Quick Guide

Data logger for continuous monitoring systems
VDL200

VAISALA

Introduction to VDL200 data logger

This document is a quick guide for installation of the VDL200 Data Logger. For the complete user guide, see VDL200 Data Logger User Guide (M212938EN) available at docs.vaisala.com.

VDL200 is an Ethernet-connected data logger for continuous monitoring systems. It provides high-accuracy measurements from up to 2 detachable humidity, temperature, and carbon dioxide probes. Suitable applications include real-time measurements in environments where wired connections are preferred. VDL200 is compatible with the Vaisala viewLinc Enterprise Server software.
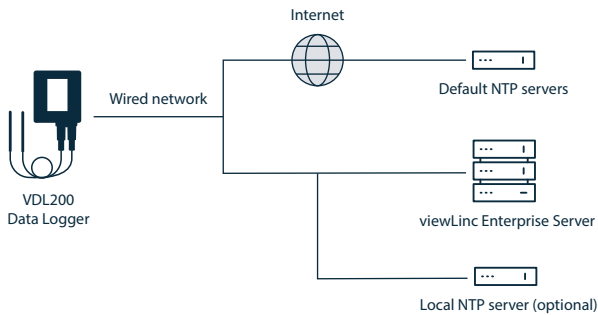
VDL200 is powered from the Ethernet connector using Power over Ethernet (PoE). If the network does not provide PoE, a separate PoE power supply must be used. Single-use 1.5 V AA size batteries are used as a temporary backup power source when PoE power is not available.

VDL200 maintains accurate time by synchronizing with a Network Time Protocol (NTP) server. VDL200 must be able to synchronize with an NTP server, otherwise it cannot store and send measurement data.

The following ports are used in the communication between VDL200 and the servers:
- TCP port 8883 (viewLinc Enterprise Server)
- UDP port 123 (NTP servers)

Parts
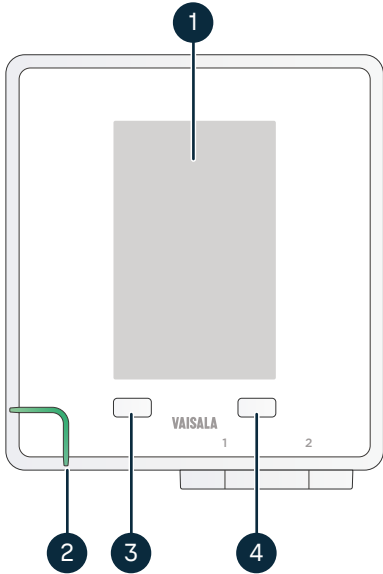
Figure 1   Front parts

1   Display
2   Status LED
3   Left button
4   Right button
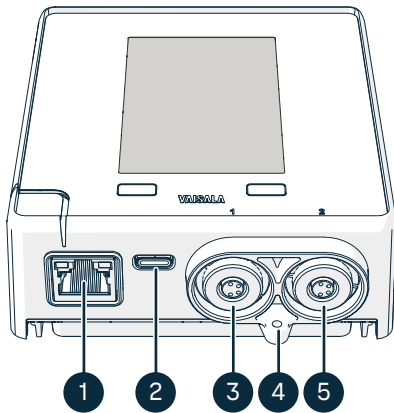
Figure 2   Connectors

