NOORA LAB TECH

Multichannel USB
Temperature - Humidity Logger

TDSH-DXN Operation Manual

Version: 1.0

2023

Contents

1 General Information

The TDSH-DXN is a multichannel USB temperature-humidity data logger that supports up to 6 solid-state temperature sensing elements, including the DS18B20 Dallas digital temperature sensors, which are controlled separately, and one built-in humidity sensor. The temperature sensors can be used in parallel and are connected via a Lemo 00B 3 series connector.

The TDSH-DXN comes with a software package (LabView & NLT-THLS) that provides a graphical user interface to display, access, and evaluate data when the TDSH-DXN data logger is connected to a PC via a USB 2.0 connection. The software and operating manual are available for download from the product website. When using the units in parallel mode, all features for all of the sensors are accessible in the software.

Please note that only sensors that come with the main controller should be used to ensure warranty coverage. Third-party sensors are not covered under warranty.

Note: NLT-THLS: Noora Lab Tech's temperature-humidity logger software.

1.1 Ordering Codes and Accessories

1.1.1 TDSH-DXN

TDSH: Series number (Temperature - Humidity data systems)
D: Digital Sensor
XN: Channel number (2, 4, 6,)
Example: TDSH-DX6 stands for a digital temperature logger with six channels and one built-in humidity sensor

1.1.2 DS1820-00B3

DS18B20: Sensor part number
00B3: connector type (3-pin Lemo connector)

1.2 Requirements

To remotely operate the TDSH-DXN USB Temperature-Humidity Logger, the following PC specifications are required:

Hardware Requirements:

- CPU: 1 GHz or higher
- RAM: 512 MB or more
- Graphics Card Resolution: Minimum 1280 x 768
- Hard Drive: Minimum 100 MB of available disk space
- Interface: Free USB 2.0 port

Software Requirements: The software package required to operate the TDS-DXN is compatible with the following operating system:

- Windows® 10 (32-bit and 64-bit)

The required software (version 1.0.0) is included with the NLT-THLS installation package.

2 Getting Started

2.1 Parts List

Before opening the package, inspect the shipping container for damage. Do not cut through the cardboard, as the box might be needed for storage or returns. If the shipping container appears to be damaged, keep it until you have inspected the contents for completeness and tested the TDSH-DXN mechanically and electrically.

Verify that you have received the following items within the package:

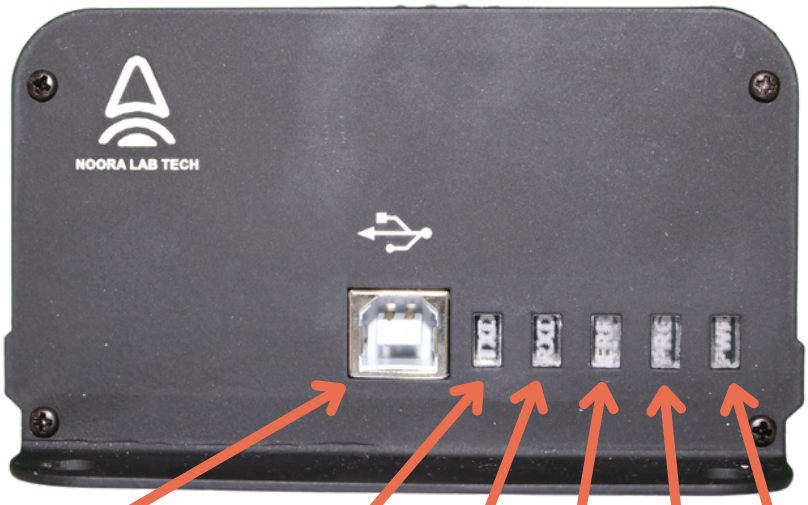
1. TDSH-DXN Multichannel USB Temperature-Humidity Logger
2. Sensors, depending on the logger's channel connectors
3. USB 2.0 type-A to type-B cable (1.X m)

3 Operation

3.1 Operating Elements

USB Connector Side >>>

<<< Sensors Connector Side



USB Type-B

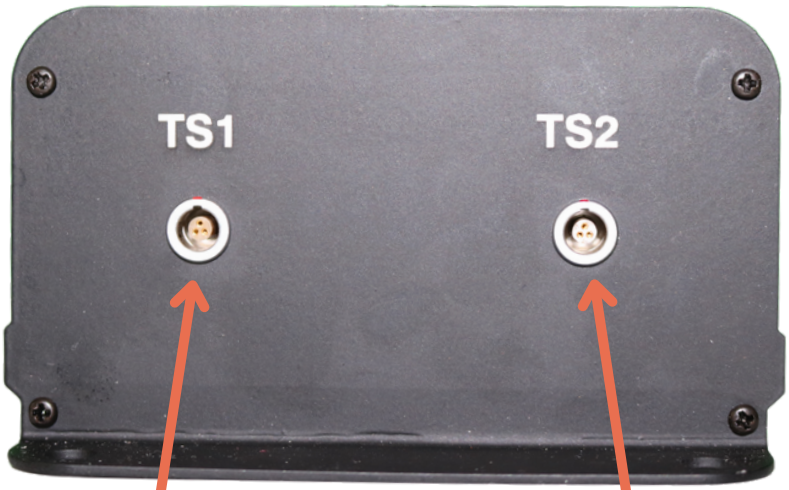
Receive Data LED

Transmit Data LED

Error LED

Program LED

Power LED



Channel one
Sensor Conector

Channel two
Sensor Conector

3.2 Installing the LabView Modules

You can obtain the Zip file(TDSH-OTI), containing the TDSH-DXN, either by downloading it from our website or by requesting it via email from our sales department.

