TS301

User Manual

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TS301 User Manual

This manual is written for the Design Technology Inc. Tiny Scan TS301. This manual will continue to be updated as product is developed. Please keep the software on your TS301 updated to ensure that all information is accurate.

Current models matching this manual include:

- **TS301 v1.0**

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Introduction

What is the TS301?

The TS301 is an engine diagnostic tool that uses the engine's diagnostics port and a built in micro-webserver that allows users to see and monitor Device Trouble Codes and live information from the engine's sensor arrays on a phone, tablet, or computer. Information such as current RPM, battery voltage, engine temperature, vehicle speed and much more can be displayed and are included in the 86 different parameters monitored. The TS301 also allows users to "Capture" and save this data to be played back locally or uploaded to cloud storage for remote viewing, aiding technicians in troubleshooting and engine analysis. These values can be displayed in a variety of ways such as a basic parameter table, gauges or graphs. Software updates are available for your TS301 on and offline.

Safety Information

For the safety of all personnel, the TS301 unit and the vehicle, please read the entire Safety Information, Getting Started and Operations chapters of this manual before attempting to install or use the TS301 hardware or software

- Always perform automotive testing in a safe environment
- Wear safety eye protection that meets ANSI standards
- Keep clothing, hair, hands, tools, test equipment, etc., away from all moving or hot engine parts
- Operate the vehicle in a well-ventilated work area; Exhaust gases are poisonous
- Put blocks on drive wheels and never leave vehicle unattended while running tests
- Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running
- Put transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking brake is engaged
- Keep a fire extinguisher suitable for gasoline/chemical/electrical fires nearby
- Don’t connect or disconnect any test equipment with ignition on or engine running
- Keep the Scan Tool dry, clean and free from oil, water and grease
- Use a mild detergent on a clean cloth to clean the outside of the Scan Tool, when necessary

Getting Started

Hardware Installation

This section will cover the basics of the initial physical installation of the TS301. Please note that the physical installation of the TS301 will vary widely per engine/vehicle and that these instructions are merely a guide of basic points to follow when installing.

Warning – Please ensure that the TS301, connectors, and cables are securely and safely positioned so that they will not be exposed to moving or heated parts of the vehicle while in operation.

1. Locate the MTD diagnostic connector on the engine.
2. Securely mount the TS301 in a safe location within easy reach of the MTD connector with enough cable slack to prevent pulling.
3. Plug the TS301 into the MTD connector. The connector will snap in place when the plug is fully seated.
4. Secure the cable as necessary.

Connecting a Smart Device to the TS301

Once the TS301 has been installed, a Smart Device is needed such as a phone, tablet or laptop with Android, Apple, or Windows operating systems and Wi-Fi capability. **(NOT A CHROMEBOOK)**

1. Do not start but turn power to the vehicle ON (the vehicle does not have to be running for the TS301 to turn on). The LED on the TS301 will flash green one time on startup and will take about 30 seconds to finish booting.

   Warning - The TS301 does not have an internal power source and will turn off if the vehicle's power is turned OFF.

2. Once the TS301 has booted up, it will offer a new Wi-Fi access point (AP)

   The TS301's AP will appear as a network named “TS301-” followed by the MAC address found on the casing of the TS301 by default. If the TS301 has already been assigned a nickname in its Settings, the TS301's Wi-Fi network will instead match its nickname.

3. Using your Smart Device (not a Chromebook) connect to the TS301's Wi-Fi.

4. Open a browser (we recommend Google Chrome), type the IP address “192.168.4.1” into the browser's address bar, and press Enter. This is the default address and can not be changed. The browser should load into the TS301's Home Menu page.

Connecting the TS301 to Local Wi-Fi

Connecting the TS301 to a Wi-Fi network is necessary to update the TS301's software, upload/backup performance captures and allow access to the TS301 from any device with a web browser that is connected to the **SAME LOCAL NETWORK**.