1   Ethernet port (RJ-45)
2   Service port (USB-C)
3   Probe port 1 (4-pin M8 female)
4   Place for locking screw (3×8 mm screw recommended)
5   Probe port 2 (4-pin M8 female)
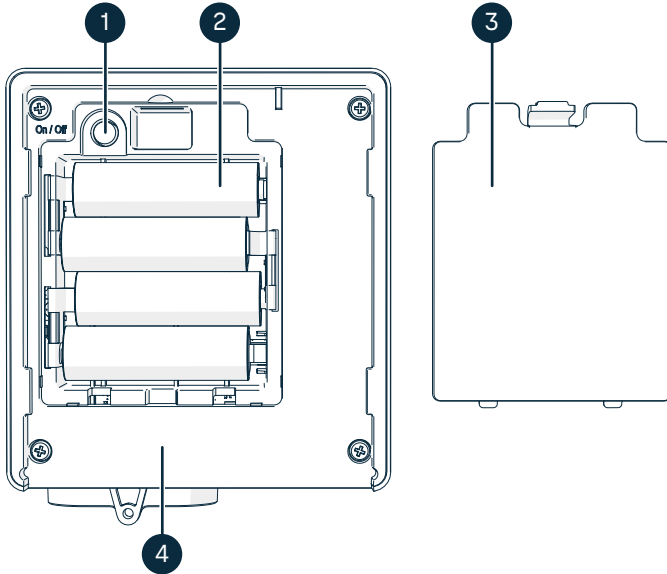
Figure 3   Rear parts

1   Power button
2   Backup batteries (4 pcs 1.5 V alkaline (LR6) or lithium (FR6))
3   Battery cover
4   Type label area
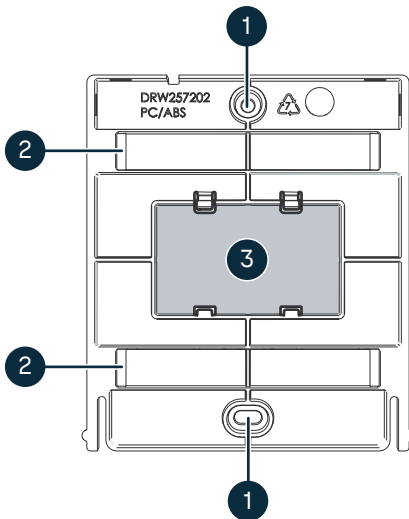
Figure 4   Mounting bracket parts

1   Screw mounting holes
2   Cable tie mounting holes
3   Mounting magnet

⚠️ **CAUTION! Strong magnet**
Keep the magnet away from devices that are sensitive to magnetic fields, for example, pacemakers, magnetic cards, and mechanical watches. Do not separate the magnet from the mounting bracket.

Display
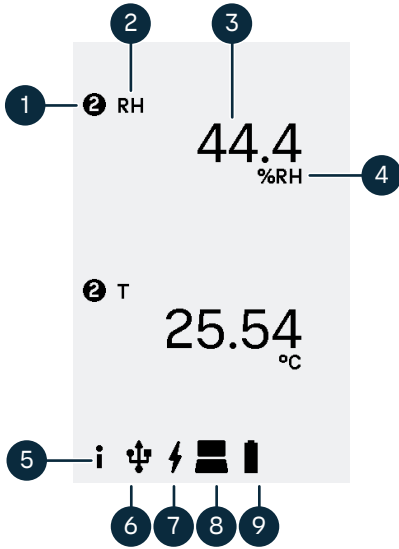
Figure 5   Display layout

1   Number of the probe port that is the source of this measurement
2   Abbreviation of measurement parameter
3   Latest measured value
4   Unit of measurement
5   Information icon. Touching the button opens the device information page.
6   Service port connection status
7   PoE power supply status
8   Host system connection status
9   Battery level
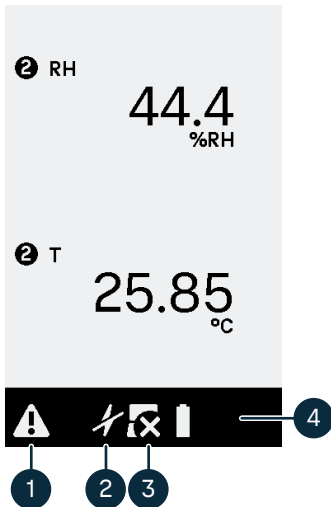
Figure 6   Display when errors are active

1   Error icon
2   PoE power supply status. In this example PoE is not connected.
3   Host system connection status. In this example the Ethernet connection is not available as PoE is not connected.
4   The color of the icon row is inverted when there are active errors.

