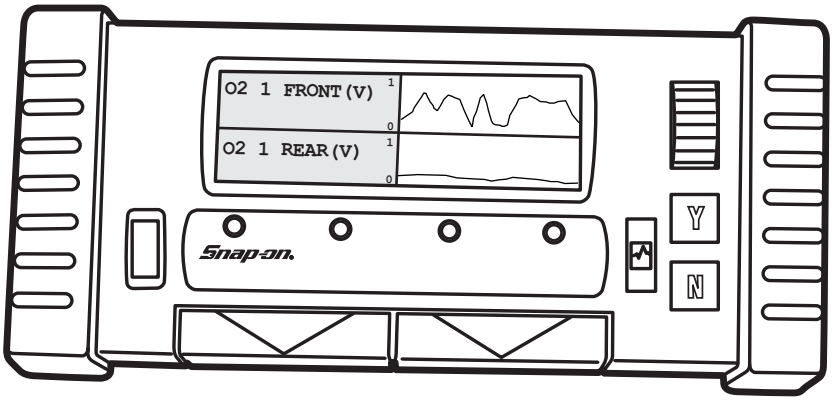
MTG2500 Color Graphing Scanner Companion Guide



Second Edition

Snap-on

MTG2500
Color Graphing Scanner
Companion
Guide

Second Edition
September, 2001

Snap-on®

The information, specifications, and illustrations in this Manual are based on the latest information available at the time of publication. The Scanner manufacturer and the vehicle manufacturers reserve the right to make equipment changes at any time without notice.

Visit our Scanner web site at:

www.snapon.com/graphingscanner

Safety Warnings and Cautions

1. Perform all testing in a well-ventilated area. Route vehicle exhaust outside if the test area does not have adequate ventilation.
2. Do not smoke or allow sparks or open flame near fuel system components.
3. Do not smoke or allow open flame near a battery.
4. Unless specifically directed otherwise by a manufacturer's procedure, be sure the ignition switch is off before connecting or disconnecting the Scanner connectors or any vehicle electrical terminals.
5. When connecting the Scanner, plug the power cable into the cigarette lighter or connect the battery power cable. Then plug the test adapter into the vehicle connector.
6. Be sure that the Scanner power cable is disconnected before removing or installing a cartridge.
7. When using the Scanner in an engine compartment, keep all cables, test leads, and tools away from drive belts and other moving parts. Do not allow cables and test leads to touch exhaust manifolds or other hot parts.
8. Do not wear watches, rings, or loose-fitting clothing when working in an engine compartment.
9. Do not dispose of the battery in fire. A nickel metal hydrite battery is used in this product and may be considered hazardous waste. Dispose of the old battery pac following all applicable regulations.
10. Battery electrolyte is corrosive. Do not allow electrolyte to contact your skin. Wash your hands immediately if you touch corroded battery terminals.
11. Do not create an electrical connection between battery terminals with a jumper wire or tools. Do not ground a hot (+) electrical terminal.
12. Before performing any test with the engine running, place the gear selector in neutral (manual transmission) or park (automatic transmission), set the parking brake, and block the drive wheels. Disconnect the parking brake release mechanism if the vehicle has an automatic parking brake release.

For technical assistance, call:
1–800–424–7226

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Introduction

The MTG2500 Color Graphing Scanner is the next generation in the family of 2500 Scanners. Like the Snap-on MT2500 Scanner, the new MTG2500 Scanner provides you with extensive vehicle specific engine, transmission, antilock brake system (ABS) and airbag trouble codes, selected functional tests, and troubleshooting information. Additionally, the Color Graphing Scanner gives you the ability to select and graph live data parameters on screen.

The advantage of having a graphic display of parameter data is that it allows you to quickly spot glitches, dropouts, spikes, and other signal inconsistencies. This comes in handy when conducting a wiggle test or trying to induce symptoms because it eliminates the need to constantly monitor the screen while watching for parameter values to change. Now you can work with both hands with only an occasional glance at the screen to see if the graph pattern has changed.

Another advantage of having a graphic display is that it allows you to quickly compare the activity of two parameter signals to see if they are synchronized or if they both respond correctly to changes in operating condition (example—comparing the crankshaft position (CKP) sensor to the camshaft (CMP) sensor signal).

