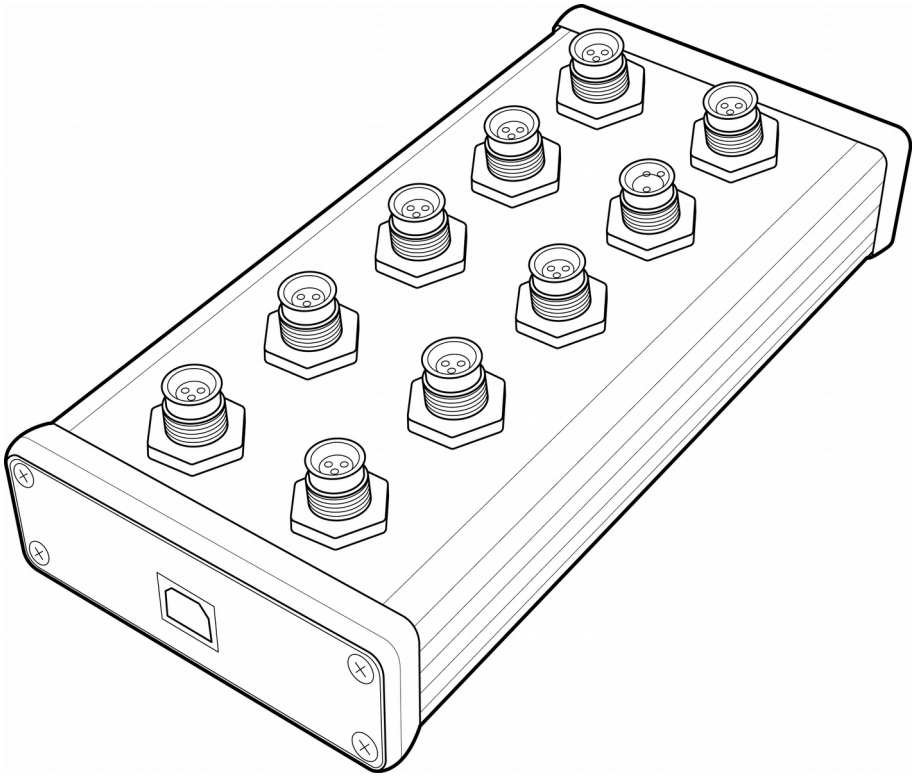
TempMon



User Guide

www.norsci.com/tempmon/

Norris Scientific

Notices....3
Warranty....3
Technology Licenses....4
Acknowledgements....4
Product Description....5
How to Use TempMon....6
PC Connection....6
Software....6
Connect Sensors....6
Sensor Mounting....8
TempMon Viewer Software....10
Installation....10
Configuration....10
Interface....11
Logging....12
Technical Data....13
Specifications....13
Dimensions....14

Notices

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Norris Scientific as governed by Australian and international copyright laws.

TempMon User Guide: Revision B.2019

TempMon Models: NSTM10 and NSTM04

PO Box 204
Moonah, TAS, 7009
Australia

All enquiries to: enquiries@norsci.com

www.norsci.com

© Norris Scientific PTY LTD, 2019

All rights reserved.

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Norris Scientific disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchant-ability and fitness for a particular purpose. Norris Scientific shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this

document or of any information contained herein. Should Norris Scientific and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

Acknowledgements

Thank you to Mr Nicholas West for his help with the electrical design and product development.

Product Description

TempMon is a general purpose temperature monitor designed for use in most laboratory and interior applications. The device supports up to 10 (NSTM10) or 4 (NSTM04) modular sensors, and the sensors can be supplied on leads up to 10m long. Longer sensors are available by request.

The device communicates with a PC over USB, and is powered over the same connection. Like most USB devices, the TempMon device is hot-plug, as are the sensors, and either can be connected or disconnected at any time. When a TempMon device is attached to a PC for the first time it will be assigned a unique serial port which it will retain indefinitely. The device drivers are included with all Windows installations, or from the Windows Update service.