Specifications

Table 1   VDL200-compatible probes

Measurement	Compatible measurement probes
Humidity and temperature (RH+T)	HMP110, HMP115
Temperature (T)	HMP110T, HMP115T, TMP115
Carbon dioxide (CO_2)	GMP251, GMP252

Table 2   VDL200 operating environment

| Property	Description/Value
Operating environment	Indoor use
Use in wet location	No
Storage temperature	−40 ... +60 °C (−40 ... +140 °F)
Operating temperature	−20 ... +60 °C (−4 ... +140 °F)
Operating humidity	0–100 %RH, non-condensing
IP rating	IP30: Protected against solid foreign objects of 2.5 mm Ø and greater.
Do not place the VDL200 unit in an environment that can exceed this specification, for example inside a climate chamber. Insert only the measurement probe(s) in the chamber and leave the VDL200 unit outside it.	

Table 3   VDL200 powering

Property	Description/Value
Powering options	Power over Ethernet (PoE) Battery backup [1] USB-C for temporary service use
PoE supply voltage	48 V DC
USB-C supply voltage	5 V DC
Power consumption	Max. 2 W
Battery type	AA size, 1.5 V, LR6 (alkaline) or FR6 (lithium)
Number of batteries	4
Typical operating time on battery power at 20 °C (68 °F)	
RH and T measurement combinations	2 weeks with alkaline batteries
CO_2 measurement	24 hours with lithium batteries

1)   *Network connection is not available when VDL200 is operating on battery power.*

Table 4   VDL200 inputs and outputs

Property	Description/value
Ethernet connector	8P8C (RJ-45)
Probe connector (2 pcs)	4-pin female M8 connector
Service port	USB-C
Ethernet interface	
Supported standards	10BASE-T, 100BASE-TX
IPv4 address assignment	DHCP (automatic), static IP

Status icons

Table 5   Status icons on VDL200 display

Icon(s)	Icon name	Meaning
i	Information	Access the device information page by touching the button below this icon.
⚠	Error	A device error is active. Touch the button below this icon to access the error page and the device information page.
⛐	Service port active	Service port is in use.
⚡	PoE available	Device is currently powered by Power over Ethernet (PoE).
⚡	PoE not available	PoE is not available and the device is operating on backup battery power. This state is considered an error state. Ethernet connection is disabled to reduce power consumption, which prevents communication with the monitoring system and the time servers.
▬	Connection OK	Monitoring system address is configured and the system is reachable.
▣✕	Connection unavailable	Ethernet connection is not available.
▣!	Check connection	Connection to monitoring system not available.
▮ ▮ ▮ ▯	Battery charge	Approximate charge remaining in the backup batteries.
▯	Batteries empty	Backup batteries do not have sufficient charge to power the device.
⚡	Batteries missing	Backup batteries are missing or inserted incorrectly.

Error messages

When VDL200 has one or more error messages to show, it flashes the status LED with red, and displays the ⚠ icon over the left button. Touching the button opens the **Errors** screen where you can view the error messages.

Some errors are associated a status icon that is shown on the home screen.

Table 6   VDL200 error messages

Error message and icon	Description	Recommended action
No probes detected. Connect probes and restart.	No compatible measurement probes were detected when VDL200 was started up. This message is shown on the home screen instead of the **Errors** screen.	Connect measurement probes and restart the VDL200.
Power over Ethernet not available.	PoE power is not available. VDL200 is operating on battery power or power from the temporary service port connection. This error means VDL200 cannot operate its network connection, which causes additional errors to be active.	1. Verify that the Ethernet cable is connected. 2. Enable PoE from the network switch or connect a PoE power source between the network and the VDL200.
Network connection not available.	VDL200 does not have a network connection.	1. Verify that the Ethernet cable is connected. 2. Connect the VDL200 to Insight software and verify the network settings. 3. Depending on how the network is configured, you may need to supply your IT support with the **MAC address** of the VDL200 so that it can be allowed to the network.
Monitoring system connection problem.	VDL200 has a network connection but it is not connected to a monitoring system.	1. Connect the VDL200 to Insight software and verify that the address of the monitoring system has been configured correctly. 2. There may be a connectivity problem between the monitoring system and the VDL200. Request help from your local IT support to resolve it.