The MTG2500 Color Graphing Scanner also provides a capture function that allows you to freeze live data on screen for review. This feature is ideal for capturing intermittent failures during a test drive.

The new Scanner operates using any of the current Domestic or Asian Import primary cartridges.

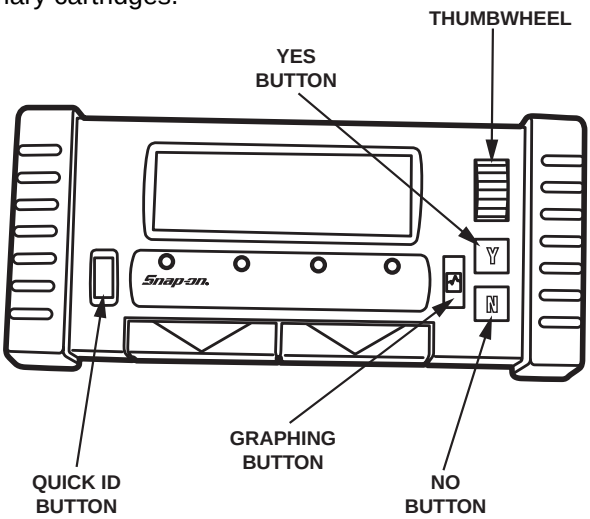


Figure 1. The MTG2500 Color Graphing Scanner.

About this Companion Guide

To facilitate your learning to use the MTG2500 Color Graphing Scanner, and to help answer questions that may arise once you begin using the scan tool, all of the documentation included with the MT2500 Scanner is also included with the new MTG2500 Color Graphing Scanner. Most of the operating instructions and testing procedures are the same for both tools. The primary difference is that the MTG2500 Scanner has an additional button to activate the graphing function, figure 1. This companion guide is designed to supplement the standard MT2500 documentation by providing instruction on those features and functions that are specific to the new scan tool.

Color Graphing Scanner Operational Flow

Until you enter the Graphing mode, the MTG2500 Color Graphing Scanner, its thumbwheel, and its buttons operate as described in the Scanner Reference Manuals included in your package. You must still use normal procedures to identify the vehicle, connect the scanner, and select the required test or information from the displayed menus. Refer to the Operational Overview in the Scanner Reference Manual for details on operating the MTG2500 Scanner.

Once you are in a live data screen you can select the Graphing button to enter Graphing mode and view a graphical representation of the parameters from the vehicle data stream.

Thumbwheel and Buttons

Although the thumbwheel, and buttons function primarily the same on the Color Graphing Scanner and on the MT2500 Scanner, there is additional functionality that is unique to the new scan tool. Those additional functions are explained here. For standard operating features, refer to the appropriate reference manual.

Quick ID Button

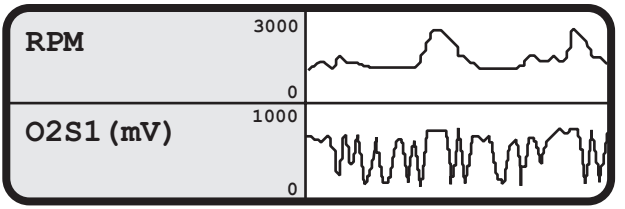
The Quick ID button, which functions the same as on the MT2500 Scanner, allows you to identify the test vehicle on the Scanner before connecting it to the vehicle. The Scanner display shows the adapter you are to use and where the vehicle connection is made once you enter the vehicle identification information.

To use, press and hold the Quick ID Button to power to the Scanner from the internal battery pac. Follow the on-screen instructions to identify the vehicle. Release the button once the identification is made and the Scanner holds the information in memory.

Graphing Button

The **Graphing** button allows you to display live vehicle data on screen in graph format. Push the button once to change from a live data display to a graph format.

In graph format the screen display is split in half with the parameter description on the left side and its corresponding graph on the right side of the screen. The screen displays two parameters at a time in graphing mode. The screen appears similar to this:



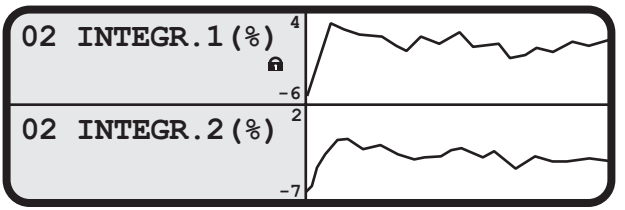
Thumbwheel

The **thumbwheel** on the MTG2500 Scanner allows you to scroll through the operating menus and data displays.

