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DTSAA ShapeArray Datalogger Manual

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REVISION HISTORY

Rev.	Revision History	Date	Prepared By	Approved By
A	Initial release.	2020-Aug-14	JT	AB

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1 INTRODUCTION

Figure 1-1 DTSAA ShapeArray datalogger

1	Cable gland	**3**	USB port
2	Black cable plug	**4**	Phillips screw

A mini-B USB connector cable is included in a standard DTSAA data logger shipment.

Contact RST Instruments if any items are missing from the shipment.

Visit https://www.rstinstruments.com/Geotechnical-Videos.html or for an instructional installation video.

An optional Cable Gland Nut Wrench may be purchased from RST for effortless cable gland access. Contact RST for more details.

Figure 1-2 Cable gland nut wrench

2 SAFETY

Avoid potential electrical faults when wiring the DTSAA data logger.

Do not wire the DTSAA data logger in a lightning storm.

2.1 BATTERY SAFETY

The DTSAA data logger uses a 3.6 V lithium-thionyl chloride D-size battery (SAFT LSH).

CAUTION:

Do NOT attempt to recharge the battery.

Do NOT replace the battery with an alkaline or zinc-carbon battery.

Do NOT ship the DTSAA data logger with the battery inside.

Recycle the battery according to local regulations.

Contact RST for replacement batteries.

3 INSTALLATION

3.1 INSTALLATION TOOLS AND MATERIALS

- Desktop or laptop computer with USB port.
  - Supported operating systems include Microsoft™ Windows 7, 8, 8.1, and 10.
- Phillips #2 screwdriver.
- Flat-head 2.5 mm screwdriver.
- Two 20 mm open wrenches or small crescent wrenches.
  - Optional: Cable Gland Nut Wrench.

3.2 SOFTWARE INSTALLATION

1 Download the DT Logger Host software from the software section of the RST Instruments website (https://rstinstruments.com/software-downloads/).

2 Follow the on-screen instructions. The default directory is:

C:\Program Files\RST Instruments\DT Logger Host

The drivers will automatically install. Refer to Section 5 if they do not install.

3.3 MEASURAND SHAPEARRAY

CAUTION:

AVOID OPERATIONS WITH THE LOGGER COVER OFF IN RAIN OR SNOW.

DO NOT ALLOW RAIN OR SNOW TO ENTER THE ENCLOSURE.

DO NOT INSTALL IN FLOODABLE LOCATIONS.

THE LOGGER IS RAIN-TIGHT ONLY AND SHOULD NOT BE SUBMERGED.

1 Loosen the cable gland using two 20 mm wrenches. Hold the bolt in place with one wrench. Loosen the cap with the other wrench. Refer to Figure 3-1 for proper wrench placement.

Refer to Figure 3-2 for the cable gland nut wrench placement.

CAUTION: ENSURE THE ENTIRE NUT BODY DOES NOT LOOSEN. LOOSEN ONLY THE GLAND.

Figure 3-1 Loosen the cable gland using two 20 mm wrenches

Figure 3-2 Loosen the cable gland using the cable gland nut wrench

2 Remove the black cable plug from the cable gland. Refer to Figure 3-3.

Figure 3-3 Remove the cable plug from the cable gland

3 Loosen the 4 Phillips screws on the top of the logger. Lift the cover off.

4 Insert the sensor cable with stripped wire ends through the cable gland and into the logger. Ensure the cable sheath is inside the enclosure.

5 Connect the leads. Refer to Table 3-1. Secure the wires to the logger circuit by tightening each wire with a 2.5 mm flat-blade screwdriver.

CAUTION: ENSURE NO BARE WIRES ARE VISIBLE.

Table 3-1 Cable connections

Terminal ID	Wire Colour
WHT	White
BLU	Blue
BLK	Black
RED	Red
SH	Bare (Shield)

6 Tighten the cable gland using the same wrench positioning as step 1. Refer to Figure 3-4. Tug gently on the cable after each half turn to inspect cable mobility.

7 Perform a final half turn once the cable is immobile. Do not overtighten or under tighten.

CAUTION:

OVERTIGHTENING THE CABLE GLAND COULD DAMAGE THE CABLE.

UNDER TIGHTENING THE CABLE GLAND COULD CAUSE A LEAKAGE AND WATER DAMAGE.

