

# User Guide

Analog output transmitter with Insight PC  
software USB-C interface

**Indigo201**



**VAISALA**

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# 1. About this document

## 1.1 Version information

This document provides detailed instructions for using and maintaining the Vaisala Indigo201 analog output transmitter.

Table 1 Document versions (English)

Document code	Date	Description
M212842EN-B	November 2022	This document. Added information on temporary use of Insight PC software connection and USB device driver installation. Updated power supply accessory options.
M212842EN-A	September 2022	This document. First version of the manual.

## 1.2 Related manuals



For the latest versions of these documents, see [docs.vaisala.com](https://docs.vaisala.com).

Document Code	Name
M212815EN	<a href="#">Indigo201 Analog Output Transmitter Quick Guide</a>
M212843EN	<a href="#">Indigo202 Digital Transmitter User Guide</a>
M212816EN	<a href="#">Indigo202 Digital Transmitter Quick Guide</a>
M211799EN	<a href="#">Vaisala CARBOCAP® Carbon Dioxide Probe GMP251 User Guide</a>
M211897EN	<a href="#">Vaisala CARBOCAP® Carbon Dioxide Probe GMP252 User Guide</a>
M211972EN	<a href="#">Vaisala PEROXCAP® Hydrogen Peroxide, Humidity and Temperature Probe HPP272 User Guide</a>
M212022EN	<a href="#">Vaisala HUMICAP® HMP Series humidity and temperature probes with MMP8 and TMP1 User Guide</a>

## 1.3 Documentation conventions



**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!** 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.

## 1.4 Trademarks

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## 2. Product overview

### 2.1 Introduction to Indigo200 transmitters

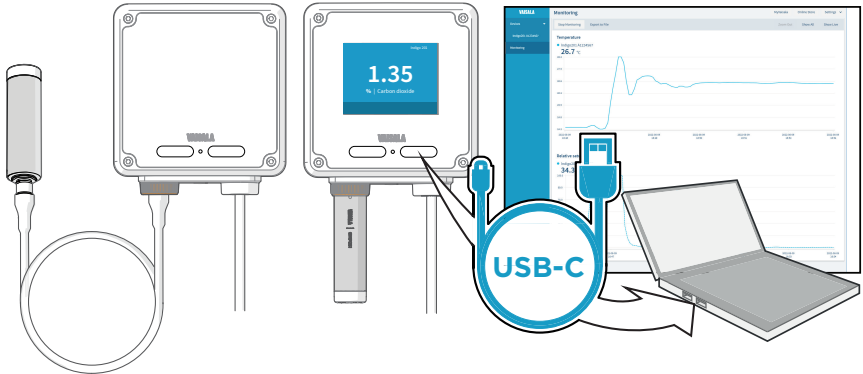


Figure 1 Indigo201 with and without display

Vaisala Indigo200 transmitters are a plug-and-play host device platform for Vaisala Indigo-compatible probes. Indigo transmitters extend the feature set of connected probes with a range of additional options for outputs, measurement viewing, status monitoring, and configuration interface access.

Depending on the Indigo200 transmitter model, a display is available as an optional selection or as a standard feature. In the non-display model, an LED indicator is used for notifications. Probes can be connected either directly on the transmitter from the probe's connector, or by using a cable between Indigo and the probe.

For easy access to configuration and additional monitoring options, the transmitter can be connected to Vaisala Insight PC software with a USB cable.

The Indigo201 transmitter is designed for analog output applications. The transmitter's output options include 3 analog output channels (current or voltage) and 2 relays.

For more information on Indigo transmitter models, see [www.vaisala.com/indigo](http://www.vaisala.com/indigo).

### 2.2 Indigo201 basic features and options

- All Vaisala Indigo-compatible probes can be connected to all Indigo transmitter models
- Plug-and-play probe installation: when unconfigured, Indigo automatically adapts the analog output configuration of the connected Indigo-compatible probe
- The transmitter can be connected to Vaisala Insight PC software with a generic USB-C cable for easy access to configuration and monitoring options
- 3.5" TFT LCD color display or non-display model with LED indicator

- Power supply input 15 ... 30 V DC (24 V AC  $\pm 10\%$  50/60 Hz)
- 3 current (mA) or voltage (V) analog outputs
- 2 configurable relays

## 2.3 Indigo200 transmitter parts

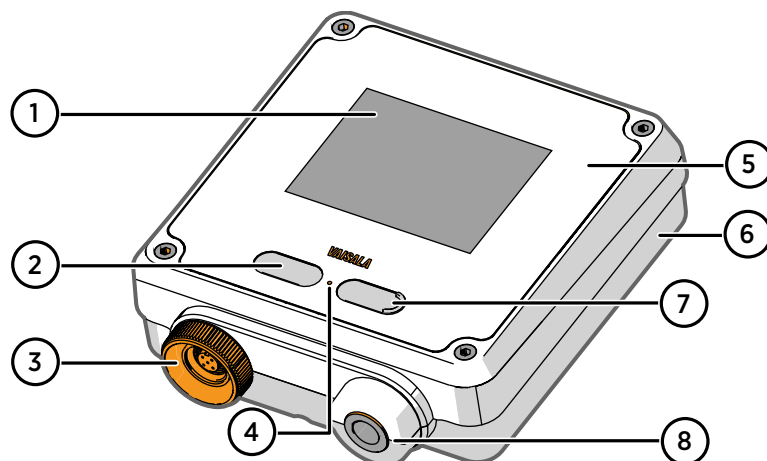


Figure 2 Indigo201 transmitter parts

- 1 Display (optional)
- 2 Push button for transmitter display quick actions (switch between display views, display off and on)
- 3 Probe and probe cable connector, locking wheel
- 4 LED status indicator
- 5 Top cover of the transmitter: LED, optional display, circuit board and connector pins
- 6 Transmitter base: input and output wiring (screw terminals), mounting base
- 7 USB-C port for connecting the transmitter to Insight PC software
- 8 Rubber lead-through with strain relief for input/output cable. See [Wiring options](#) (page 17) for instructions and the location of the alternative wiring route on the back of the transmitter.