Error message and icon	Description	Recommended action
Backup batteries empty.	The battery level is insufficient to operate the VDL200.	Replace the batteries.
Backup battery level low.	The battery level is low but currently sufficient to operate the VDL200.	
Backup batteries not installed.	Backup batteries are not installed, or they are installed incorrectly.	Insert new batteries or check and correct the orientation of the batteries.
System time not available.	The real-time clock of the VDL200 does not have system time set. This error means the VDL200 cannot store and send measurement data.	Resolve the time synchronization error.
Time synchronization problem.	VDL200 is currently unable to synchronize its system time with any of the network time protocol (NTP) servers.	1. Verify that VDL200 has a network connection and PoE power connected. 2. Connect the VDL200 to Insight software and verify that the addresses of the NTP servers have been configured correctly. 3. A network firewall may be blocking UDP port 123 that is needed for the NTP protocol to function.

Installing VDL200

To install the VDL200, you need the following tools and equipment:
- Content of the VDL200 product package:
    - VDL200 device with mounting bracket
    - According to order: measurement probes, probe cables, probe holders, and batteries
- If not included in the order: 4 pcs AA size 1.5 V batteries, type LR6 (alkaline) or FR6 (lithium)
- Cable ties or screws and wall plugs for mounting
- Cable tie cutter or screwdriver, depending on mounting method
- Ethernet cable
- Power over Ethernet (PoE) power source
- For configuring the settings of the VDL200:
    - Computer with Microsoft Windows® operating system (64-bit version) and a free USB port
    - USB cable with a USB-C connector (type C to A or type C to C)
    - Insight PC software, available from vaisala.com/insight.

1. Slide the mounting bracket out of the data logger.
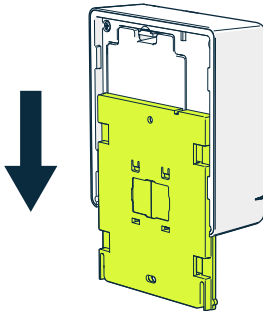
2. Connect the measurement probes to the probe ports of the data logger:

- Directly attached probes: Verify the orientation of the connector pins and push the probe to the connector. Secure the probe using a probe nut.
- Cable-attached probes: Connect the cable to the probe port, and secure it using the M8 nut on the cable. Then connect the probe to the cable.
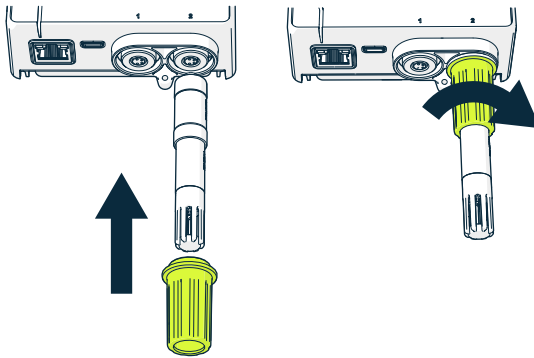
3. Open the battery cover.
4. If the battery compartment is empty, insert 4 AA size 1.5 V batteries of the appropriate type. Follow the markings on the battery compartment to insert the batteries in the right orientation.

> ℹ️ Use batteries that have a full charge and are not past their expiration date. Lithium batteries must be used with CO_2 measurement, and when the ambient temperature of the data logger's installation location is below 0 °C (+32 °F).

5. Press the power button for approximately 1 s to turn on the data logger. The data logger plays a short sound effect when turning on and off.

The data logger starts up on battery power and detects the connected probes. The measurements from the probes are automatically assigned for display and recording.