Figure 3-4 Tighten the cable gland

8 Hold down the battery with one hand. Pull the entire battery tab out with the other hand. Refer to Figure 3-5.

Figure 3-5 Activate the battery

9 Roll the battery back and forth inside the sheath to clear contact surfaces.

10 Replace the cover. Loosely tighten each screw in the X pattern as shown in Figure 3-6. Then securely tighten each screw in the X pattern.

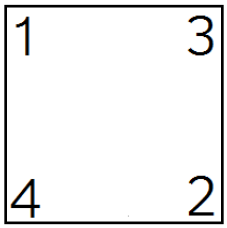

Figure 3-6 Tighten screws in the following order

CAUTION:

ENSURE THE DT LOGGER HOST SOFTWARE AND USB DRIVERS ARE INSTALLED BEFORE PROCEEDING FURTHER.

11 Unscrew the cover of the mini-B USB port. Refer to Figure 3-7.

Figure 3-7 Mini-B USB port

12 Connect the supplied USB connector cable to the DT ShapeArray data logger and computer's USB port.

13 Launch the DT Logger Host software. Wait for the port and status indicator to turn green. Refer to Figure 3-8. Refer to Section 5 if the indicators do not turn green.

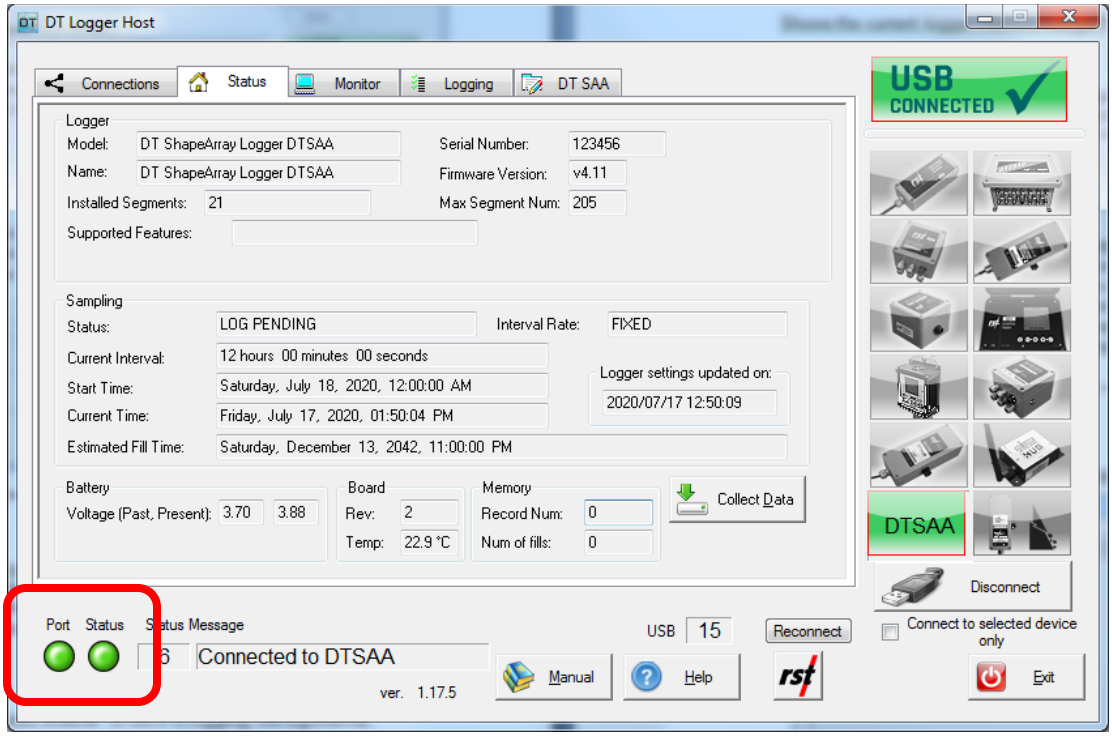

Figure 3-8 Port and status indicators

The DT ShapeArray Logger is now ready to be configured for data logging.

4 LOGGER CONFIGURATION

This section describes how to correctly configure a DTSAA using the DT Logger Host software. For additional information, please consult the DT Logger Host Instruction Manual (ELM0080).

4.1 LOGGING TAB

Configure the logger in the Logging Tab of the DT Logger Host software prior to data collection.

Refer to Table 4-1 for logging settings and descriptions.