**CAUTION!** Only use Vaisala Indigo-compatible probes with the transmitter. Attempting to connect incompatible probes or probe cables can damage the equipment.

## 2.4 Display and LED indicator

Indigo201 transmitters can be ordered either with the optional display, or as a non-display model that uses an LED indicator for notifications. In the display model, measurements can be viewed in numerical and graph format from the display, and status notification messages are shown on the bottom of the display. In the non-display model, the LED indicator is used to inform about the device status.

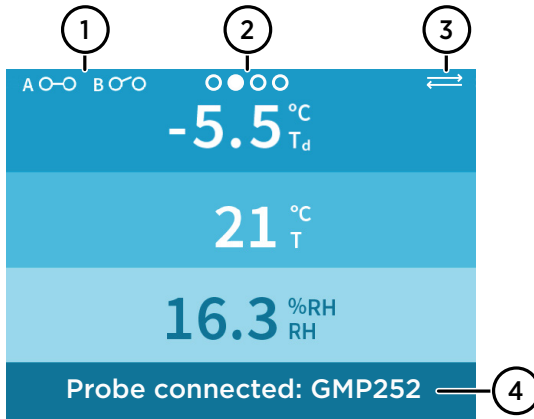


Figure 3 Indigo200 display with relays, three parameters and USB connection notification

- 1 Relay A and relay B status
- 2 Display view navigation icons
- 3 Active USB connection notification icon
- 4 Message field for notifications, warnings and errors

You can configure the transmitter display to show 1 to 3 measurement parameters in numeric and graph format. Information about the transmitter and connected probe (for example, notifications and warnings) is shown on a message row on the top part of the display.

Relay and USB connection status are also shown on the display as applicable.

The parameters shown, display brightness, and display mode (numeric or graph) can be configured with the Insight PC software.

### Switching between display views and turning display off and on

To switch between different display views, push the left button on the front cover once.

To turn the display off and on, keep the left button pressed down for a few seconds.

## 2.4.1 Graph mode

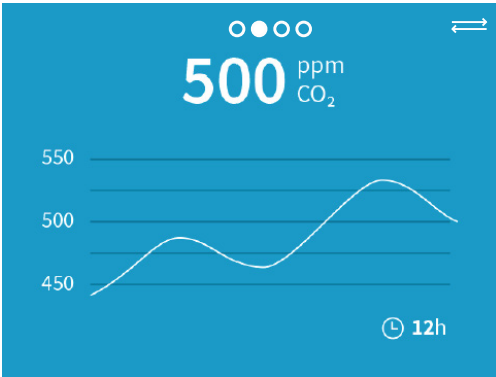


Figure 4 Transmitter display in graph mode

You can set the transmitter display to show the connected probe's measurement data as graphs. The measurement parameters can be configured with the Insight PC software.



You can switch between the numerical and graph views shown on the display with the push button on the front of the transmitter.

## 2.4.2 LED states in transmitter with no display

In the display model, notifications, warnings and other messages are shown on the display as text rows and indicator graphics. In the LED indicator model, the status of the transmitter and probe is indicated by LED color and whether the LED blinks. To view more information on the notifications, connect the transmitter to Insight PC software.

The LED states are described in [Table 2 \(page 12\)](#).

Table 2 LED states in transmitter with no display

LED color	Meaning
Not lit	Power off.
Green, fast blinking	Starting up.
Green, not blinking	Power on, normal measurement.
Green, slow blinking	Notification or warning, normal measurement. Connect to Insight to view status information and configure.

LED color	Meaning
Red	Error. Connect to Insight to view status information and configure.
Red and blinking	Critical error. Connect to Insight to view status information and configure.

## 2.5 Configuration access with Insight PC software

The screenshot shows the 'Configure Device' window for 'Indigo201 A1234567' in 'Advanced Mode'. On the left is a sidebar with a list of configuration categories: Analog output 1, Analog output 2, Analog output 3, Relay output A (selected), Relay output B, Compensation power-up defaults, Compensation setpoints, and Measurement. The main area displays settings for 'Relay output on/off', which is currently turned on. Below this, the 'Output parameter' is set to 'CO2'. The 'Activate above' threshold is 500, 'Activate below' is 100, and 'Hysteresis' is 20. The 'Error output state' is set to 'Inactive'. At the bottom are 'Save' and 'Close' buttons.

Figure 5 Insight PC software configuration example: relay output A options

Indigo200 transmitters and the probes connected to the transmitters can be configured, monitored, and calibrated by connecting the transmitter to a PC that has Vaisala Insight PC software installed. To access the configuration options in Insight PC software, you need to connect a computer with Insight PC software to the transmitter front cover USB port with a USB-C (type C to A) cable. You can either use either a generic USB-C cable, or the Vaisala accessory cable (item code: 273956). Using Indigo200 transmitters with Insight software requires the Vaisala USB Device driver.



Note that a USB-C cable is not included in Indigo200 transmitter deliveries by default.



Note that the USB cable connection to Insight is only intended for temporary use during configuration, and must not be used for permanent installations. The IP rating and EMC properties of the transmitter can be affected when the USB port is open.

For an overview of using the Insight PC software, see [Insight PC software overview \(page 25\)](#).