1. Connect a Smart Device to your TS-301 by following the steps above in **“Connecting a smart device to the TS-301”**.
2. From the TS301's Home Menu page, select **“Wi-Fi Connection”**.
3. Enter the SSID and Password for your available Wi-Fi network and select the **“Connect”** button. A new display box will appear beneath the **“Save”** and **“Connect”** buttons which provides details on the connection process, including notes on a successful connection or problems that were encountered.
4. Select the **“Save”** button if you wish to keep the SSID and Password saved for future use.
5. Select the **“Autoconnect”** if you want the TS301 to automatically connect to that Wi-Fi network in the future.

   We recommend both saving and selecting the **Autoconnect** box for easy access to the TS301 via the local network after the initial network connection setup.
6. Once the TS301 is connected, the Connections page will display the TS301's new local IP address (labeled as Wi-Fi IP). The TS301 will still be accessible at the "192.168.4.1" IP address, but any device with a web browser that is connected to the same local network can now access the TS301 by entering the TS301's new IP address into a browser's address bar.

Updating Software

See **“Wi-Fi Connection”** in the **“Operations”** section below.

Warning - Do not turn off the vehicle or your Smart Device during the update process or the TS301 may become corrupt.

Operations

Home Menu

The Home Menu (Index) page contains Buttons (links) to the other pages that are used in the set up and operation of the TS301.

Buttons included are: Device Trouble Codes, Parameters, Gauges, Graphs, Capture Data, System Settings, Wi-Fi Connection and About. Each are covered in detail below.

Device Trouble Codes

The Device Trouble Codes (DTC) page displays a list of any error codes that are currently in the ECU's record. The data presented will include the DTC itself and the code definition.

Included on this page are Buttons for:

Home Menu – returns to the Home Menu. This button is on every page except the Home Menu page.

Rescan for current codes – rescans the ECU for codes.

Clear current DTC codes – will clear all current codes active or stored. Any active codes will reappear.

Parameters

The Parameters page contains a list of all the parameters that the ECU monitors. This list will present the name and the current value of that parameter. Selecting a parameter will cause a menu of buttons to appear under the selected parameter. These buttons offer the user options to move the selected parameter all the way to the top or the bottom of the list, up or down one level on the list or the user can select or unselect this parameter to be displayed. All parameters are monitored. The user can customize the order the parameters are in and whether or not to display them.

Included on this page are buttons for:

Live/Hold – When selected will pause or continuously stream data from the ECU.

Rescan – Normally used when the stream is paused, will cause the TS301 to rescan the ECU for a new set of readings.

Show Selected/Show All – Will show user-selected parameters or the complete list of available parameters.

Save Display View – Saves the display order if it was changed.

Gauges

The Gauges page presents key parameter values as gauges for ease of reading. The currently presented parameters include RPM, Voltage, Engine Temperature, Intake Temperature, O2 Sensor and Throttle Position.

Graphs

The Graphs main page displays any previous captures. Selecting a previously saved capture file presents the user with options to Display the file for graphing (see **Live graphs** for buttons and options), rename it, delete it, upload it to the cloud or exit without doing anything. All parameters are logged and saved, giving the user the ability to choose what to graph.

Included on this page are buttons for:

Live graphs – Brings up the graphs. Displayed on this page are the graphs, a timeline and a button menu.

Selecting the Timeline Index presents options to change the time scale from 15 seconds to 5 minutes.

Selecting a graph heading brings up a new menu:

Select Left and **Select Right Parameter -** drop down menu, allows the user to change the parameter that the current graph is displaying. Each graph can display two parameters as chosen by the user allowing for easier comparison of specific parameters.

Add New Graph – Allows the user to add another graph. Selecting this will bring up another graph. Select the heading of the new graph to choose parameters to be displayed.

Delete this Graph – Permanently deletes the selected graph.

Cancel – Exits without doing anything.

Buttons on the live graphs page are:

Graphs Menu – Go back to the main Graphs menu

Play/Pause – Will display live data streaming from the ECU or pause it the display.

Forward – Will move to the next reading. Will not work on live data streaming.

Back – Will move to the previous reading. Will not work on live data streaming.

Save Graph View – Will save the graphs as currently set up. Once saved will display **Graph View Saved**.