Y(Yes) Button

In addition to its general use, when the Scanner is in Graphing mode, the **Y(Yes)** button is a toggle switch that holds and releases the top graph on the screen. This feature allows you to custom configure the screen to view any two parameters and graphs simultaneously. Note that only the top graph is held, the lower graph always scrolls.

To use this feature, scroll until one of the graphs you want to view is in the top position, then, press **Y** once to lock it in place. Now, only the lower graph changes as you scroll the thumbwheel. When the top graph is held, a lock icon appears alongside the graph and the screen looks similar to this:



N(No) Button

The **N(No)** button allows you to exit to the previous screen. When in Graphing mode, selecting **N** returns you to the Graphing Scanner menu. Selecting **N** from the Graphing Scanner menu screen, returns you to the Vehicle Verification screen.

The Graphing Scanner Menu

The graphing function of the MTG2500 is available from any “live” data screen, such as **Codes and Data** or **Data only**. Press the Graphing button once from a “live” data screen to display the Graphing Scanner menu, which is similar to this:

Graph Parameters

Press **Y** to select **Graph Parameters** and view the graphs of the live data parameters available on the vehicle you are testing. The Scanner displays two parameters at a time with their graphic representation.

Once the MTG2500 Scanner is operating in Graphing mode, scroll the thumbwheel to view other parameters available on the data list.

Exit

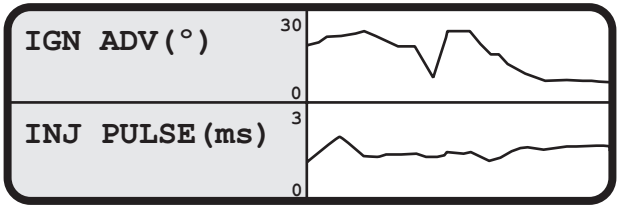
From the Graphing Scanner menu, scroll to **Exit** and press **Y**. The Scanner returns you to the previously displayed screen.

Screen Layout

The parameter description appears on the left side of the screen and the graph appears on the right hand side. Be aware, the graph area of the screen is a variable time base and the time interval of the display is determined by the baud rate, or data transmission speed, of the control module on the test vehicle, not the Scanner.

The Scanner begins drawing the graph from the right side, then moves across the screen to the left. To get a rough idea of how

quickly the control module transmits data, simply time how long it takes for the graph to fill the entire screen area when graphing mode is first activated. The screen appears similar to this:



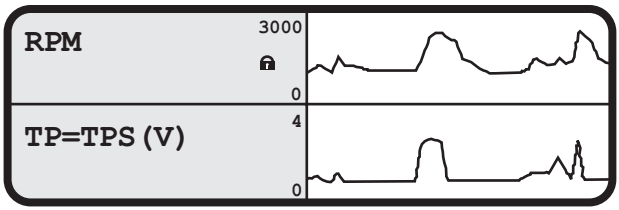
Understanding the Screen Display

To get the most out of your MTG2500 Color Graphing Scanner, it is important to understand what the screen is displaying. The graphs on the screen are digitally compiled based on signals that the electronic control module (ECM) of the vehicle is transmitting on the serial data stream. Although the graph may look similar to a graph that displays on a lab scope or a power graphing multimeter, such as the Snap-on Vantage, there are some significant differences.

Most importantly, the Scanner is graphing the vehicle data stream information, **not** actual sensor and actuator signals. If the electronic control module (ECM) is operating in a default mode, substituting pre-programmed values to control the actuators due to absent or unreliable input signals, these default values transmit on the data stream of some vehicles.

Another consideration is that the graph plots trends of the parameter signals and is not intended to be used for measuring voltage level, frequency, amplitude, or other signal characteristics. Use the Snap-on Vantage, a lab scope, or digital multimeter for taking accurate signal measurements.

When a parameter changes, the graph responds immediately and plots the change. The change appears on the graph as the signal going low, going high, or displaying some other inconsistency. The screen below shows a comparison of engine speed to the throttle position sensor signal. Note how both graphs change simultaneously.