## 2.6 Receiving analog output settings from probe

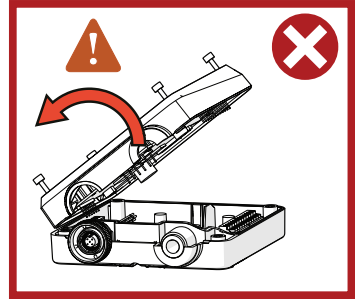
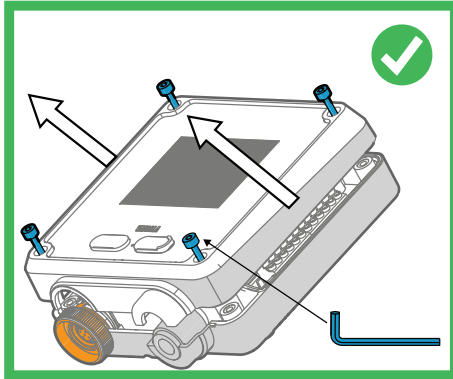
When you take Indigo201 in use for the first time and have not entered an analog output configuration, the transmitter automatically adapts the analog output configuration of the first Vaisala Indigo-compatible probe you connect.

If an analog output configuration already exists in Indigo201 (that is, you have previously connected a probe or configured the settings), you need to set the analog output configuration of the new probe manually. Analog output from the transmitter is halted and does not resume until you have set the new probe's configuration.

Alternatively, you can clear the analog output settings in Indigo201 configuration. This returns the transmitter to a state where it automatically starts using the analog output configuration of the next connected probe. For instructions, see [Clearing transmitter analog output configuration \(page 30\)](#).

## 3. Installation

### 3.1 Opening and mounting



**CAUTION!** To avoid damaging the connector pins of the transmitter, pull the transmitter cover off the base in a straight angle. Do not twist or bend.

- ▶ 1. Loosen the 4 screws on the transmitter cover.
2. Carefully open the transmitter cover part of the way from both sides so it is easier to pull the cover off the base.
3. Pull the transmitter cover off the base in a straight angle. Do not twist or bend.
4. Lead the input/output cable inside the transmitter (see [Wiring options \(page 17\)](#)). If you are wiring through the lead-through on the bottom of the transmitter, test that the strain relief works with your cable.
5. Place the transmitter base on the installation surface and mount it with 3 screws. See the screw positions in [Figure 6 \(page 16\)](#).
6. Connect the input/output cable's wiring to the screw terminals (see [Indigo200 transmitter base \(page 16\)](#)) and reattach the cover when done.

## 3.2 Indigo200 transmitter base

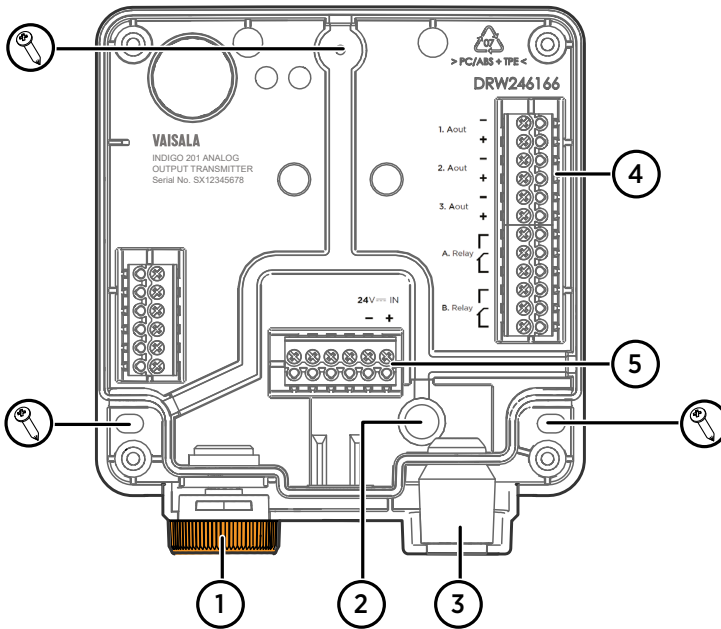


Figure 6 Indigo 201 transmitter base main parts and mounting screw positions

- 1 Probe and probe cable connector inside the locking wheel
- 2 Wiring from the back: cut open the seal
- 3 Rubber cable lead-through with strain relief
- 4 Screw terminals for analog outputs 1-3 and relays A and B
- 5 Screw terminals for 24 V power supply input



**CAUTION!** Do not energize the power supply before the wiring has been connected.



### 3.3 Wiring options

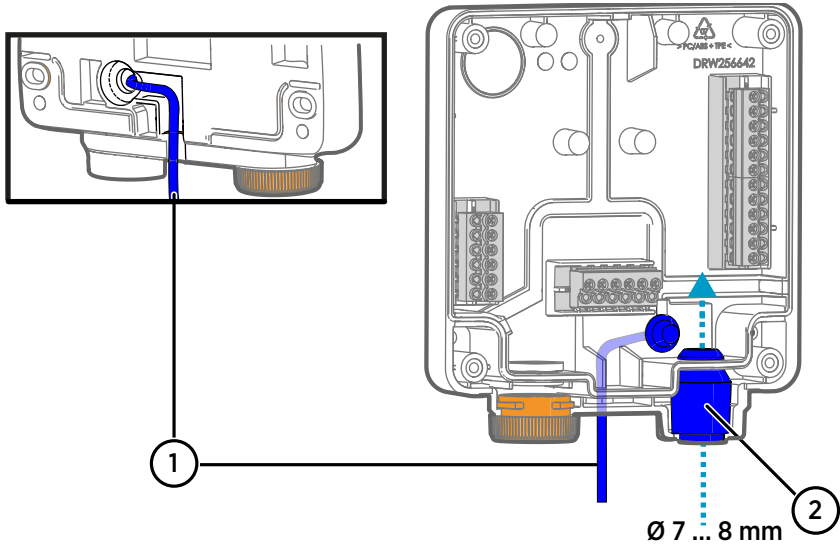


Figure 7 Indigo200 wiring options

- 1 Wiring from the back: cut the seal open and nest the cable in the groove on the back of the transmitter base
- 2 Wiring through the rubber lead-through on the bottom of the transmitter

- 1. To wire the input/output cable through the back of the transmitter:
- a. Cut off as much of the seal on the transmitter base as is needed to fit your cable through the opening.
  - b. Lead the cable through the cut in the seal.
  - c. Nest the cable inside the groove on the back of the transmitter as shown in [Figure 7 \(page 17\)](#), and attach strain relief as needed.