The sensors are waterproof and packaged in stainless steel tubes with an outside diameter of 6mm. Sensors can be easily mounted to most objects using the supplied mounting clips. Plastic clips are provided so as to offer thermal isolation from the object being mounted to, thus improving the response to changes in ambient temperature. Metal clips are provided to improve thermal bonding to the object being mounted to.

A windows program “TempMon Viewer” is provided with all TempMon units. The software allows basic charting and logging of TempMon measurements.

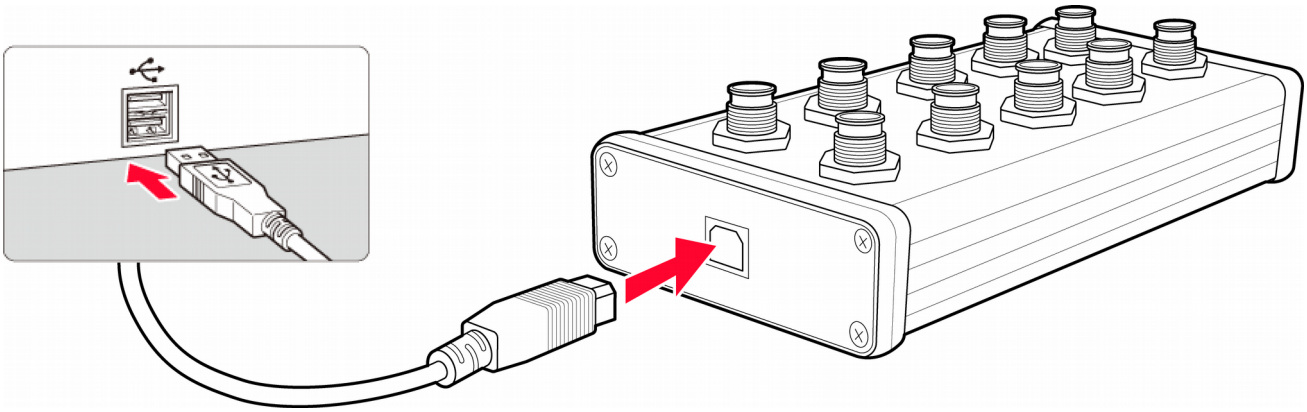
This user guide, software, errata, and any additional information can be downloaded from the TempMon website:

http://norsci.com/tempmon/

How to Use TempMon

PC Connection

Connect the TempMon device to a PC using the supplied USB cable. The device driver is included with all Windows installations, or, it will be downloaded automatically from the Windows Update site.



Once the device is correctly installed it will appear in the Windows Device Manager as a “USB Serial Port”.