3.2.1 Setup

If you are using Windows 7 or a higher version, you do not need to install the TDSH-DXN USB driver. However, if you are using a version lower than 7, you can download the driver from here.

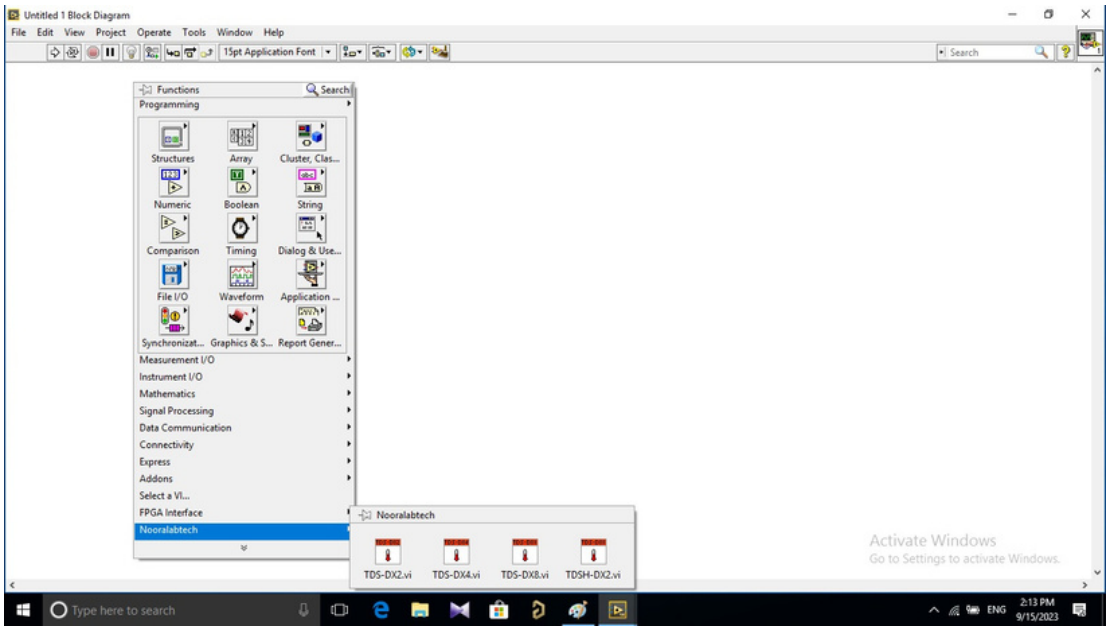
To install the modules, please follow the instructions below:

1. Connect the TDSH-DXN to your PC using the USB cable that comes with the logger.
2. Please download and unzip the TDSH-OTI Zip file. (Please ensure that any open LabView applications are closed.) The extracted files can be located in the directory you specified. Afterward, copy the Nooralabtech folder to the following address::

- For 32-bit operating systems: C:\Program Files (x86)\National Instruments\LabVIEW XXX\menus\Categories\Nooralabtech

- For 64-bit operating systems: C:\Program Files\National Instruments\LabVIEW XXX\menus\Categories\Nooralabtech

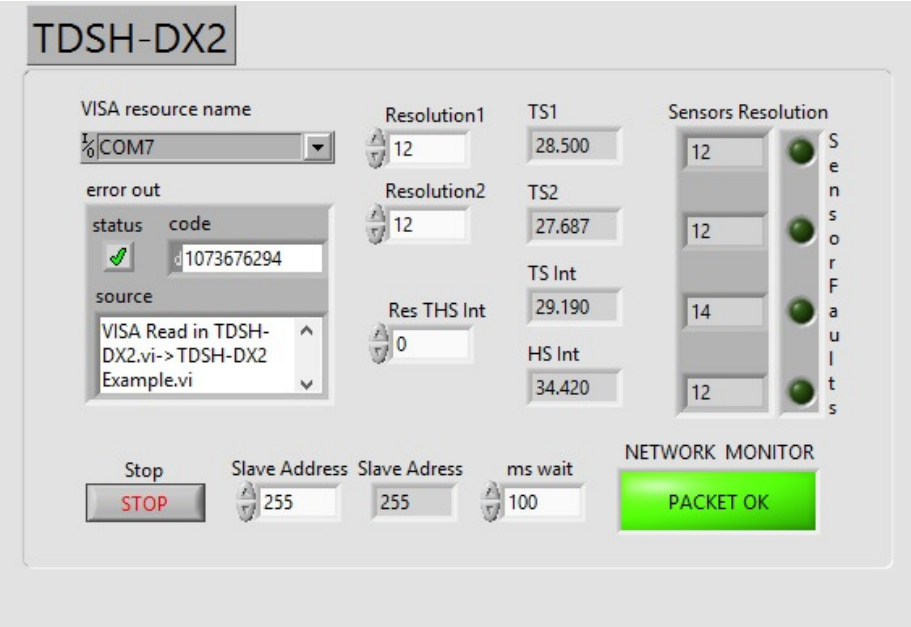
3. Open the LabView program and click on the NooraLabTech Palette. Then, select the TDSH-DXN module.