NOTE: SOME LOGGER CONFIGURATION PARAMETERS WILL BE CONTROLLED BY THE RTU BASE STATION WHEN THE LOGGER IS IN RSTAR ENABLED MODE. ANY SUCH PARAMETERS WILL BE INACCESSIBLE BY THE DT LOGGER HOST SOFTWARE.

CAUTION: DATA LOSS WARNING

ENSURE THE DATA HAS BEEN DOWNLOADED PRIOR TO APPLYING SETTINGS. ALL EXISTING LOGGER DATA WILL BE ERASED DURING LOGGER SETTINGS UPLOAD.

Table 4-1 Logging tab options and description

Setting	Application
Interval	Select 'Use Fixed Interval' to adjust the intervals and set the logging frequency. Select 'Use Multi Interval Table' and click on 'Multi Interval' to set up to 12 custom, multiple logging frequencies. **Note**: The hour, minute, second, and number of iterations per interval must be specified. Each interval MUST have an iteration except the last iteration which must be set to zero. This tells the program that the logger will continue at the last iteration rate.
Logger Options (24 Hour Time)	Check 'Use Start Time' to select the desired logging start time (24-hour format). **Note**: The logger will not start until it reaches the custom start time even if the time has already passed. E.g., if the current time is 13:01 and the start time is set to 13:00, the logger will not start logging data until 13:00 the **next day**. The status will read *Log Pending* until the custom start time is reached. Select 'Wrap on Memory Full (Overwrite Data)' to overwrite the logger memory when logger memory is full. Select 'Stop Logging when Memory Full' to stop collecting data when logger memory is full. This option is recommended for locations with access issues where data may not be retrieved prior to battery failure.
Clock Options	Select a custom date and time or click 'Sync to computer date/time' to sync it to the computer's current date and time. Select 'Auto sync date/time' to always sync to the computer's date/time when connected via USB.
Logger Label	Type a custom name for the logger. Click 'Update Label' to apply the label. This name will appear in the data files.
Apply Settings	Click 'Apply Settings' to save any changes and upload them to logger memory. 'Apply Settings' **must** be clicked to ensure settings are saved. **CAUTION: DATA LOSS WARNING** **ALL EXISTING LOGGER DATA WILL BE ERASED DURING LOGGER SETTINGS UPLOAD. ENSURE THE DATA HAS BEEN DOWNLOADED PRIOR TO APPLYING SETTINGS. SENSOR CONFIGURATION WILL NOT BE AFFECTED.**

Clicking 'Apply Settings' will display a prompt reminding the user to download existing logger data.

Only click 'yes' if the data has already been downloaded. Click 'no' to return to the Logging Tab.

Data may be collected in the Status Tab.

4.2 DT SAA TAB

All currently configured segments are listed along with segment index, segment serial number and segment type. To discover a new ShapeArray that has been connected to the DTSAA logger, select the “Discover Arrays” button.

