TITAN S8

Titan S8-CAN Portable Data Acquisition Logger

PRODUCT USER GUIDE

To view the full MadgeTech product line, visit our website at **madgetech.com**.

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PRODUCT OVERVIEW

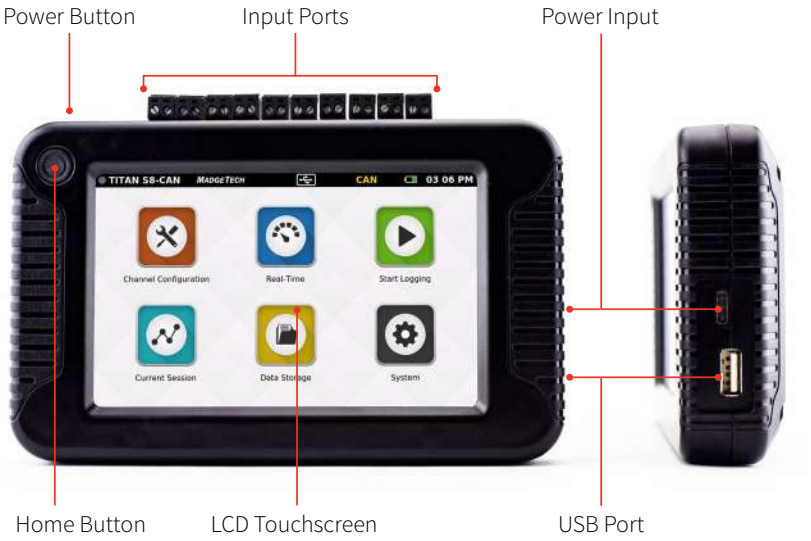
Device Overview

The Titan S8-CAN is compatible with diesel engines that use SAE J1939 CAN communication protocol. The Titan-CAN connects to the vehicle via the J1939 diagnostic port and has the ability to monitor/record up to 23 active SPNs (suspect parameter numbers). In addition to CAN measurements, this versatile logger measures and records temperature, current, voltage and pulse simultaneously and displays data in real-time. The Titan S8-CAN is compatible for use with many thermocouple, RTD or thermistor probes as well as a number of voltage output sensors, current switches, transmitters and transducers.

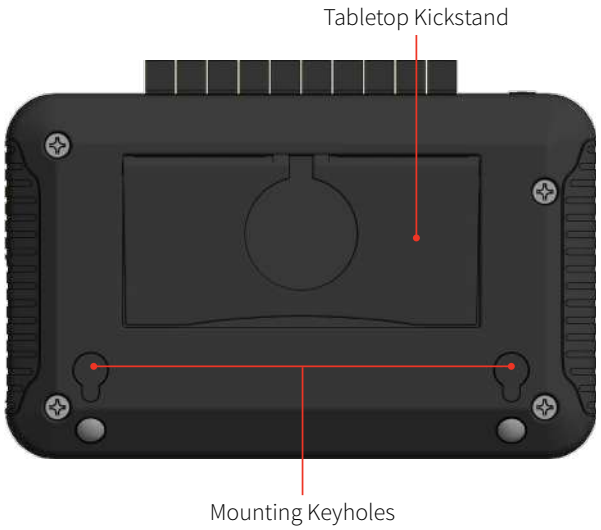
The Titan S8-CAN is helpful for allowing diesel technicians and fleet owners with preventative and predictive maintenance with their fleet of vehicles. It's touchscreen user interface allows for easy set up and configuration.

The Titan S8-CAN is a powerful, independent tool. Unlike other data loggers, the Titan S8-CAN delivers an all-in-one data collection and monitoring solution that does not require a PC or any downloaded software for operation.

External Features



- **Power Button:** To power on and power off the device, hold down the Power button for 3 seconds.
  **If device doesn't power on after 3 seconds and the battery is charged, hold down the power button for 20 seconds to reset the system.*
- **Home Button:** The Home button will return the user to the home screen (details on page 5).
- **Input Ports:** The Titan S8-CAN features 8 sensor channel inputs plus one alarm port and a ground (details on pages 3-4).
- **LCD Touchscreen:** 5 inch LCD capacitive touchscreen.
- **USB Port:** The Titan S8-CAN has a built-in USB port for connecting the CAN converter (details on page 4) and downloading data to a flash drive.
- **Power Input:** Charging port.



PRODUCT OVERVIEW

Device Orientation

The Titan S8-CAN display can rotate 180 degrees depending on the desired orientation of the device. This option is available from the Settings menu under the Display section. ***Please note:*** *Power restart required in order to apply screen rotation.*

Desktop Orientation

For handheld and tabletop use, the inputs will be on the top. Note port number as it relates to device orientation.

Wall Mount Orientation

For wall mount use the unit will be rotated so that the inputs will be on the bottom.

Tabletop Orientation

The Titan S8-CAN features a built in kickstand on the back of the device for use on flat surfaces.

Device Ports

The Titan S8-CAN features 10 ports. Please refer to the images above for the port number as it relates to device orientation.

Channels and Functions

- Ports 1 thru 8 are sensor input channels (Temperature, Current or Voltage)
- Port 9 serves as an alarm output
- Port 10 serves as a ground for the device

Frequency or Pulse Counter

Can only be used on port 1

3-Wire and 4-Wire PT100 RTD Sensors

Use ports 1-2, 3-4, 5-6, or 7-8

2-Wire PT100 RTD Sensors

Can be used on ports 1-8

PRODUCT OVERVIEW

Powering, Charging and Downloading Data

USB Port
For Offloading data files, updating device software, screen captures, and remote keyboard.

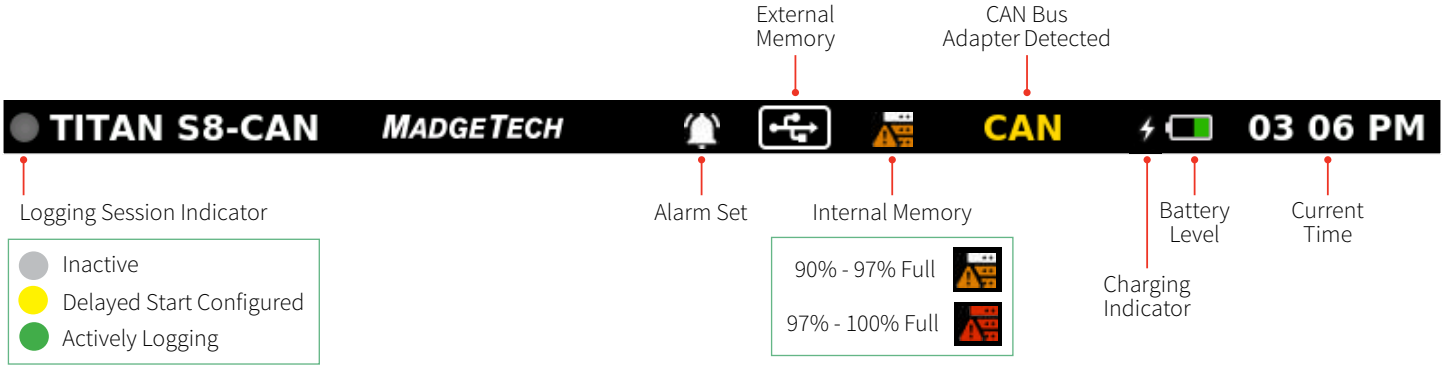
CAN to Vehicle Connection

CAN Connections are made by connecting CAN converter to USB port. Diagnostic cable is then plugged into the 9-pin DIN connector and plugged into the vehicle.

USER INTERFACE

Top Menu Bar

The top bar of the Titan S8-CAN Interface features status icons and useful information to refer to while using the device.



Home Screen

The Home screen will display the following options when the Home button is selected.

- **Channel Configuration:** Configure parameters and options for each channel.
- **Real-Time:** Quickly view Real-Time data for all active channels.
- **Start Logging:** Start logging using current settings. (Stop logging if device is actively logging.)
- **Current Session:** View data from the current logging session as graph, tabular or real-time.
- **Data Storage:** View, Copy, Delete and Add notes to logged sessions.
- **System:** Access device preferences and options.

External Memory

The External Memory icon is also a button for screen capture. Press the icon to save screen images to the attached USB drive. Images are saved in the pictures folder.

CAN Bus Adapter Detected

CAN Bus driver is opened and ready to receive
Will turn from yellow to green once the Update button in the Channel Configuration Screen has been pressed.

CAN Bus adapter has been removed
If the USB CAN Bus adapter is removed while data logging is active then data logging is automatically terminated and a popup alert message is displayed. In this case, the red CAN icon will flash for a couple of seconds before going blank.

Stop Logging
The Start Logging icon will change to "Stop Logging" when device is recording.

USER INTERFACE

First Time Use

Follow these steps when the device is powered on for the first time.

1

POWER BUTTON

Press and hold the Power Button for 3 seconds to power up the device.

2

SCREEN READY

Wait for the device to initiate, you will see the MadgeTech logo when complete.

3

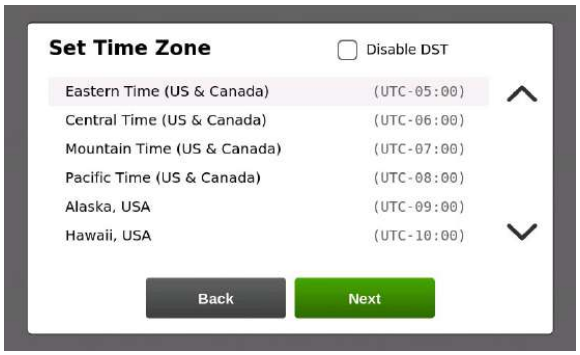
SELECT SCREEN ORIENTATION

For desktop use, inputs are facing upward.
For wall mounted use, inputs are facing downward.

4

SET INITIAL TIME ZONE

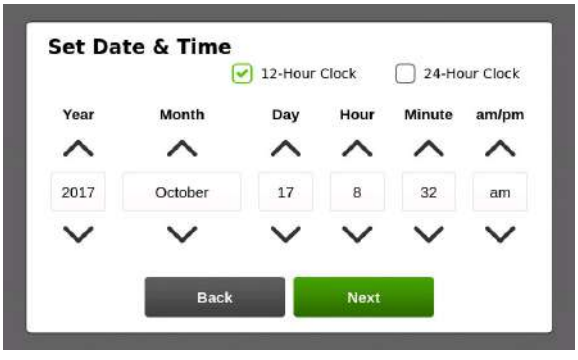
Enter the local time zone to be used by the device and select **Next**. Available in version v4.7 or later.



4

SET INITIAL DATE AND TIME

Enter the local date and time and select **Next**.



5

When the device presents the Home screen it is ready to use.

USER INTERFACE

Channel Configuration

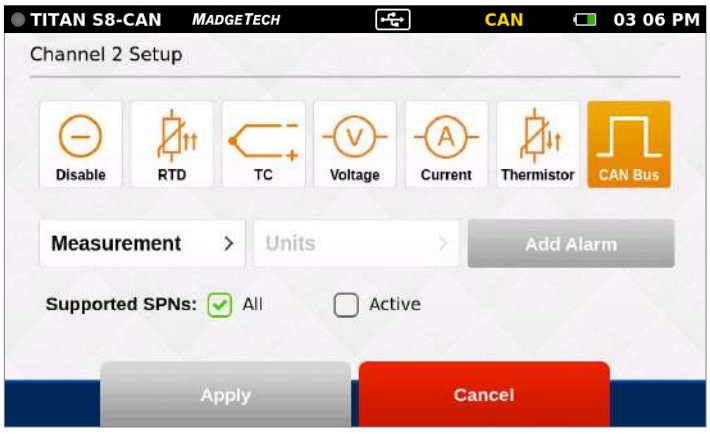
When the Channel Configuration icon is selected, the device will display the screen shown below:

Select Channel Configuration

- **Channel 1-8:** Configures the type of channel input, units, engineering units (if applicable), alarms and user calibration adjustments. ***Channel 1 cannot be used for CAN.***
- **Channel 9-24:** Channels 9-24 are for CAN measurements. Channels 2-24 can be programmed for Active or All SPNs.
- **Update:** Applies the current channel configuration to make the device ready to start logging or display real-time data.
- **File:** Loads previously saved channel configurations.
- **Save:** Saves the current channel configuration so it may be loaded and used later.
- **Disable All:** Clears the configuration of all channels, returning them to the default disabled status.
- **Cancel:** Cancels changes and then goes back to the Home screen.