> ℹ️ Batteries are intended for backup use only. Proceed to connect Power over Ethernet (PoE) as soon as possible. **The Ethernet connection is disabled until PoE is available.**

6. Connect the Ethernet cable.
7. If the network does not provide PoE, connect a PoE power source between the network and the data logger.
8. Connect the VDL200 to your laptop using a USB-C cable and configure its settings. See Configuring settings using Insight software (page 15).

9. Attach the mounting bracket to the installation location with screws, cable ties, or the magnet.

    Note the orientation – when the data logger is installed, the probe ports should point down.

10. Slide the data logger into the mounting bracket.

11. Optional: Insert a 3×8 mm screw into the locking screw hole to prevent the data logger from being easily removed.

12. Use the included accessories to attach cabled probes to their final locations and secure the cables. See Mounting probes (page 17).

13. Log in to your viewLinc Enterprise Server as an administrator and accept the data logger as a new device. See Managing devices using viewLinc Enterprise Server (page 22).

> Remote management provides additional configuration options that may be relevant for you. For example, the temperature unit displayed by the data logger can be changed remotely. The default temperature unit is degrees Celcius.

14. Check the display of the VDL200 to verify there are no active errors.

Configuring settings using Insight software

Required tools:
- Computer with Microsoft Windows® operating system (64-bit version) and a free USB port
- USB cable with a USB-C connector (type C to A or type C to C)
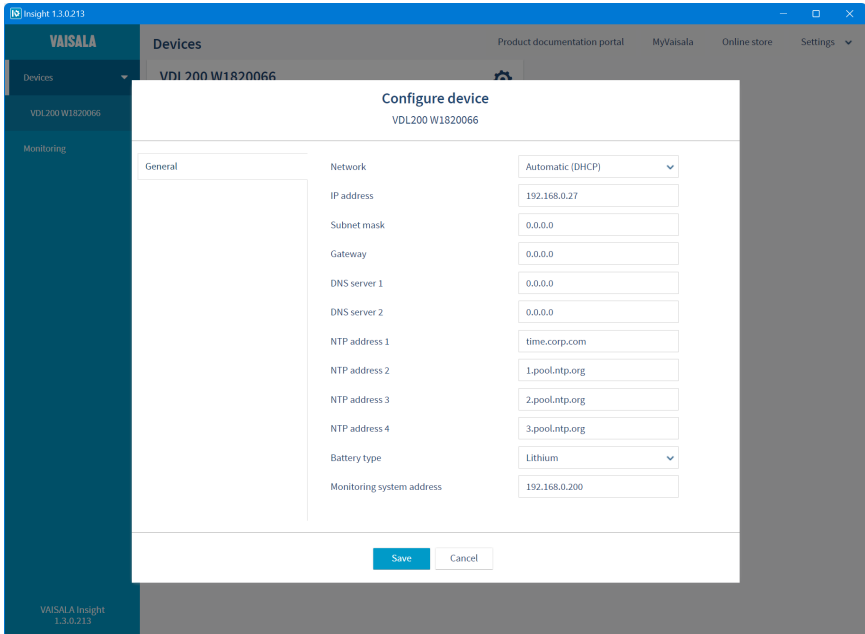- Insight PC software, available from vaisala.com/insight.

Figure 7   Configuring VDL200 settings with Insight

1. Turn on the VDL200 if it is off.

2. Open the Insight software on your computer.

3. Connect the USB cable between your computer and the service port of the VDL200.

4. Wait for the Insight software to detect the data logger.

5. Select ⚙ > **Configure device**

6. Configure the **Network** setting to select addressing type:

   - To use automatic IP address configuration using DHCP, select **Automatic (DHCP)**.
   - To configure a static IP address, select **Static IP**.

   > ℹ Your network administrator may request the **MAC address** of the device to allow it to the network. It is marked on the device itself, and you can also press the left button on the device to view it on the device information screen.

7. If you selected Static IP configuration, fill the following fields as instructed by your network administrator:

   - **IP address**
   - **Subnet mask**
   - **Gateway**
   - **DNS server 1** and **DNS server 2**

8. If you have an NTP server (time server) in your local network, overwrite **NTP address 1** with its hostname, fully qualified domain name, or IP address.

