Store (HOLD H) button momentarily to activate the hold function with LCD annunciator turns on. Press momentarily again to release. When in normal measuring modes, the hold feature freezes the display for later view. When in **RECORD** or **CREST** mode, however, the hold function stops updating the measurements, and you can read throughout the locked **MAX, MIN, MAX-MIN**, and **AVG** readings. Release the hold function to continue **RECORD** or **CREST.**

5.8 TRIGGER LEVEL Selection

The meter is set at carefully selected trigger levels, and as power up default on individual functions for most applications. However, car signal levels under test may vary due to aging of components, abnormal conditions, and different design from different car manufacturers.

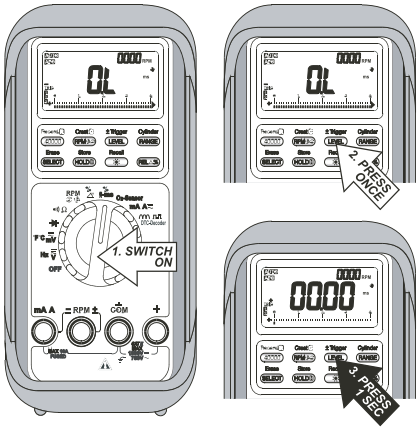
Therefore, a Trigger level selection function is designed to provide more flexibility to cope with your applications. The 4 trigger levels provided are carefully selected and tested to include all of the extreme conditions, and you virtually do not need more. More trigger levels may decrease the ease of use and increase the measuring uncertainty as you may encounter in some old technology.

If your measuring reading is unstable, select lower sensitivities (higher trigger level number) by pressing the **LEVEL** button momentarily. If your measuring reading shows zero, select higher sensitivities (lower trigger level number).

5.9 TRIGGER + − Selection

Trigger + or − is to identify whether the on or off portion of the signal under test is of measuring interest. For example, as in duty cycle function, if you get a reading of 10% in the trigger + (on portion), you then will get a reading of 90% in trigger − (off portion).

To toggle between trigger + and − , Press and Hold the (LEVEL ± Trigger) button for 1 second.



5.10 MANUAL or AUTO RANGING

- Press the (Cylinder RANGE) button momentarily to select manual ranging, and the meter will remain in the range it was in with LCD annunciator AUTO turns off. Press the button momentarily again to step through the ranges. Press and hold the button for 1 second or more to resume auto-ranging. In ∠° Dwell function.
- Press the (Cylinder RANGE) button momentarily to display the cylinder setting on the secondary display, and press momentarily again within one second to select the number of cylinders from 1 through 12 to match the engine under test.

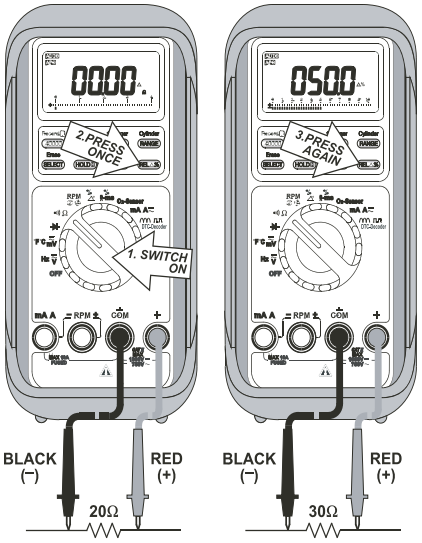
5.11 DATA STORE, RECALL & ERASE

This feature stores the whole display data in memory for later recall. The memory will remain even in auto-power-off mode, and can also be recalled while you are in another meter function. The memory will be erased if the rotary switch is switched to the OFF position.

- Press the (Store HOLD) button for 1 second to store the displaying information. The LCD will show "Sto" and the memory data number to confirm storage. You can store up to 18 datas by repeating this procedure.
- Press the (Recall ☼) button for 1 second to recall the last stored data. The LCD will show "rEC" and the last memory data number before displaying the recalled data. The annunciator H will then turn on to identify that the recalled data is being displayed. Then press the (Recall ☼) button momentarily to retrieve other stored datas.
- Press any other buttons momentarily EXCEPT (Recall ☼) to resume measurement. Press and Hold the (Erase SELECT) button for 1 second to Erase all the stored data.

5.12 RELATIVE Δ.% Modes

- Press the (REL Δ%) button momentarily to enter the Relative Zero (Δ) mode with LCD annunciator turns on. Relative zero allows the user to offset the meter measurements with a relative reference value. Practically all display readings can be set as relative reference value including MAX, MIN, MAX-MIN, and AVG readings of RECORD functions.



- Press the (REL Δ%) button momentarily again to enter the Relative Percentage Change (%) mode with LCD annunciators % turn on. In this mode, the readings show relative percentage changes with respect to the relative reference value. It simplifies zero, peaking, nulling measurements, and is excellent for fine adjustments and comparison.
- Press and hold the (REL Δ%) button for 1 second or more to exit relative modes and resume normal measurements.

5.13 AUTO POWER OFF (APO)

The Auto Power Off (APO) mode turns the meter OFF automatically to extend battery life after 5 minutes of inactivities. The meter turns back ON if the rotary switch is turned. Activities are specified as:

1- Rotary switch or push button operations.

2- Significant measuring data readings.