Channel Setup

When the user selects a Channel, the device will display the Channel Setup screen with several options:



- **Disable** (Channel is not being used)
- **RTD** (RTD probe)
- **TC** (Thermocouple probe)
- **Voltage**
- **Current**
- **Thermistor** (Thermistor probe)
- **Can Bus**
- **Pulse** (Only available on channel 1)

Select Channel Configuration

Select Channel

Swipe Left for Channels 9-24

USER INTERFACE

Measurement Setup

When the user selects a Measurement Parameter, the device will display the relevant options for that selection. The example below shows the SAE J1939 CAN Bus options:

Select the **Measurement** button to display a pop-up screen of relevant measurement types to choose from.

For CAN, selecting the **Measurement** button will bring up a list of all or active SPNs.

Select Channel Configuration

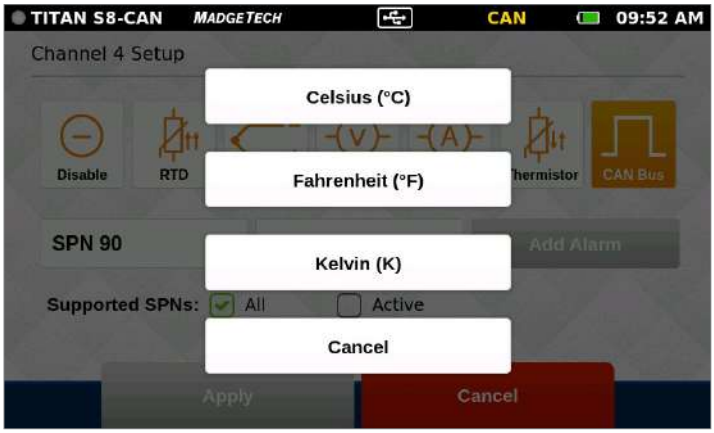
Select Channel

Select Measurement Parameter

Select Measurement Type

Measurement Units

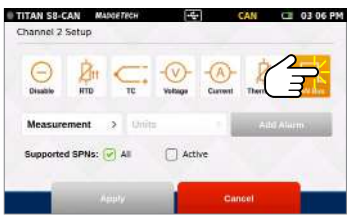
When the user selects the Units button, the device will display a pop-up menu of the corresponding options for that selection. The example below shows the Temperature options:



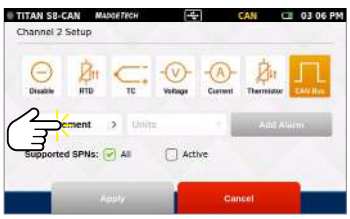
Units: These are the associated units for the specific SPN selected. For instance for engine temp = °F or °C. For fuel level = 0-100%, etc.

If the user selects **Engineering Units** for Voltage, Current or Pulse sensor, see set-up instructions on page 11-12.

Select Channel



Select Measurement Parameter



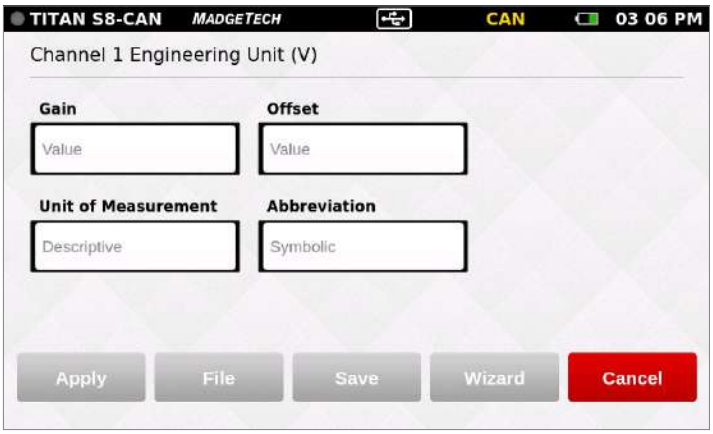
Select Measurement Type

Select Measurement Units

USER INTERFACE

Engineering Units

Engineering Units can be applied to any channel measuring Voltage, Frequency or Pulse to display readings in a user selected custom unit of measure.



- **Gain:** User selected gain value.
- **Offset:** User selected offset value.
- **Unit of Measurement:** Desired unit to be measured.
- **Abbreviation:** User defined abbreviation.
- **Apply:** Saves the settings.
- **File:** Retrieves a previously saved Engineering Unit setting.
- **Save:** Saves the Engineering Unit setting for future use.
- **Wizard:** Allows the user to set up units by entering the input and output values for low and high scale points. The unit will automatically calculate the gain and offset the from these values.
- **Cancel:** Cancels Engineering Unit configuration and returns the user to the Channel Configuration screen.

Select Measurement Parameter

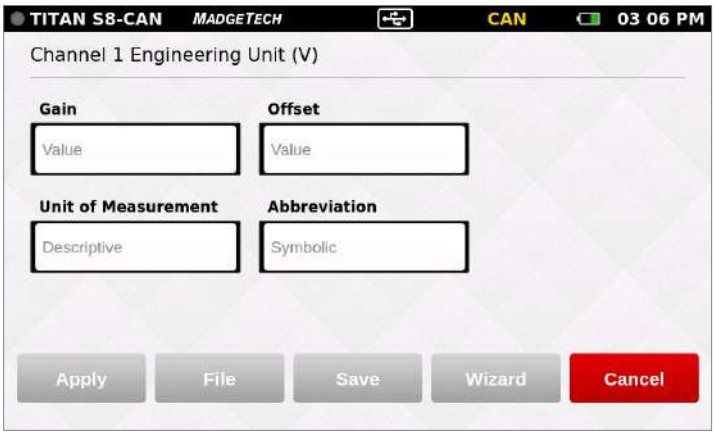
Select Measurement Type

Select Measurement Units

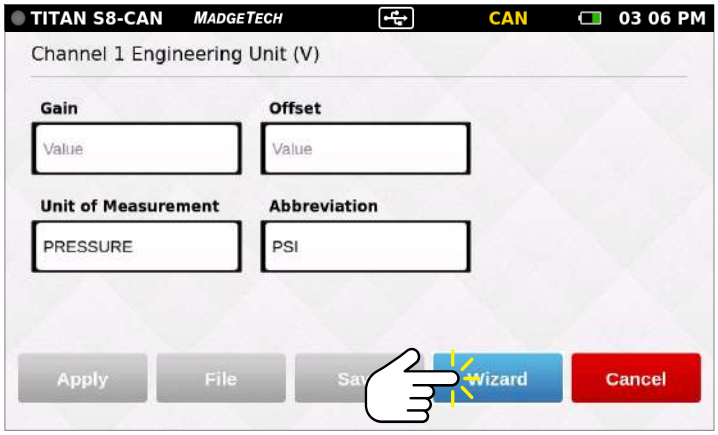
Select Engineering Units

USER INTERFACE

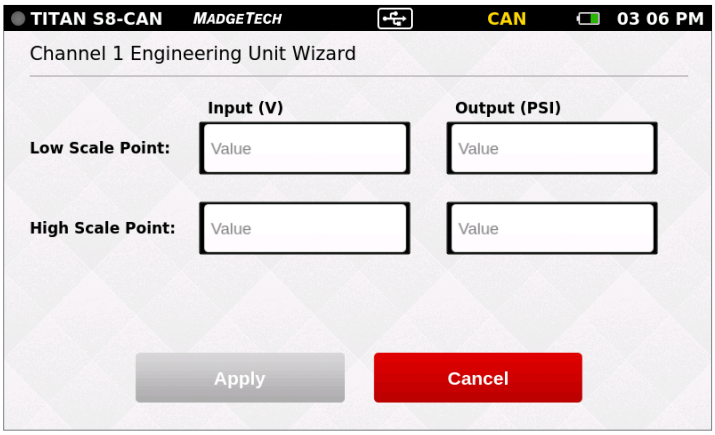
Setting Up Engineering Units



Enter the unit of measurement and abbreviation.



Click the **Wizard** button to launch the Engineering Unit Wizard.



Enter the low and high scale point inputs and outputs and click **Apply**.

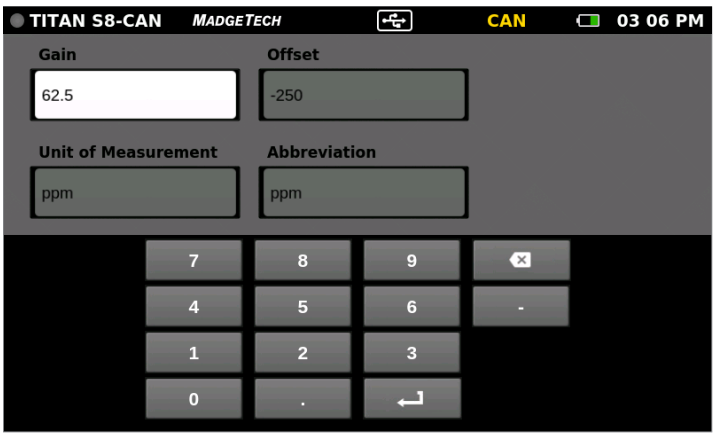
The gain and offset are automatically set. Click **Save** to save the engineering units to the channel and click **Apply** to apply the changes to current logging session.

USER INTERFACE

Keyboard Function

When the user taps in any text field within the interface, the keyboard will appear. The numeric keypad appears when the **Gain** and **Offset** fields are selected. The keyboard appears when **Unit of Measurement** and **Abbreviation** fields are selected.

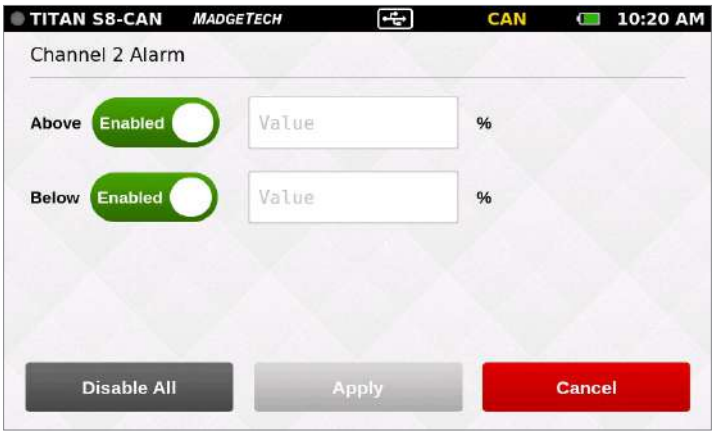
To prevent the keyboard from obscuring content, the screen will always focus on the selected field and bring it into view. Once the text field is complete, the user can tap anywhere on the screen and the keyboard will disappear from view.



An external keyboard can also be used by plugging it into the USB port on the device.