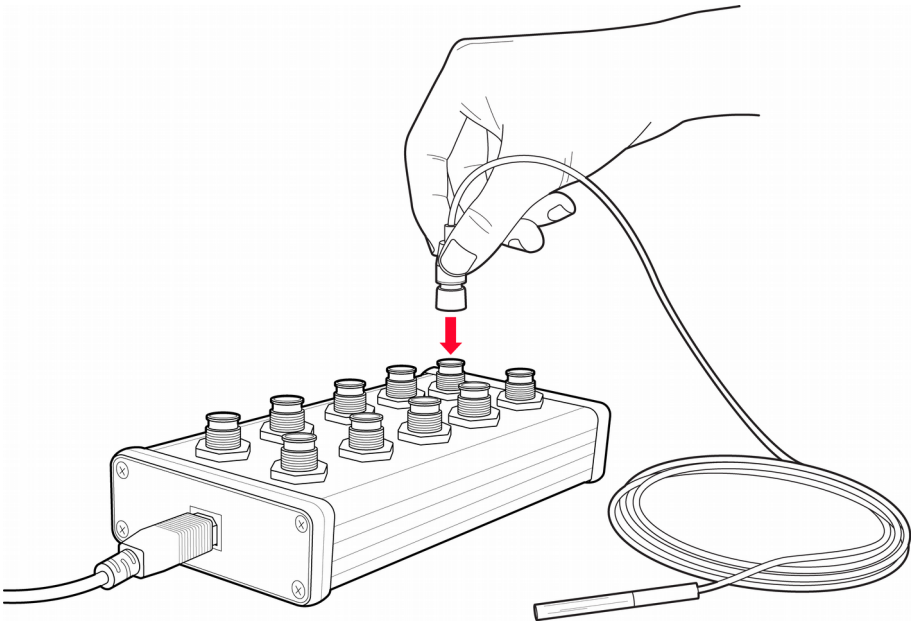
Software

Run the TempMon Viewer software to test the TempMon connection. The device contains an internal temperature sensor and the software should start to show readings from this sensor, even when no other sensors are attached to the device. Additional assistance with the software is covered in the following section “TempMon Viewer Software”.

Connect Sensors

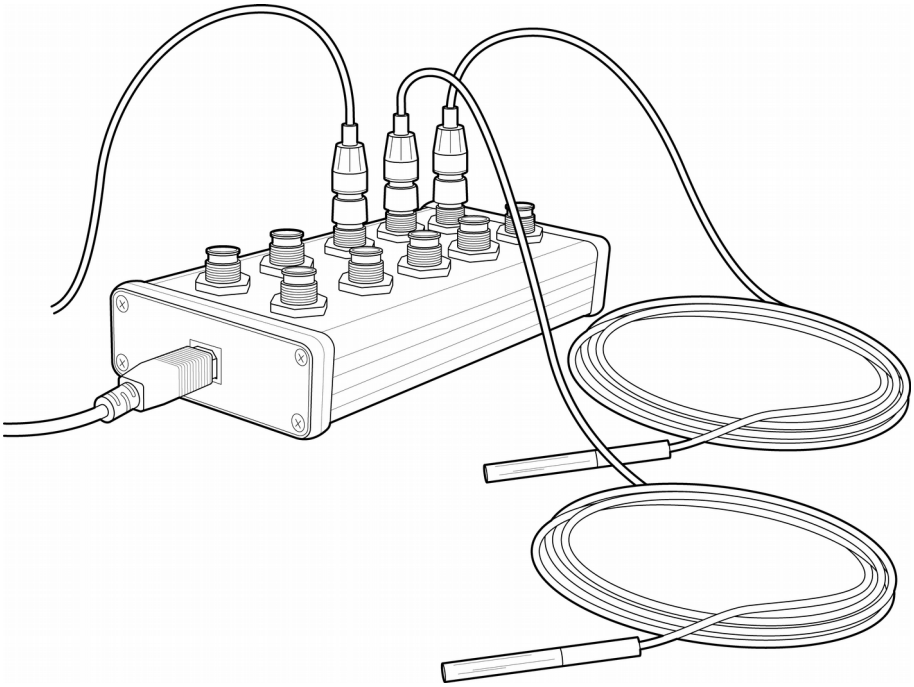
Additional sensors can be attached to the device and mounted where required.

Because each sensor is identified by its unique serial number, they can be plugged into any available port on the device.



It is suggested that you connect each device one at a time. Once the sensor is attached, use the software to rename the sensor so it can be easily identified in the future.

Multiple sensors can be connected to the device.



Sensor Mounting

All sensors are waterproof and can be submerged in up to 10m of water.

When sensors are used to measure ambient temperature they should be thermally isolated from the mounting. Use the plastic clips to hold the sensor, and where possible allow the sensor to protrude beyond the object to which it is attached.