**CAUTION!** To preserve the IP rating of the transmitter, the back of the transmitter must rest flat on the installation surface. Always nest the cable inside the groove on the back, so that the cable does not push the back of the transmitter off the installation surface.

- d. If you wire only through the back, plug or seal the other lead-through on the bottom.

2. To wire the input/output cable through the rubber lead-through on the bottom:
  - a. Push the input/output cable through the lead-through.
  - b. The lead-through provides strain relief and holds the cable in place. Tightening is not required.



The recommended cable diameter for wiring through the rubber lead-through is 7 ... 8 mm. If you use a different cable size, test that the strain relief works as intended.

## 3.4 Inputs and outputs

Table 3 Inputs and Outputs

Property	Specification
Insight PC software <sup>1)</sup> configuration access	USB-C port on transmitter (compatible with generic USB cables)
Analog outputs	3 voltage (V) or current (mA) outputs: <ul style="list-style-type: none"> <li>• 0 ... 10 V / 0 ... 5 V / 0 ... 1 V / 1 ... 5 V (min. load 1k<math>\Omega</math>)</li> <li>• 0 ... 20 mA / 4 ... 20 mA (max. load 500 <math>\Omega</math>)</li> </ul>
Accuracy of analog outputs at +20 °C (+68 °F)	$\pm 0.1\%$ full scale
Relays	2 configurable relays (VAC/VDC)
	Device maximum specification (resistive load): <ul style="list-style-type: none"> <li>• Max. switching power 30 W / 37.5 VA</li> </ul>
	UL-rated maximum specification (resistive load): <ul style="list-style-type: none"> <li>• AC: max. 28 V / 0.5 A</li> <li>• DC: max. 40 V / 0.24 A</li> <li>• Up to 30 VDC:               <ul style="list-style-type: none"> <li>• max. switching current 1 A</li> <li>• max. switching power 30 W</li> </ul> </li> </ul>
Power supply input <sup>2)</sup>	15 ... 30 VDC (24VAC $\pm 10\%$ 50/60 Hz)
Maximum current	Transmitter and connected probe max. 1 A
Power consumption	Transmitter max. 3 W (+ connected probe, varies depending on probe type)
Probe connector	M12/5 connector for probe or probe cable connection (Vaisala Indigo-compatible probes)
Cable lead-throughs	2 options: rubber lead-through on the bottom of the transmitter, and opening with a seal at the back of the transmitter

Property	Specification
Screw terminal wire size	0.2 ... 1.5 mm <sup>2</sup>

- 1) *Vaisala Insight software for Windows® available at [www.vaisala.com/insight](http://www.vaisala.com/insight).*
- 2) *Using a power supply with overload protection is recommended for electrical safety.*



**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.

### 3.5 Dimensions

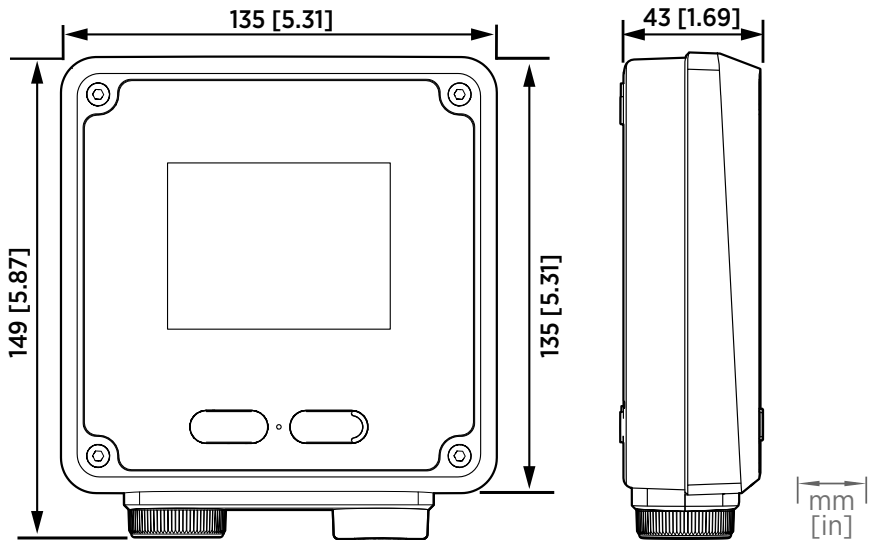


Figure 8 Indigo200 transmitter dimensions

### 3.6 Attaching probes and cables



**CAUTION!** Only connect compatible measurement devices to the transmitter. Attempting to connect incompatible devices or cables can damage the equipment. Refer to transmitter specifications for compatibility information.