Alarms

Users can create one alarm configuration per channel with up to two alarm values per channel (above and below threshold):



- **Above:** Indicates the high reading threshold at which above the alarm becomes active.
- **Below:** Indicates the low reading threshold at which below the alarm becomes active.
- **Enabled/Disabled:** Tap the button to either enable or disable the text field to enter desired alarm value.
- **Disable All:** Clears the alarm settings.
- **Apply:** Applies the setting to the current channel.
- **Cancel:** Cancels changes and then returns the user to the Channel Configuration screen.

Select Channel Configuration

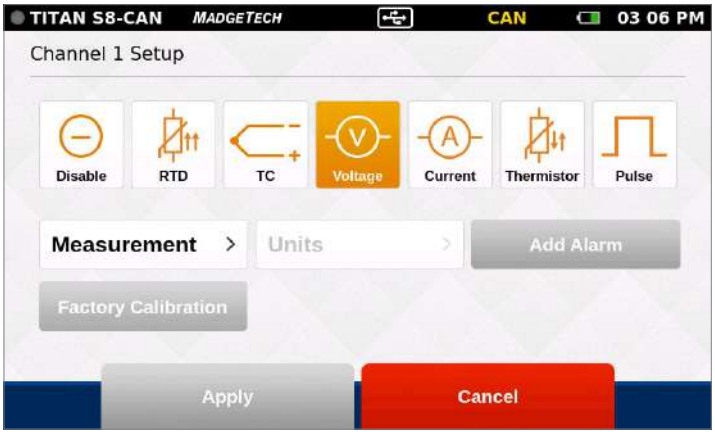
Select Channel

Select Add Alarm

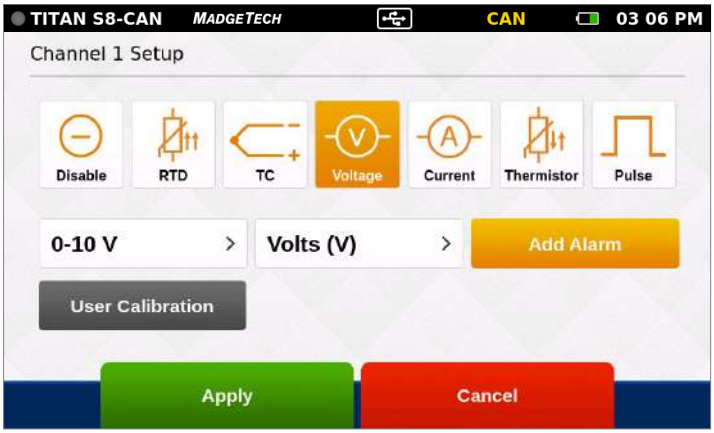
USER INTERFACE

Factory Calibration

The Titan S8-CAN includes a complete Factory Calibration feature that provides users with the ability to adjust the calibration settings per channel and revert back to the factory settings at any time. ***Note:*** *For best performance and accuracy, Factory Calibration should be performed by MadgeTech at least once every 12 months.*



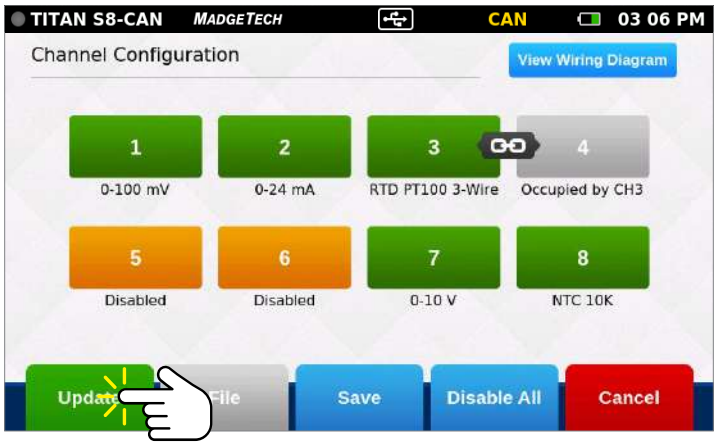
Factory Calibration: Indicates the device is currently in the factory calibrated state.



User Calibration: Indicates the calibration settings have been modified by the user.

Channel Configuration Overview

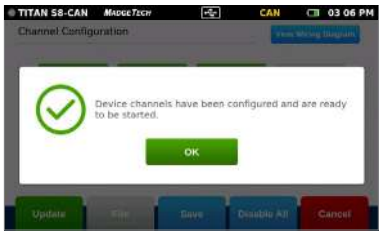
An example of a completed channel configuration screen is shown below.:



Apply Channel Configuration

Once channels are configured as desired, the user must then select **Update** to use those settings.

A pop-up as shown to the right will confirm that settings have been applied.

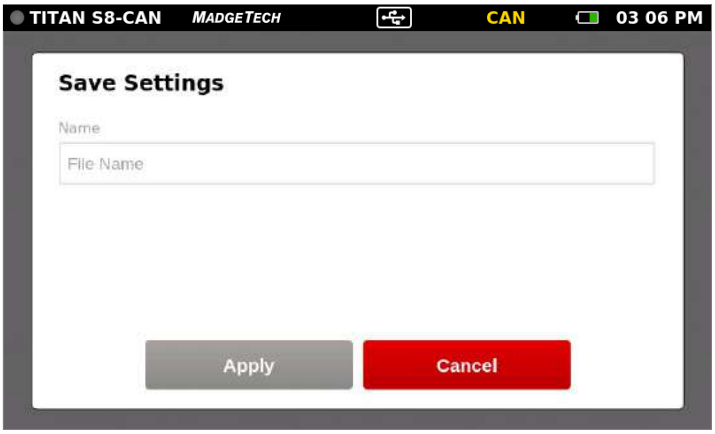


- **View Wiring Diagram:** Shows how to properly wire the device.
- **Green Channel:** Enabled channel.
- **Orange Channel:** Disabled channel.
- **Linked Channels / Gray Channels:** 3 or 4 wire RTD sensor types can be selected for Channels 1, 3, 5 and 7. This sensor type will also occupy the next sequential channel and will be visually represented with a Link icon as seen between Channels 3 and 4 on the screen to the left.
- **Update:** Once the user has configured the channel settings, this button will apply the current settings to all channels.
- **File:** Loads previously saved configurations.
- **Save:** Saves the current Channel Configuration so it may be loaded and used in the future.
- **Disable All:** Clears the programmed channels to disable all.
- **Cancel:** Cancels user changes and then goes back to the Home screen.

USER INTERFACE

Save Configuration Settings

Completed channel configurations can be saved for repeated use. The user can select **Save** from the channel configuration screen to select a name for the saved settings file and apply them.

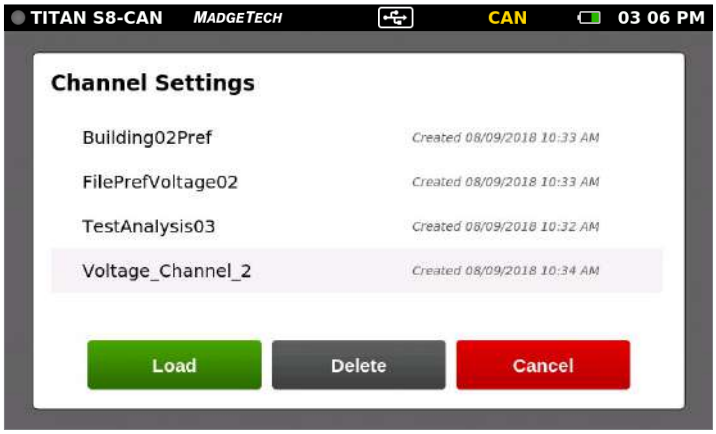


Select Channel Configuration

Select Save

Load Configuration Settings

Saved channel configurations can be easily loaded for repeated use. The user can select File from the channel configuration screen to choose from the list of previously saved settings files. ***Note:*** *Loading a saved settings file will replace the existing configuration.*



Select Channel Configuration

Select File

Wiring Diagram

From the channel configuration screen, the user can select the Wiring Diagram button to display the proper wiring of the unit based on the currently applied configuration. *Please note the position of channel 1 in regards to screen orientation.*

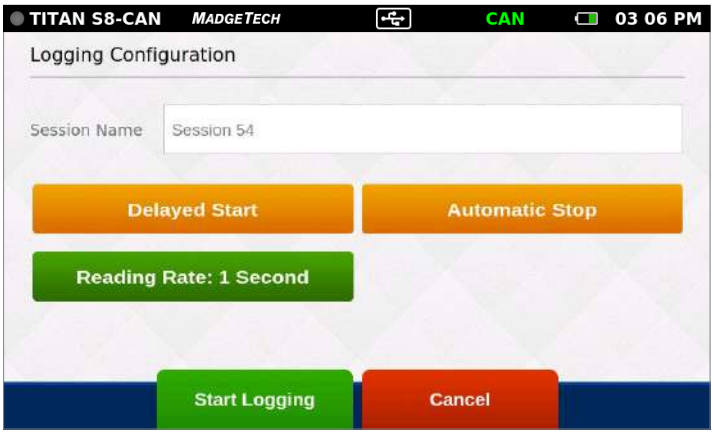
Select Channel Configuration

Select View Wiring Diagram

LOGGING DATA

Start Logging

When **Start Logging** is selected from the **Home** screen, the **Logging Configuration** screen will appear and the user will be prompted to name the data logging session. If the user has not already configured the channels, they will be prompted to configure prior to starting a logging session. The user will be able to configure start time, stop time, and reading rate in addition to naming the logging session.



Select Start Logging

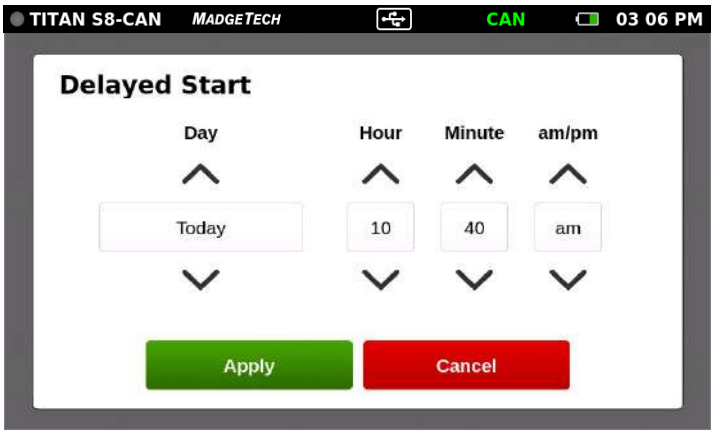
Keyboard will appear when user taps in the session text field.

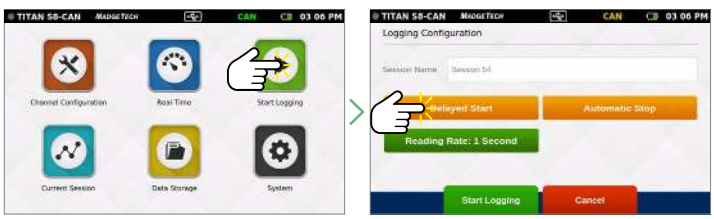
- **Session Name:** Enter the desired name for the logging session. If no name is given, a unique default name will be assigned (i.e. Session 1).
- **Delayed Start:** To set a logging start time in the future, select delayed start. To start logging immediately, select the Start Logging button at the bottom of this screen.
- **Automatic Stop:** The user has the option of selecting an Automatic Stop time. If no time is selected, the user will use the Stop Logging button on the Home screen to manually stop the device.
- **Reading Rate:** The reading rate will default to 10 seconds or use the setting of the last session configuration.
- **Start Logging Data:** Begins logging data session. If delay start has been set, the logging session will begin on the selected date and time.
- **Cancel:** Cancels user configuration and returns back to the Home screen.