Since the graph represents a period of time the glitch stays on screen for a while, it gradually moves across the screen as the data continues to update. Remember that the amount of time represented on the Scanner screen graph is dependent upon the baud rate of the ECM being tested. Typically, newer ECMs transmit data at a faster rate and the entire screen refreshes in about 20 seconds. The screen updates considerably slower on older ECMs that have a lower baud rate. Regardless of the data transmission rate, the Scanner graph reflects the most recent frames of data.

Entering Graphing Mode

The following steps describe how you move from normal Scanner functions into Graphing mode.

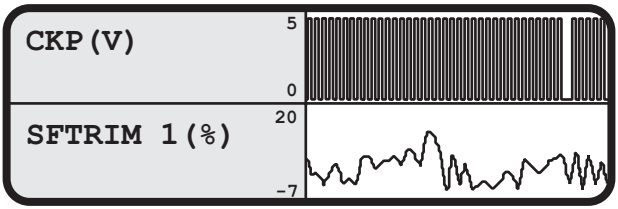
To enter Graphing Mode:

1. From any live data screen (**Data** or **Codes and Data**), press the **Graphing** button on the scanner. The Graphing menu displays and appears similar to this:

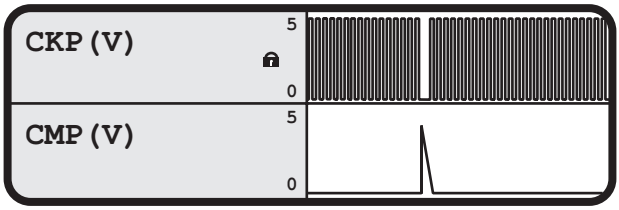
   The cursor should default to **Graph Parameters**. If not, scroll to **Graph Parameters** with the thumbwheel and press the **Y** button.

   The live data parameters for the vehicle you are testing display in text and graph format.

2. Scroll the thumbwheel until the first parameter you want to view displays on the top portion of the screen. The screen appears similar to this:



3. Press the **Y** button to hold the top line of the display. A lock icon appears to show the parameter is locked.
4. Scroll the thumbwheel until the second sensor parameter you want to view displays on the bottom line. The screen appears similar to this:



Now the two graphs build simultaneously. In this example there should be a consistent number of CKP sensor pulses between each CMP sensor pulse.

5. Press **Y** again to unlock the top line of the display. You are again able to scroll both lines to select parameters for viewing.

Capturing the Graph

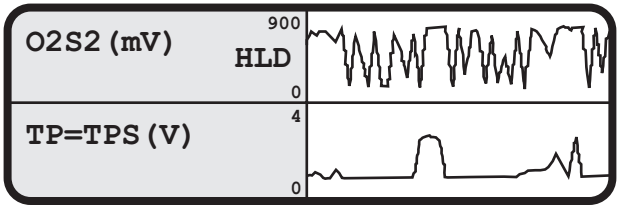
The capture function of your MTG2500 Graphing Scanner allows you to instantly capture and hold the data on the display. This function freezes not only the two parameters displayed on the screen, but also freezes all the parameters transmitted on the data stream. You can scroll through the entire data list to get an accurate picture of everything that was occurring when the capture function was invoked.

To capture a graph:

- While the Scanner is operating in Graphing mode, press the **Graphing** button on the scan tool.

  The displayed data is now captured and held.

Once the Graphing button is pressed, “HLD” appears on the display so you know instantly that you are no longer viewing “live” data. A typical screen is shown below:



Resetting Min/Max Parameter Values

The minimum and maximum values displayed to the left of the graph represent the highest and the lowest values the Scanner has displayed. These values can be recalculated during graphing if necessary.

To recalculate minimum and maximum values:

- While the Scanner is operating in Graphing mode, press and hold the **Graphing** button on the scan tool for two seconds.

  The values are changed to reflect the data that is visible on the screen.

Exiting Graphing Mode

To exit Graphing mode:

- Press the **N** button once.

  The Scanner returns to the Graphing Scanner menu.
- Press the **N** button a second time.

  The Scanner returns to the Vehicle Verification screen.

If you want to continue testing on the same vehicle, press **Y** for the Scanner main menu of the selected vehicle and follow steps described earlier in the "**To enter Graphing mode**" section.

