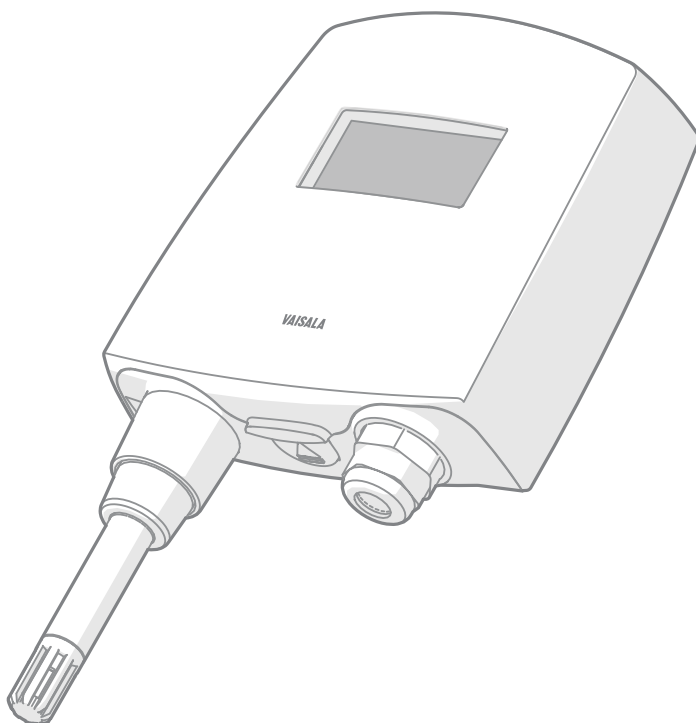


# User Guide

Vaisala Wi-Fi Data Logger  
**HMT140**



**VAISALA**

PUBLISHED BY

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# 1. About this document

## 1.1 Version information

This document provides information for installing, operating, and maintaining Vaisala Wi-Fi Data Logger HMT140. It also details the operation of Vaisala HMT140 Utility software.

Table 1 Document versions (English)

Document code	Date	Description
M211488EN-J	March 2020	This manual. Removed section <i>Regional versions</i> . Updated section <a href="#">Regulatory compliances (page 16)</a> and <a href="#">Table 12 (page 58) Standards and approvals</a> , as well as the note after the table. Minor corrections made throughout the document.
M211488EN-H	July 2019	Previous version. Updated section <a href="#">Regulatory compliances (page 16)</a> and the references to standards and approvals in section <a href="#">HMT140 specifications (page 55)</a> .
M211488EN-G	April 2019	New document template. Added sections <a href="#">Regional Versions (page 10)</a> , <a href="#">FCC compliance statement (page 17)</a> , and <a href="#">ISED compliance statement (page 17)</a> . Updated power supply specifications and section <a href="#">HMT140 specifications (page 55)</a> .

## 1.2 Related manuals

Table 2 Related manuals

Document code	Name
M211484EN	<i>Vaisala Wi-Fi Data Logger HMT140 Quick Guide</i>
M211975EN	<i>Vaisala viewLinc Enterprise Server Version 5.0 User Guide</i>

## 1.3 Documentation conventions



**WARNING! Warning** alerts you to a serious hazard. If you do not read and follow instructions carefully at this point, there is a risk of injury or even death.



**CAUTION! Caution** warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.



**Note** highlights important information on using the product.



**Tip** gives information for using the product more efficiently.



Lists tools needed to perform the task.



Indicates that you need to take some notes during the task.

## 1.4 Trademarks

Vaisala® and HUMICAP® are registered trademarks of Vaisala Oyj.

All other product or company names that may be mentioned in this publication are trade names, trademarks, or registered trademarks of their respective owners.

## 2. Product overview

### 2.1 Overview of HMT140 features

Vaisala Wi-Fi Data Logger HMT140 measures relative humidity and temperature using the connected probe and analog signals – RTD, voltage, current loops, and Boolean contacts. HMT140 comes with or without an optional LCD display.

HMT140 supports several different signal measurements (channels), which are monitored in Vaisala viewLinc Enterprise Server software:

- relative humidity (RH)
- temperature (T)
- switch contact
- voltage and current

Channel types are set at the factory during the time of order. Other wireless parameters can be changed at a later date using HMT140 Configuration Cable and Vaisala HMT140 Utility software.

#### More information

- [Options and accessories \(page 10\)](#)

### 2.1.1 Data management

HMT140 can store several thousands of records before needing to overwrite data. In the event of a communication problem, HMT140 will continue to log and store data until it has collected 3060 records per channel and then it will begin overwriting data.

For example, if HMT140 is configured with a 5-minute sample rate, it will continue to log data for approximately 10 days before overwriting data.

### 2.1.2 Models

The following HMT140 models and options are available:

- HMT141: Vaisala HUMICAP® Humidity and Temperature Probe (RH/T)
- HMT143: dual RTD temperature inputs with 5 m probes (–90 to +90 °C (–130 to +194 °F))
- HMT144: voltage inputs (0 ... 5 VDC)
- HMT145: voltage inputs (0 ... 10 VDC)
- HMT146: current inputs (0 ... 20 mA)
- HMT147: Boolean inputs
- HMT148: RTD temperature input with 5 m probe and Boolean input
- HMT14C: RTD inputs (customer-supplied probe)
- HMT14D: RTD and current input
- HMT14E: RTD and voltage input (0 ... 5 VDC)
- HMT14F: RTD and voltage input (0 ... 10 VDC)

### 2.1.3 Options and accessories

- Vaisala HUMICAP® humidity and temperature probe HMP110
- Humidity and temperature replacement probe HMP110R (Requires a separate order form. For more information, contact Vaisala.)
- Humidity sensor HUMICAP180R
- HMP110 probe mounting flange 226061
- HMP110 probe mounting clamps, 10 pcs 226067
- HMP110 probe cable 3 m (9.8 ft) HMT120Z300
- HMP110 probe cable 5 m (16.4 ft) HMT120Z500
- HMP110 probe cable 10 m (32.8 ft) HMT120Z1000
- Duct installation kit 215619
- Probe mounting flange 226061
- Boolean switch kit with door contact 236319
- Thermal dampener blocks 236310SP
- Recommended battery: Xeno XL-060F
  - Form factor: AA
  - Chemistry: lithium-thionyl chloride (Li-SOCI<sub>2</sub>)
  - Nominal voltage: 3.6V
  - Nominal capacity: 2400mAh
  - Pulse current capability: 120mA
  - Operating temperature range: -40 °C... +60 °C (-40 °F... +140 °F)
  - Voltage @ 2mA & -20 °C (-4 °F): 2.6V
  - Voltage @ 2mA & +60 °C (+140 °F): 2.6V
- HMP110 sensor protection:
  - Plastic grid filter DRW010522SP
  - Plastic grid with membrane filter DRW010525
  - Stainless steel sintered filter HM46670SP

### 2.1.4 Fixed or remote probe

HMT140 is available either with a fixed probe directly attached to the housing or a remote probe with different cable lengths (3/5/10 m (9.8/16.4/32.8 ft)). Extension cables can be easily cascaded in order to obtain longer reach, to a maximum length of 10 m (32.8 ft).

### 2.1.5 Interchangeable probe

The HMP110 humidity and temperature probe used in HMT140 is fully interchangeable. You can easily remove the probe and replace it with a new one without having to adjust HMT140. You have the following options when purchasing a new probe from Vaisala:

- Order a new probe and keep your current one.
- Order a new probe and return the old one to Vaisala (replacement probe).



Only probes that have a compatible digital output (VDIGI mode) can be used with HMT140. Compatible probes have the letter "V" as the first letter in their order code. The order code is written on the probe.

## 2.1.6 Optional display

HMT140 is also available with an optional graphical 128×64 pixel resolution LCD display. The display shows the measurement results of selected parameters in selected units (defined at the time of ordering). The parameters are displayed simultaneously as 2 separate rows on the display.

## 2.2 HMT140 components

The following figure illustrates the main features of HMT140. On the left is a remote probe model without display, and on the right is a fixed probe model with the optional display. The numbers and arrows indicate the main components of the HMT140 models.

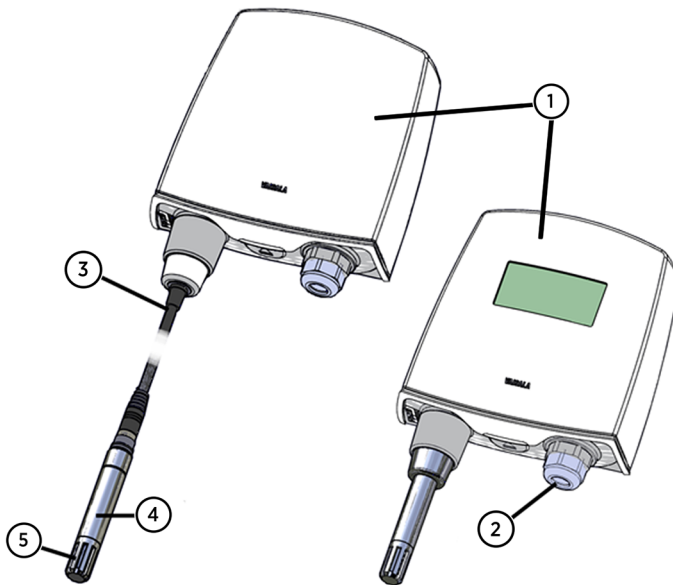


Figure 1 HMT140 features

- 1 HMT140 enclosure
- 2 Cable bushing: cable gland
- 3 Probe cable
- 4 HMP110 probe
- 5 Plastic grid filter

### 2.2.1 Installation kit

HMT140 is typically installed mounted on the wall with up to 4 screws (not included).

For duct mounting, duct installation kits are available as accessories.

To help you position the screws correctly, use the drilling template, available inside the back cover of *HMT140 Quick Guide*.

**More information**

- [Options and accessories \(page 10\)](#)
- [Wall mounting \(page 19\)](#)

## 2.2.2 HMT140 Utility software and HMT140 Configuration Cable

To connect HMT140 to your network, install HMT140 Utility software and connect HMT140 to your PC with HMT140 Configuration Cable (software and cable shipped with viewLinc).