NOTE: Maximum number of readings per session is 1,000,000 or 5,000,000 (user selectable in System/File Format).

Delayed Start

Selecting **Delayed Start** will bring up the following configuration screen:





Select Start Logging

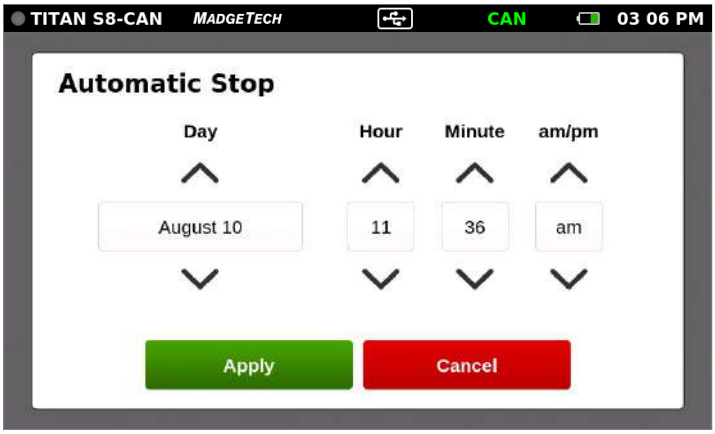
Select Delayed Start

- **Day:** Using the up and down arrows, the user is able to adjust the day.
- **Hour:** Using the up and down arrows, the user is able to adjust the hour.
- **Minute:** Using the up and down arrows, the user is able to adjust the minute.
- **am/pm:** Using the up and down arrows, the user is able to select am or pm (12-hour clock only).
- **Apply:** Applies the start or stop time settings and returns the user back to the Logging Configuration screen.
- **Cancel:** Cancels the start time settings and returns the user to the Logging Configuration screen.

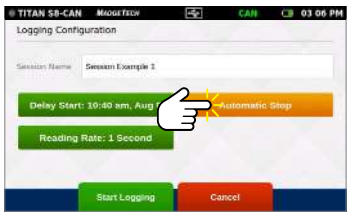
LOGGING DATA

Automatic Stop

Selecting **Automatic Stop** will bring up the following configuration screen:



Select Start Logging

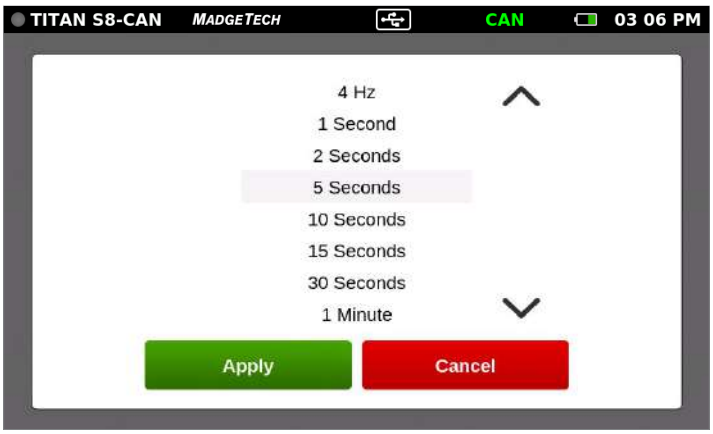


Select Automatic Stop

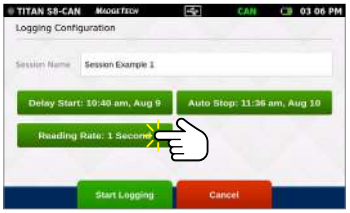
- **Day:** Use the up and down arrows to adjust the day.
- **Hour:** Use the up and down arrows to adjust the hour.
- **Minute:** Use the up and down arrows to adjust the minute.
- **am/pm:** Use the up and down arrows to select am or pm (12 -hour clock only).
- **Apply:** Applies the start or stop time settings and returns the user back to the Logging Configuration screen.
- **Cancel:** Cancels the stop time settings and returns the user to the Logging Configuration screen.

Reading Rate

When the user selects **Reading Rate**, the following configuration screen will appear. Once the desired reading rate is selected, the user must select **Apply** to use that option, or **Cancel** to return to the previous screen. See page 31 for available reading rates.



Select Start Logging

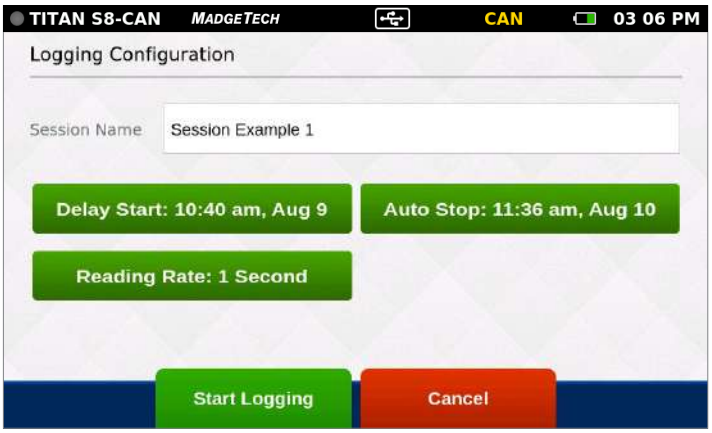


Select Reading Rate

LOGGING DATA

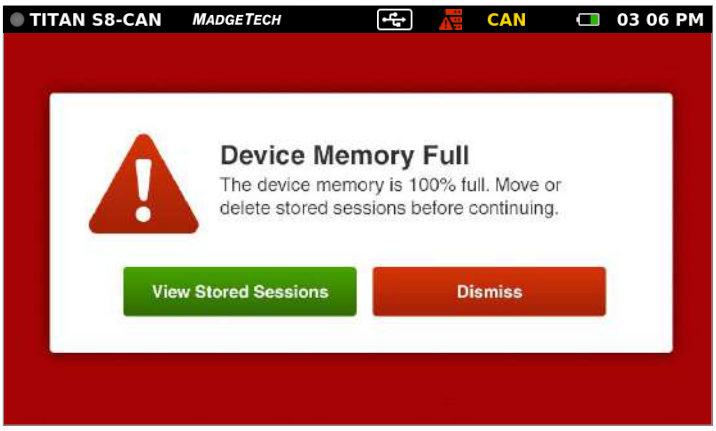
Review Session Details and Start Logging

Once the user selects a Session Name, Start Time, Stop Time and Reading Rate, the screen will look similar as it does below. Once the settings are complete, the user will select **Start Logging** to begin **Logging Mode**. After selecting **Start Logging**, the user will be brought to the **Home** screen.



Device Memory Warning

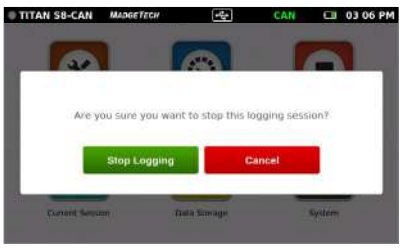
After selecting **Start Logging**, if the internal memory of the device is 100% full, the user will be notified with a pop-up warning message and two options to choose from. This warning will also appear if the internal memory of the device reaches 100% capacity while actively logging.



- **View Stored Sessions:** Takes the user to the Data Storage screen to delete or remove stored data from the device.
- **Dismiss:** Returns the user back to the Home screen and logging will not start.

Stop Logging

To manually stop a logging session, the user will select the **Stop Logging** button from the **Home** screen. ***Note:*** *Access the Home screen at any time by pressing the Home button.*



Stop Logging Confirmation

When the user selects Stop Logging, a pop-up screen will emerge prompting the user to confirm the action.

- **Stop Logging:** Ends the current logging session.
- **Cancel:** Continues logging and returns the user to the Home screen.

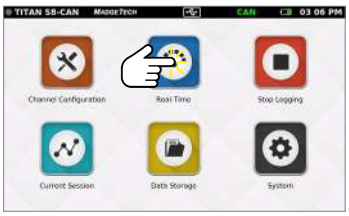
VIEWING DATA

Real-Time Data

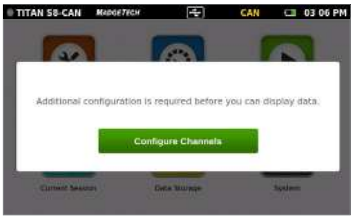
When **Real-Time** is selected from the **Home** screen, the device will display data from all enabled channels and update at the user selected reading rates. The **Real-time** view is also available from the **Current Session** menu when the device is actively logging.

- **Current Reading:** Displayed in the center of the gauge.
- **Minimum:** Displayed on the bottom left of each gauge.
- **Maximum:** Displayed on the bottom right of each gauge.
- **Zero:** (Pulse Only) Resets the displayed reading to zero.
- **Scale:** Scales the readings on the screen. Maximum value will be reset to the current value.

If an SPN is not active, it will not allow you to log data or see real time data. You will need to disable that channel with the inactive SPN or change to an active SPN.



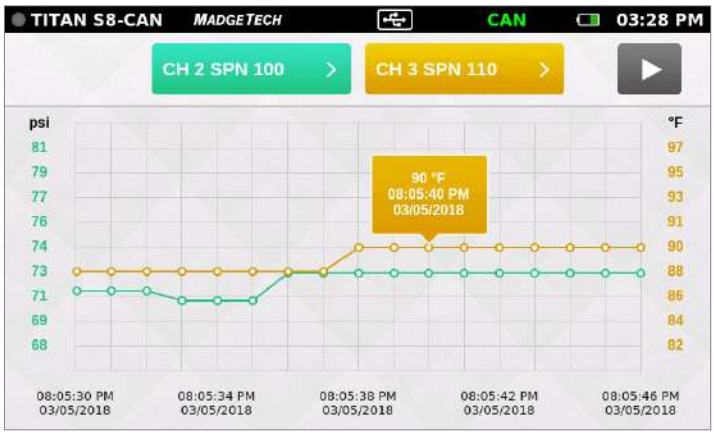
Select Real-Time



Configuration Warning
Real-Time data is only available if the device channels are configured.

Current Session — Graph View

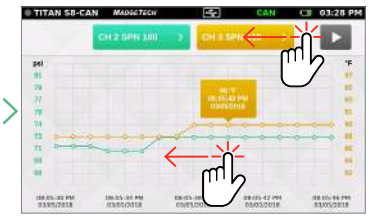
Select the **Current Session** button from the **Home** screen to view the recorded data in various formats, swipe the screen to the left or right to navigate. This view can only be used or seen while actively logging.



Graph View

- Use the drop down menus at the top to select which channels to view.
- Touch any point on the graph line to display more detailed information.
- Triggered alarm events will be visible within the graph.
- **Start/Stop Button:** Stop the current screen display to analyze the data. Restarts the screen to go back to real time display on the graph.

Select Current Session



Swipe to Navigate

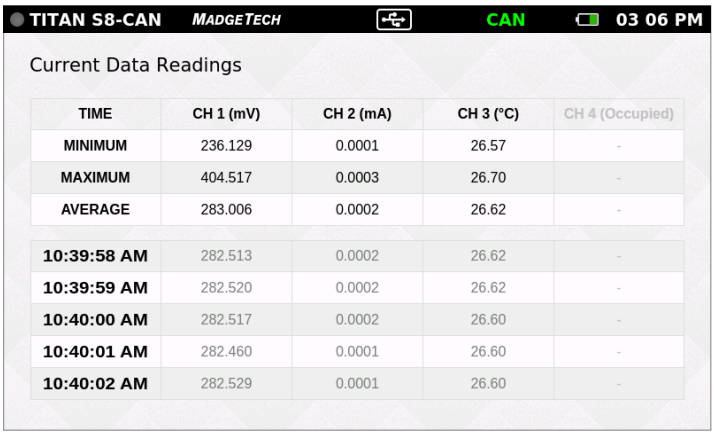
Swipe Options

- Swipe left at the top of the screen to go to the tabular data view.
- Swipe within the graph to scroll through the graph timeline.