Internal Battery Pac

The Snap-on internal battery pac (Snap-on part number EAA0278B04A) is used **only** to power the Scanner during the Quick ID procedure. During normal operation, the Scanner will receive power through the connection to the vehicle you are testing (refer to the instructions provided on the Scanner screen display for connector location). Depending upon use and care, the long-life battery pac can last up to several years.

Recharging Procedures

The internal battery pac that comes with the Scanner is designed for long life and is fully rechargeable. When recharging is necessary a screen message displays to alert you that your “keep-alive battery voltage is low.” Remember to use only the battery adapter wall unit (part number MT2500-600-2) supplied with your Scanner to recharge the battery. Allow eight hours to fully recharge the battery.

To recharge the battery, plug the adapter lead into the right connector on the top of the Scanner and insert the adapter unit into a standard (110 volt) electrical outlet socket, figure 2.

If after prolonged use, your battery consistently fails to hold a charge, the battery must be replaced. Replace the battery pac with the Snap-on battery pac (part number EAA0278B04A). To obtain the required battery, contact your Snap-on Sales Representative.

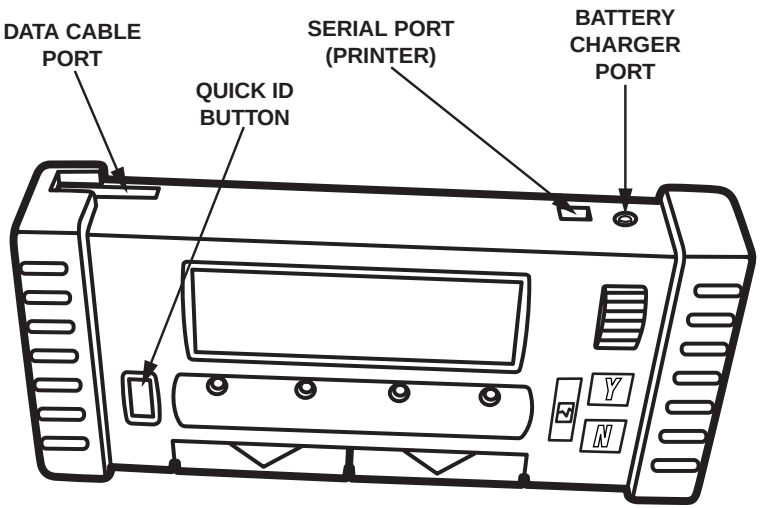


Figure 2. The battery charger plugs into the port on top of the Scanner.

Battery Replacement Procedures

To replace the battery:

1. Grasp the left handgrip and carefully pull it outward and backward off of the Scanner body. Do not remove the metal bail from the handgrip.
2. Slip the battery pac out of the Scanner body and separate the wire connector, figure 3.
3. Connect the new battery pac to the Scanner making sure the connector is fully seated, then slip the assembly back into the Scanner body.
4. Fit the hand grip onto the end of the Scanner.

Warning: Do not dispose of the battery in fire. A nickel metal hydrite battery is used in this product and may be considered hazardous waste.

Dispose of the old battery pac following all applicable regulations.

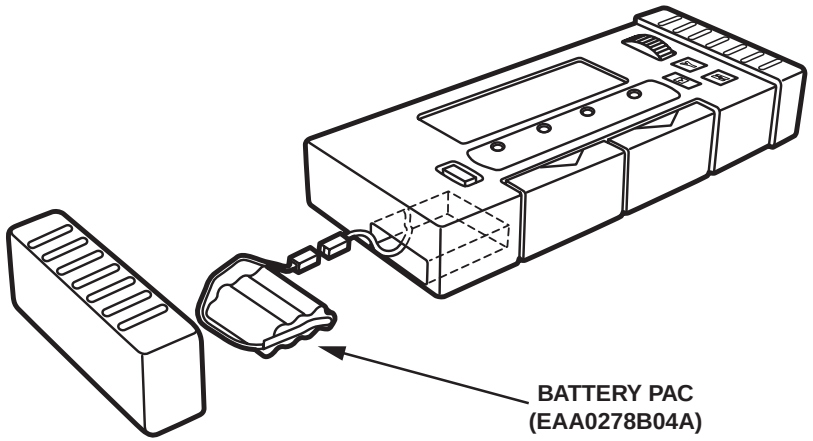


Figure 3. Replacing the MTG2500 internal battery pac.