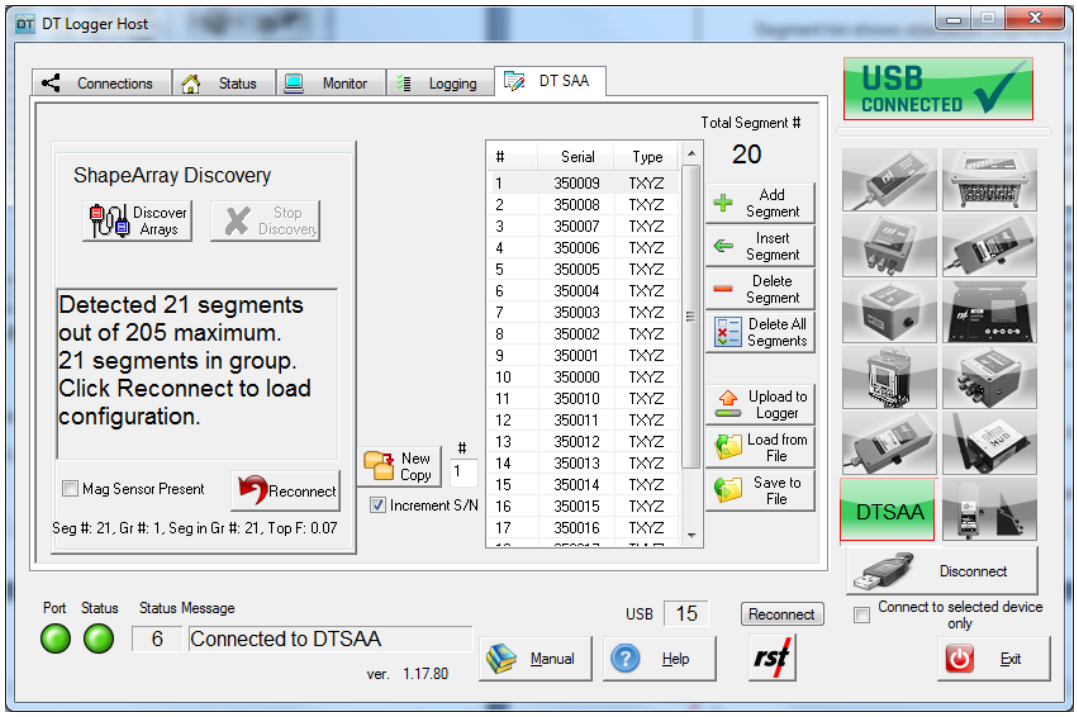

Figure 4-1 DTSAA segment setup tab

CAUTION: DATA LOSS WARNING

ENSURE THE DATA HAS BEEN DOWNLOADED PRIOR TO DISCOVERING A NEW SHAPEARRAY. ALL EXISTING LOGGER DATA WILL BE ERASED AFTER RECONFIGURATION.

4.3 MONITOR TAB

Selecting the monitor tab sets the data logger into monitor mode.

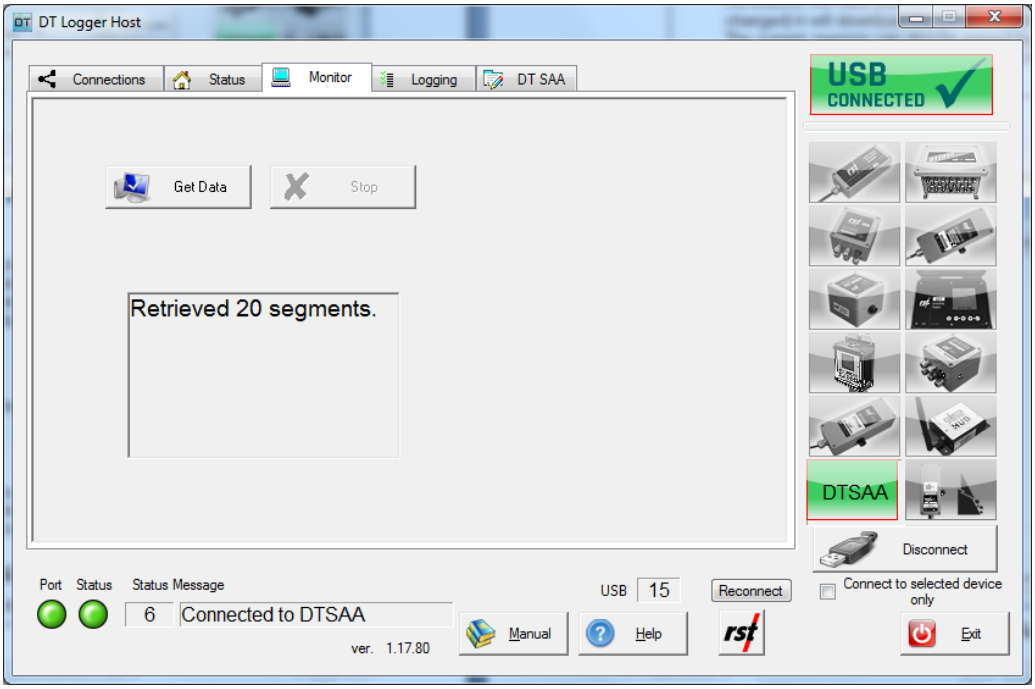

Figure 4-2 DTSAA logger monitor tab

Click “Get Data” to save the current array values into .dat files. These .dat files can be imported into Measurand SAA-SUITE for processing and visualization.

4.4 STATUS TAB

View general information about the currently connected DT ShapeArray data logger (such as logger information, logger status, battery life, and current memory usage) in the Status Tab.

Ensure the serial number displayed matches the logger serial number.

Click 'Collect Data' to download the data into a *.dat file. A prompt will appear asking to append or overwrite data. “Append” will **continue** to add data to existing readings in the memory. “Overwrite data” will erase all data in the logger and **restart** the logging process. The *.dat files can be imported into Measurand SAA-SUITE for processing and visualization.