VIEWING DATA

Current Session — Tabular View

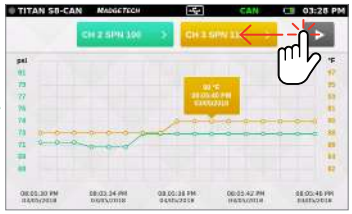
Select the **Current Session** button from the **Home** screen to view the recorded data in various formats, swipe the screen to the left or right to navigate. This view can only be used or seen while actively logging.



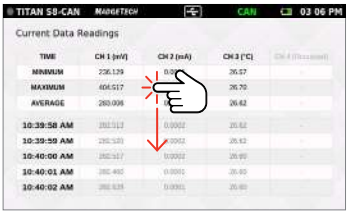
TIME	CH 1 (mV)	CH 2 (mA)	CH 3 (°C)	CH 4 (Occupied)
MINIMUM	236.129	0.0001	26.57	-
MAXIMUM	404.517	0.0003	26.70	-
AVERAGE	283.006	0.0002	26.62	-
10:39:58 AM	282.513	0.0002	26.62	-
10:39:59 AM	282.520	0.0002	26.62	-
10:40:00 AM	282.517	0.0002	26.60	-
10:40:01 AM	282.460	0.0001	26.60	-
10:40:02 AM	282.529	0.0001	26.60	-

- Displays the Minimum, Maximum and Average values for the current session.
- Readings that exceeded user selected thresholds/ alarms are displayed as red.
- Scroll vertically to see data timeline in tabular format.
- View four channels at a time.
- Swipe left at the top of the screen to see additional active channels.
- Pressing on the Time heading will change it from Time to Number.

Select Current Session



Swipe Left to View Tabular Data



Swipe Vertically to Scroll Timeline

Swipe Left for Additional Active Channels

Additional Views

Swipe left and right to rotate through the various screens.
Graph View > Tabular Views > Real-Time View > Current Session Overview

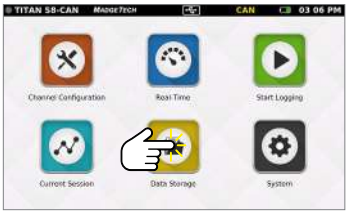
Note: *Use the swipe navigation of data views for both current and stored sessions.*

MANAGING DATA

Data Storage

Selecting the **Data Storage** icon will bring up the screen pictured below. Stored sessions are displayed in a scrollable list. Swipe vertically to browse the list. Session Information includes the name of the session, the start time and date of the session, and the number of readings. The options available on this screen include the following:

- **INT:** Available percentage of internal memory remaining on the device.
- **EXT:** Available percentage of memory remaining on the external USB drive.
- **Number of Sessions:** The total number of stored sessions on the device.
- **Session Information:** Tap on any row to view session specific options.
- **Delete All:** Erases all stored sessions from the internal memory.
- **Eject USB:** Select this button prior to removing the external USB drive.



Select Data Storage

Swipe Vertically Through Sessions

Storage Space

Every channel configured is considered a separate reading, so the number of readings divided by the number of channels gives you the readings per channel. Maximum number of readings per session is 1,000,000 or 5,000,000 user selectable in Device Settings.

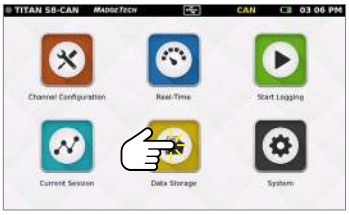
Thermocouple Channels:	Millivolt, Volt, RTD, Thermistor (NTC), Milliamp channels:	Frequency/Counter (Single Channel):
• **1 Hz or slower** — 62,000,000 to 150,000,000 readings (depends on number of configured channels) in 1,000,000 or 5,000,000 reading increments. • **4 Hz or faster** — 80,000,000 to 150,000,000 readings (depends on number of configured channels) in 1,000,000 or 5,000,000 reading increments.	• **1 Hz or slower** — 93,000,000 to 164,000,000 readings (depends on number of configured channels) in 1,000,000 or 5,000,000 reading increments. • **4 Hz or faster** — 150,000,000 to 173,000,000 readings (depends on number of configured channels) in 1,000,000 or 5,000,000 reading increments.	• **1 Hz or slower** — 93,000,000 readings in 1,000,000 or 5,000,000 reading increments.

MANAGING DATA

Saved Session Options

From the **Data Storage** screen, tap on any row in the list to select a specific session to view options. The **Session Options** screen features four actions the user can take on any stored session:

- **Copy:** Copies the stored session to an external USB drive. If no USB drive is plugged into the device, the Copy button will not display.
- **View Data:** Views the data of this session in tabular or graph view.
- **View/Edit Note:** Add notes or comments to the session. Also allows the user to change the Session name (v4.7 or later).
- **Delete:** Removes the stored session from the device.

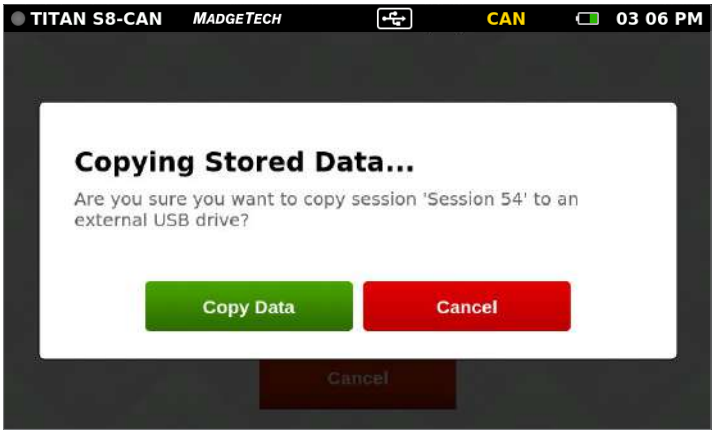


Select Data Storage

Select a Session

Copy Stored Sessions

Sessions can be copied from the internal device memory to an external USB drive. When the **Copy** option is selected, the **Copy Stored Session** pop-up will appear to confirm the user's request.



Note: *Data can be saved to external memory as .csv and/or .mtb file format (user selectable in System/File Format).*

- **Copy Data:** The session is copied to the external USB drive.
- **Cancel:** Cancels the copy and takes the user back to the Options screen.

Select Data Storage

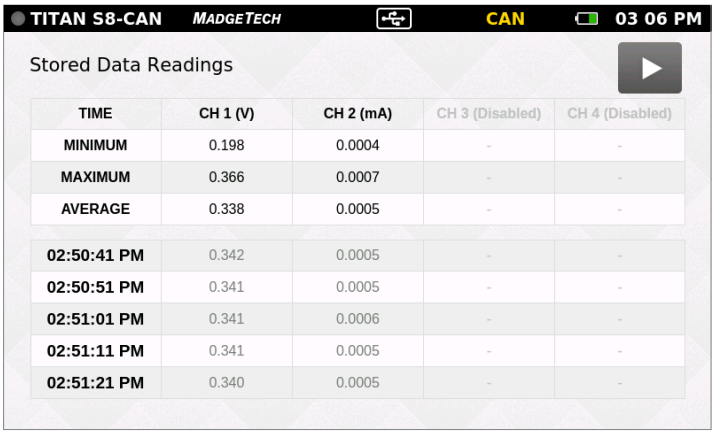
Select a Session

Select Copy

MANAGING DATA

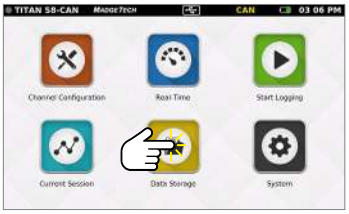
View Data Sessions

When the **View Data** option is selected, the user is presented with the **Tabular Data** view of that session. From this screen the user can swipe left and right to navigate other views of the recorded data from that session (see swipe navigation options on page 18).



TIME	CH 1 (V)	CH 2 (mA)	CH 3 (Disabled)	CH 4 (Disabled)
MINIMUM	0.198	0.0004	-	-
MAXIMUM	0.366	0.0007	-	-
AVERAGE	0.338	0.0005	-	-
02:50:41 PM	0.342	0.0005	-	-
02:50:51 PM	0.341	0.0005	-	-
02:51:01 PM	0.341	0.0006	-	-
02:51:11 PM	0.341	0.0005	-	-
02:51:21 PM	0.340	0.0005	-	-

Playback mode is available in tabular Data form or in the graphing mode.



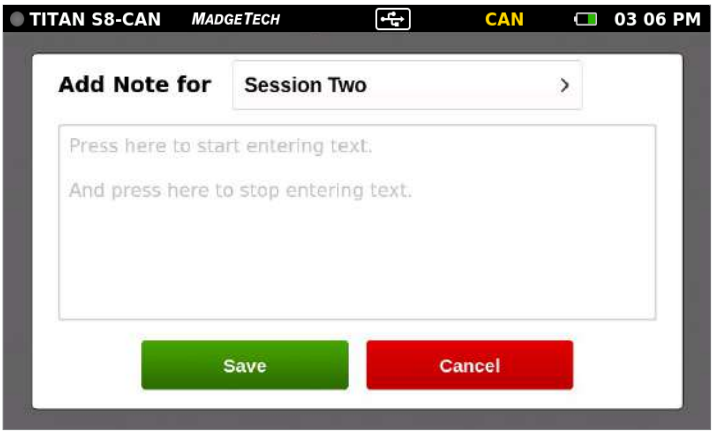
Select Data Storage

Select a Session

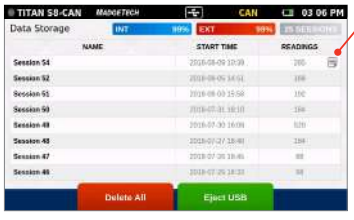
Select View Data

View/Edit Note and Session Name

When the **View/Edit Note** option is selected, the user is presented with a text entry screen. Text entered here is stored as a note associated with a particular session. This can be accessed and edited by users as desired.



User also has the ability to change the Session name in this section (v4.7 or later).

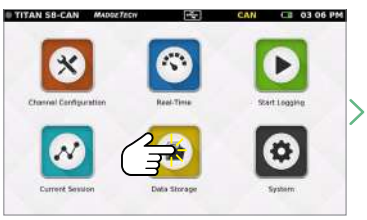


Note Flag

When a note has been added to a logging session, a notes icon appears in the list of sessions.

Delete a Note

To delete a note, edit to remove all text and click **Save**.