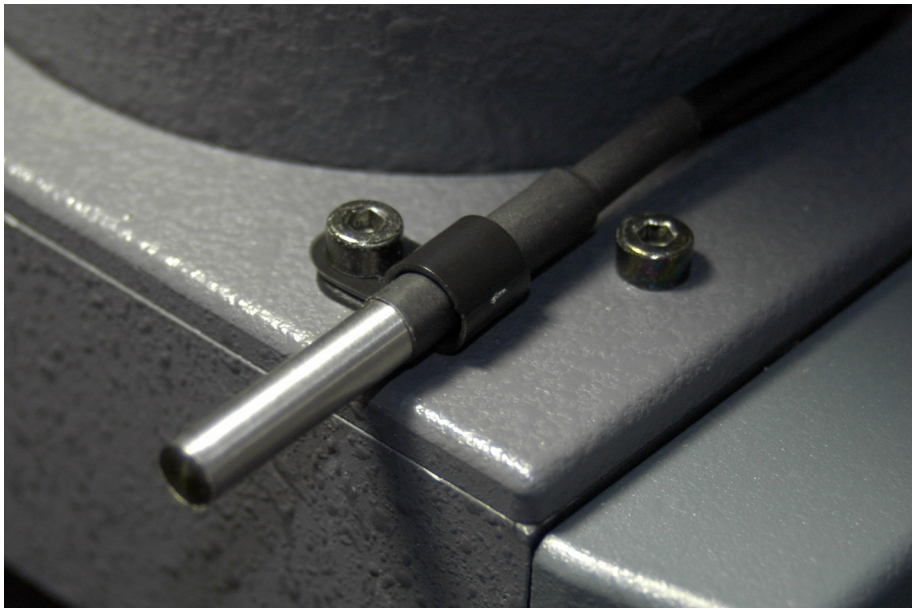


Figure 1: Sensor Mount: Thermally Isolated

When sensors are used to measure the temperature of an object, the sensor should be thermally bonded to the object as much as practically possible. Use the metal clips to hold the sensor up against the object.

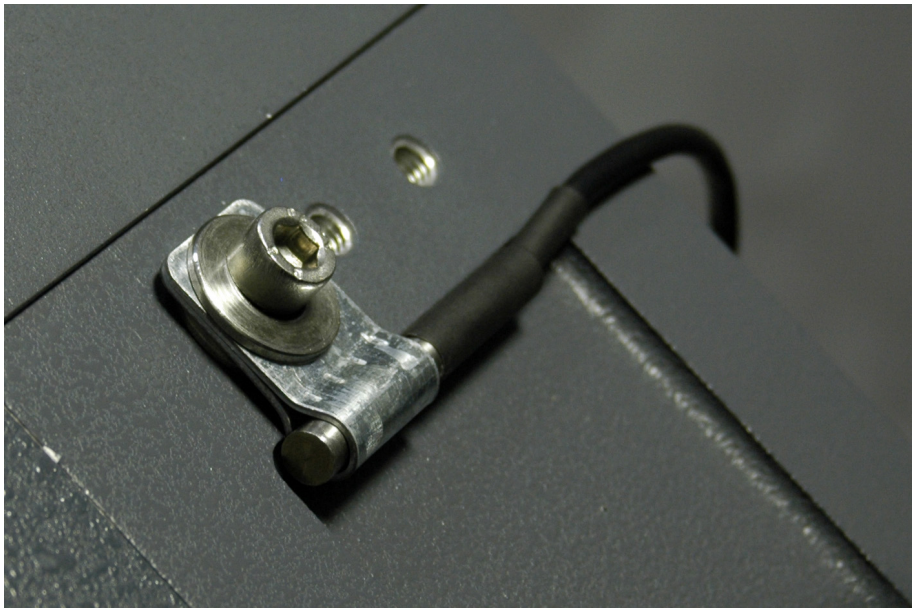


Figure 2: Sensor Mount: Thermally Bonded

If additional accuracy is required, the sensor can be covered with insulation, such as a block of foam or polystyrene.

TempMon Viewer Software

Installation

The TempMon Viewer software does not need to be installed. Download the latest version from the website, unzip the archive, and run the program by double clicking on the TempMonViewer.exe file.