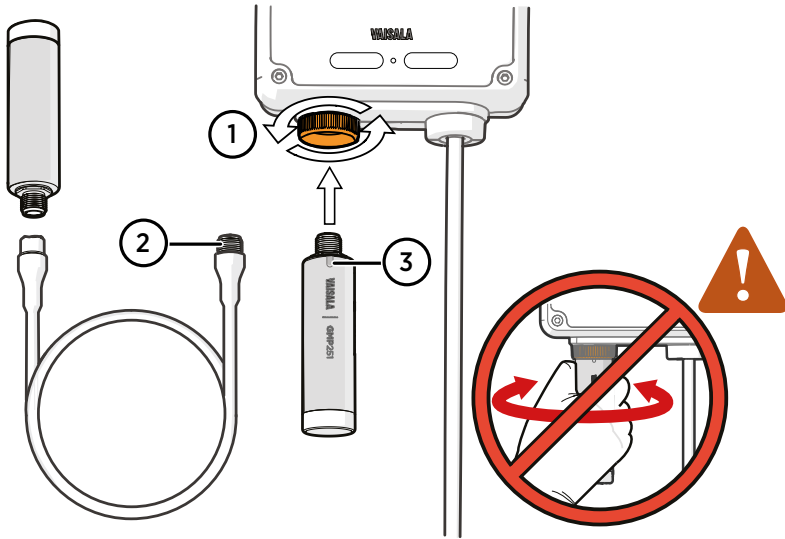


Figure 9 Attaching probes and cables to Indigo200

- 1 Probes are locked in place with the locking wheel. **Never turn from the probe body.**
  - 2 Connect probe cables in the same way as probes: insert the cable in the connector and hold in place while turning the locking wheel.
  - 3 Insert probes into the probe connector with the orientation mark facing out.
- 1. Insert the probe into the probe connector with the orientation mark on the probe body facing out.
2. Hold the probe in the probe connector and lock it in place by turning the locking wheel counterclockwise. Do not turn the probe body when attaching, only the locking wheel on the transmitter.
3. If no previous configuration exists (that is, this is the first time a probe is connected to Indigo, and no configuration has been set manually), Indigo adapts the analog output settings of the connected Vaisala Indigo-compatible probe automatically.



If a configuration that differs from the attached probe's configuration exists in the transmitter, you must configure the new probe manually to enable analog output. See [Analog output configuration overview \(page 28\)](#).

## 4. Using Indigo201 with Insight PC software

### 4.1 Vaisala Insight PC software

Vaisala Insight PC software is a configuration software for Vaisala Indigo-compatible probes and transmitters. Insight is available for the Windows operating system (64-bit only). For a full list of supported operating system versions, see <http://www.vaisala.com/insight>.



To ensure support for your transmitter, download the latest version of Insight at [www.vaisala.com/insight](http://www.vaisala.com/insight).

With the Insight PC software, you can:

- See real-time measurements and device and status information
- Configure outputs and relays
- Calibrate and adjust output
- Configure the transmitter settings (for example, display mode)
- Calibrate and adjust the probe connected to the transmitter
- Test and adjust the analog output channels of the transmitter

Indigo200 transmitters can be connected to Insight PC software with a standard USB-C cable (type C to A or type C to C). For instructions on connecting the transmitter to Insight, see [Connecting to Insight PC software \(page 23\)](#).



Note that the USB cable connection to Insight is only intended for temporary use during configuration, and must not be used for permanent installations. The IP rating and EMC properties of the transmitter can be affected when the USB port is open.



To connect the Indigo transmitter to Vaisala Insight PC software with a USB cable, you must have the Vaisala USB Device driver installed on your PC.

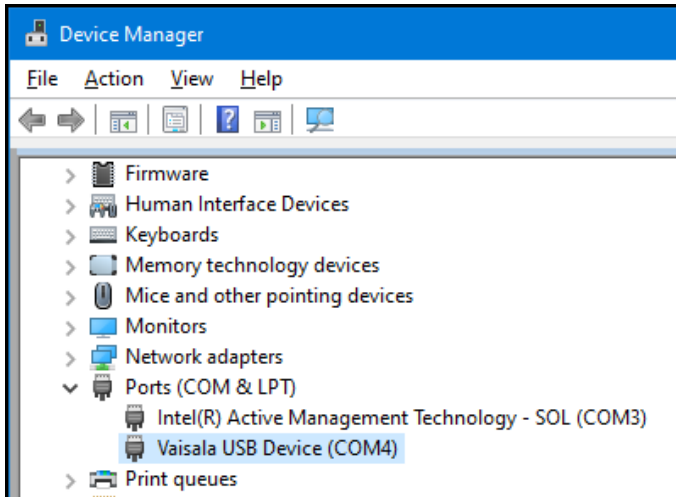
#### 4.1.1 Installing Vaisala USB Device driver



The Vaisala USB Device driver only supports Windows® operating systems.

1. Connect your USB-C cable to the Indigo transmitter USB port, and then connect the USB cable to a USB port on a PC that has Insight PC software installed. Windows® detects the new device and installs the appropriate driver.

2. Open **Device Manager** from the Windows® Start menu. Use search to find it if necessary (search for "device").



3. Locate the Vaisala USB device in the Device Manager list of devices :
  - If the device is listed as **Vaisala USB Device** with a COM port number in brackets, the driver is ready for use.
  - If the device is listed as **Vaisala USB Instrument Cable** without a COM port number listed, you must install the driver manually.
4. To install the driver manually:
  - a. Disconnect the USB cable from the computer.
  - b. Download the Vaisala USB device driver at <http://www.vaisala.com/software> (look for **USB Instrument Driver Setup** for cables).
  - c. Extract the driver zip file and run the USB driver installation program *Vaisala USB Device Driver Setup.exe*. Accept the installation defaults.
  - d. Go back to [step 1](#) and verify that the driver installation works as expected.

## 4.2 Connecting to Insight PC software

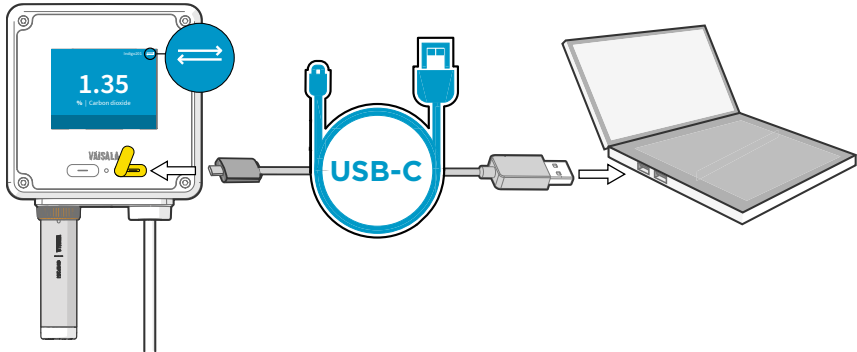


Figure 10 Connecting Indigo200 transmitter to Insight PC software with USB-C cable



### Required tools:

- Computer with a Microsoft Windows® operating system (64-bit version), Vaisala Insight PC software, and Vaisala USB Device driver installed
- USB cable with a USB-C (type C to A or type C to C) connector (available as an accessory, a generic cable can also be used)



Note that the USB cable connection to Insight is only intended for temporary use during configuration, and must not be used for permanent installations. The IP rating and EMC properties of the transmitter can be affected when the USB port is open.