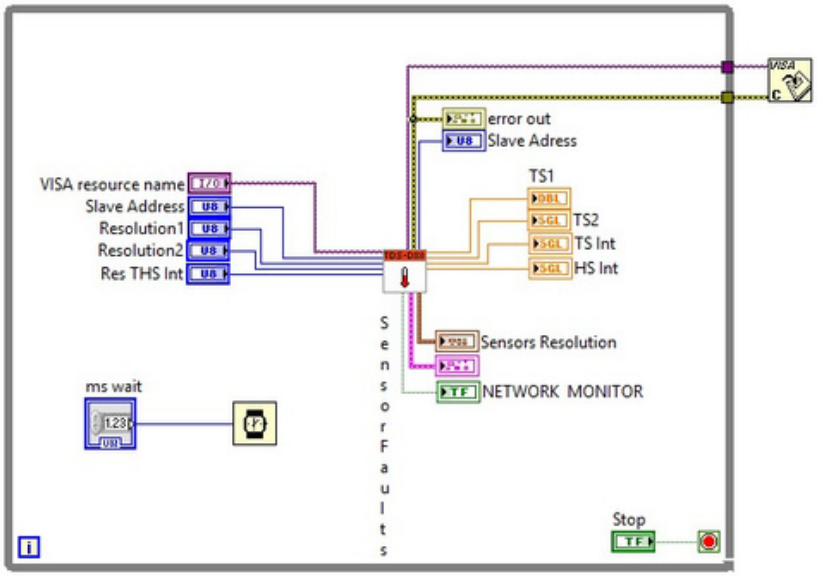


4. You can use the modules and wiring as shown in the sample files below or view them from the directories are listed below:

- For 32-bit operating systems: C:\Program Files (x86)\National Instruments\LabVIEW xxx\examples\Nooralabtech\TDSH-DXN
- For 64-bit operating systems: C:\Program Files\National Instruments\LabVIEW xxx\examples\Nooralabtech\TDSH-DXN

TDSH-DX2:

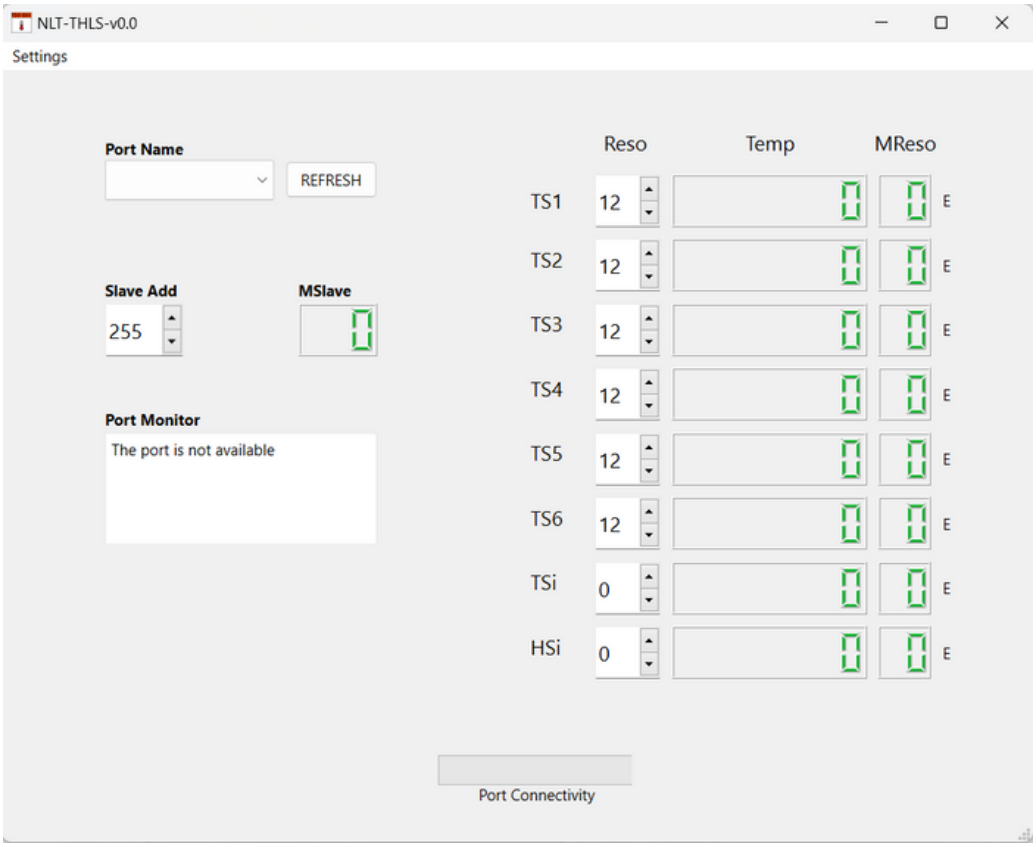




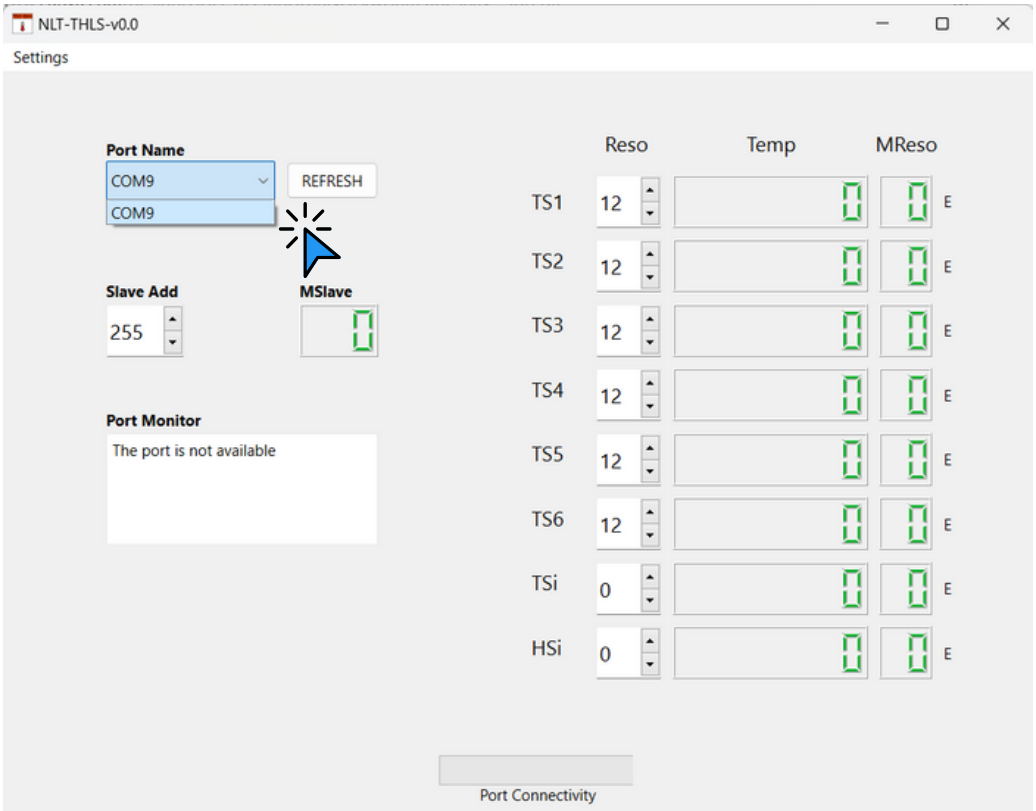
TS1 and TS2 display the temperatures of external wired sensors, while TS-Int and HS-Int represent internal sensors. TS-Int indicates the temperature inside the enclosure, which typically registers 1-3 degrees higher than the external temperature, while HS-Int displays the humidity level. We provided additional details regarding the other options in section 3.3.

3.3 Installing the NLT-THLS Software:

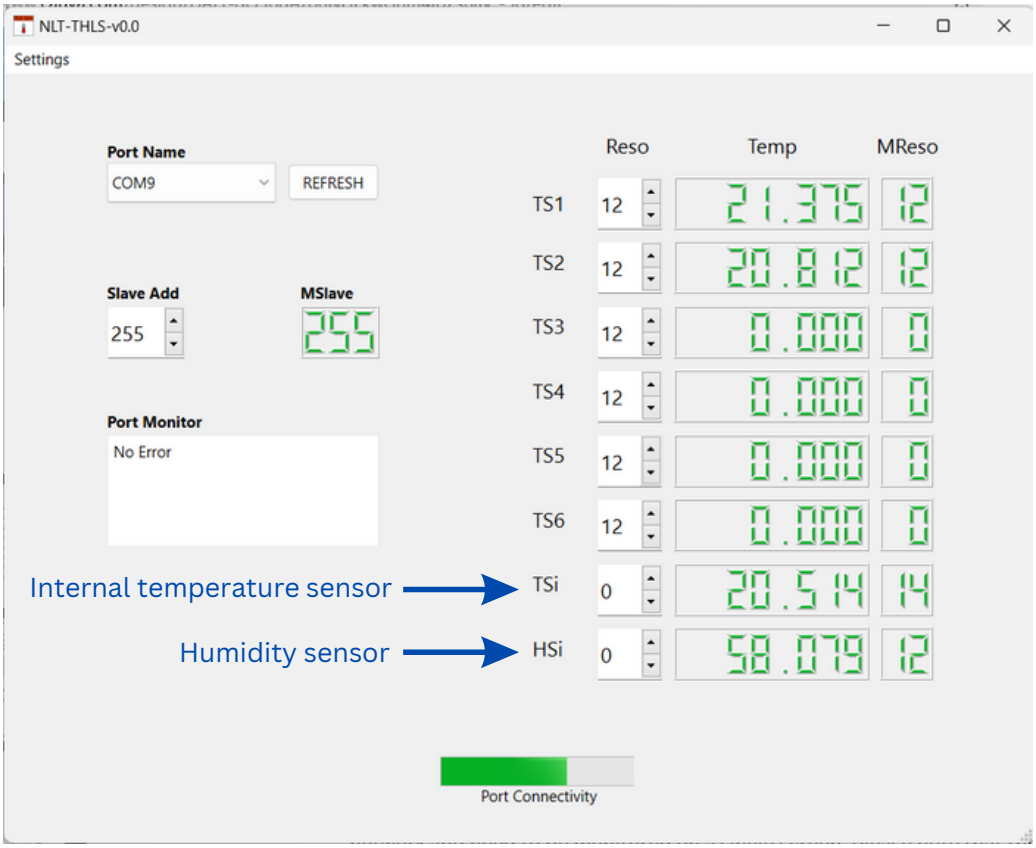
Locate the NLT-THLS folder within the directory where you extracted the Zip file(TDSH-OTI). Next, access the folder and execute the NLT_THLS_v0.exe file to launch the NLT-THLS Windows software.



If you haven't already connected the USB cable to your PC, kindly establish the connection and then click the "Refresh" button. Following that, choose the connected COM port from the Port Name list.



Presently, the temperature and humidity readings are visible on the screen. TS1 and TS2 display the temperatures of external wired sensors, while TSi and HSi represent internal sensors. TSi indicates the temperature inside the enclosure, which typically registers 1-3 degrees higher than the external temperature, while HSi displays the humidity level.