9. Select the **Battery type** so that it matches the batteries currently inserted in the device.

   The battery type setting is important to optimize the accuracy of the battery indicator and to allow the monitoring system to reliably send the low battery warning.

10. Configure the hostname, fully qualified domain name, or IP address of your viewLinc Enterprise Server in the **Monitoring system address** field.

    > 💡 VDL200 communicates with TCP port 8883 by default. You do not have to specify the default port in the address. However, if the port has been changed on the viewLinc side, you must add a colon ":" and the correct TCP port number to the address. For example:
    > **viewlinc.examplecompany.com:1234**

11. Select **Save** when done.

Mounting probes

For more information on probe mounting and available accessories, refer to the user guides of the probes:
- HMP60 and HMP110 Series User Guide (M211060EN)
- GMP251 and GMP80P User Guide (M211799EN)
- GMP252 User Guide (M211897EN)

Probe holder
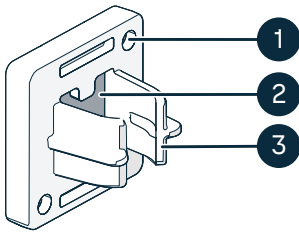
Figure 8   Probe holder ASM213382

1   Holes for attaching the holder with screws (screws not included)
2   Magnet
3   Probe attachment

The probe holder is a versatile mounting accessory for securing Ø 12 mm diameter cable mounted probes.

To attach the probe, simply press the body of the probe into the probe attachment. HMP115 and TMP115 probes have a groove that locks the probe in the holder when it is centered in the probe attachment.

Figure 9   HMP110 probe in the probe holder
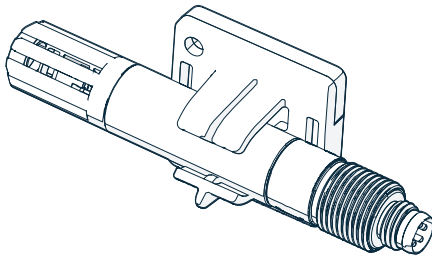
CO$_2$ probe mounting kit

When the data logger is purchased with a CO$_2$ measurement probe, a CO$_2$ probe mounting kit (Vaisala item ASM214253SP) is included. The kit includes a versatile probe support accessory that has attachments for a Ø 25 mm probe (for example, GMP251), a Ø 12 mm probe (for example, HMP110), and the sensor tip of the TMP115 probe. It also provides sufficient separation between the probes to prevent the mild heating effect of the CO$_2$ probe from affecting the measurement of the other probe. For this reason, it is best not to attach the CO$_2$ probe to another probe using a cable tie, for example.