**More information**

- [Configuring HMT140 to your network \(page 25\)](#)

## 2.2.3 Connections and wiring

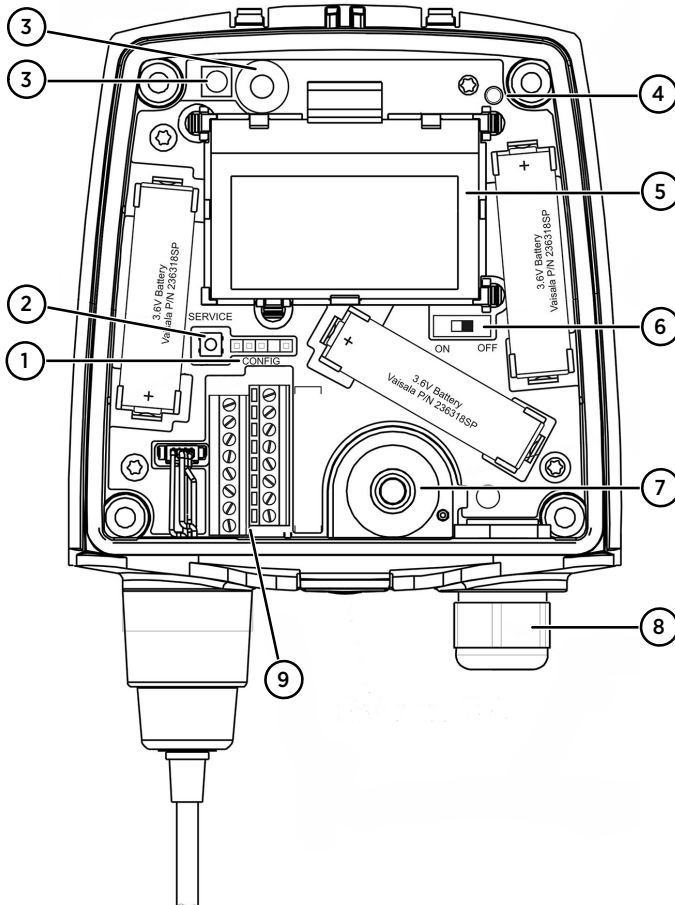
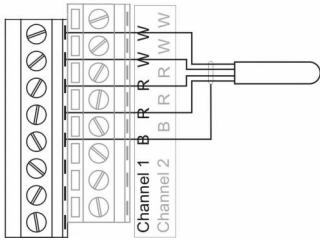


Figure 2 HMT140 components diagram

- 1 **CONFIG** header
- 2 **SERVICE** button
- 3 Infrared sensor
- 4 Status LED
- 5 LCD
- 6 Power switch for battery
- 7 Cable grommet (rubber plug)
- 8 Cable gland
- 9 Channel wire terminals

Channel 1: RTD



Channel 2: RTD

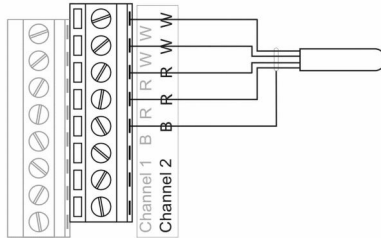
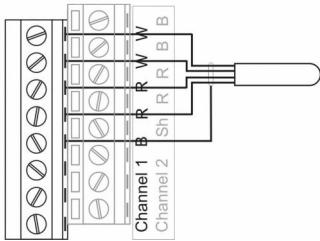


Figure 3 RTD wiring diagram

Channel 1: RTD



Channel 2: Boolean  
(magnetic switch)

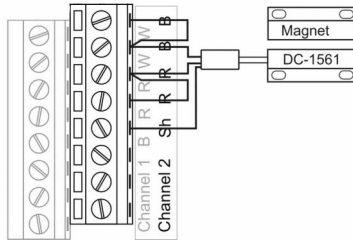
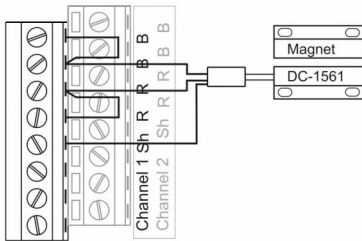


Figure 4 RTD and Boolean wiring diagram

Channel 1: Boolean  
(magnetic switch)



Channel 2: Boolean  
(magnetic switch)

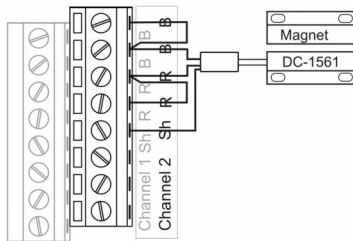


Figure 5 Boolean wiring diagram



Channel 1: DC voltage

Channel 2: DC voltage

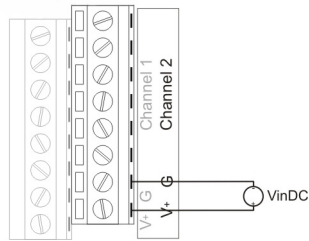
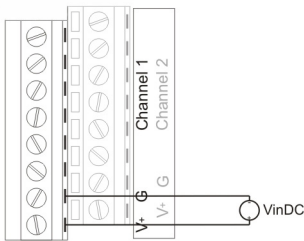


Figure 6 Voltage wiring diagram

Channel 1: Current loop 4-20 mA

Channel 2: Current loop 4-20 mA

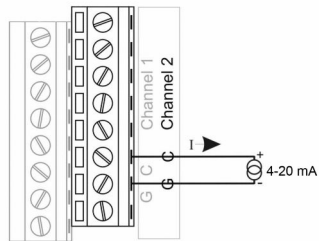
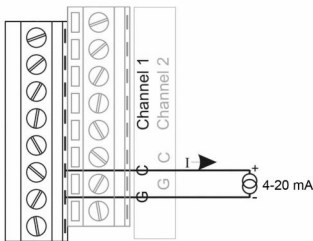


Figure 7 Current wiring diagram

## 2.3 Safety

This product has been tested for safety. Note the following precautions:



**WARNING!** Remove batteries before shipping.



**CAUTION!** Do not modify the unit or use it in ways not described in the documentation. Improper modification or use may lead to safety hazards, equipment damage, failure to perform according to specification, or decreased equipment lifetime.



**WARNING!** If the equipment is used in a manner not specified by Vaisala, the protection provided by the equipment may be impaired.



**CAUTION!** This device requires a separation distance of at least 20 cm. This distance must be maintained between the user and the device when the device is operating.



**CAUTION!** Cet appareil nécessite une distance de séparation d'au moins 20 cm. Cette distance doit être maintenue entre l'utilisateur et l'appareil lorsque l'appareil est en fonctionnement.

### 2.3.1 ESD protection

Electrostatic Discharge (ESD) can damage electronic circuits. Vaisala products are adequately protected against ESD for their intended use. However, it is possible to damage the product by delivering electrostatic discharges when touching, removing, or inserting any objects in the equipment housing.

Avoid touching component contacts or connectors when working with the device.

## 2.4 Regulatory compliances

This product complies with the following standards:

- EN 61326-1, EN 301 489-1, EN 300 328 V2.1.1


This product complies with the following safety standard:

- EN 61010-1

In accordance with the provisions on the Radio Regulations of the People's Republic of China, this radio transmission equipment, after examination, conforms to the provisions with its SRRC ID:

- 2019DJ5109

This product contains a radio module with the following module approvals:

- FCC ID: U30-G2M5477
- IC ID: 8169A-G2M5477
- NCC ID: CCAF11LP0240T6
-  201-125765

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している

## 2.4.1 FCC compliance statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that of the receiver.
- Consult the dealer or an experienced radio/TV technician for help.



**WARNING!** This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



**WARNING!** Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## 2.4.2 ISED compliance statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device has a whip antenna with a gain of 2 dBi.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Le présent appareil dispose d'une antenne fouet avec un gain de 2 dBi.

## 3. Installation

### 3.1 Mounting

Depending on your installation requirements, you may wish to complete the network configuration and setup prior to mounting. Note that you can complete the configuration and setup procedures after mounting with a laptop computer.



To connect HMT140 to your network and view HMT140 data using viewLinc, you need HMT140 Utility software and HMT140 Configuration Cable (software and cable shipped with viewLinc).

#### 3.1.1 Opening HMT140 cover

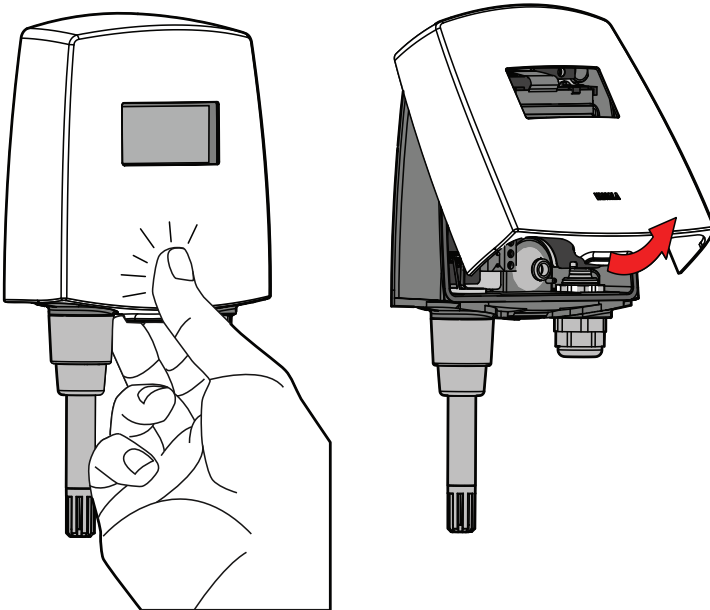


Figure 8 Opening HMT140 cover

- ▶ 1. If HMT140 is not mounted already, hold it against a flat surface.
2. Push on the cover with your thumb, and pull the bottom part of the cover towards yourself.

### 3.1.2 Wall mounting

Before mounting HMT140, consider the environment. It is recommended that wireless devices be mounted in an area with a minimum of wireless interference.

- If you plan to install a device without an LCD in a dark or low-light area, a high-traffic area, or an area with a solid object situated within 10 cm (3.9 in) of the front of the device, you may want to turn off the proximity sensor to avoid triggering unnecessary transmissions (see [Modify transmission settings \(page 27\)](#)).
- To ensure consistent communications and data transfer to Vaisala viewLinc, limit interference from solid structures or wireless/microwave radiation. For additional guidance, please contact Vaisala.



If mounting against a metal surface, be sure to keep a minimum of 2 mm (0.08 in) between the metal and the back of HMT140 to ensure an uninterrupted radio signal.

- ▶ 1. Open the HMT140 cover.
2. Make sure that HMT140 is correctly aligned and attach it directly to the wall with up to 4 screws (not included in the package).  
Select the size and type of the fastening screws according to the wall material (for example, wood or stone). The diameter of the fastening screws is typically between 3.5 and 4 mm (0.14 and 0.16 in). Refer to the drilling template in *HMT140 Quick Guide*.

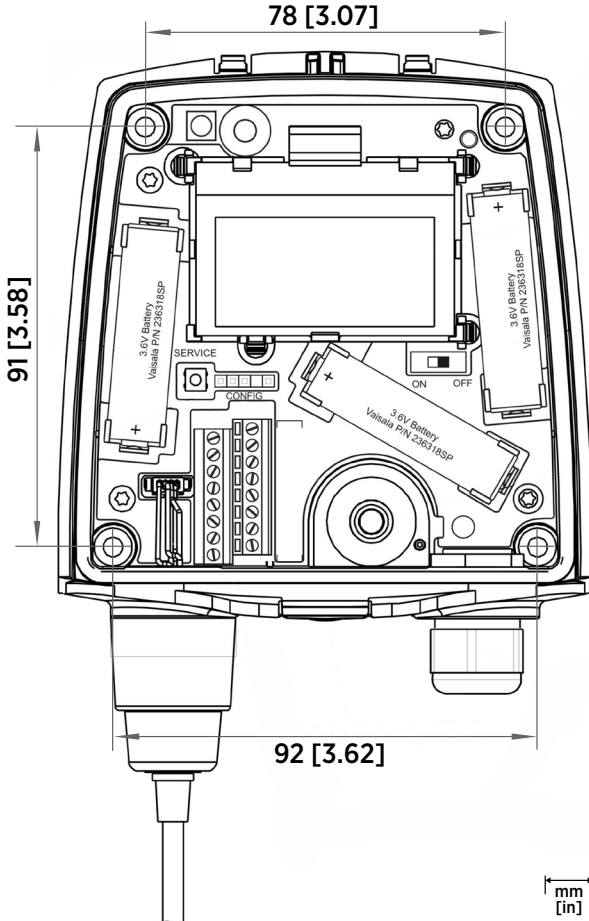


Figure 9 Mounting diagram



Vaisala strongly recommends you to use all 4 screws; however, the HMT140 enclosure fastening holes are initially covered with a thin plastic membrane, so less than 4 screws could also be used without sacrificing the ingress protection (IP) class of the enclosure.