Select Data Storage

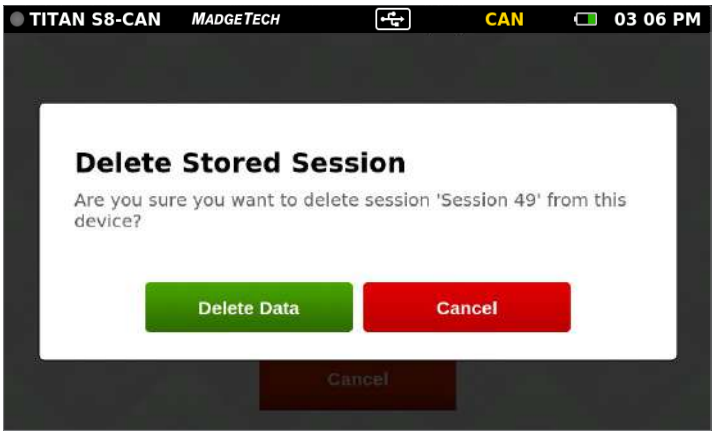
Select a Session

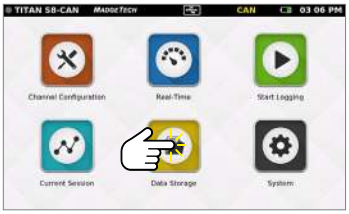
Select View/Edit Note

MANAGING DATA

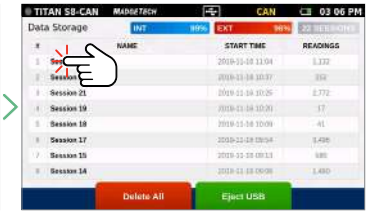
Delete Stored Session

When the **Delete** session option is selected, the user is presented with a pop-up screen confirming the request:





Select Data Storage

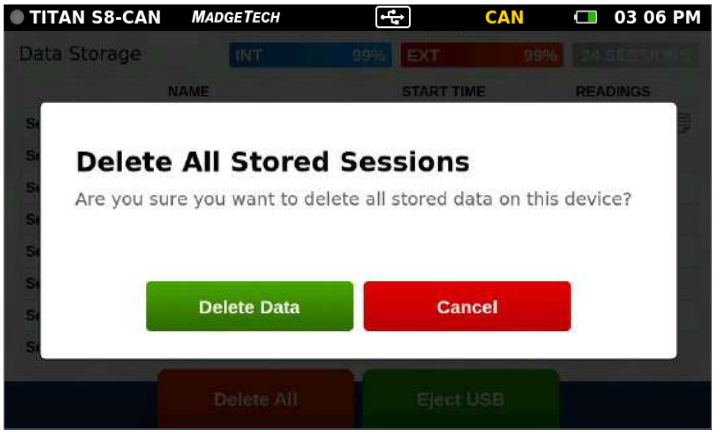


Select a Session

Select Delete

Delete All

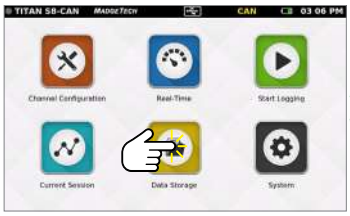
If a user selects the **Delete All** option, they will be presented with a confirmation screen. Selecting **Cancel** will return the user to the **Data Storage** screen and the stored data will not be deleted.



Deleting Stored Data Confirmation

When Delete Data is selected a pop-up screen will display a progress bar and confirm when action is complete. After data is successfully removed the user will be returned to the Data Storage screen.

Warning: Deleting a session is a permanent action.



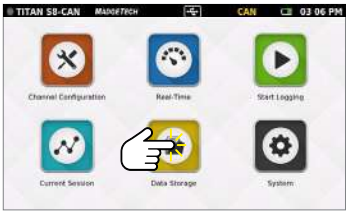
Select Data Storage

Select Delete All

MANAGING DATA

No Stored Sessions

Before first use or after all data has been deleted, the **Data Storage** screen on the device will resemble the screen shown below:



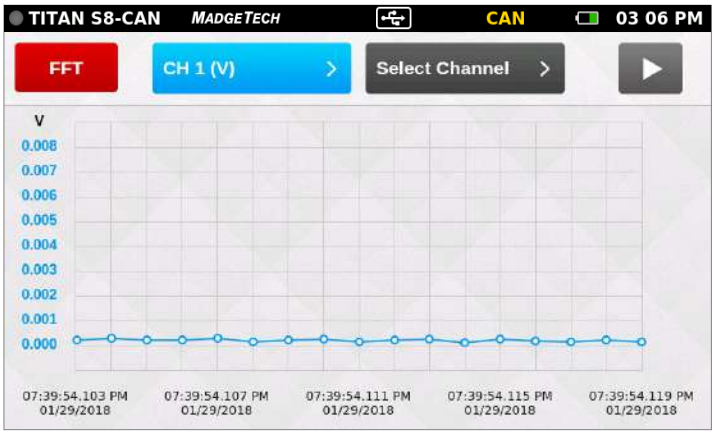
Select Data Storage

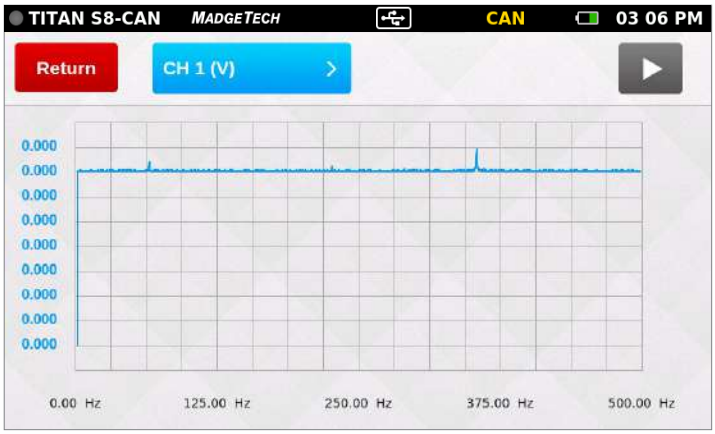
FFT User Capabilities

The Titan S8-CAN will automatically calculate FFT for users in real time providing exact frequencies to make post analysis data easily available for both vibrational and electrical applications.

To enable FFT go to **System** (Device Settings/Display). FFT is available to view in both current sessions and stored sessions. To view FFT in a current session, select the **Current Session** icon and select the desired channel to be viewed. From the upper left-hand corner, select the red FFT button to view the real-time FFT monitoring.

To view FFT in a stored session, select the **Data Storage** button from the home screen. From the **Data Storage** tab, select the desired stored session to be viewed. Select **View Data** from the options panel. Once the graph is visible, select the red FFT button to view FFT monitoring from a stored session. 2,048 data readings have to be recorded before FFT will plot.





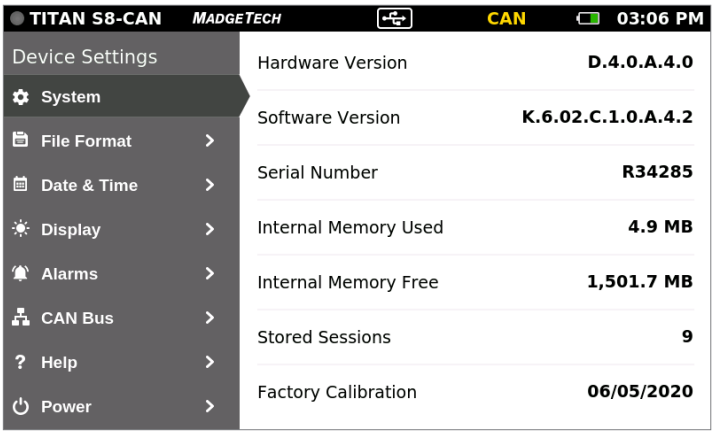
Select Data Storage

Select Stored Session to View

DEVICE SETTINGS

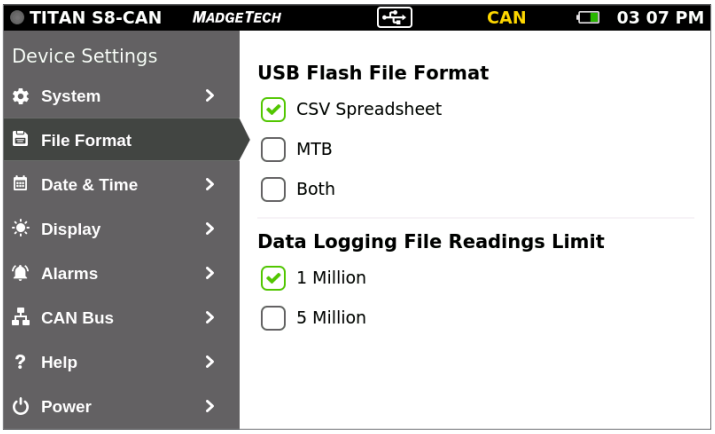
Device Settings

When the **System** button is selected from the **Home** screen, the user is presented with options, preferences and information as shown below. The **System** panel displays an overview of information specific to the device. Network settings appear in v5.0 or later.



- **Hardware Version**
- **Software Version**
- **Serial Number**
- **Internal Memory Used and Available**
- **Number of Stored Sessions**
- **Factory Calibration Date**

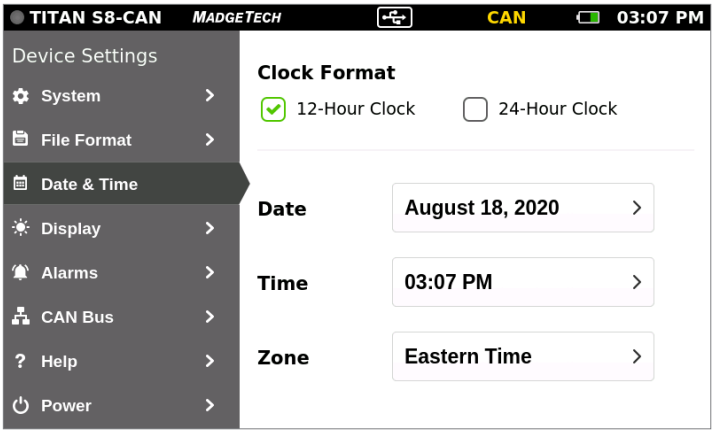
Select System

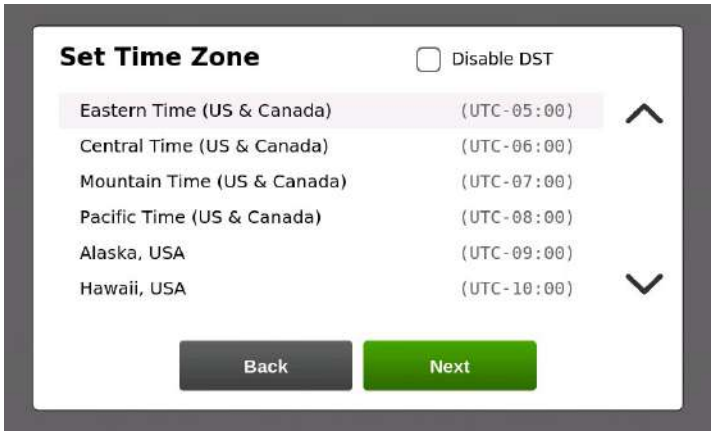


File Format

Data from the Titan S8-CAN can be saved to external memory in one of two formats.

- **USB Flash File Format:** .csv spreadsheet, .mtb file or both.
- **Data Logging File Readings Limit:** Choose between 1 million or 5 million file readings limit.

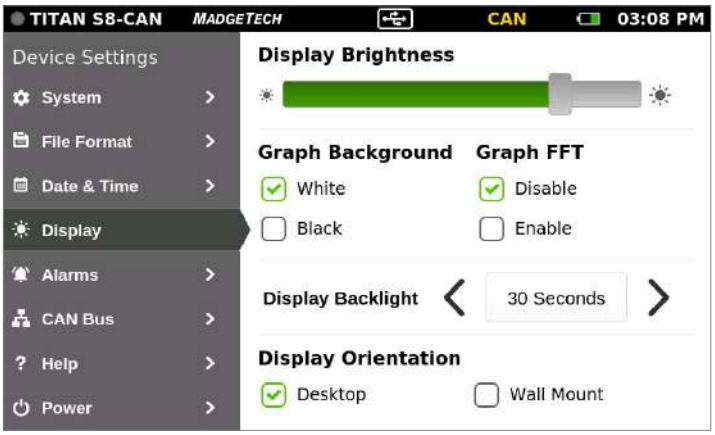




Date & Time

The **Date & Time** screen will display the current date and time as well as provide the user with 12-Hour or 24-Hour clock options and time zone settings. Except for time zone UTC and “International Date Line West”, a selected time zone may automatically support Daylight Saving Time. Arizona does not support DST so “Disable DST” has to be checked and “Mountain Time (US & Canada)” selected when in Arizona.