4.5 CONNECTIONS TAB

Change the logger settings and access advanced features in the Connections Tab.

Advanced features should be used only with the assistance of RST Instruments technical personnel. Contact RST for more information.

Table 4-2 Connections tab options and description

Problem	Solution
Browse	Click to change the *.dat save folder location.
Open Folder	Click to open the *.dat save folder location.
Wireless Settings	Click to select RSTAR mode.
▼Options	Click to access advanced features.
Logger Options	Click to enable Fahrenheit temperature units.
Advanced	Click to access advanced features. Advanced features should be used only with the assistance of RST Instruments technical personnel.
Default Settings	Click to revert logger settings back to default.
Admin Password	Click to change logger password.
Update Check	Click to check for software update.
Update Options	Click to adjust software update frequency and downloads folder location.

5 TROUBLESHOOTING

Press F1 or click the help button to activate the help system. Answers to common problems and troubleshooting tips may be found by browsing help topics or by searching keywords.

Table 5-1 Common troubleshooting problems and solutions

Problem	Solution
Failed Drivers Installation	Manual installation of the USB drivers: **Start Menu > RST Instruments > DT Logger Host > Tools > Install USB Drivers**
Status Message: Port Not Open	Close other windows applications. Select the correct logger using logger mode buttons.
Status Message: Connecting to the logger	Verify that the communication cable is tightly connected. Replace logger batteries.
Reading Errors	Close and restart DT Logger Host software.
Transmission Error	Check the battery state on the Status tab. Drained battery may cause data transmission errors.
Damaged USB port cover	Contact RST for a replacement cap.
Battery voltage below 3V	Contact RST for replacement batteries. Do **not** replace the battery with an alkaline or zinc-carbon C-size battery.

The software should always be closed when changing loggers or reconnecting the cable.

5.1 CHANGING THE BATTERY

CAUTION: CONNECT THE DATA LOGGER TO THE DT LOGGER HOST SOFTWARE AND VERIFY LOGGING SETTINGS AND LOGGER TIME AFTER BATTERY REPLACEMENT. FAILURE TO VERIFY SETTINGS COULD RESULT IN IMPROPER TIME STAMPS AFTER BATTERY REPLACEMENT.

The DT ShapeArray Data Logger uses a 3.6V lithium-thionyl chloride D-size battery (SAFT LSH). Contact RST for a replacement battery.

CAUTION:

DO NOT ATTEMPT TO RECHARGE THE BATTERY.

DO NOT REPLACE THE BATTERY WITH AN ALKALINE OR ZINC-CARBON BATTERY.

DO NOT SHIP THE DTSAA DATA LOGGER WITH THE BATTERY INSIDE.

Replace the battery when estimated battery life is low to ensure uninterrupted operation. The Status Tab battery indicator will turn red when estimated battery life is 20% or less.

The following steps outline the procedure to change the battery:

1 Connect the data logger to the DT Logger Host software. Download existing logger data within the Status Tab.

2 Disconnect the logger from the computer. Loosen the 4 Phillips screws on the top of the logger. Lift the cover off.

3 Remove the battery from the carrier. Replace with a new battery provided by RST. Do not replace the battery with an alkaline or zinc-carbon battery.

4 Replace the cover. Loosely tighten each screw in the X pattern as shown in Figure 5-1. Then securely tighten each screw in the X pattern.

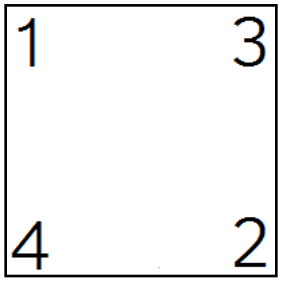

Figure 5-1 Tighten screws in the following order

5 Connect the data logger to the DT Logger Host software. Click on the Connections Tab. Click on 'Advanced'. Click on 'Initialize Battery'.

6 Click on the Logging Tab. Verify that the settings are correct. Click on 'Apply Settings' to verify any parameter changes or to ensure current settings are accurate.

NOTE: 'APPLY SETTINGS' MUST BE CLICKED EVEN IF NO CHANGES HAVE BEEN MADE.

6 SERVICE AND REPAIR

The product contains no user-serviceable parts. Contact RST for product service or repair not covered in this manual.