### 3.1.3 Duct installation

The duct installation kit includes a plastic pipe with a flange (Vaisala item code 215619). To install the HMP110 probe with the duct installation kit, drill a hole into the duct wall, assemble the probe to the duct installation kit, slide the probe head through the hole, and attach the flange to the duct wall with 4 screws.

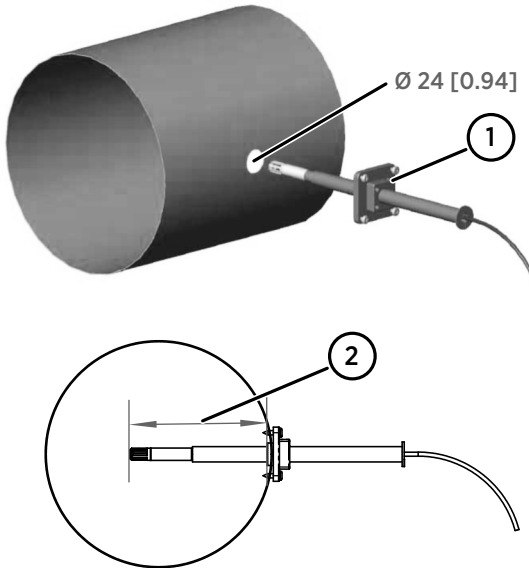
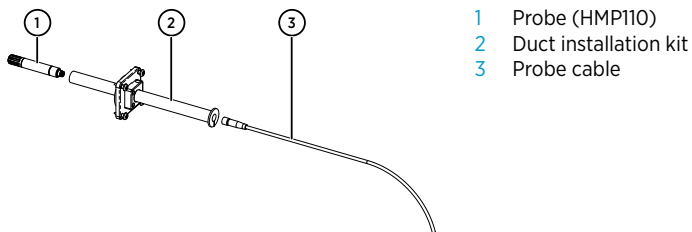


Figure 10 Probe installation with duct installation kit

- 1 Tension screw
- 2 Installation depth. Adjust the depth and lock in place with the tension screw.

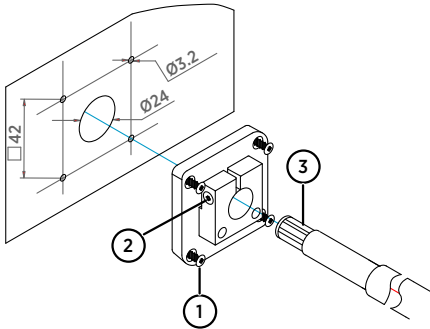
### 3.1.4 Probe assembly with duct installation kit



- 1 Probe (HMP110)
- 2 Duct installation kit
- 3 Probe cable

1. Pass the probe cable through the plastic pipe of the duct installation kit.

2. Connect the probe cable to HMP110.



- 1 Mounting screw
- 2 Tension screw
- 3 HMP110 assembled in duct installation kit plastic pipe

To attach the probe assembly to the duct:

1. Drill holes for the duct installation kit as follows:
  - Use a 24-mm (0.9-in) drill bit to drill a hole in the wall.
  - Use a 3.2-mm (0.1-in) drill bit to make 4 holes for the installation screws (4 pcs ST4.2×16-C-Z DIN 7981 screws). The holes should be arranged in a square around the 24-mm (0.9-in) hole, at a distance of 42 mm (2 in) from each other.
2. Mount the probe holder using the screws.
3. Adjust the depth of the plastic pipe and tighten the screw to lock the probe in place.

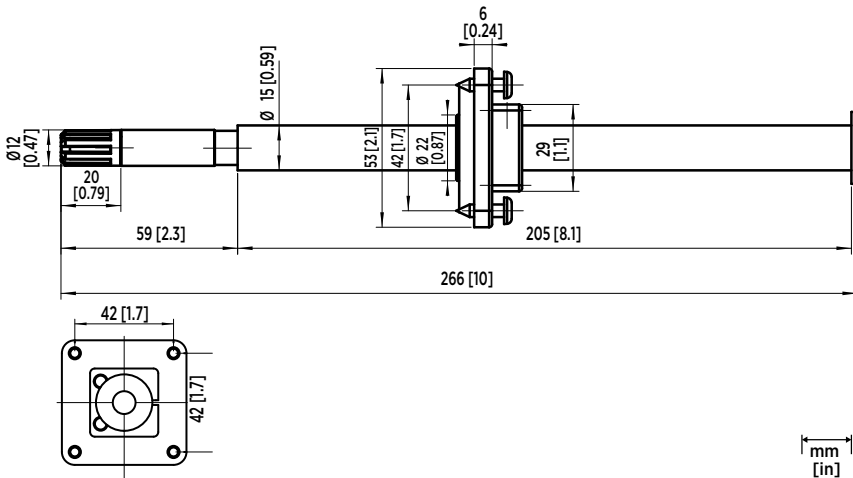


Figure 11 Dimensions of HMP110 probe with duct installation kit



## 3.2 Optional mounting accessories

### 3.2.1 Probe mounting flange

The probe mounting flange (Vaisala item code 226061) is a general purpose mounting flange for 12 mm (0.5 in) diameter probes. It can be used to hold the HMP110 probe in a through-wall installation.



The silicone plug that is delivered with the flange is not suitable for use with the probe cable of HMT140.

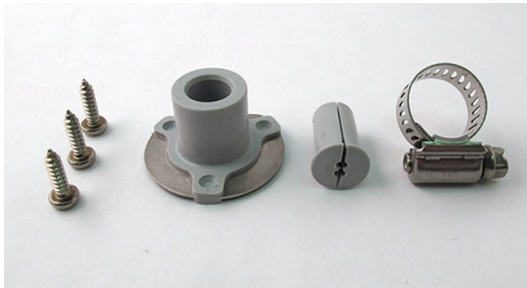


Figure 12 Optional probe mounting flange

### 3.2.2 Probe mounting clamp

The optional mounting clamp (Vaisala item code 226067) makes it easy to install the probe on the wall of the measurement environment. The probe can be detached for calibration simply by loosening the lower screw.

Installing the entire probe in the measurement environment prevents heat conduction to the sensor, and is the recommended installation method.

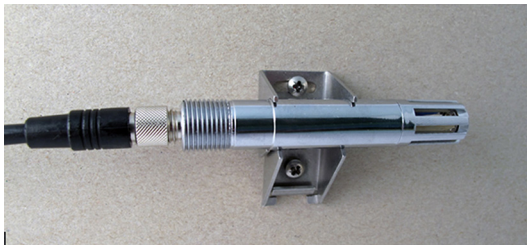


Figure 13 Optional probe mounting clamp

## 4. Setup and operation

### 4.1 Connect and configure

HMT140 Configuration Cable allows you to connect HMT140 to your PC. You can then configure HMT140 with your network settings using HMT140 Utility software (software and cable shipped with viewLinc).

#### 4.1.1 Installing HMT140 Utility software

HMT140 Utility software configures and reads the settings in HMT140, which uses 802.11b and 802.11g wireless networks. The address of the destination host, the wireless network parameters, transmit period, and other important network functions of HMT140 are specified using HMT140 Utility. HMT140 Utility also provides you with access to tools for diagnosing connection problems.

Before you configure HMT140, install HMT140 Utility software on a PC. HMT140 Utility is compatible with Windows 10 (64-bit), Windows 8.1 (64-bit), Windows 7 (32-bit and 64-bit), Windows XP (32-bit), Windows Server 2008, and Windows Server 2012.

To install HMT140 Utility software:

- ▶ 1. Disconnect the HMT140 Configuration Cable if it is already connected to your PC.
2. Insert the CD that came with the HMT140 Configuration Cable, or download the software from [www.vaisala.com/hmt140](http://www.vaisala.com/hmt140).
3. Run the HMT140 Utility installation program (HMT140UtilitySetup.exe).
4. Accept the license agreement terms, then click **Next** to accept the installation default settings. The installation of the driver may take several minutes.
5. After the software is installed, connect the HMT140 Configuration Cable to a USB port on your PC to complete the installation setup.
6. When the installation is complete, disconnect the cable from your PC. You are now ready to set up and configure your device.

If you wish to remove the Vaisala HMT140 Utility software at a later date, use the uninstall function in the Windows **Control Panel**.

#### 4.1.2 Setting up HMT140 hardware

Once HMT140 Utility software is successfully installed, you can set up your data monitoring device.

To set up an HMT140 data logger for the first time:

- ▶ 1. Make sure HMT140 Configuration Cable is disconnected from your PC.
2. Open the HMT140 cover.
3. Make sure the power switch on the device is in the OFF position.

4. Install 3 pcs 3.6V lithium batteries. For the recommended battery type, see [Options and accessories \(page 10\)](#).
5. Turn the power switch on the device to the ON position, and wait for the setup process to complete (5 seconds). LED light turns on, then off.

### 4.1.3 Configuring HMT140 to your network

After you install HMT140 Utility software and set up HMT140, use HMT140 Configuration Cable and HMT140 Utility software to connect and configure HMT140 to your network.



To avoid depleting the battery power too quickly, make sure that your network is on-line and available before configuring your device.

The following steps provide you with standard network settings. To set specific settings depending on your network configuration, see [Custom settings \(page 27\)](#).

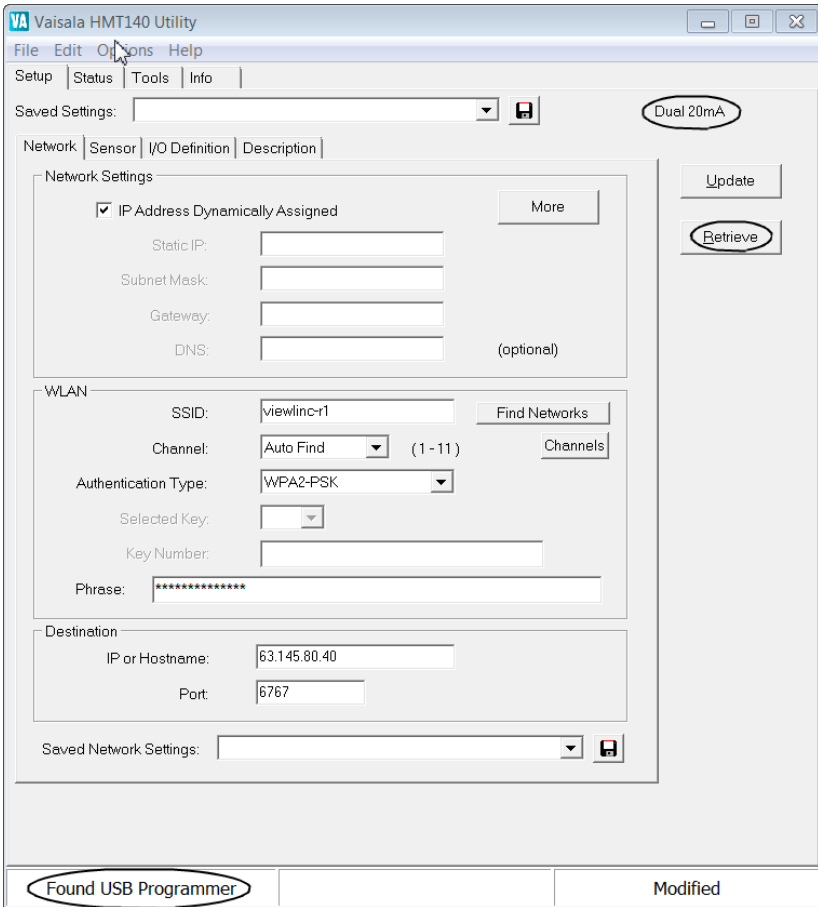


Follow the steps carefully. Do not connect HMT140 Configuration Cable to the HMT140 configuration port unless HMT140 Configuration Cable is connected to a computer USB port, the batteries are installed, and the power switch is in the ON position.