Configuration

Each TempMon device is identified within Windows by a different serial port number. This number can be found by opening the Windows Device Manager and expanding the list of Ports. It is also possible to find TempMon devices automatically from within the TempMon Viewer program.

Configuration of the TempMon Viewer program is achieved via the Settings window, opened from the main menu option Edit → Settings (Figure 3).

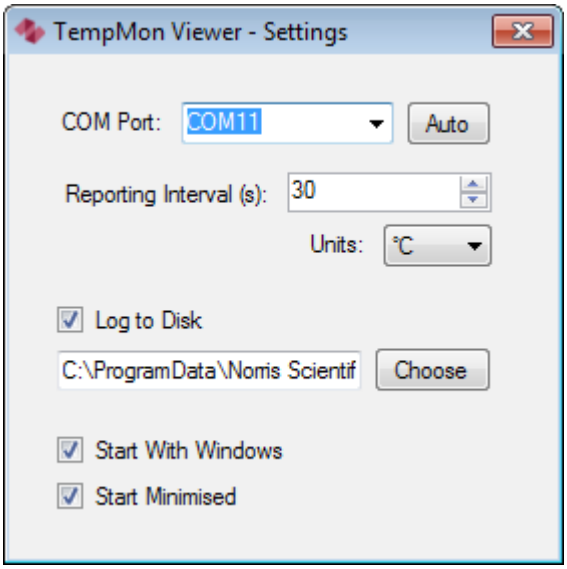


Figure 3: TempMon Viewer Settings

Click the “Auto” button to automatically locate the TempMon device and select its COM port. If more than one TempMon device is present then the first device will be chosen.

Interface

The main TempMon Viewer interface is shown in Figure 4. The chart shows time-resolved temperature measurements, and the table shows all sensors that have been connected since the program was started.