You can connect the Indigo200 transmitter to Vaisala Insight PC software with any generic USB cable that has a USB-C connector. The Insight software can be downloaded at [www.vaisala.com/insight](http://www.vaisala.com/insight). Using Indigo200 transmitters with Insight software requires the Vaisala USB Device driver.

For an overview of the Insight PC software configuration and monitoring options for Indigo200, see [Insight PC software overview \(page 25\)](#).

To connect the transmitter to Insight PC software:

1. Verify that you have the Vaisala USB Device driver installed on your computer. For instructions, see [Installing Vaisala USB Device driver \(page 21\)](#).
2. Open the Insight software on your PC.
3. Connect the USB cable to a free USB port on the PC.
4. Open the protective cover of the right-hand port on the front of the transmitter, and connect the USB cable to the USB-C connector.

5. In transmitter models with a display, the USB connection icon (see [Figure 10 \(page 23\)](#)) appears on the top right corner of the transmitter display when the USB cable connection is active.
6. Wait for Insight software to detect the device.



You can also temporarily power the transmitter through your computer with the USB cable when using Insight. Note that certain probe functionalities that increase the power supply requirements, such as purge or heating, may affect the Insight connection when powering the transmitter only through the USB connection. If the probe connected to the transmitter has a purge or heating feature, do not use the temporary USB powering option.



## 4.3 Insight PC software overview

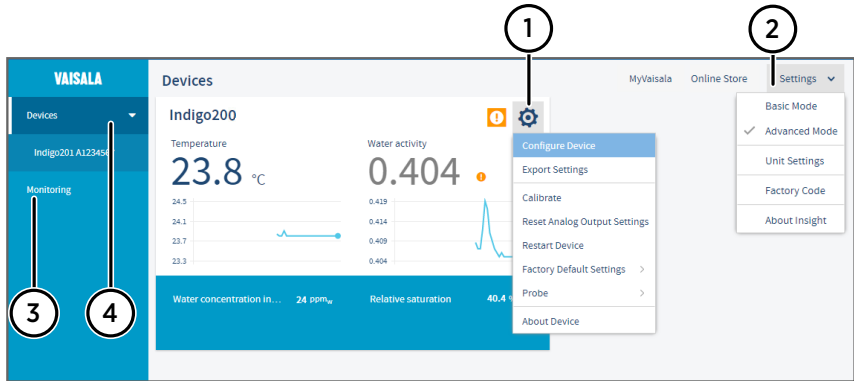



Figure 11 Insight software main menu view with Indigo200 transmitter and connected probe

- 1 Select  to access Insight main menu.
  - **Configure Device:** display and graph options, output and relay settings, parameter and unit selection, environmental compensation settings, filtering factor, probe options, and general settings.
  - **Export Settings:** creates a text file export of the device settings.
  - **Calibrate:** options for calibrating and adjusting the measurement of the connected probe, adjusting outputs, viewing adjustment data, and restoring factory adjustments.
  - Various reset, factory default settings, and restart options for transmitter and probe.
  - **About Device:** general device information such as serial number and software version.
- 2 Select **Settings** to switch between the **Basic Mode** and **Advanced Mode** user modes, change the units of parameters (metric/non-metric), enter a factory code to access restricted functionalities, or view information about the Insight software.
- 3 **Monitoring** provides options for monitoring and recording selected parameters, and exporting the monitoring data as a CSV (comma-separated values) file.
- 4 Device information menu with the following tabs:
  - **Measurements:** measurement graph view with parameter drop-down selection.
  - **Calibration information:** read-only information about the latest stored calibration.
  - **Diagnostics:** troubleshooting and administrative information about the device status. Also includes options for exporting the device error log and other diagnostics information as files (CSV/ZIP). When contacting Vaisala support, it is recommended to include an up-to-date export of the error log with the support request.

### 4.3.1 Unit settings

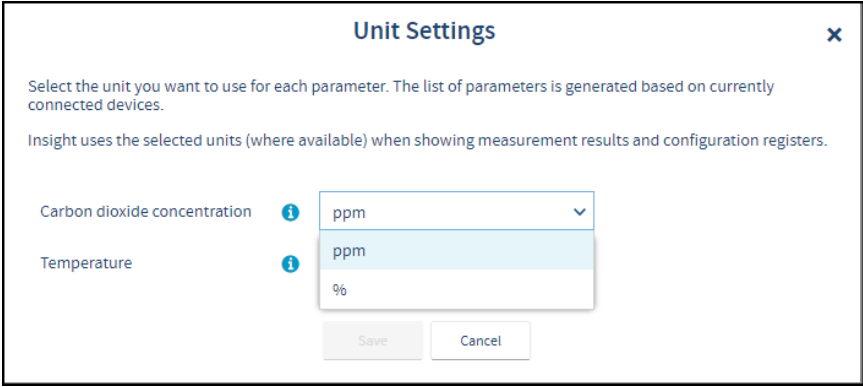


Figure 12 Unit selection example with a CO<sub>2</sub> probe

You can change the units of the measurement parameters in the Insight PC software main view **Settings** menu. For the location of the menu, see [Figure 11 \(page 25\)](#).



The unit selection has an effect on entering configuration values (for example, whether you must enter relay activation limits as ppm or % values).