To configure HMT140 for your network with standard settings:

- ▶ 1. Make sure that the HMT140 cover is open and the correct batteries are installed.
2. Turn on HMT140 and wait 5 seconds to make sure the startup process completes.
3. Plug the USB connector in HMT140 Configuration Cable to the computer, if it is not already connected.
4. From the **Start** menu, open HMT140 Utility software.
5. Connect the end of HMT140 Configuration Cable labeled **USB Wi-Fi Programmer** to the 4-pin HMT140 CONFIG header.
6. On the HMT140 Utility **Setup** tab, click **Retrieve** to identify HMT140. The bottom left status bar will initially read **Looking for sensor or USB programmer**, then, once HMT140 is identified, the status bar will read **Found USB Programmer**.

7. Click **Retrieve** again to force retrieval of current settings. The connected type is identified in the upper right corner of the **Setup** tab window.



The status bar is located at the bottom of the HMT140 Utility window. It contains the following panels:

- **Left panel:** Displays HMT140 Configuration Cable status: **Found USB Programmer** or **Looking for USB Programmer**.
- **Middle panel:** Displays progress messages of the different actions: **Update**, **Retrieve**, **Status**, and **Info**.
- **Right panel:** Displays a message when the parameters on the **Setup** page have been modified and require saving.

8. If the IP address is static, uncheck the **IP Address Dynamically Assigned** option and enter the network parameters. Otherwise leave this option checked.  
For additional IP address settings information see, [Check transmission status \(page 30\)](#).

9. Enter the parameters for the WLAN (wireless LAN router settings).
10. Enter the Destination IP address/name and port number of the host (viewLinc server settings).



If you do not know the information required, request these parameters from your network administrator.

11. Click the **Sensor** tab and select a **Transmit Period Time** and number of **Tries**, or accept the default settings.
12. Click **Update**. HMT140 Utility will configure HMT140.
13. Select the **Status** tab to check that the settings appear as configured. Click **Get** if the settings do not appear automatically.
14. Disconnect HMT140 Configuration Cable from HMT140 and wait for 8 seconds.
15. Press the **SERVICE** button on HMT140.  
Optional: Enter a name for the saved settings on the **Setup** tab in the **Saved Settings** field, and click the disk icon to save.  
To configure custom settings for HMT140, see [Custom settings \(page 27\)](#).

#### 4.1.4 Setup consideration

If DHCP or DNS is being used, it is best to use local DHCP and DNS servers rather than a DNS server on the internet. The local servers will give better response times compared to the remote servers and, as a result, help to conserve battery life.

## 4.2 Custom settings


Use HMT140 Utility software to make additional changes to the network configuration settings of an HMT140 data logger.

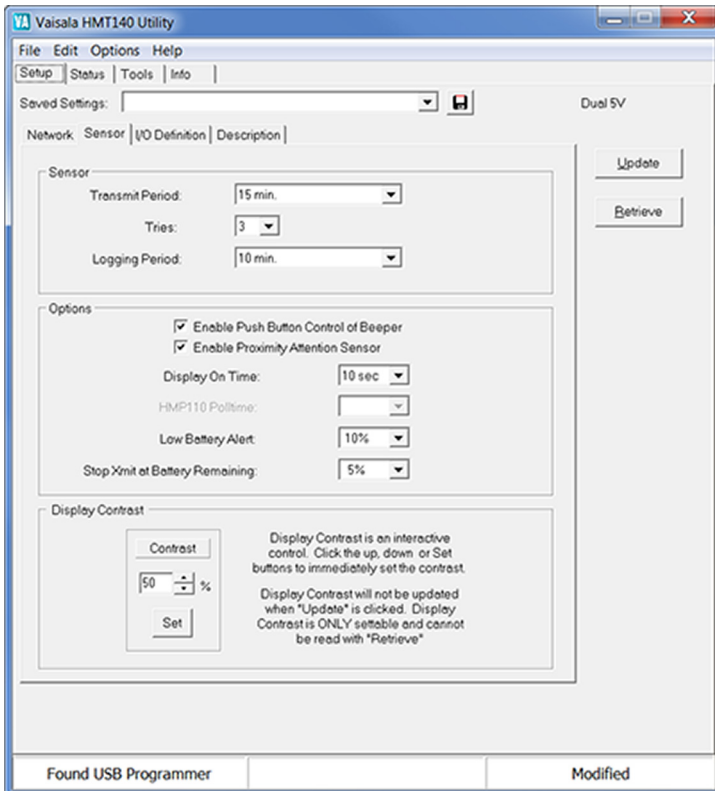
### 4.2.1 Modify transmission settings

Before making changes to transmission settings, consider the impact to battery life.

- ▶ 1. Make sure the HMT140 cover is open and the correct batteries are installed.
2. Turn on HMT140 and wait 5 seconds to make sure the startup process completes.
3. Plug the USB connector in HMT140 Configuration Cable to the computer, if it is not already connected.
4. From the **Start** menu, open HMT140 Utility.
5. Connect the end of HMT140 Configuration Cable labelled **USB Wi- Fi Programmer** to the 4-pin HMT140 CONFIG header.
6. On the HMT140 Utility **Setup** tab, click **Retrieve** to identify HMT140 and view current settings.

7. On the **Sensor** tab, select from the following options:
- **Transmit Period:** Select how frequently HMT140 transmits data. In the event of an alarm condition, transmission frequency is overridden automatically. If you require a faster transmit period, HMT140 Utility version 1.1.4.0 and higher provide additional options. Select the **Options** menu and then **Advanced**. Check the option **Extended Transmit**.
  - **Tries:** Select the number of transmission attempts permitted for the specified Transmit Period.

 **CAUTION!** Increasing the transmission frequency will deplete batteries more rapidly.



For example, if you select 15 minutes for the **Transmit Period**, and 3 for the number of **Tries**, HMT140 will attempt to transmit every 15 minutes. If the transmission does not complete successfully, it will make 2 additional transmission attempts, then will go into 'sleep' mode until the next scheduled transmit period.

- **Logging Period:** Specify how often HMT140 will log I/O into the log buffer. If you are using HMT140 Utility version 1.1.4.0 or higher and require a more frequent log period, select the **Options** menu, then **Advanced**, and check the option **Log Periods**.
- **Enable Beeper/Enable Push Button Control of Beeper:** Select the option to enable or disable the button control of the Beeper (whether you want to be able to turn the Beeper on or off with the push button on HMT140). It is also possible to turn the Beeper on and off by holding down the **SERVICE** button for approximately 5 seconds. The Beeper is enabled by default. There is no external Beeper status indicator. It must be enabled/disabled with the **SERVICE** button.
- **Enable Proximity Attention Sensor:** Select this option to enable or disable the proximity attention sensor. The sensor is used to wake up HMT140, turn on the display (if present), and to force HMT140 to send a data packet to the host. If your HMT140 does not have an LCD or is installed in an area where the IR sensor may be triggered more frequently (due to low-light, high-traffic or transmission obstacles), turn off the sensor to save battery life.
- **Display On Time:** Select the length of time the display stays on (choose a minimum length of time to save battery power).
- **HMP110 Polltime:** If your HMT140 uses an HMP110 probe, select how frequently HMT140 polls the HMP110 probe (leave at the default setting, 2 minutes, to save battery power).



The polling rate should be equal to or faster than the Logging Period, otherwise you will record the same measurement multiple times.

- **Low Battery Alert:** Specify at what percentage of battery power remaining you want the Low Battery indicator to display and notify the host software.
  - **Stop Xmit at Battery Remaining:** Specify at what percentage of battery power remaining you want HMT140 to stop transmitting data to the host (to save battery power). Once this threshold is reached, HMT140 continues to log data and function normally, but it will not transmit data using the Wi-Fi radio.
8. Use the **Display Contrast** interactive control to set the HMT140 display contrast. When the **Up**, **Down** or **Set** buttons are clicked, HMT140 Utility will attempt to set the contrast.



The contrast value can only be set when you click **Set**. The value is not set with the **Update** or **Retrieve** buttons.

9. Click **Update**. HMT140 Utility will send these settings to HMT140 and then reboot. After the settings are successfully configured, a dialog displays **Configured!**. If there was an error sending the settings, HMT140 Utility will display the error in a popup dialog window. The center panel in the bottom status bar will display the update status.

10. Select the **Status** tab to check that the settings appear as configured. Click **Get** if they do not appear automatically.
11. Disconnect HMT140 Configuration Cable from HMT140 and wait 8 seconds.
12. Press the **SERVICE** button on HMT140.  
**Optional:** Enter a name for the saved settings on the **Set up** tab in the **Saved Settings** field and click the disk icon to save. If HMT140 is used with more than 1 wireless network, enter a name in the **Saved Network Settings** field and click **Save**. Other network settings files can be saved and recalled from the **Saved Settings** field.

#### More information

- [Options and accessories \(page 10\)](#)
- [Battery usage \(page 35\)](#)
- [Viewing battery life remaining \(page 35\)](#)

### 4.2.2 Modify HMT140 description

If you want to make it easier to identify specific HMT140 data loggers, enter custom names. By default, each HMT140 is identified using the model name and channel type.



Check with your network administrator before making changes.

To modify your HMT140 name and channel descriptions:

- ▶ 1. Complete steps 1 to 6 in [Modify transmission settings \(page 27\)](#).
2. Select the **Description** tab and enter a name, and/or Channel descriptions. You can view these descriptions in viewLinc, and make changes in viewLinc if required.

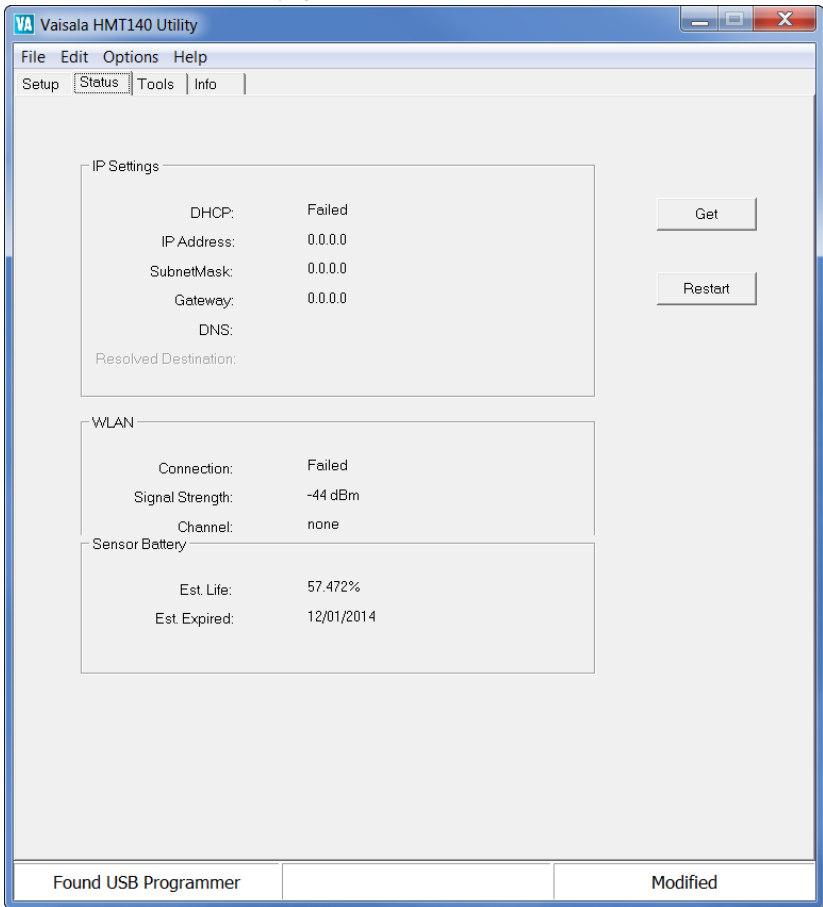
### 4.2.3 Check transmission status

The **Status** page displays the current state of the IP settings, connection status, signal strength, and battery life parameters, as applied using the **Update** button on the **Network** tab.