Figure 10   Probe support accessory mounting options

A   Mounting through a hole using the screw-on attachment part.
B   Mounting using a reusable fastener strip. Clean the attachment surfaces using the included cleaning pad before applying the strip.
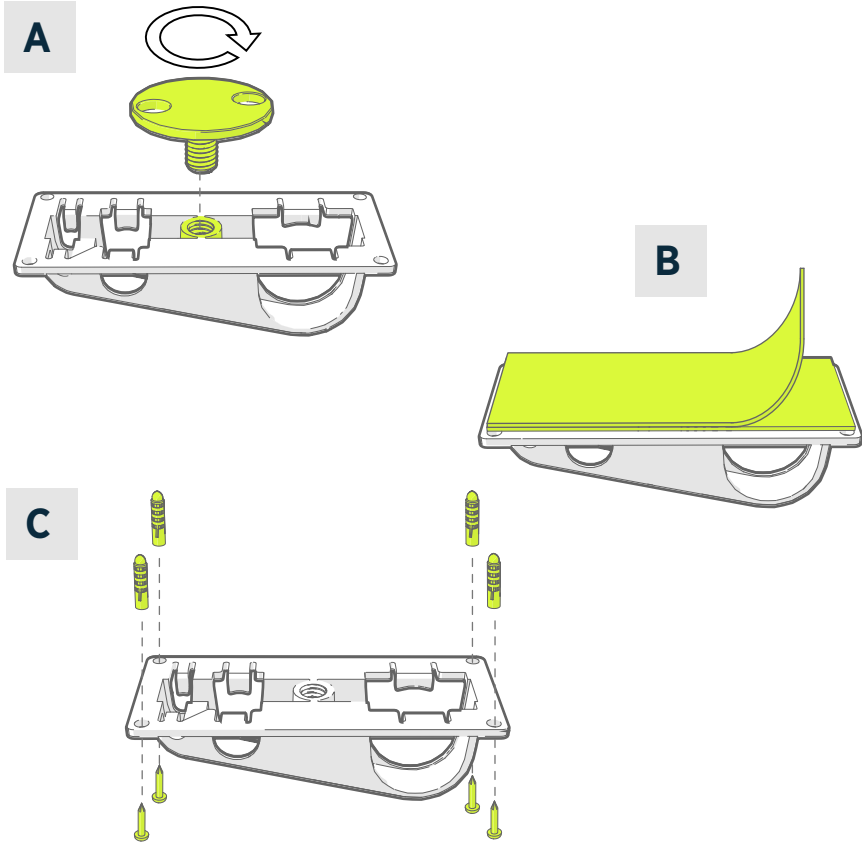C   Mounting with screws and wall plugs.

Mounting HMP110 probes

HMP110 is a robust stainless steel probe for humidity and temperature measurement in demanding conditions. Suitable for measurement inside chambers, fridges, and freezers in temperature range -40 ... +80 °C (-40 ... +176 °F). Must be connected to the data logger using a cable. Probe diameter 12 mm (0.47 in).
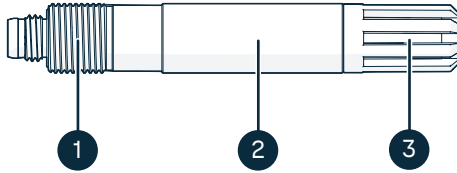
Figure 11   HMP110 probe

1   M12×1 thread for through-wall installation using mounting nuts.
2   Attach from this area using probe holder ASM213382 or cable tie.
3   Sensor protection filter. Do not attach from this area.

Mounting HMP115 probes
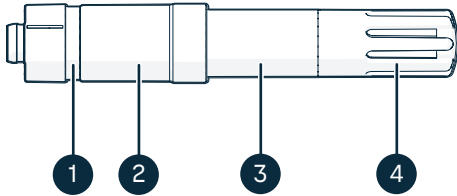
Figure 12   HMP115 probe

1   If using a probe holder, align it to this groove.
2   Plastic sleeve that locks the probe in place when connected to a mechanically compatible host device (for example, RFL100 data logger). Diameter 14 mm (0.55 in) at this point.
3   Attach from this area if using a cable tie. Diameter 12 mm (0.47 in) at this point.
4   Sensor protection filter. Do not attach from this area.

Mounting TMP115 probes

Figure 13   TMP115 probe

1   If using a probe holder, align it to this groove.
2   Plastic sleeve that locks the probe body in place when connected to a mechanically compatible host device (for example, RFL100 data logger). Diameter 14 mm (0.55 in) at this point.
3   Probe body with measurement electronics. Attach from this area if using a cable tie. Diameter 12 mm (0.47 in) at this point. Operating temperature range −40 ... +60 °C (−40 ... +140 °F).
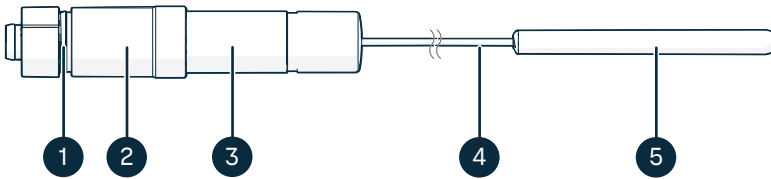4   Sensor cable. Do not cut or bend into a tight loop. Numbering labels included with the probe splitter accessory are designed to be attached to this cable.
5   Sensor tip, diameter 4.8 mm (0.19 in). Secure using a cable tie or insert into thermal dampener block for added thermal mass. Insert into the probe support accessory when using together with a CO_2 probe. Operating temperature range −196 ... +150 °C (−320.8 ... +302 °F).