## 4.4 Disabling and enabling USB functionality with DIP switch

If you install the transmitter to a location where it is necessary to limit access to configuration, you can disable the USB functionality with a DIP switch on the Indigo201 front cover component board.

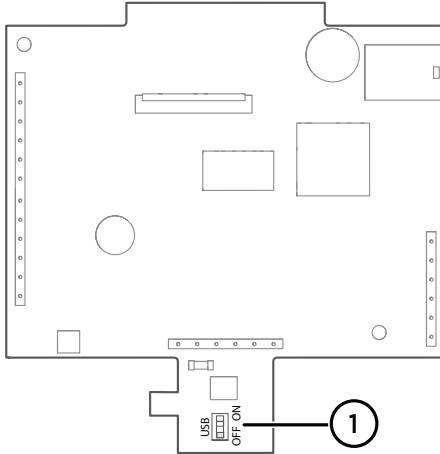


Figure 13 USB OFF/ON DIP switch location on Indigo front cover component board

### 1 DIP switch for setting USB functionality OFF or ON

To switch USB communication OFF or ON with the DIP switch:

- ▶ 1. Power off the transmitter.
2. Open the transmitter cover. See [Opening and mounting \(page 15\)](#).



To avoid damaging the connector pins of the transmitter, pull the transmitter cover off the base in a straight angle. Do not twist or bend.

3. Use a small screwdriver or a similar tool to change the position of the USB DIP switch to OFF or ON.
4. When done, close the transmitter cover and power on Indigo. When the DIP switch is in the OFF position, the transmitter USB port is inactive and it is not possible to connect Indigo201 to Insight PC software.

# 5. Configuring analog outputs

## 5.1 Analog output configuration overview

The transmitter has 3 analog outputs that can be configured with the Insight PC software. Each output has the same set of configuration options in the analog output 1 – 3 menus under the **Configure Device** menu (**Analog output 1** shown in example).



The available selections depend on the probe that is connected to the transmitter (for example, CO<sub>2</sub> output parameter selection is only available for CO<sub>2</sub> probes).

Configure Device

In Advanced Mode

Indigo201 A1234567

General

Display

Displayed parameters

Displayed units

Analog output 1

Analog output 2

Analog output 3

Relay output A

Output mode

Output parameter

Scale low end

Scale high end

Error output level

Clipping limit

Error limit

4...20 mA

CO<sub>2</sub>

100

500

3.60

1.0

2.0

mA

%

%

Save

Close

Figure 14 Analog output configuration options example



The **Analog output type** selection in the **General** menu defines whether the outputs are used for voltage or current output.

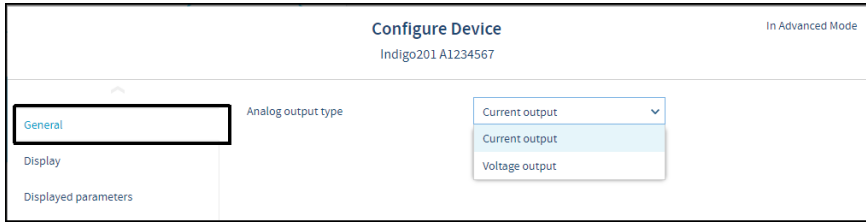


Figure 15 Analog output type (current or voltage) selection

## Receiving analog output settings automatically from probe

The transmitter can receive the analog output settings automatically from the connected probe in the following cases:

1. The transmitter is a new unit and has not been configured yet.
2. The user has removed the analog output configuration from the transmitter.




It is recommended to always review the analog output settings with the Insight PC software after connecting a probe.

## 5.2 Analog output configuration example

This example shows how to configure analog output 1 to use the following settings when a CO<sub>2</sub> probe is connected to the transmitter:

- 4 ... 20 mA current output
- Carbon dioxide measurement scaled to 0 ... 20 %CO<sub>2</sub>
- Clipping limit 5 %, error limit 10 %, and error output 3.6 mA

1. Connect the transmitter to the Insight PC software.
2. Select  and open the **Configure Device** menu.
3. Open the **General** menu and select **Current output** from the dropdown. Store your selection with **Save**.
4. Return to the **Configure Device** device menu and select one of the 3 analog outputs.
5. Select **4 ... 20 mA** from the **Output mode** dropdown.
6. Select **CO<sub>2</sub>** from the **Output parameter** dropdown.



Set the scaling according to the unit (for example, ppm or %CO<sub>2</sub>) selected in the **Settings > Unit Settings** menu in the Insight main view. The example here uses scaling for %CO<sub>2</sub>.

7. Type **0** in the **Scale low end** field.

8. Type **20** in the **Scale high end** field.
9. Type **3.6** in the **Error output level** field.
10. Type **5** in the **Clipping limit** field and **10** in the **Error limit** field.
11. Select **Save** to take your configuration into use.

### 5.2.1 Adjusting analog output channels

If the analog output of the transmitter appears to be inaccurate, you can test and adjust the output level in the Insight PC software calibration menu. In analog output adjustment, the output of the transmitter's analog output channels is forced to a fixed current or voltage level. The test output can then be verified with a multimeter, and the analog output level adjusted as necessary.


For instructions on testing and adjusting analog output, see [Analog output adjustment \(page 43\)](#).

## 5.3 Clearing transmitter analog output configuration

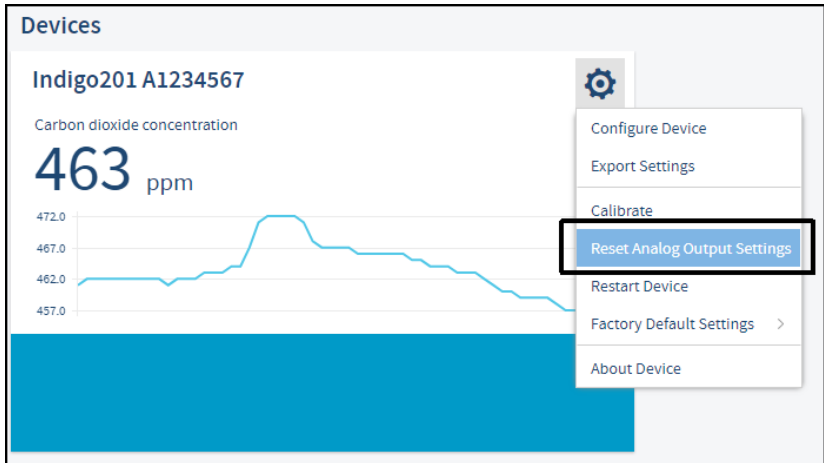
If you need to restore the transmitter to a state where no analog output configuration exists in the transmitter, you can clear the current configuration from the Insight main menu.