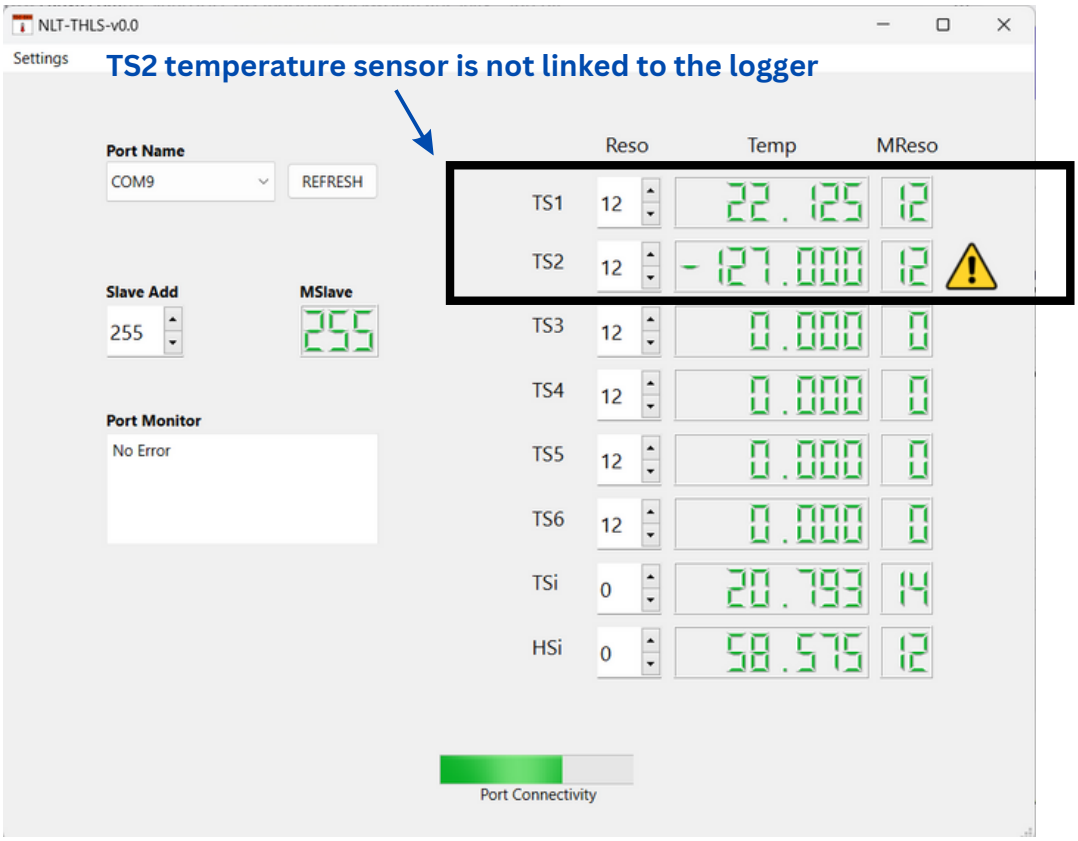


The logger includes an option for situations where multiple loggers operate together within a network and need to be monitored on a single screen. Please note that this feature is not activated in the current version, but it can be customized for your future requirements. The "Slave Add" section has been specifically designed for this purpose.

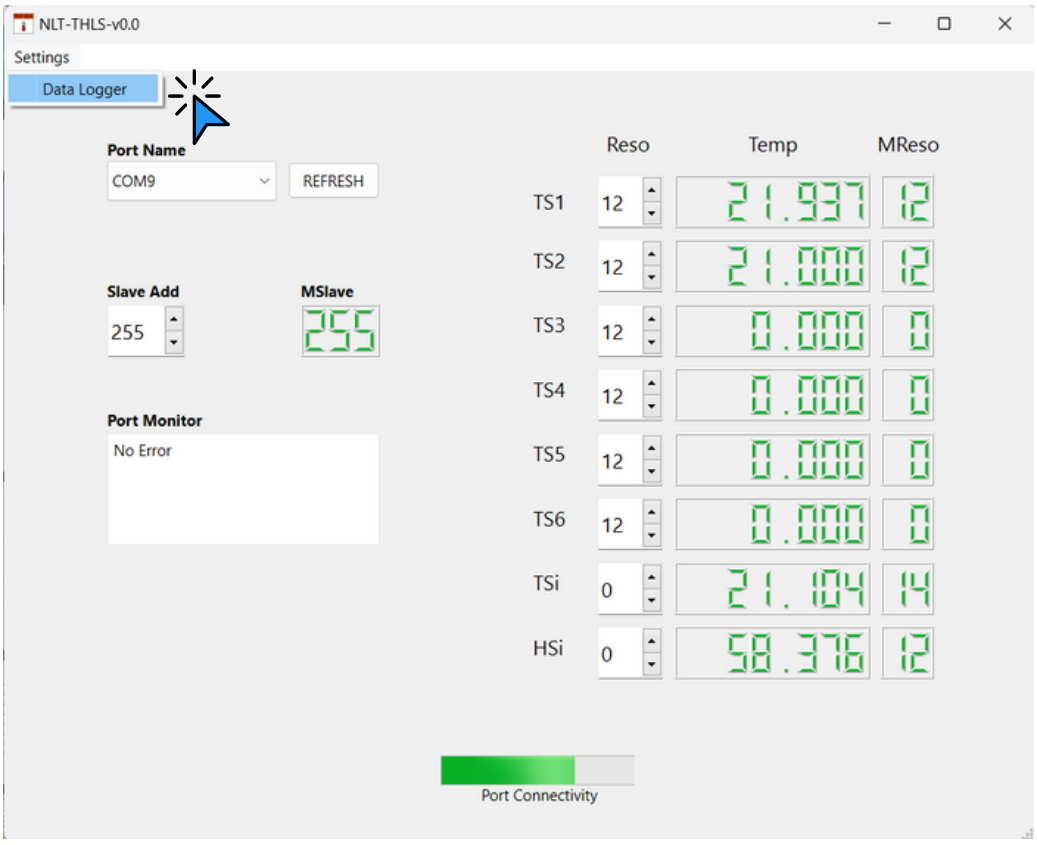
You can track any errors through the "Port Monitor" section and check the connectivity status using the status bar labeled "Port Connectivity" located at the bottom of the screen.