To monitor the transmission status:



1. On the **Status** tab, click **Get** to update the HMT140 Utility window with the latest status information: IP settings, WLAN and Sensor battery. If successful, HMT140 Utility displays the information on the **Status** page.



2. Read **IP Settings** status.
  - **DHCP:**
    - **Off** – static IP address information is being used
    - **On** – IP settings are successfully assigned
    - **Cache** – IP settings are successfully assigned and HMT140 will cache this IP address
    - **Failed** – HMT140 could not obtain the IP settings.
  - **IP Address:** Current IP address. If “0.0.0.0”, then no IP address has been assigned.
  - **Subnet Mask:** Current assigned subnet mask.
  - **Gateway:** Current assigned gateway address.
  - **DNS:** Current assigned Name Server address.
  - **Resolved Destination:** Appears if the hostname is given for the Destination.
3. Read **WLAN** status.
  - **Connection:**
    - **Failed:** HMT140 has failed to connect to a wireless network.
    - **Associated - Not Connected:** HMT140 has associated with the network but has not connected.
    - **Authenticated - Not Connected:** Security settings have been authenticated but has not connected.
    - **Assoc/Authen - Connected:** HMT140 has associated and authenticated to the network and connected successfully to the network.
  - **Signal Strength:** Signal strength of the last communications. The signal strength can vary from reading to reading. Multiple samples should be taken to determine the signal strength.
  - **Channel:** This is the channel found during the Channel Auto Find feature or the channel set in the **Setup** page. If HMT140 cannot find a channel when in Auto Find mode, HMT140 Utility will display “none”.
4. Check HMT140 battery status.
  - **Est. Life:** Estimated percentage remaining of the battery.
  - **Est. Expired:** Estimated date when the battery should be changed (dependent on the **Transmit Period** and the number of alarms).

#### More information

- [Battery usage \(page 35\)](#)
- [Viewing battery life remaining \(page 35\)](#)

## 4.3 HMT140 function modes

### 4.3.1 Operating modes

HMT140 operates in 2 modes: Config mode and Transmitter mode.

### Config mode

When HMT140 is powered on, and HMT140 Configuration Cable is connected to it, HMT140 connects to the network for about 2 seconds and then goes to sleep. When new activity occurs, HMT140 will wake again, connect, then go back to sleep after 5 seconds.

### Transmitter mode

When HMT140 is powered on and HMT140 Configuration Cable is not plugged into it, data is transmitted according to the transmit settings.

In Transmitter mode, HMT140 spends most of its time in a very low power state (sleep) to save battery power. When a transmit period is due, it powers up the radio, attempts to link to the specified wireless network, transmits its data and then goes back to sleep. HMT140 transmits based on the configured transmit period or when it is entering an alarm state.

## 4.3.2 Transmission of data

HMT140 will go through the following steps in order to connect to a network and deliver data:

1. Associates with the network.
2. HMT140 authenticated by the network (depends on the type of security).
3. Requests IP from DHCP Server (if set to dynamic IP)
4. HMT140 receives request from Name Server IP address of hostname (if a hostname is used for the Destination address and DNS Server specified).
5. Sends data.
6. viewLinc returns acknowledgement.

## 4.3.3 Transmit attempts

HMT140 will initiate a Transmit Attempt repeatedly (typically every 30 seconds) until either an acknowledgement is received from the host, or the number of tries has been exhausted. It follows this transmission mechanism both when the transmit period arrives and for alarm attempts.



**CAUTION!** HMT140 should not be turned on until a network is available for it to join. Without a valid network to join, the device will wait for the maximum allowable period for a response (**Transmit Period** multiplied by **Tries**), thereby rapidly draining its batteries.

## 4.3.4 Alarm-triggered transmission

HMT140 has the ability to initiate a Transmit Attempt based on an alarm, if this functionality is configured in viewLinc.

An alarm can be triggered either when the measured value exceeds a high threshold or goes below a low threshold for a period of time, as configured in viewLinc as HighHigh or LowLow threshold alarm settings. HMT140 can also be configured to initiate a Transmit Attempt when it exits an alarm state. Refer to *Vaisala viewLinc User Guide* for information about alarm settings.

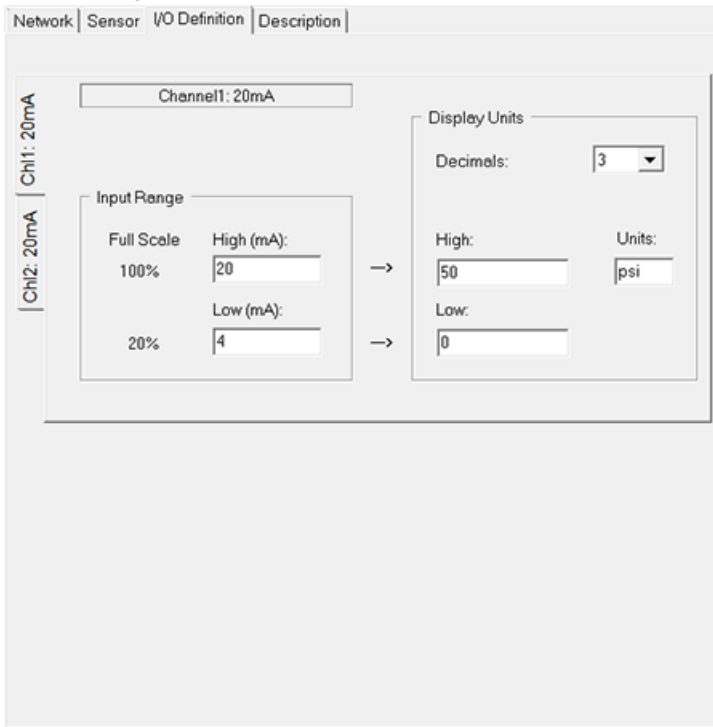
## 4.4 Additional settings

### 4.4.1 Change input/output scale

If you want your HMT140 to provide more meaningful voltage or current output measurements, you can modify the output settings (if you are not sure if your network requires or supports this option, contact Vaisala Technical Support for assistance).

To modify voltage or current input/output values:

- ▶ 1. From the **Setup** tab, select the **I/O Definition** tab.



- 2. Enter the input range values of HMT140.
- 3. Enter required **Display Units**, the number of decimal places you want recorded, the high/low output values and desired measurement units.

## 4.4.2 Save and recall settings

Your setup parameters can be saved and associated with a name on the **Setup** tab, in the **Saved Settings** field. These setup parameters can then be recalled by that name, saving you time reentering the settings.

The network parameters can also be saved separately and associated with a name on the **Network** tab, in the **Saved Network Settings** field. The network setup parameters can then be recalled by that name.

## 4.4.3 Delete saved settings

Both the **Saved Settings** and the **Saved Network Settings** can be deleted, to help keep the list of saved settings easier to view and/or manage.

- ▶ 1. On the **File** menu, select **Delete Sensor Setup** or **Delete Network Setup**, then choose the correct settings name to delete.

## 4.4.4 Restarting HMT140

You may want to reboot your HMT140 to reconnect to the network and re-acquire status information.

- ▶ 1. On the **Status** tab, click **Restart**.

## 4.4.5 Get general information

To gather general information about HMT140, select the **Info** tab and then click **Get**. HMT140 Utility will retrieve the following information:

- MAC address
- Firmware version
- HMT140 serial number
- HMP110 serial number (if using)

# 4.5 Battery usage

HMT140 has a built-in battery meter. The meter provides a general estimate of battery power remaining by calculating the number of transmission attempts relative to the number of transmissions expected from the battery.

## 4.5.1 Viewing battery life remaining

HMT140 Utility software displays the estimated battery expiration and the estimated battery life percentages on the **Status** page.

To improve battery life, consider increasing the amount of time between transmit periods.

Transmit period (minutes)	Estimated battery life (months)
15	18
10	12
5	6
2	2.4

To view battery life remaining, view the battery meter status in the **Est. Life** field in the **Status** tab.

To reset the battery meter:



The meter must be reset after installing new batteries to ensure the battery meter status estimate is accurate.

- ▶ 1. Turn off HMT140. Make sure HMT140 Configuration Cable is disconnected.
2. After replacing batteries, press and hold the **SERVICE** button.
  - Turn the HMT140 power switch on while the **SERVICE** button is engaged.
  - Wait approximately 10 seconds until the LED light flashes and you hear several beeps.
3. Release the **SERVICE** button to complete the battery meter reset.
4. Confirm that the battery meter is reset:
  - Reconnect HMT140 Configuration Cable to HMT140 and your PC.
  - Start HMT140 Utility.
  - On the **Setup** tab click **Retrieve**.
  - On the **Status** tab the **Est. Life** field should indicate 100 %.

#### More information

- [Battery replacement \(page 47\)](#)

## 4.5.2 Units and temperature

Use the **Options** menu to set the measurement units you want to display on screen.

To change display units:

- ▶ 1. On the **Options** tab, select **Units**.

## 4.5.3 Connection performance

Consistent connection performance is essential for longevity of battery life. HMT140 Utility can perform a test to indicate how well HMT140 connects to the network, which provides an indication about the expected battery life.



If the average connection time is more than 5 seconds, HMT140 may not connect consistently and the battery may be exhausted before the battery meter indicates.

#### More information

- [Test network connectivity \(page 42\)](#)

#### 4.5.3.1 Connect times

The following are the components of the connect time:

Table 3 Connect time components

Description	Option	802.11b (sec)	802.11g (sec) cache/noncache
HMT140 Startup	No	2	0.1
Auto Find Channel	Yes	1	0.1
Associate/Authentication	No	< 1	< 1
DHCP lookup	Yes	< 1	< 1
DNS lookup	Yes	< 1	< 1

#### 4.5.3.2 Determining connection problems

In some networks, one of the optional components of the connect time may take too long to perform on a consistent basis. If the average connection time is too long it is important to try isolate the cause.

To isolate a connection problem:

- ▶ 1. Open HMT140 Utility and connect HMT140 Configuration Cable to HMT140 and your PC.
2. Temporarily turn off one of the connection options and then measure the average connection time:
  - Try setting the dynamically assigned IP address as the static address temporarily, or,
  - Try using a Destination IP address instead of the hostname address temporarily.
3. Select the **Tools** tab. In the **Test Connect Time** area, click **Start**. HMT140 Utility will repeatedly attempt to connect to the network with 1 second between connection attempts. You can then view:
  - Number of connection attempts.
  - Last connect time.
  - Average, minimum and maximum connect times.
  - History of connect attempts displayed as a bar graph (each bar graph is the number of seconds for the attempt).
  - Failed connection attempts displayed as a grey bar. Failed connection attempts are not factored in the statistics.

4. To change the **Connect Window** time, on the **Options** menu select **Advanced Options**, and then select the desired **Connect Window** time.

## 4.6 Advanced options

These advanced parameters (**Options > Advanced Options**) are applied each time an **Update** function is performed (available in HMT140 Utility version 1.1.4.0 and higher).