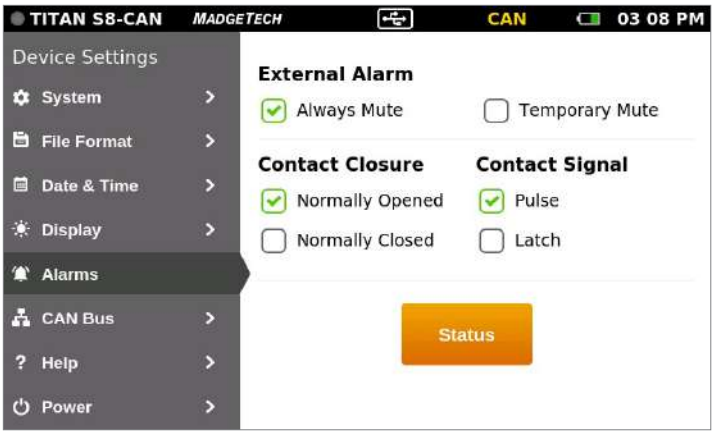
DEVICE SETTINGS



Display

The **Display** screen allows the user to adjust options for the touch-screen display including:

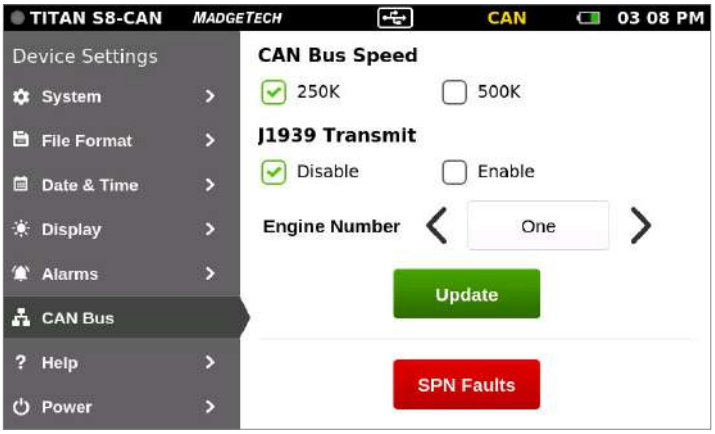
- **Display Brightness:** User adjustable screen brightness level.
- **Graph background:** Select white or black.
- **Graph FFT:** Select enable or disable.
- **Display Backlight:** User selectable timeout period.
- **Display Orientation:** Changing the display orientation requires a reboot of the device.



Alarms

The **Alarms** screen provides the user with two **Contact Closure** options for when an alarm is triggered.

- **Always/Temporary Mute**
- **Contact Closure:** Normally Open / Closed
- **Contact Signal:** Pulse / Latch
- **Status:** Shows if there are any alarms triggered.



CAN Bus

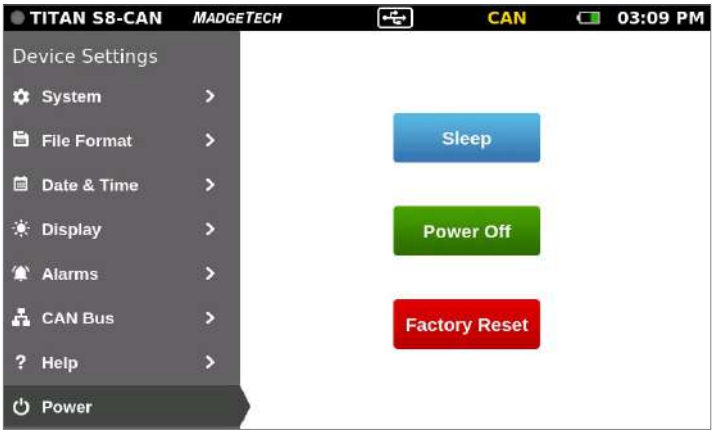
The **CAN Bus** screen allows the user to set up CAN Bus options.

- **CAN Bus Speed:** 250K / 500K
- **J1939 Transmit:** Disable / Enable
- **Engine Number:** One or Two
- **SPN Faults List**

DEVICE SETTINGS

Help

Provides MadgeTech's contact information to the user.



Power

Provides sleep mode, power off via screen and factory reset.

Warning: Factory reset will restore the unit to Factory Settings. This will delete all saved sessions and configurations.

SAE PARAMETERS

SAE J1939 Parameters

The Titan S8-CAN supports 55 suspect parameter numbers (SPN).

SPN	PARAMETER NAME	PGN Parameter Group No.	DESCRIPTION Per SAE J1939 Documentation	TITAN PARAMETER Displayed Name in Configuration	UNIT OF MEASURE Displayed in Titan S8-CAN
38	Fuel Level 2	65276	When Fuel Level 2 (SPN 38) is not used, Fuel Level 1 represents the total fuel in all fuel storage containers. When Fuel Level 2 is used, Fuel Level 1 represents the fuel level in the primary or left-side fuel storage container	Fuel Level 2	0-100%, Engineering Units
51	Engine Throttle Valve 1 Position	65266	The position of the valve used to regulate the supply of a fluid, usually air or fuel/air mixture, to an engine. 0% represents no supply and 100% is full supply.	Engine Throttle Position	0-100%, Engineering Units
52	Engine Intercooler Temperature	65262	Temperature of liquid found in the intercooler located after the turbocharger.	Engine Intercooler Temp	°C, °F, K
80	Washer Fluid Level	65276	Ratio of volume of liquid to total container volume of fluid reservoir in windshield wash system.	Washer Fluid Level	0-100%, Engineering Units
84	Wheel-Based Vehicle Speed	65265	Speed of the vehicle as calculated from wheel or tailshaft speed	Wheel-Based Speed	Kilometers per hour, miles per hour, knots
90	Power Takeoff Oil Temperature	65264	Temperature of lubricant in device used to transmit engine power to auxiliary equipment.	Power Takeoff Oil Temp	°C, °F, K
91	Accelerator Pedal Position 1	61443	Accelerator Pedal Position 1	Accelerator Position	0-100%, Engineering Units
92	Engine Percent Load At Current Speed	61443	Engine Percent Load At Current Speed	Engine Percent Load	0-100%, Engineering Units
94	Engine Fuel Delivery Pressure	65263	Gage pressure of fuel in system as delivered from supply pump to the injection pump. See also SPN 5578 for Fuel	Engine Fuel Pressure	PSI, megapascal, kilopascal, bar
96	Fuel Level 1	65276	Ratio of volume of fuel to the total volume of fuel storage container. When Fuel Level 2 (SPN 38) is not used, Fuel Level 1 represents the total fuel in all fuel storage containers.	Fuel Level 1	0-100%, Engineering Units
97	Water In Fuel Indicator	65279	Signal which indicates the presence of water in the fuel	Water in Fuel Indicator	Numberic code
98	Engine Oil Level	65263	Ratio of current volume of engine sump oil to maximum required volume.	Engine Oil Level	0-100%, Engineering Units
100	Engine Oil Pressure	65263	Gage pressure of oil in engine lubrication system as provided by oil pump.	Engine Oil Press	PSI, megapascal, kilopascal, bar
101	Engine Crankcase Pressure	65263	Gage pressure inside engine crankcase.	Engine Crankcase Press	PSI, megapascal, kilopascal, bar
102	Engine Intake Manifold #1 Pressure	65270	The gage pressure measurement of the air intake manifold. If there are multiple air pressure sensors in the intake stream, this is the last one in flow direction before entering the combustion chamber. This should be the pressure used to drive gauges and displays.	Intake Manifold Press	PSI, megapascal, kilopascal, bar
103	Engine Turbocharger 1 Speed	65245	Rotational velocity of rotor in the turbocharger.	Turbocharger Speed	PSI, megapascal, kilopascal, bar
104	Engine Turbocharger Lube Oil Pressure 1	65245	Gage pressure of oil in turbocharger lubrication system.	Turbocharger Oil Press	PSI, megapascal, kilopascal, bar
105	Engine Intake Manifold 1 Temperature	65270	Temperature of pre-combustion air found in intake manifold of engine air supply system.	Intake Manifold Temp	°C, °F, K
109	Engine Coolant Pressure	65263	Gage pressure of liquid found in engine cooling system.	Engine Coolant Press	PSI, megapascal, kilopascal, bar
110	Engine Coolant Temperature	65262	Temperature of liquid found in engine cooling system.	Engine Coolant Temp	°C, °F, K
111	Engine Coolant Level	65263	Ratio of volume of liquid found in engine cooling system to total cooling system volume. Typical monitoring location is in the coolant expansion tank.	Engine Coolant Level	0-100%, Engineering Units
114	Net Battery Current	65271	Net flow of electrical current into/out of the battery or batteries.	Net Battery Current	Amps
115	Alternator Current	65271	Measure of electrical current flow from the alternator. Alternator Current (High Range/Resolution) parameter SPN 1795 has a higher range and resolution of the same parameter.	Alternator Current	Amps
116	Brake Application Pressure	65274	Gage pressure of compressed air or fluid in vehicle braking system measured at the brake chamber when brake shoe (or pad) is placed against brake drum (or disc).	Brake Application Press	PSI, megapascal, kilopascal, bar
117	Brake Primary Pressure	65274	Gage pressure of air in the primary, or supply side, of the air brake system	Brake Primary Press	PSI, megapascal, kilopascal, bar
118	Brake Secondary Pressure	65274	Gage pressure of air in the secondary, or service side, of the air brake system	Brake Secondary Press	PSI, megapascal, kilopascal, bar
124	Transmission Oil Level 1	65272	First instance of a transmission oil level indicator. Conveys the ratio of volume of transmission sump oil to recommended volume	Transmission Oil Level	0-100%, Engineering Units
127	Transmission Oil Pressure	65272	Gage pressure of lubrication fluid in transmission, measured after pump	Transmission Oil Press	PSI, megapascal, kilopascal, bar
157	Engine Injector Metering Rail 1 Pressure	65243	The gage pressure of fuel in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.	Engine Injector 1 Press	PSI, megapascal, kilopascal, bar

SAE PARAMETERS

SAE J1939 Parameters (cont'd)

The Titan S8-CAN supports 55 suspect parameter numbers (SPN).