When entering the Record or Crest mode, the Auto Power Off will be disabled automatically, and the LCD annunciator APO will be off. The Auto Power Off feature can be disabled manually as a power-on option by pressing the (Crest RPM) button while turning the meter on. The LCD annunciator will be off during operation. For maintenance testing purposes, the Auto Power Off timing can be shortened to 5 seconds by pressing the (Cylinder RANGE) button while turning the meter on

Note: 1. Stored data remains after Auto Power Off, BUT will be erased if the rotary switch is switched to the OFF position

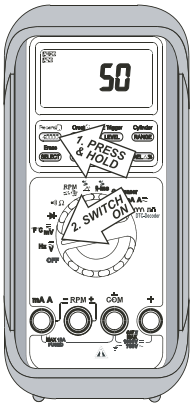
2. Always turn the rotary switch to the OFF position when the meter is not in use. The meter will produce a beep sound to alert the user while turning off automatically

5.14 LINE FILTER FREQUENCY 50 Hz or 60 Hz selection

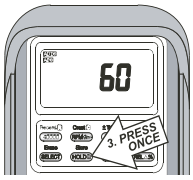
The line filter frequency can be selected as a power-on option.

- Press the (Record 40000) button while turning the meter on to display the set frequency.
- Press the (Erase SELECT) button for 50 Hz or press the (Store HOLD) button for 60 Hz selections.
- Then press the (Cylinder RANGE) button to store the selected frequency.

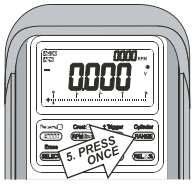
Selecting the appropriate line filter frequency to cope with your line frequency can maximize the meter's noise rejection ability. This feature is normally only available in expensive bench top multimeter.



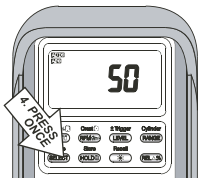
1. PRESS THE BUTTON WHILE
2. TURNING ON THE METER



3. PRESS MOMENTARILY
TO SELECT 60Hz



5. PRESS MOMENTARILY
TO ENTER (SET)

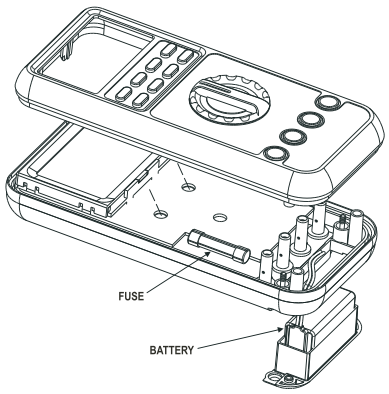


4. PRESS MOMENTARILY
TO SELECT 50Hz

6. MAINTENANCE

⚠ **WARNING**: To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input jacks and turn OFF the meter before opening the case. Do not operate with open case. Install only the same type of fuse or equivalent.

6.1 Battery and Fuse Replacement



6.1.1 Battery Replacement

Battery: Single 9V battery NEDA1604, JIS006P or IEC6F22; or 9V alkaline battery NEDA1604A, JIS6AM6 or IEC6LF22.

Loosen the 2 screws from the battery access door of the case bottom. Lift the battery access door and thus the battery compartment up. Replace the battery. Re-fasten the screws

6.1.2 Fuse Replacement

Fuse: 15A/600V, IR 100kA, F fuse for mA/A current input.

Loosen the 4 screws from the case bottom. Lift the end of the case bottom nearest the input jacks until it unsnaps from the case top. Replace the blown fuse. Replace the case bottom, and ensure that all the gaskets are properly seated and the two snaps on the case top (near the LCD side) are engaged. Re-fasten the screws.

7. Cleaning and Storage

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for periods of longer than 60 days, remove the battery and store it separately.

8. Troubleshooting

If the instrument fails to operate, check battery, fuses, leads, etc., and replace as necessary. Double check operating procedure as described in this user's manual. If the instrument voltage-resistance input terminal has been subjected to high voltage transient (caused by lightning or switching surge to the system) by accident or abnormal conditions of operation, the series fusible resistors will be blown off (become high impedance) to protect the user and the instrument. Most measuring functions through this terminal will then be open circuit. The series fusible resistors and the spark gaps should then be replaced by qualified technician. Refer to the LIMITED WARRANTY section for obtaining warranty or repairing service.

9. LIMITED WARRANTY

With the exception of the batteries and the fuse, this instrument is warranted against defects of material or workmanship which develop within a period of one (1) year after the date of purchase by the original owner. Proof of date of purchase will be required when applying for repair or replacement under this guarantee. For this reason, we strongly suggest that you keep your sales receipt safely in your intrument storage case.

In the event a flaw develops in any of the units, please return it to your dealer who will arrange repair or replacement. The manufacturer will either repair or replace the tool (at the manufacturer's option) free of charge providing the instrument is still under warranty. If the warranty has expired, there will be a repair charge payable to your dealer when you pick up the unit. When a unit has been repaired or replaced under warranty, the replacement unit will extend the warranty period of the original unit for six (6) months after the date of replacement or until the original warranty expires, whichever is the longest period. This warranty shall not apply to any problem, failure or damage caused by improper use or inadequate maintenance or care.

The manufacturer shall not be obligated to provide service under this warranty or to repair damage resulting from attempts by unauthorized persons to repair or service the units, other than to replace the batteries, or to repair damage resulting from improper use. Specifically if there is evidence of an attempt to open the units the warranty is void.

Any implied warranties arising out of the sale of the units including but not limited to implied warranties of merchantability and fitness for a particular purpose are limited in duration to the above mentioned one (1) year period, and the manufacturer shall not be liable for loss of use of the instrument or other incidental damages, expenses or economic loss. Some jurisdictions do not allow limitations on how long implied warranties last or the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

General Technologies Corp.

#121 - 7350 72nd Street
Delta, BC V4G 1H9
Canada

Tel.: (604) 952-6699
Fax: (604) 952-6690
www.gtc.ca