**CAUTION!** Modification of these parameters may negatively impact transmission performance and reduce battery life.

- **Extended Transmit, Log Periods and HMP Polltime:** Adds an additional transmission, logging and polling time periods on the **Sensor** tab. These additional periods are meant to be used for testing, evaluation and demonstration of HMT140 and, if used regularly, can have a severe impact on battery life.
- **Log Conversations:** When this option is selected, HMT140 Utility will capture the conversation between HMT140 Utility and HMT140, and place it in a file called OutputLog.txt. To locate the file, go to the **Help** menu, select **Utility Folder Paths**, and then **Explore Data**.
- **DHCP Caching:** When this option is selected, HMT140 will cache its IP address assigned from the DHCP server until the DHCP lease time has expired or HMT140 is power-cycled. If not selected, HMT140 will request an IP address each time it attempts to contact the host.
- **ARP Caching:** When this option is selected, HMT140 will store and keep a list of IP/MAC relationships. If not selected, HMT140 will rebuild the IP/MAC relationships with every attempt to contact the host.
- **DNS Caching:** When this option is selected, HMT140 will cache the IP address that results from the DNS lookup of the Destination hostname. HMT140 will keep the destination IP address until either the DHCP lease time expires or HMT140 is power-cycled. If not selected, HMT140 will request a DNS lookup of the Destination hostname each time it attempts to contact the host. This setting is not recommended for most monitoring systems.
- **Allow Channels 12 and 13:** Enable the use of channels 12 and 13. This option should only be used in regions in where these channels are not restricted.
- **Connect Window:** Set the amount of time in seconds (3 to 8 seconds) that HMT140 will attempt to associate and authenticate to an access point or a wireless router (this includes the time to obtain an IP address from a DHCP server). The default rate is 5 seconds.
- **Data Rate:** The default data rate is 1 Mbit/sec. and can be set from 1 to 54 Mbit/sec. The lower the data rate the longer range HMT140 will have. The 802.11b data rates are: 1, 2, 5.5 and 11. All other data rates are 802.11g data rates. An access point or wireless router may be configured to exclude 802.11b data rates.
- **Override Destination Port:** Leave blank to not use this feature. If a number (1 to 65535) is placed in this field, HMT140 Utility will force the Destination Port to use this entered number. Use this feature to force the Destination Port to another value other than the default 6767.



## 4.6.1 Passwords

To improve security, you can require that a user log in to make changes to HMT140 parameters. If Passwords are enabled, a password prompt appears when a user clicks **Update** on the **Setup** tab. No other HMT140 functions will require a login password.



**CAUTION!** Use of passwords in HMT140 is not recommended for use with Vaisala viewLinc software. Passwords may limit the ability of viewLinc to update settings or values in the device. For example, changes to a threshold alarm template in viewLinc may not transfer to HMT140 if passwords are required on the device.

To set, change, or remove an HMT140 password:

- ▶ 1. Open HMT140 Utility.
2. Connect HMT140 to your computer.
3. From the **Options** menu, select **Advanced Options**.
4. On the **Advanced Options** window, check **Enable use of passwords in HMT140**, then click **OK**.
5. To set the password for the first time:
  - Leave the **Current Password** field blank.
  - Check the **Change Password** option.
  - Enter the new password in the **New Password** and **New Password Again** fields.
  - Click **Update**.
6. To change an existing password:
  - Enter the current password.
  - Check the **Change Password** option.
  - Enter the new password in the **New Password** and **New Password Again** fields.
  - Click **Update**.
7. To clear a password:
  - Enter the current password.
  - Check the **Change Password** option, and leave the **New Password** and **New Password Again** fields blank.
  - Click **Update**.



**CAUTION!** Record the password in a safe location for safe-keeping; HMT140 does not save the password. If the password is forgotten, contact Vaisala Technical Support.

## 4.6.2 Set up a new channel

On the **Network** tab, you can select a specific channel to view, using the **Channel** field.

To select multiple channels for HMT140 to search when connecting to an access point or a wireless router, select **Auto Find**.



The Channel Auto Find feature defaults to search for channels 1 through 11. These channels are set in the .INI file of HMT140 Utility.

For Wi-Fi 802.11b radio mode, do not set the Channel Auto Find search channels to more than 3 channels. This will have an effect on the range and battery life of HMT140.

For Wi-Fi 802.11g radio mode, HMT140 can search all channels with minimal effect on battery life and range.

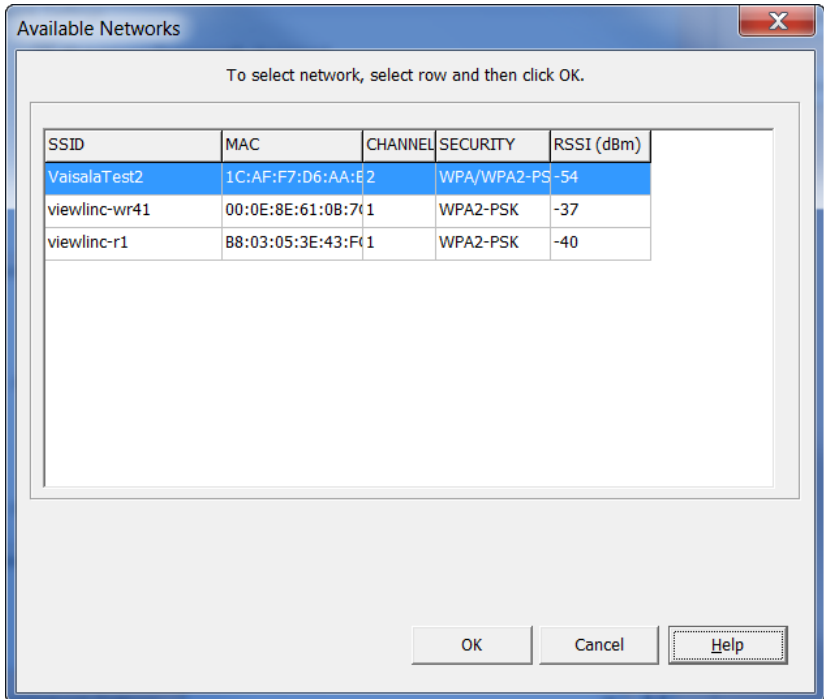
#### More information

- [Additional program parameters \(page 42\)](#)

### 4.6.3 Find additional networks

To locate additional networks:

- On the **Setup** tab, on the **Network** page, click the **Find Networks** button to scan for all available wireless networks. HMT140 Utility displays details about the currently available networks:
  - SSID:** SSID of the access point or router (wireless channel).
  - MAC:** MAC address of the access point or router.
  - Channel:** Channel of the access point or router.
  - Security:** Security setting of the access point or router. Note that some security settings will not work with HMT140.
  - RSSI:** Current signal strength.



- To select a network, click on the row in the **Available Networks** window, then click **OK**. HMT140 Utility automatically places the network settings information in the appropriate fields in the **Setup** tab.



During the Find Networks operation, HMT140 is disconnected from the current network. To reconnect, either click **Update** on the **Setup** tab or click **Restart** on the **Status** tab.

## 4.6.4 Test network connectivity

### Ping from Sensor

For radio module version 2.27 and earlier (Utility > **Info** tab): When the **Ping from Sensor** button is clicked, HMT140 will use either the IP address in the **IP Address** field or the current address in the **Destination IP** field in the **Setup** tab and ping that specified address. Once the ping operation is complete, HMT140 Utility will either indicate failed or success and specify the IP address in the **Result** field.

### Ping from This PC

When the **Ping from This PC** button is clicked, HMT140 will use either the IP address in the **IP Address** field or the current address in the **Destination IP** field in the **Setup** tab and ping that specified address from the local PC. Once the ping operation is complete, HMT140 Utility will either indicate failed or success and specify the IP address in the **Result** field.

### Contact Destination Host

HMT140 Utility will instruct HMT140 to send a transmission (data packet) to the Destination Address. If the Destination responds with an acknowledgement, HMT140 Utility will indicate success, otherwise it will display "Failed" in the **Result** field. Use the **Contact Destination Host** function to confirm that HMT140 is sending packets to the Destination.



The Destination must be capable of responding with an acknowledgement for this function to work.

## 4.7 Additional program parameters

HMT140 Utility software stores all program information in an INI text file, *HMT140Utility.INI*. You can use this file for reference, and, if you are updating several HMT140 loggers, save time by making edits to the file directly.

To modify the *HMT140Utility.INI* file:

- ▶ 1. Go to the **Help** menu, select **Utility Folder Paths**, and then select **Explore Setup**.
2. Double-click the file, *HMT140Utility.INI*. It will open in a text editor.
3. To set the maximum number of tries (updates the **Tries** field, default maximum is 5):

```
[Settings]
MaxNumTries=5
```

4. To modify the default UDP port (default is 6767): code

```
[Settings]  
DefaultPort=6767
```

5. To specify the auto find channels:

```
[Settings]  
ChannelMask=1,2,3,4,5,6,7,8,9,10,11
```

6. Restart HMT140 Utility to apply the changes.

## 5. Maintenance

### 5.1 Improving sensor response time

To ensure maximum operating life and a fast sensor response time, replace a dirty filter. The filter should be replaced when it is damaged or dirty. Do not attempt to clean the filter.

To change the filter:

- ▶ 1. Turn the filter counterclockwise to loosen it.
- 2. Remove the filter from the probe.



**CAUTION!** Be careful not to touch the sensors with the filter. Without the filter in place, the sensors are easily damaged – handle the probe carefully.

- 3. Install a new filter on the probe, and tighten it so it is finger-tight.
- 4. Make sure the filter sits straight and meets the threads properly.

### 5.2 Removing and fastening probes

#### 5.2.1 Fixed probe model

To remove and replace a fixed probe:

- ▶ 1. Loosen the metal locking bushing by carefully turning it counterclockwise.
- 2. Remove the probe from HMT140 by pulling it gently outwards.
- 3. Attach the new probe to the 4-pin M8 panel connector on HMT140 (only 1 position possible).

4. Tighten the locking bushing to the M8 panel connector by turning it clockwise.

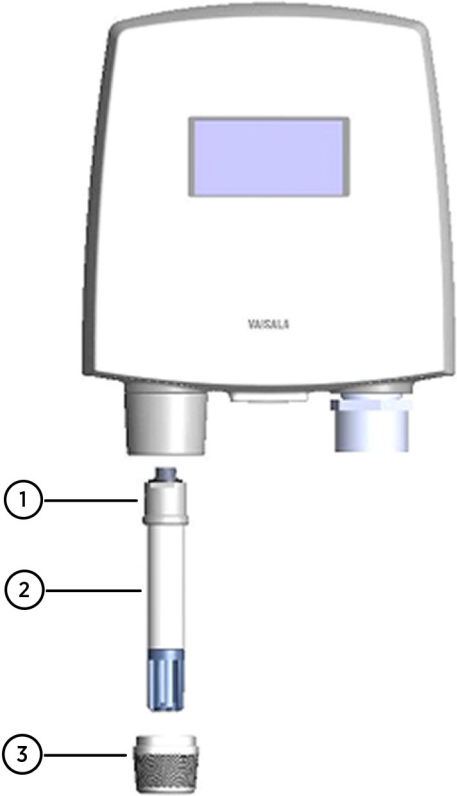


Figure 14 Fixed probe model

- 1 Holder bushing (attached permanently to the probe)
- 2 HMP110 probe
- 3 Locking bushing

### 5.2.2 Remote probe model

To remove and replace a remote probe:

- ▶ 1. Unscrew the small sleeve at the end of the probe cable that secures the probe in place, and pull out the probe.