Rescan for Captures – Rescans for new captures

Capture Data

The Capture Data (or Captures) page displays previous captures and allows the user to capture and save live streaming data from the ECU. A capture is a snapshot of all parameters and is taken at approximately one second intervals. These snapshots are given an Event ID starting from zero and are time stamped. The snapshots are saved in a single.txt file. By default, the captured file is named as the starting timestamp. Selecting a previously saved Capture file presents the user with options to open the file for viewing, rename or delete the file, upload the file to **Tinyscan.net**, save a .csv file on your current Smart Device or exit without doing anything. Once the file is uploaded to **Tinyscan.net** anyone with internet access and permission can view and manage files uploaded from any TS301.

Once a saved file is opened a new button menu is displayed:

Capture Menu – Returns to the **Capture Data** main page.

Play/Pause – Starts or stops the captured file.

Forward – Goes forward one event timestamp.

Back – Goes back one event timestamp.

Show Selected/Show All – Will show user-selected parameters or the complete list of available parameters.

Save Display View – Saves the display order if it was changed.

Two buttons are presented on this page. These are the New Capture and Rescan for Captures buttons.

New Capture - brings up the New Capture menu to start a new capture.

Buttons on this menu are:

Capture Menu – Returns to the main **Capture Data** page.

Start Capture/Stop Capture – will start or stop a capture.

Hold/Live – When selected will pause or continuously stream data from the ECU.

Show Selected/Show All – Will show user-selected parameters or the complete list of available parameters.

Save Display View – Saves the display order if it was changed.

Rescan for Captures – Refreshes the capture screen.

System Settings

The System Settings (or Settings) page provides a variety of customization settings that the user may configure and save as desired. Included are the abilities to change the units nickname or assign a server and port of your choice to upload your files. Our cloud server **Tinyscan.net** is the default location for saving your information. Also included on this page is the TS301s server IP address, the current channel in use by the server and the AP name and IP address if the unit is connected to a local network.

Wi-Fi Connection

The Wi-Fi Connection (or Connections) page shows the current Wi-Fi information. Included is the TS301s server IP address, the current channel in use by the server and the AP name and IP address if connected to a local network. When this page first comes up, the TS301 will scan for networks. Available networks can be selected by using the drop-down menu or information can be entered via text boxes allowing the user to enter and save SSIDs and passwords for one or more APs to give the user easy access to multiple networks. Connecting the TS301 to a local Wi-Fi connection is necessary to allow devices on the local network to interact with the TS301 and, as long as an internet connection is available, with proper credentials the TS301 can download updates from anywhere on the internet and upload captured data files to the cloud server. Manually entered information can be used to connect immediately or saved for future use. After saving a new SSID and Password, the information will be added to the drop-down list and available for selection.

The drop-down list contains a list of available networks (signal strength, name and security information) and any saved networks. The unit will only **auto connect** to an access point that the **"Powerup Autoconnect"** box was checked and only on power up or reset.

Warning – If the TS301 loses connection with the AP, the user will have to manually reconnect. Follow directions above in "**Connecting a Smart Device to the TS301"** and "**Connecting the TS301 to Local Wi-Fi"**. The unit will only scan for an AP and auto connect at start up.

About

The About page presents the user with information about the TS301's hardware and current software. Hardware consists of the MAC address and software information includes the version number and build date.

Buttons on the About page include:

Technical Manual – A link to this document.

Check for Update – For updating the TS301 online. When selected, will check the

cloud server for updates. If an update is available, the user will have the option to **"Update Software"** or **"Cancel Update".**

Choose File – For updating the TS301 offline. When selected will present the user a browsing window to select the location and .a1p file to be uploaded from your Smart Device.

Submit – Selecting this button will install the .a1p file chosen above from your Smart Device.

Warning - Do not turn off the vehicle or Smart Device during the update process the TS301 may become corrupt.

Troubleshooting

My device won't stay connected to the TS301's Wi-Fi.

Some Smart Devices may refuse to stay connected to the TS301 because the TS301 does not provide internet access.

If you have this problem, you may need to temporarily disable the Mobile Data on your Smart Device and have it forget other **available** AP's. That will force your Smart Device to stay connected to the TS301. For ease of use in the future, you may want to save the SSID and Password and enable the Autoconnect setting so that the TS301 will be available on the local network when powered on in range of your AP. Another ease of use solution could be to have a dedicated Smart Device for communicating with the TS301's.