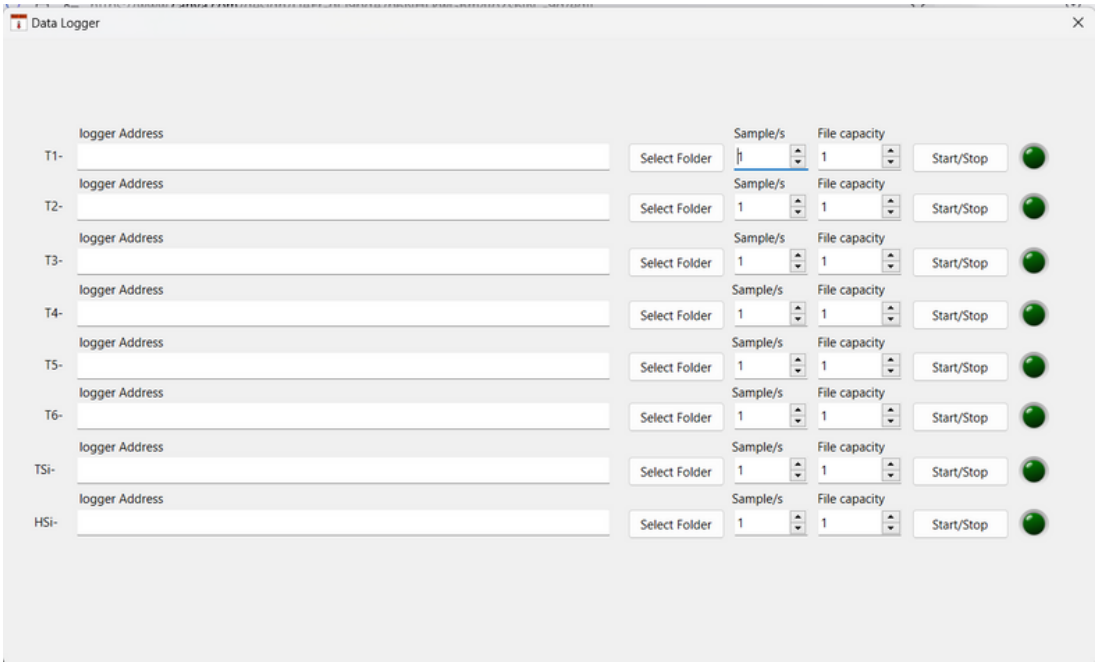
The temperature sensor resolutions range from 9 to 12, while the humidity sensor and internal temperature sensor resolutions fall within the 0 to 3 range.

If either of the two temperature sensors is not linked to the logger, a yellow alert triangle will be displayed next to its corresponding row, and the value will read as -127.000.



To log the sensor's data, click on "Settings" and then "Data Logger." A new screen will open, where you'll need to input your custom numbers.



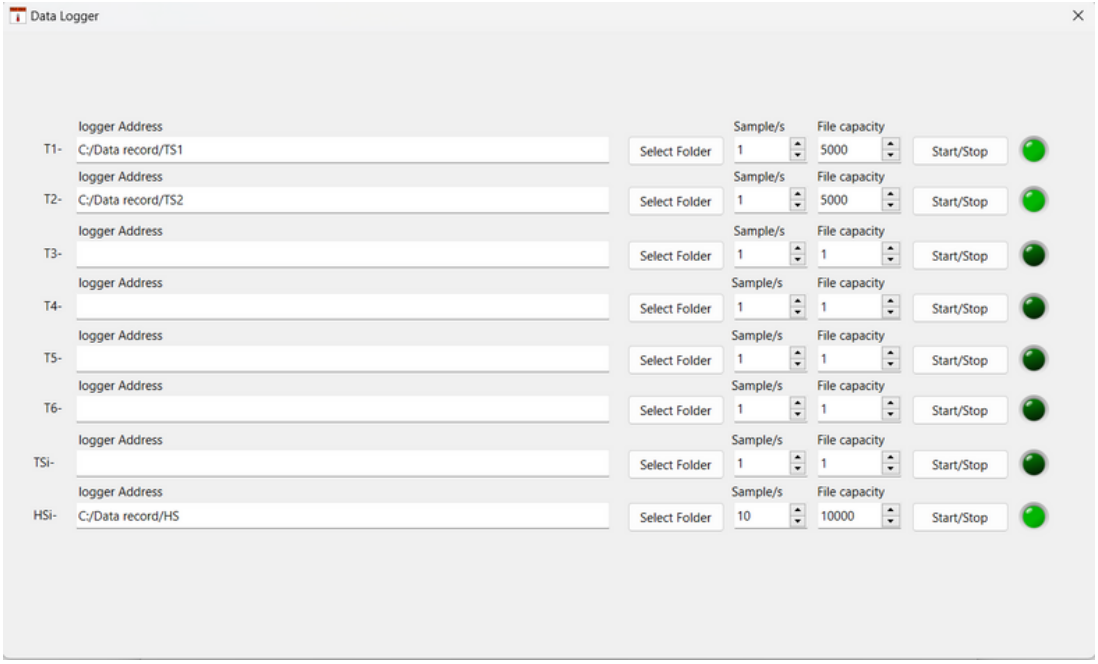


The "Sample" section displays time in seconds. You can input a value between 1 and 65535 to specify the data recording interval. For instance, if you set it to 2, the temperature will be recorded every two seconds.

The "File Capacity" section indicates the maximum number of records in each file. You can set this value between 1 and 10,000. For example, if you choose 5,000, the logger will close the current file after recording 5,000 temperature entries and will automatically create a new file.