2. Replace the probe and screw the small sleeve back on, securing the probe tightly in place.

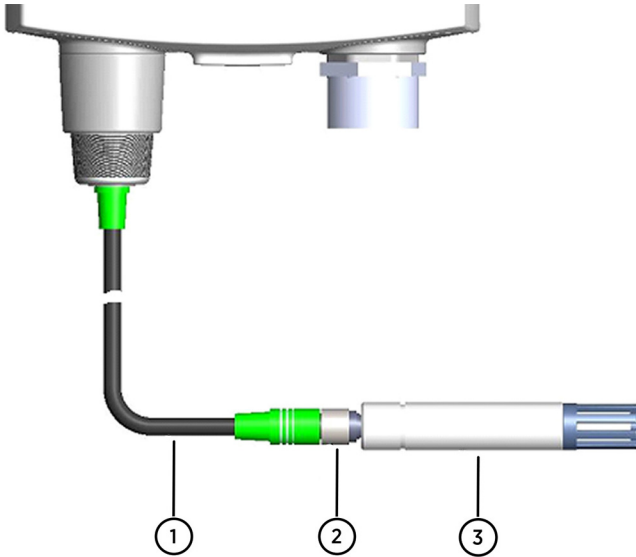


Figure 15 Remote probe model

- 1 Probe cable
- 2 Sleeve securing the probe to the cable
- 3 HMP110 probe

## 5.3 Calibration and adjustment

HMP110 probe calibration status can be viewed with HMT140 Utility software. Calibration settings are adjusted using viewLinc.

To view probe calibration status:

- ▶ 1. On the **Info** tab, click **Get**. This page will display calibration information including calibration date, calibrator, and next calibration due date.

Please refer to *Vaisala viewLinc User Guide* for further information, or visit [www.vaisala.com/viewlinc](http://www.vaisala.com/viewlinc).

For calibration of HMP110 probes, refer to the supporting documentation available on the Vaisala website.



## 5.4 Battery replacement

When replacing batteries, it is important to use new, recommended batteries and to reset the battery meter to make sure an accurate estimate of battery life remaining.

To replace the batteries and reset the battery meter of HMT140:

- ▶ 1. Open the HMT140 cover.
2. Turn the power switch off.
3. Remove the batteries by pulling them up firmly. If the battery does not come out easily, gently pull back on one of the battery holder tabs first.
4. Reset the battery meter:
  - Press and hold the **SERVICE** button.
  - Turn the power switch on.
  - Wait approximately 10 seconds until the LED light flashes and you hear several beeps.
5. Release the **SERVICE** button.
6. Confirm that the battery meter is reset:
  - Reconnect HMT140 Configuration Cable to HMT140 and your PC.
  - Start HMT140 Utility software.
  - On the **Setup** tab, click **Retrieve**.
  - On the **Status** tab, the **Est. Life** field should indicate 100 %

### More information

- ▶ [Options and accessories \(page 10\)](#)

## 6. Troubleshooting

Use HMT140 Utility software to help troubleshoot issues that may occur while connecting HMT140 to a wireless network.

### 6.1 HMT140 operation mode

When HMT140 Configuration Cable is connected to HMT140, it enters Config mode. In this mode, HMT140 continuously attempts to connect to the wireless network and stays connected until HMT140 Configuration Cable is disconnected or the setup has changed.

HMT140 is in Transmitter mode when HMT140 Configuration Cable is not connected, and the HMT140 power switch is turned on. When in Transmitter mode, HMT140 remains in a low power state, but will turn on, connect, transmit a UDP packet, and then go back to the low power state when it is ready to transmit.

### 6.2 Signal strength

HMT140 works best with signal strengths above -63 dBm (for 802.11b mode) and -75 dBm (for 802.11g mode). If the signal strength is less, HMT140 may work marginally or not at all. Stronger signal strength improves transmission performance.

Since the signal strength will vary from sample to sample, you should take multiple samples to determine the signal strength. View signal strength on the **Status** tab and in the **Available Networks** window (click the **Find Networks** button on the **Setup** tab).

### 6.3 Indicator lights

The red LED on the main board (center, or below LCD) indicates that a transmit attempt has just started. The LED on the radio module indicates that radio module is connected to the network. When in Transmitter mode, the LED will flash when a connection is made. When in Config mode (when HMT140 Configuration Cable is connected to HMT140) the LED will remain on continuously when a connection is established.

### 6.4 Access points

Some access points have a mode called Auto Channel mode where it will move between up to 11 channels. If the access point is using this feature, HMT140 may work properly in Config mode, but could fail or work very marginally in Transmitter mode. If the access point is using Auto Channel mode, make sure HMT140 has "Auto Find" for the channel and the right channels have been selected for "Auto Find" channels.

Some access points will move between 3 channels (typically 1, 6, and 11). HMT140 Utility software will work with these access points with the Channel Auto Find feature, but the channels that are used must match the channels for which HMT140 is configured.

## 6.5 Transmit cycle

In Transmitter mode, it can take up to 5 seconds for the transmit cycle to complete. Transmit time is calculated from when the **SERVICE** button is pressed to when the acknowledgement is received from the host.

## 6.6 Frequently asked questions

### Is the connect time too long?

If the connect time to the network is consistently long (over 5 seconds), HMT140 may not be able to connect to the network. If you suspect the connect time to the network is long:

1. Use the **Test Connect Time** tool (see [Determining connection problems \(page 37\)](#)), or,
2. Use a PC to connect to the network and then measure the time it takes to connect.
3. If the network consistently takes longer than 5 seconds to connect, you may need to adjust the settings:
  - Set the **Connect Window** to a longer value (use the **Connect Time** tool to help determine this value) or,
  - Change a connection component like channel Auto Find or DHCP.



Extending the connect time may decrease battery life.

### Why can't I connect to the wireless network?

1. Verify that the network exists.
2. Verify signal strength. Use the built-in signal strength meter. Determine if adequate signal strength exists at that location. See [Signal strength \(page 48\)](#).
3. Verify your network settings.
4. Make sure the router or Access Point accepts connections of 1 Mbps. Some access points may be set up to exclude certain WLAN data rates. You may have to change the WLAN data rate setting in HMT140.
5. If HMT140 was previously connected at one location, but will not connect at the new location, temporarily move it to the previous location and verify operation. It is also possible that a setting on the network has changed.

### I can connect to the network, but cannot obtain a dynamic IP address

1. Verify your network settings.
2. Verify that you are connected to the right network.
3. Use the **Ping from PC** function in HMT140 Utility software to see if your PC can ping an address on that network (your PC must be connected to that network).

4. Use the **Ping from PC** function in HMT140 Utility (if this PC is connected) and see if you can ping HMT140 when it is in Config mode. Go to the **Status** tab to determine the IP address.
5. Use a static IP address temporarily and connect to the network to determine if HMT140 transmissions are being received by the host.
6. Make sure the DHCP Server has not exhausted the number of assignable IP addresses.
7. Check if the DHCP Server needs to be configured to accept this type of device (it is possible the DHCP Server is taking too long to respond to the request).

## I can connect to the network, but host is not receiving UDP packets

1. Verify your network settings.
2. Verify that you are connected to the right network.
3. Verify that the Destination IP address is correct.
4. If using the broadcast address, verify that the network can support broadcasts. Most routers by default will not route broadcast traffic.
5. **Use the Ping from PC** feature if this PC is connected or a PC on the network and ping the host. Also try pinging HMT140 when it is in Config mode.
6. Check the following:
  - Is the host ready to receive the transmit packets?
  - Is the host configured to listen for the UDP packets?
  - Is the host software running?
  - Is firewall software installed at the host that would prevent the UDP traffic?
  - Is there anything on the network that would restrict packets from being routed (like MAC filtering)?
7. Perform a destination test (use the **Contact Destination Host** function from the **Tools** tab).
8. If using a hostname for the destination address, make sure the DNS address is correct (whether set as static or obtained through the DHCP server).
9. Check if the hostname is being resolved in Config mode (go to the HMT140 Utility **Status** tab and examine the **Resolved Destination** field).

## I can connect to the network and Contact Destination using HMT140 Utility software, but host is not receiving UDP packets in Transmitter mode

1. Verify your network settings.
2. Check if the access point using Auto Channel mode is switching between channels. The access point may have switched to a different channel than is set up in HMT140.

- Use the **Test Connect Time** tool in HMT140 Utility to verify how long HMT140 takes to connect to the network.  
If the network consistently takes longer than 5 seconds to connect to the network, you may need to make adjustments to the settings. Set the connect time window to a longer value (use the **Test Connect Time** tool to help determine this value) or change a connection component like channel Auto Find or DHCP.



Extending the connect time may decrease battery life. The battery meter cannot be used to verify battery life remaining if connect times are set longer than the default.

- Verify the signal strength where HMT140 is located. Also check how HMT140 is mounted and oriented at this location with respect to the access point. For example, HMT140 is mounted at the back of a refrigerator but may work better being mounted near the top of the refrigerator.
- Change batteries.

### HMT140 Utility cannot find HMT140

- Make sure HMT140 Configuration Cable is connected to HMT140.
- Disconnect the cable, power HMT140 off, power back on, wait 5 seconds, connect the cable and try again.
- If the red LED in HMT140 Configuration Cable flashes when doing an operation, disconnect the cable from HMT140 and connect again.
- Disconnect the cable from HMT140 and then disconnect the cable from the PC. Wait 30 seconds. Insert cable back into PC and into HMT140.
- Reboot your computer.
- Use an externally powered USB Hub. Your computer may not be supplying enough power through the USB port.

### HMT140 Utility network compatibility issue: Data is not reaching destination in Transmitter mode

While in Config mode, HMT140 can connect (associate/authenticate) to the network and Contact Destination is successful, but while in Transmitter mode, the data never reaches the destination. The UDP data packet from HMT140 is not forwarded by the router.

Workaround:

- Use Dynamic IP and have DHCP Caching turned off. If the IP address is static or the DHCP Caching is enabled, these routers will not forward the UDP data packet of HMT140.
- Replace the router (Contact Vaisala Technical Support).

### Why does the battery meter indicate a lower battery life than expected?

- Confirm whether the battery meter was reset when the batteries were last changed. (See [Battery usage \(page 35\)](#).)

2. Set a longer transmit period.
3. Check HMT140. Was the **SERVICE** button pressed frequently?
4. Check alarm history. Were there a large number of alarms initiating more frequent transmission attempts?
5. Check transmission attempts. Is the setting for number of tries too high?
6. Check network quality. Is the connect time for HMT140 greater than 5 seconds? Use the **Test Connect Time** tool in HMT140 Utility software.
7. Check the signal strength.