> ⚠️ **CAUTION!** The operating temperature range of the sensor tip is much wider than that of the probe body. Leave the probe body outside the measured environment if possible, and avoid inserting it in environments that are outside its operating range.

> When working with equipment in extremely cold temperatures, use appropriate personal protective equipment such as thermally insulated gloves and clothing. Wear protective eyewear if working with coolants such as liquid nitrogen, and observe safe handling and storage precautions.

Mounting GMP251 and GMP252 probes

GMP251 and GMP252 are robust carbon dioxide (CO_2) measurement probes for use in demanding applications such as life science incubators. Operating temperature range −40 ... +60 °C (−40 ... +140 °F). The CO_2 probe mounting kit (Vaisala item ASM214253SP) is recommended for mounting, but the probes can also be attached from the probe body by other methods.
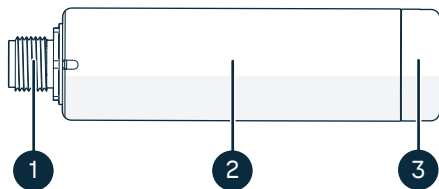

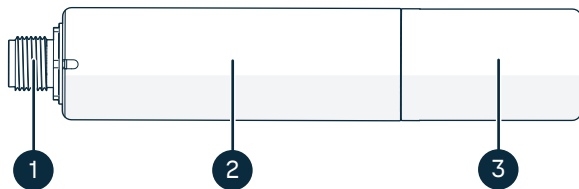Figure 14   GMP251 probe

Figure 15   GMP252 probe

1   M12 5-pin male connector. Must be connected to the M12 connector of the Probe Splitter M8/M12 accessory.
2   Ø 25 mm probe body.
3   Sensor protection filter. Do not attach from this area.

Managing devices using viewLinc Enterprise Server

1. Open the viewLinc Enterprise Server user interface by double-clicking the desktop icon, or by entering the server's IP address and port in a web browser's address field.

2. Log in with a user account that has the right to manage devices.

3. When viewLinc detects new devices, **New Devices** text appears at the top of the screen. If there are any new devices:

   a. Click the **New Devices** text to open the **New Devices** window.

   b. Compare the list of new devices to your device installation plan to verify that all your devices have been found. In the **Accept** column, select each device you want to add.

   c. Select **Save** to register the selected devices with your viewLinc Enterprise Server.

4. To access management options for accepted devices:

   a. Select **Sites Manager > Hosts and Devices**.

   b. Locate the device you want to manage from the device tree, right-click the entry of the device, and select **Edit Properties**. The **Edit Device Properties** window opens.

   c. In this window you can set some information fields that viewLinc uses (for example, **Device alias**) and some actual settings that are sent to the device. Note the following settings for VDL200:

      • **Metric units enabled**: Change the setting to **No** to display degrees Fahrenheit for temperature on the device display.
      • **Device log level**: Do not adjust this setting unless instructed by Vaisala to do so. Changing the setting will increase the power consumption of the device, which will reduce the battery backup time.

Maintenance and calibration services

Vaisala offers comprehensive customer care throughout the life cycle of our measurement instruments and systems. Our factory services are provided worldwide with fast deliveries. For more information, see vaisala.com/calibration.

- Vaisala Online Store at store.vaisala.com is available for most countries. You can browse the offering by product model and order the right accessories, spare parts, or maintenance and calibration services.
- To contact your local maintenance and calibration expert, see vaisala.com/contactus.

Warranty

For standard warranty terms and conditions, see 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. 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 vaisala.com/support.

FCC Part 15 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 to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION! 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.

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.

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Visit docs.vaisala.com for product documentation updates and translations.