Selecting distinct folders for each sensor and providing clear, distinctive names is crucial to avoid any confusion. You can observe our approach to choosing separate files and naming them clearly in the image below.

The data will be recorded in TXT files within each designated folder, and these files will contain information such as the date, time, and sensor data.



3.4 Status LED:

The TDSH-DXN has a status LED that indicates the following states:

- PWR LED: Indicates power status with a green LED.
- PRG LED: Indicates firmware upgrade status with a blue LED and also indicates WiFi connectivity.
- ERR LED: Indicates fatal hardware and sensor errors with an orange LED.
- RXD LED: Indicates data receive status with a red LED.
- TXD LED: Indicates transmit data status with a green LED.

*Please be aware that the WiFi feature was not enabled for this particular series.

3.5 Mounting the TDSH-DXN

The mounting holes of the TDSH-DXN are designed to fit both millimeter and inch-based breadboards. Follow the steps below to mount the TDSH-DXN:

1. Place the TDSH-DXN on the breadboard.
2. Align the holes of the TDSH-DXN with the holes of the breadboard.
3. Use M6 or 1/4'' cap screws to secure the TDSH-DXN in place.

Bottom View

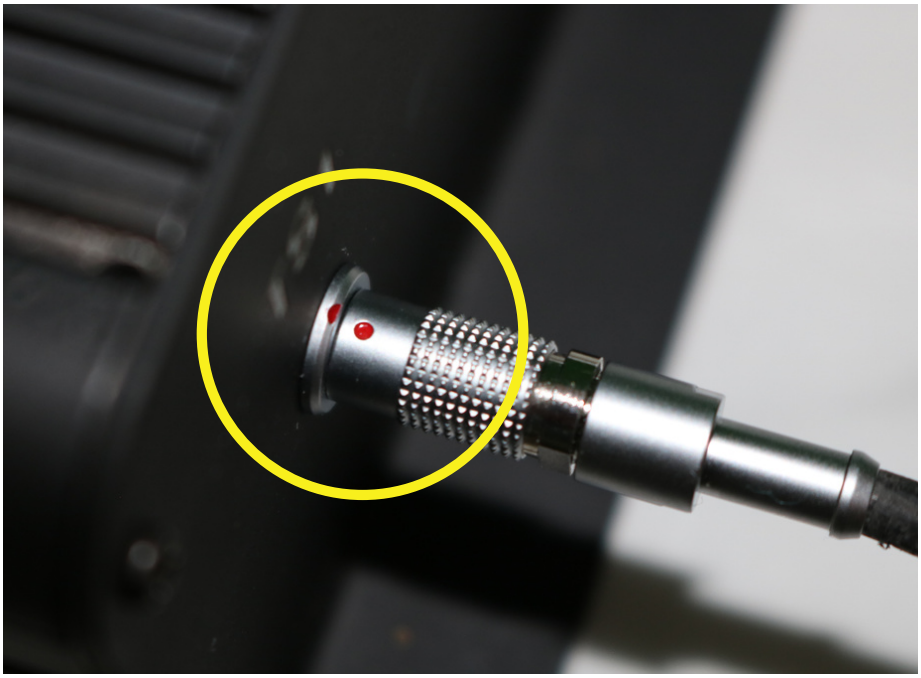
3.6 PIN-OUT Diagram

The pin assignment is described in the picture below.

1- VCC
2- GND
3-Data

All other connectors are the same as sample

To properly connect a sensor to the logger, it is important to ensure that the two little red circles on the sensor and logger are facing each other.
To detach a sensor from the logger, simply pull the sensor's connector outward to disengage it, allowing for easy separation from the logger.



4. Maintenance and Service

To protect the TDSH-DXN, avoid exposing it to adverse weather conditions as it is not water-resistant. Additionally, to prevent damage to the instrument, avoid exposing it to sprays, liquids, or solvents. Please note that the unit does not require regular maintenance by the user, and it does not contain any modules or components that can be repaired by the user. In case of a malfunction, please contact Noora Lab Tech for return instructions. Finally, do not remove the covers to avoid causing any damage.

5. Appendix

5.1 Technical Data

TDSH-DXN SPECIFICATIONS

Compatible Temperature Sensors	**solid-state temperature sensing elements, including the DS18B20 Dallas digital temperature sensors**
Measurement Rate (Sum of All Channels)	**In 9 bit resolution, data response 93.75 ms. In 10 bit resolution, data response 187.5 ms. In 11 bit resolution, data response 375 ms. In 12 bit resolution, data response 750 ms.**
Built-In Non-Volatile Flash Memory	**N/A**
Maximum Data Points (Sum of All Channels)	**N/A**
Connector	**Lemo 00B 3**
Control Interface	**USB Type-B**
Power Supply	**5 V; 200 mA via USB (Max)**
DC Input	**USB 5V**
USB Protocol	**USB 2.0 (USB CDC Class Device)**
Maximum USB Cable Length	**5 meters (16.4 feet)**
Operating Temperature Range TDSH-DXN	**-20 °C to 70 °C**
Storage Temperature Range TDSH-DXN	**-40 °C to 70 °C**
Housing Dimensions (W x H x D)	**134*95*54 mm (5.27*3.74*2.12")**
Mass (Weight)	**250 gr**