## 7. Technical data

### 7.1 HMT140 dimensions (fixed probe)

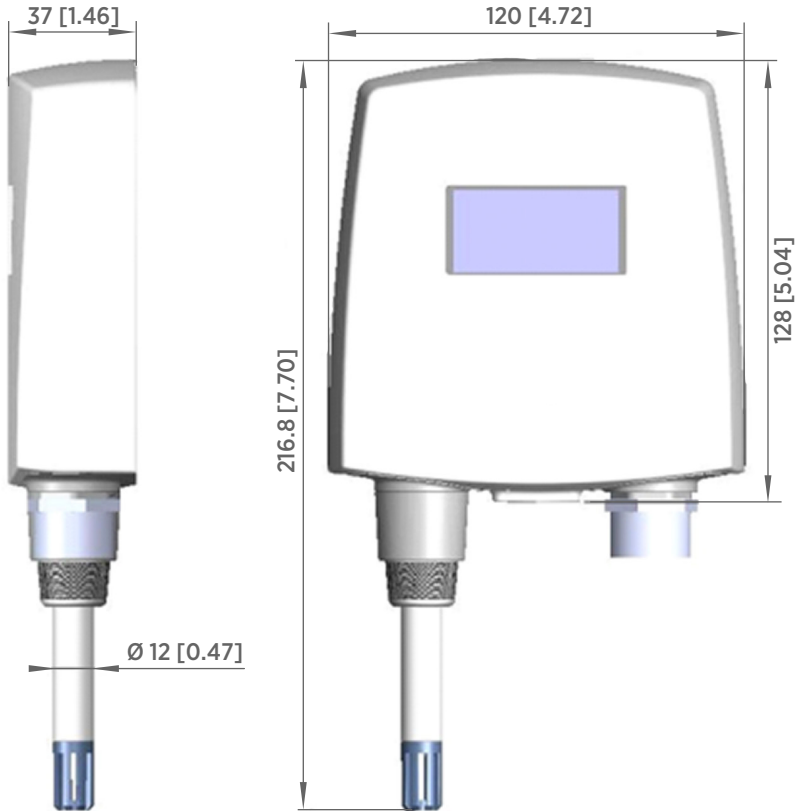


Figure 16 HMT140 fixed probe dimensions in mm (in)

## 7.2 HMT140 dimensions (remote probe)

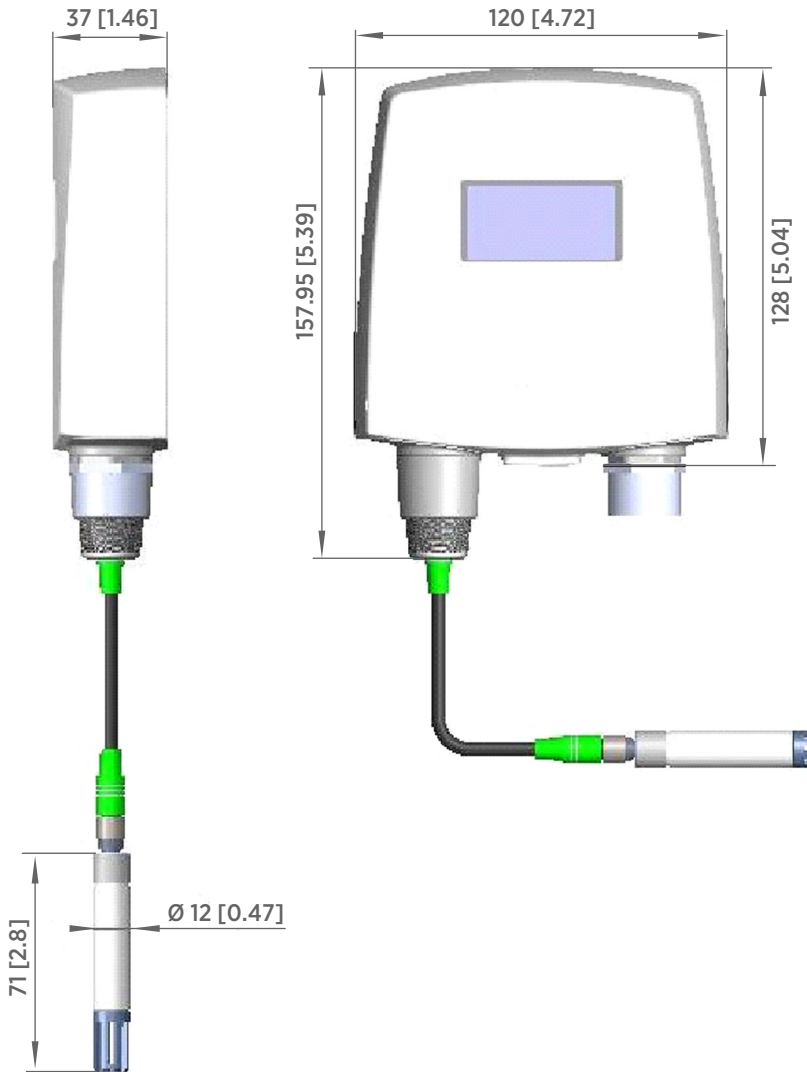


Figure 17 HMT140 remote probe dimensions in mm (in)



## 7.3 HMT140 specifications

Table 4 HUMICAP® Humidity and Temperature Probe HMP110

Property	Description/Value
<b>Relative humidity</b>	
Measurement range	0 ... 100 %RH
Accuracy (incl. non-linearity, hysteresis, and repeatability):	
At temperature range 0 ... +40 °C (+32 ... +104 °F):	
0 ... 90 %RH	±1.5 %RH
90 ... 100 %RH	±2.5 %RH
At temperature range -40 ... 0 °C, +40 ... +80 °C (-40 ... +32 °F, +104 ... +176 °F):	
0 ... 90 %RH	±3.0 %RH
90 ... 100 %RH	±4.0 %RH
Factory calibration uncertainty at +20 °C (+68 °F)	±1.5 %RH
Humidity sensor	Vaisala HUMICAP® 180R
Stability	±2 %RH over 2 years
<b>Temperature</b>	
Measurement range	-40 ... +80 °C (-40 ... +176 °F)
Accuracy over temperature range:	
+15 ... +25 °C (+59 ... +77 °F)	±0.2 °C (±0.36 °F)
0 ... +15 °C, +25 ... +40 °C (+32 ... 59 °F, +77 ... +104 °F)	±0.25 °C (±0.45 °F)
-40 ... 0 °C, +40 ... +80 °C (-40 ... +32 °F, +104 ... +176 °F)	±0.4 °C (±0.72 °F)
Temperature sensor	Pt1000 RTD 1/3 Class B IEC 751
HMP110 probe	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-50 ... +70 °C (-58 ... +158 °F)

Table 5 Temperature probes

Property	Description/Value
<b>Resistive temperature input signals</b>	
Temperature sensor	Pt100 RTD / 4 wire, Class A IEC 751

Property	Description/Value
Input impedance	5.1K $\Omega$
Measurement range	-196 ... +90 °C (-320.8 ... +194 °F)
Accuracy over temperature range:	
-196 ... -90 °C (-320.8 ... -130 °F)	$\pm 2.5$ °C ( $\pm 4.5$ °F)
-90 ... -30 °C (-130 ... -22 °F)	$\pm 0.75$ °C ( $\pm 1.35$ °F)
-30 ... 0 °C (-22 ... +32 °F)	$\pm 0.5$ °C ( $\pm 0.9$ °F)
0 ... +50 °C (+32 ... +122 °F)	$\pm 0.25$ °C ( $\pm 0.45$ °F)
+50 ... +90 °C (+122 ... +194 °F)	$\pm 0.75$ °C ( $\pm 1.35$ °F)

Table 6 Analog inputs

Property	Description/Value
<b>Current input signals</b>	0 ... 22 mA
Resolution	0.67 $\mu$ A
Accuracy	$\pm 0.15$ % F.S. at +25 °C (+77 °F)
Input impedance	62 $\Omega$
Overload protection	40 mA
<b>Voltage input signals</b>	0 ... 5 V, 0 ... 10 V
Resolution	0.0034 % F.S.
Accuracy	$\pm 0.15$ % F.S. at +25 °C (+77 °F)
Input impedance	37K $\Omega$
Overload protection	50 V max.
Isolation	One common per logger
<b>Contact inputs</b>	Open/Closed with magnetic reed switch cable connections (dry contact)

Table 7 Measurement variants

Model	Measurement channels
HMT141	1 temperature and 1 humidity channel
HMT143	2 RTD temperature channels
HMT144	2 voltage inputs (0 ... 5 VDC)
HMT145	2 voltage inputs (0 ... 10 VDC)
HMT146	2 current inputs (0 ... 20 mA)

Model	Measurement channels
HMT147	2 door contacts
HMT148	1 RTD temperature and 1 door contact
HMT14D	1 RTD temperature and 1 current input (0 ... 20 mA)
HMT14E	1 RTD temperature and 1 voltage input (0 ... 5 VDC)
HMT14F	1 RTD temperature and 1 voltage input (0 ... 10 VDC)

Table 8 Operating environment

Property	Description/Value
<b>Operating temperature</b>	
Data logger body, no display	-40 ... +60 °C (-40 ... +140 °F)
Data logger body, with display	-20 ... +60 °C (-4 ... +140 °F)
IP rating	IP65
Maximum operating altitude	2000 m (6 500 ft)

Table 9 General specifications

Property	Description/Value
Memory	3,060 samples
Sample rate	User selectable (interval: 2 ... 60 minutes)
Display (optional)	128 × 64 resolution full graphics B&W display without backlight

Table 10 Mechanical specifications

Property	Description/Value
Weight (with battery/without probe)	300 g (10.6 oz)
Screw terminals	26 AWG ... 20 AWG
HMP110 probe interface	4-pin M8 female panel connector
HMP110 probe cable lengths	3 m, 5 m, and 10 m (9.8 ft, 16.4 ft, and 32.8 ft)
Hermetic door switch sensor cable length	7.6 m (24.9 ft)
<b>Material</b>	
Data logger housing	PBT plastic
Display window	PC plastic

Property	Description/Value
HMP110 probe body	Stainless steel (AISI 316)
HMP110 probe grid filter	Chrome coated ABS plastic
<b>RTD temperature sensor</b>	
Sensor tip material	Stainless steel (AISI 316)
Sensor tip length	50.8 mm (2 in)
Sensor tip diameter	4.76 mm (0.19 in)
Cable length	5 m (16.4 ft)

Table 11 Wireless


Property	Description/Value
Networking standards	IEEE 802.11b/g
Data rates	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps
Frequency band	2402 - 2480 MHz
Wi-Fi security	WEP (128-bit), WPA, WPA2 (Personal)
Output power	+18 dBm (63 mW)
Receiver sensitivity	-85 dBm typical
Antenna	Onboard whip
Contains	FCC ID: U30-G2M5477 IC ID: 8169A-G2M5477 NCC ID: CCAF11LP0240T6  R 201-125765 当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

Table 12 Standards and approvals

Property	Description/Value
Electromagnetic compatibility	EN 61326-1, EN 301 489-1, EN 300 328 V2.1.1
Safety	EN 61010-1
Radio transmission equipment type approval	CMIIT ID: 2019DJ5109



Region-specific standards and regulations are applied to wireless devices. The HMT140 logger can be used in the following regions/countries. The list is subject to change without prior notice.

- EU countries
- The United States
- Australia
- Canada
- China
- Iceland
- Japan
- Liechtenstein
- New Zealand
- Norway
- Taiwan

Table 13 Spare parts and accessories

Item	Order code
<b>HMP110</b>	
Humidity and temperature probe	HMP110 <sup>1)</sup>
Humidity and temperature replacement probe	HMP110R <sup>1)</sup>
Humidity sensor	Vaisala HUMICAP® 180R
Probe mounting flange	226061
Probe mounting clamps, 10 pcs	226067
Probe cable 3 m (9.8 ft)	HMT120Z300
Probe cable 5 m (16.4 ft)	HMT120Z500
Probe cable 10 m (32.8 ft)	HMT120Z1000
Duct installation kit	215619
<b>Sensor protection</b>	
Plastic grid filter	DRW010522SP
Plastic grid with membrane filter	DRW010525SP
Stainless steel sintered filter	HM46670SP
<b>Other accessories</b>	
RTD temperature probe 5 m (16.4 ft)	ASM210644SP
Hermetic door switch sensor kit	236319SP
Thermal dampener blocks	236310SP

Item	Order code
Four Dual Lock™ strips (76 mm/3 in)	237217SP

1) *See separate order form.*

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## Warranty

For standard warranty terms and conditions, see [www.vaisala.com/warranty](http://www.vaisala.com/warranty).

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

## Technical support



Contact Vaisala technical support at [helpdesk@vaisala.com](mailto:helpdesk@vaisala.com). Provide at least the following supporting information as applicable:

- Product name, model, and serial number
- Software/Firmware version
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see [www.vaisala.com/support](http://www.vaisala.com/support).

## Recycling



Recycle all applicable material.



Follow the statutory regulations for disposing of the product and packaging.





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