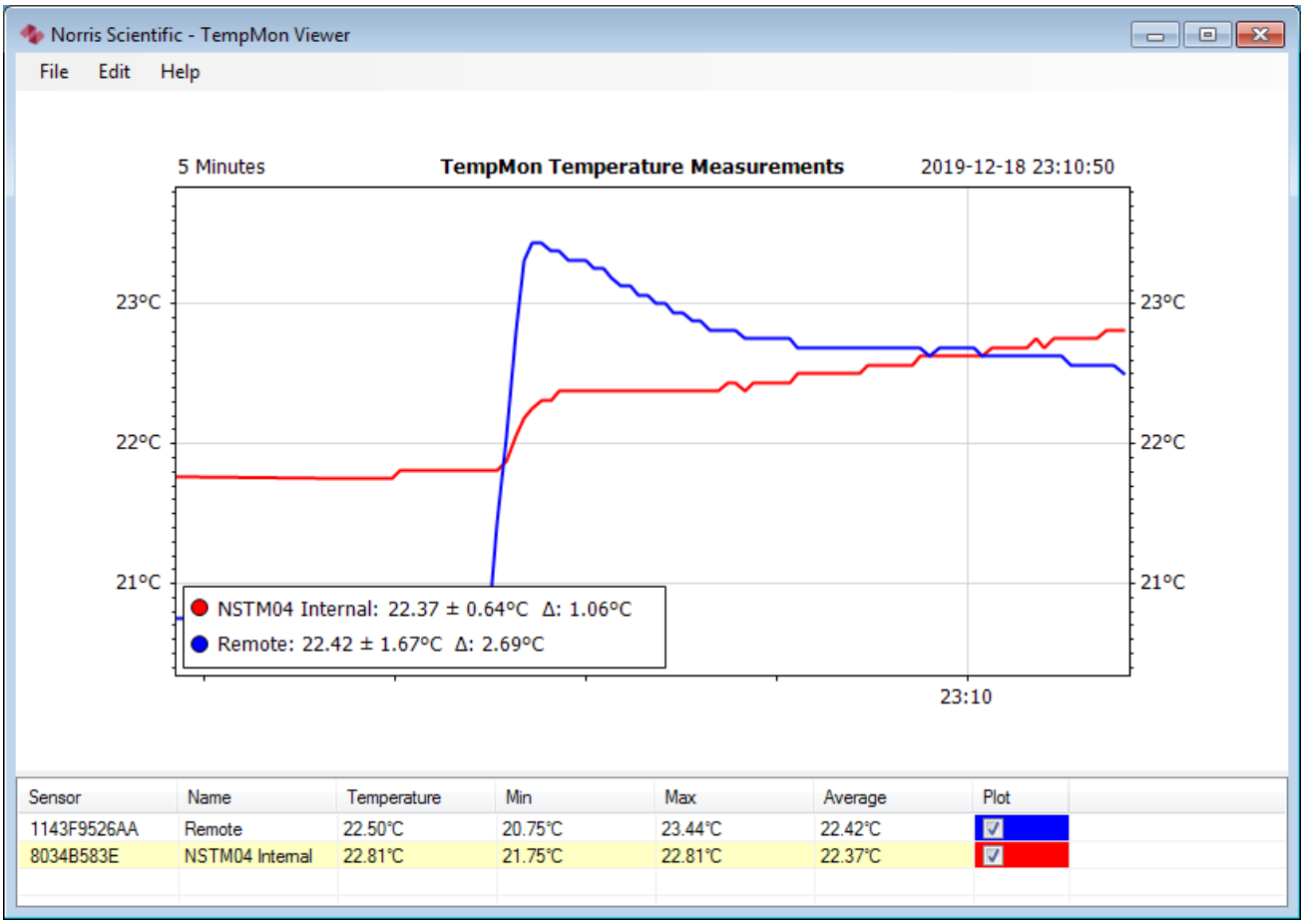


Figure 4: TempMon Viewer Interface

The chart can be configured using the Chart Timeperiod sub-menu under the Edit menu. Choose a timeperiod to display and the chart and table will be instantly updated. The statistics shown in the table (Min, Max, Average) are computed on the readings visible on the chart.

Internally the program stores up to 1000000 readings per sensor. If reporting readings every 30s then the program can store approximately 1 year of readings. Maximum memory use is approximately 50MB per sensor. The program is limited to using approximately 1.6GB of RAM (.NET limitation for 32bit processes) which imposes a theoretical limit of 30 sensors.

The checkbox in the table can be used to control whether the sensor is shown on the chart. If only one sensor is shown on the chart then additional statistics values are also rendered on the chart.

The colours are assigned automatically to the sensors in the order they are enumerated.

Double-clicking any value in the Name column allows the name to be edited. The association of the name to the sensor is remembered indefinitely.

Logging

When logging is enabled readings from each sensor will be written to separate files in the designated folder. A reading will be logged for each sensor at the reporting interval. The log files are in CSV format and contain the following columns:

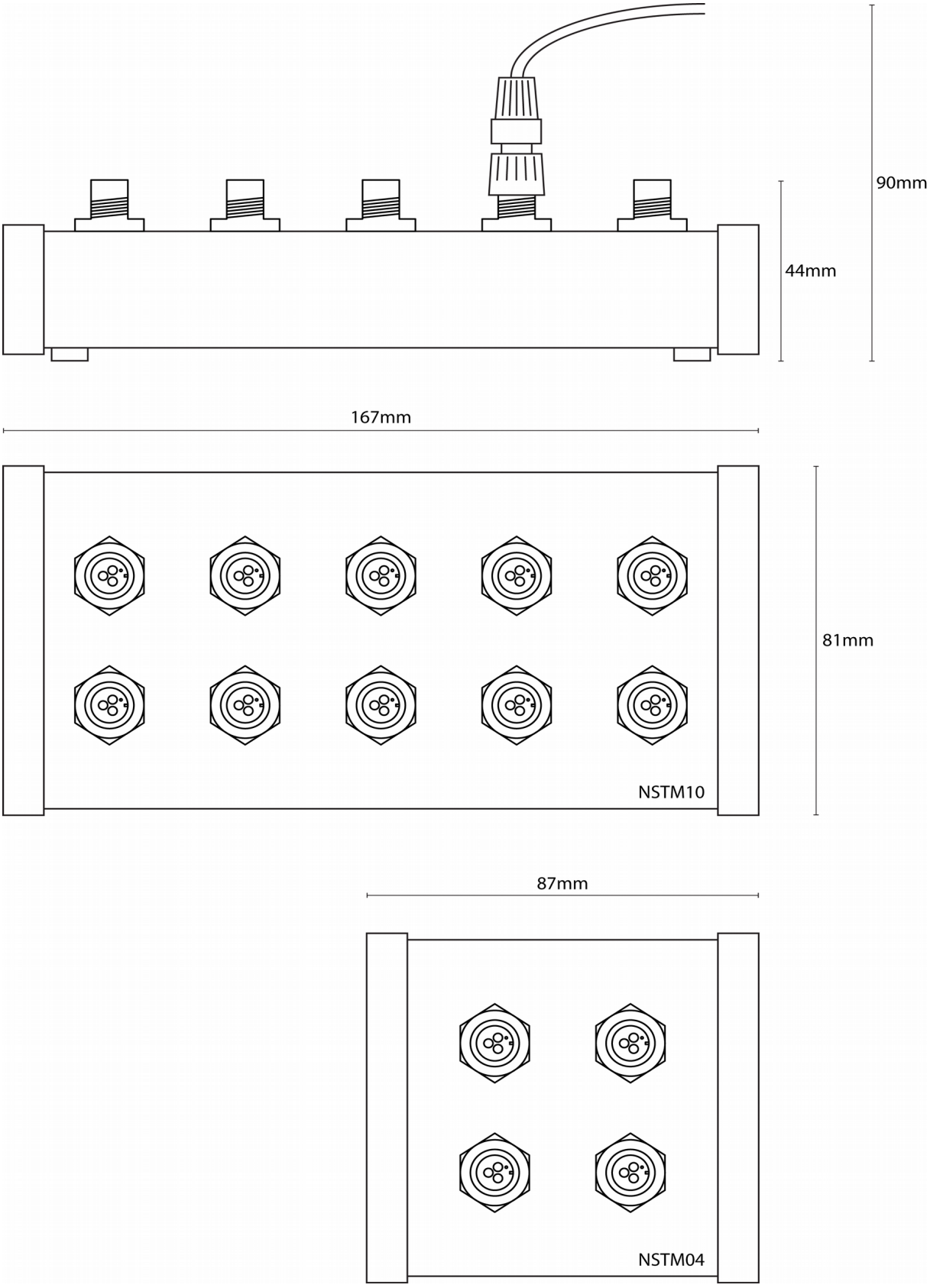
- Time Stamp: The time when the reading was made, using local time, with a fixed format: “yyyy-MM-dd HH:mm:ss”
- Seconds From Start: The number of seconds since the first time stamp in the file.
- Temperature: The reading in the current units with 3 decimal places of precision.
- Units: A string indicating the units associated with the reading.

Please note that logging does not check for empty space on the drive. A representative file, logging every 30s, will accumulate 50KB every 12 hours. This is approximately 250MB per year.

Technical Data

Specifications

Range	-55 to +125 °C
Accuracy	±0.5°C from -10°C to +85°C ±2°C otherwise
Resolution	0.0625 °C
Power	USB (5V⎓100mA)
Interface	USB
Minimum Read Time	750ms
Max # of Sensors[1]	10 (NSTM10) 4 (NSTM04)
Environmental	Device is for interior use only Sensors are waterproof to 10m
Dimensions	167 x 81 x 44mm (NSTM10) 87 x 81 x 44mm (NSTM04)
Weight	400g (NSTM10) 300g (NSTM04)
Colour	Black

1 Each device also includes an internal sensor for ambient temperature measurement.

Dimensions