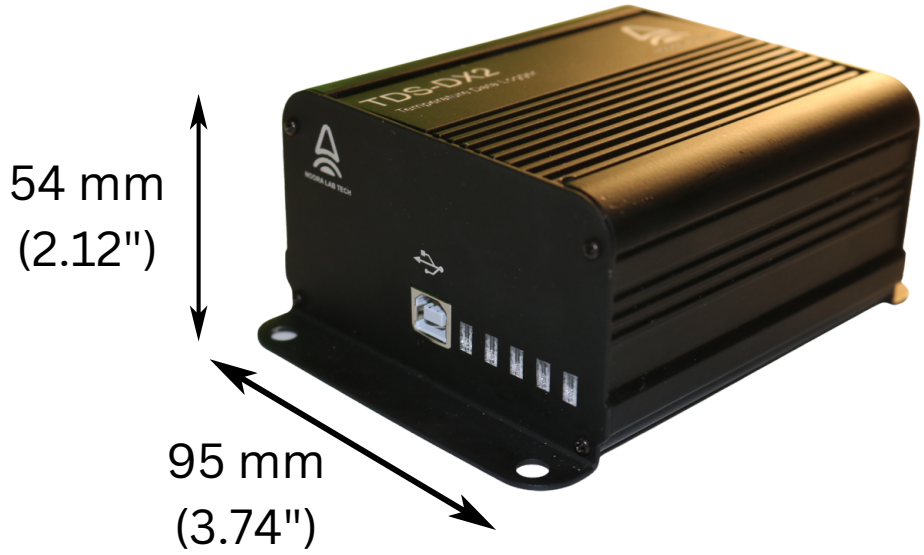
DS18B20 DALLAS TEMPERATURE SENSOR

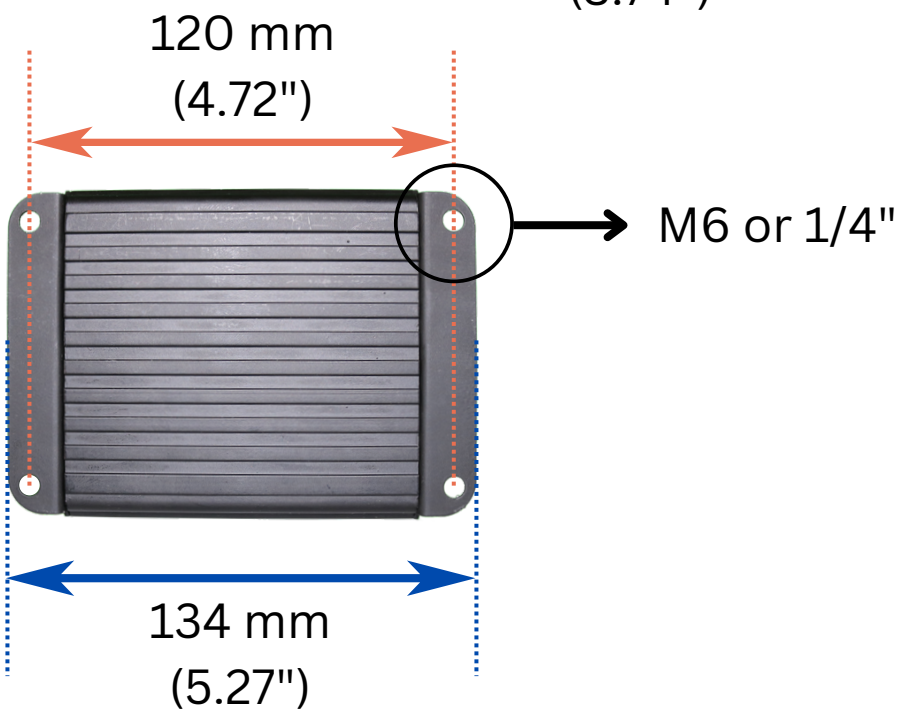
Sensor Channel Count	up to 6
Sink Current	4.0 mA
Storage Temperature Range	-55°C to +125°C
Operating Temperature Range	-55°C to +125°C
Accuracy	±0.5°C Accuracy from -10°C to +85°C
Resolution	9 bit: 0.35˚ 10 bit: 0.175˚ 11 bit: 0.087˚ 12 bit: 0.043˚
Mass (Weight)	20 gr

HUMIDITY SENSOR

Sensor Channel Count	1
Max. supply current	330 uA
Repeatability	±0.1 %RH
Operating Range	0 to 100 %RH
Typ. relative humidity accuracy	3 %RH
Resolution	8 bit: 0.7 %RH 12 bit: 0.04 %RH
Hysteresis	±1 %RH
Nonlinearity	<0.1 %RH

5.2 Dimensions





5.3 List of Acronyms

TDSH-DXN: Multichannel USB temperature-humidity data logger.
NLT-THLS: Noora Lab Tech's temperature-humidity logger software.

5.4 Safety

The safety of any system incorporating the equipment is the responsibility of the person assembling the system. This instruction manual's statements regarding the safety of operation and technical data apply only when the unit is operated correctly as designed. The TDSH-DXN must not be operated in explosion-endangered environments.

It is important not to obstruct the air ventilation slots in the housing, and do not remove covers as there are no user-serviceable parts inside. This precision device is only serviceable if returned and properly packed into the complete original packaging, including the cardboard inserts. If necessary, ask for replacement packaging.

Please refer servicing to qualified personnel. Any changes to this device cannot be made, nor can components not supplied by Noora Lab Tech be used without written consent from Noora Lab Tech.

5.6 Return of Devices

Only return and service this precision device if it is properly packed, like in the complete original packaging

5.7 Manufacturer Address

Noora Solutions Pty Ltd
33 Albany Crescent, Oaklands Park, South Australia, 5046, Australia
+61 416365199
www.nooralabtech.com
sales@nooralabtech.com

5.8 Warranty

The TDSH-DXN logger is warranted by Noora Solutions for a period of 24 months from the date of receiving, covering material and production.