SPN	PARAMETER NAME	PGN Parameter Group No.	DESCRIPTION Per SAE J1939 Documentation	TITAN PARAMETER Displayed Name in Configuration	UNIT OF MEASURE Displayed in Titan S8-CAN
158	Keyswitch Battery Potential	65271	Battery potential measured at the input of the electronic control unit supplied through a keyswitch or similar switching device.	Battery Voltage (Combined with SPN 168)	Volts
167	Charging System Potential (Voltage)	65271	Electrical potential measured at the charging system output. The charging system may be any device charging the batteries. This includes alternators, generators, solid state charger and other charging devices.	Charging System	Volts
168	Battery Potential / Power Input 1	65271	This parameter measures the first source of battery potential as measured at the input of the ECM/actuator etc. coming from one or more batteries, irrespective of the distance between the component and the battery. This SPN is also used when ECM's are interconnected in a series configuration, where the source of power is coming directly or indirectly from the same battery/batteries	Battery Voltage (Combined with SPN 158)	Volts
173	Engine Exhaust Gas Temperature	65270	Temperature of combustion byproducts leaving the engine. See SPNs 2433 and 2434 for engines with more than one exhaust gas temperature measurement	Exhaust Gas Temp	°C, °F, K
174	Engine Fuel Temperature 1	65262	Temperature of fuel (or gas) passing through the first fuel control system. See SPN 3468 for the second control system	Engine Fuel Temp	°C, °F, K
175	Engine Oil Temperature 1	65262	Temperature of the engine lubricant	Engine Oil Temp	°C, °F, K
176	Engine Turbocharger Oil Temperature	65262	Temperature of the turbocharger lubricant	Turbocharger Oil Temp	°C, °F, K
177	Transmission Oil Temperature 1	65272	First instance of transmission lubricant temperature	Transmission Oil Temp	°C, °F, K
183	Engine Fuel Rate	65266	Amount of fuel consumed by engine per unit of time	Engine Fuel Rate	liters per hour, ounces per hour, quarts per hour, gallons per hour
184	Engine Instantaneous Fuel Economy	65266	Current fuel economy at current vehicle velocity	Instant Fuel Economy	kilometers per liter, miles per gallon
185	Engine Average Fuel Economy	65266	Average of instantaneous fuel economy for that segment of vehicle operation of interest	Average Fuel Economy	kilometers per liter, miles per gallon
186	Power Takeoff Speed	65264	Rotational velocity of device used to transmit engine power to auxiliary equipment.	Power Takeoff Speed	RPM
190	Engine Speed	61444	Actual engine speed which is calculated over a minimum crankshaft angle of 720 degrees divided by the number of cylinders.	Engine Speed	RPM
245	Total Vehicle Distance	65248	Accumulated distance traveled by vehicle during its operation.	Total Vehicle Distance	kilometers, miles, nautical miles
246	Total Vehicle Hours	65255	Accumulated time of operation of vehicle.	Total Vehicle Hours	Hours
247	Engine Total Hours of Operation	65253	Accumulated time of operation of engine.	Total Engine Hours	Hours
248	Total Power Takeoff Hours	65255	Accumulated time of operation of power takeoff device.	Total Power Takeoff Hrs	Hours
917	High Resolution Total Vehicle Distance	65217	Accumulated distance traveled by the vehicle during its operation	Hi-Res Total Distance	kilometers, miles, nautical miles
1349	Engine Injector Metering Rail 2 Pressure	65243	The gage pressure of fuel in the metering rail #2 as delivered from the supply pump to the injector metering intake. See Figure SPN16_A for fuel system related parameters. Although the figure does not show rail #2 it does show the relationship of rail pressure to other signals.	Engine Injector 2 Press	PSI, megapascal, kilopascal, bar
1638	Hydraulic Temperature	65128	Temperature of hydraulic fluid.	Hydraulic Temperature	°C, °F, K
1761	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	65110	Ratio of volume of diesel exhaust fluid to the total volume of diesel exhaust fluid storage container	DEF Tank Level	0-100%, Engineering Units
2602	Hydraulic Oil Level	65128	This parameter indicates the level of the hydraulic fluid in tank as a ratio of current volume to total tank volume. This parameter is intended for reporting the hydraulic fluid level in the system tank or reservoir. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.	Hydraulic Oil Level	0-100%, Engineering Units
3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	65110	Temperature of the diesel exhaust fluid in the storage tank	DEF Tank Temperature	°C, °F, K
3515	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	64923	Temperature of the diesel exhaust fluid at the device measuring diesel exhaust fluid quality	DEF Temperature 2	°C, °F, K
3516	Aftertreatment 1 Diesel Exhaust Fluid Concentration	64923	A measure of the concentration of urea in water. Zero percent means that the tank contains no urea. A 32.5% value indicates that the diesel exhaust fluid is of the proper concentration. The 32.5% value indicates that the concentration is highest quality.	DEF Concentration	0-100%, Engineering Units
3517	Aftertreatment 1 Diesel Exhaust Fluid Tank Level 2	65110	The measure of the diesel exhaust fluid level in the diesel exhaust fluid tank	DEF Tank Level 2	millimeter, centimeter, meter, inch, feet, yard
3521	Aftertreatment 1 Diesel Exhaust Fluid Property	64923	This parameter indicates the property of the fluid compound in the tank. A value of 0011 indicates uncontaminated Diesel Exhaust Fluid.	DEF Propery	numberic code

SPECIFICATIONS

Specifications subject to change. See MadgeTech's Terms and Conditions at **madgetech.com**.

GENERAL	
Dimensions	6.65 in x 4.40 in x 1.41 in (168.9 mm x 111.8 mm x 35.8 mm) *Data logger only*
Touch Screen Dimensions	5 inches
Number of Channels	24: 23 can be configured for CAN data. Channel 1 cannot be CAN, and channels 2-8 can be used for direct measurements. If 1-8 are configured for direct measurements, 9-24 can still be CAN channels.
Weight	1.3 lbs (20.8 oz)
IP Rating	IP20
Start Modes	Immediate Start & Delay Start
Memory	1.8 GB, with session size of 1,000,000 or 5,000,000 readings
Battery Type	Rechargeable 3.7 V Lithium Ion Battery Pack
Battery Life	• Continuous on-screen sampling: 7–9 hours depending on display setting and reading rate • Stand-by mode: 100 hours
Data Format	Exported .csv file format, .mtb or both
Time Accuracy	±1 minute/month
Operating Environment	0 °C to +50 °C (32 °F to +122 °F) 0 %RH to 95 %RH non-condensing
Enclosure Material	Polycarbonate, TPE Protective Boot
Calibration	Factory calibration is recommended annually
Alarm Output	50 mA @ 100V, Solid State Relay Output
SAE	J1939 (55 available SPN's)
Range	SPN Dependent
Resolution	SPN Dependent
Message Priority	SPN Dependent

0 - 24 mA	
Range	-5 mA to 50 mA
Resolution	0.0001 mA
Accuracy	±0.024 mA (0 to 24 mA)
Input Impedance	30 Ω

0 - 100 mV	
Range	-100 mV to 2450 mV
Resolution	0.001 mV
Accuracy	±0.1 mV (0 to 100 mV)
Input Impedance	1 GΩ
Maximum Voltage	3.0 V
0 - 10 V	
Range	-0.5 V to 12.0 V
Resolution	0.001 V
Accuracy	± 0.01 V (-0.5 V to 12.0 V)
Input Impedance	1 GΩ
Maximum Voltage	25 V
FREQUENCY / PULSE	
Maximum Count	4,000,000,000
Maximum Frequency	25 KHz
Input Signal	0 V to 12 V
Input Impedance	58 KΩ
TEMPERATURE PT-100 (2, 3, 4-WIRE RTD) (0.00385 CURVE)	
Range	-200 °C to +850 °C (Probe Dependent) (18.5 Ω to 390.5 Ω)
Resolution	0.01 °C
Accuracy	±0.1 °C (-200 °C to +400 °C) (Probe Dependent) ±0.034 Ω (18.5 Ω to 247.1 Ω)
TEMPERATURE NTC-1 (2252)	
Range	-25 °C to +150 °C (Probe Dependent) (29,380 Ω to 41.9 Ω)
Resolution	0.01 °C
Accuracy	±0.50% FSR (Probe Dependent)
TEMPERATURE NTC-2 (10K)	
Range	-25 °C to +150 °C (Probe Dependent) (102,900 Ω to 238 Ω)
Resolution	0.01 °C
Accuracy	±0.50% FSR (Probe Dependent)

RTD Note (All RTD Configurations)
Temperature Specifications based on ideal 100 Ω PT RTD Complaint with IEC 751(1983) and ITS-90. Accuracy based on 4-wire configuration.

BATTERY WARNING: Battery may explode or catch fire if mistreated. Do not disassemble or dispose of in fire. Do not charge except specified with charging condition. Do not heat above 212 °F, or short circuit. Do not crush or modify.

SPECIFICATIONS

Sensor Types & Measurement Ranges

Each of the 8 input channels can be individually configured for the following types and sensor ranges.

PARAMETER	INPUT TYPE	RANGE
Current	Current input	-5 mA to 50 mA
Frequency (port 1 only)	Frequency input	0 to 25,000 Hz
Pulse / Counter (port 1 only)	Pulse input	0 to 4,000,000,000 Pulses
Voltage	Volt input	-0.5 V to 12.0 V
Voltage	Millivolt input	-100 mV to 2450 mV
Temperature	Thermistor NTC-1 (2252)	-25 °C to +150 °C
Temperature	Thermistor NTC-2 (10K)	-25 °C to +150 °C
Temperature	PT100 RTD 2-Wire	-200 °C to +850 °C
Temperature	PT100 RTD 3-Wire	-200 °C to +850 °C
Temperature	PT100 RTD 4-Wire	-200 °C to +850 °C
Temperature	Thermocouple J	-210 °C to +760 °C
Temperature	Thermocouple K	-270 °C to +1370 °C
Temperature	Thermocouple T	-270 °C to +400 °C
Temperature	Thermocouple E	-270 °C to +980 °C
Temperature	Thermocouple R	-50 °C to +1760 °C
Temperature	Thermocouple S	-50 °C to +1760 °C
Temperature	Thermocouple N	-270 °C to +1300 °C
Temperature	Thermocouple B	+50 °C to +1820 °C

Measurement Accuracy

- At room temperature (25 °C ±10 °C) after 60 minute warm-up period.
- Temperature calibrated accuracy is thermocouple dependent.
- Accuracy does not include Cold Junction Compensation (CJC). CJC error: ±1.5 °C

THERMOCOUPLE TYPE	RANGE	RESOLUTION	ACCURACY
J	-200 °C to +760 °C	0.1 °C	±0.5 °C
K	-270 °C to +1370 °C	0.1 °C	±0.5 °C
T	-270 °C to +400 °C	0.1 °C	±0.5 °C
E	-270 °C to +980 °C	0.1 °C	±0.5 °C
R	-50 °C to +1760 °C	0.5 °C	±2.0 °C
S	-50 °C to +1760 °C	0.5 °C	±2.0 °C
N	-270 °C to +1300 °C	0.1 °C	±0.5 °C
B	50 °C to 1820 °C	0.5 °C	±2.0 °C

SPECIFICATIONS

Reading Rate Information

All channels will use the same reading rate.
Reading rates will be capped at 4 Hz when a temperature channel is selected.

- 4 KHz (Supports single channel of voltage or current measurement only)
- 2 KHz (Supports single channel of voltage or current measurement only)
- 1 KHz (Supports single channel of voltage or current measurement only)
- 500 Hz (Supports single channel of voltage or current measurement only)
- 250 Hz (Supports single channel of voltage or current measurement only)
- 100 Hz (Supports single channel of voltage or current measurement only)
- 50 Hz (Supports single channel of voltage or current measurement only)
- 25 Hz (Supports single channel of voltage or current measurement only)
- 10 Hz (Supports multiple channels of voltage or current measurement only)
- 4 Hz
- 1 Second
- 2 Seconds
- 5 Seconds
- 10 Seconds
- 15 Seconds
- 30 Seconds
- 1 Minute
- 2 Minutes
- 5 Minutes
- 10 Minutes
- 15 Minutes
- 30 Minutes
- 1 Hour
- 2 Hours
- 5 Hours
- 10 Hours
- 12 Hours
- 24 Hours

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NEED HELP?

Device Maintenance:

- To provide optimum performance and accuracy, MadgeTech recommends an annual factory calibration for the Titan S8-CAN.
- To send a device back to MadgeTech for calibration or repair, please visit the MadgeTech website at **madgetech.com**.

Product Support & Troubleshooting:

- Visit our Knowledge Base online at **madgetech.com**.
- Contact our friendly Customer Support Team at (603) 456-2011 or **support@madgetech.com**.

MADGETECH
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