When you remove the analog output configuration from the transmitter, the transmitter automatically adapts the analog output settings of the next probe you connect to it.

- ▶ 1. Connect the transmitter to the Insight PC software.
2. Select  to open the Insight main menu.

3. Select **Reset analog output settings** and then select **Yes**. Insight displays a message that notifies about the settings being cleared.



## 5.4 Analog output overrange behavior

The analog output has a defined behavior when the measured values are outside the scaled analog output range. At first, the output is clipped when the measurement exceeds a set limit (the measurement continues, but the output does not change from the clipped value).

When the measurement exceeds the second limit (error limit), the analog output switches to the error state defined for the output.

The same clipping and error limits are applied when the measured value drops back to the scaled range: at first the output returns to the clipped value from the error state, and then to normal output.

### 5.4.1 Analog output overrange example

This example describes the analog output overrange behavior when an output uses a range of 0 ... 5 V, scaled to 0 ... 200 000 ppm (= 0 ... 20 %) CO<sub>2</sub>. The error level is set to 0 V, clipping limit is set to 5 % overrange, and error limit is set to 10 % overrange. CO<sub>2</sub> concentrations (ppm) are indicated for the clipping point and error limit point.

## Output voltage (V)

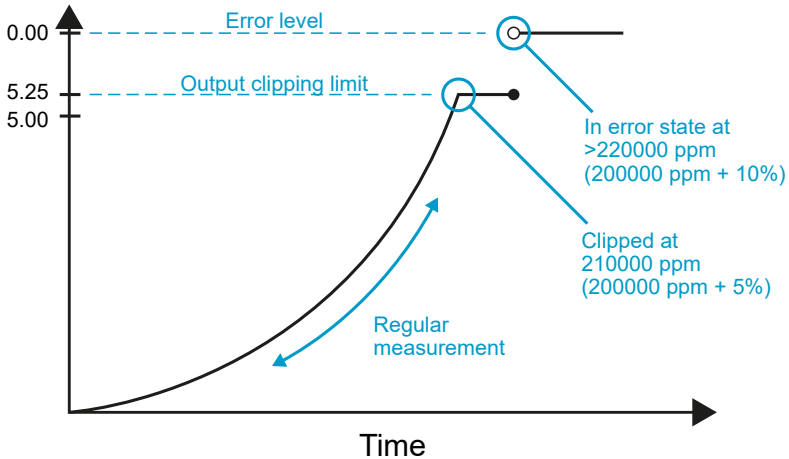


Figure 16 Analog output overrange behavior example

- When the measured CO<sub>2</sub> rises above 20 %, the output rises above 5 V.
- The output keeps rising until the measurement is 21 %CO<sub>2</sub>, at which point the probe outputs 5.25 V.
- If the CO<sub>2</sub> level rises above 21 %CO<sub>2</sub>, the output still remains at 5.25 V.
- If the CO<sub>2</sub> level rises above 22 %CO<sub>2</sub>, the output enters the error state, which is 0 V for the 0 ... 5 V output.



## 6. Configuring relays

### 6.1 Relay configuration overview

Indigo200 transmitters have 2 configurable relays (relay A and relay B). Both relays have configuration options for selecting the parameter that is used to control the relay, activation triggers, hysteresis, and error state behavior.

Relay output on/off	<input checked="" type="checkbox"/>	1
Output parameter	CO <sub>2</sub>	2
Activate above	500	3
Activate below	100	4
Hysteresis	20	5
Error output state	Inactive	6

Figure 17 Relay configuration options (CO<sub>2</sub> probe example)

- 1 **Relay output on/off:** Set to **ON** to enable relay output.
- 2 **Output parameter:** The measurement that is used to control the relay. Options vary based on the type of the connected probe.
- 3 **Activate above:**  
When the measurement value exceeds the value set here, the relay activates.  
See the different relay activation options described in [Figure 20 \(page 36\)](#).
- 4 **Activate below:**  
When the measurement value falls below the value set here, the relay activates.  
See the different relay activation options described in [Figure 20 \(page 36\)](#).
- 5 **Hysteresis:** Define a buffer value for relay deactivation (set the value according to the parameter selected for the relay). With hysteresis, an activated relay switches off only when the measured value crosses the relay activation/deactivation limit and the additional buffer value.
- 6 **Error output state:** Select which state the relay is set to when an error occurs (on, off, or remains in its current state).

## Relay state information

When one or both relays are enabled, the relay state (active/not active) is shown on the transmitter display. You can also view the status of the relays with Insight PC software.



Figure 18 Relay icons on display (relay A active, relay B not active)

### 6.1.1 Relay activation options



Note that the values given must match the parameter and unit selections.

Relay activation and deactivation can be configured to happen either when the measurement passes a single setpoint, or also when the measurement is within or outside a set range. The following options are available:

- The relay activates when the measurement rises above or falls below a single setpoint, and deactivates when the measurement returns to the other side of the setpoint value.
- When you set a higher value for **Activate above** and a lower value for **Activate below**, the relay is **passive** when the measured value is in between the setpoints.
- When you set a lower value for **Activate above** than for **Activate below**, the relay is **active** when the measured value is in between the setpoints.

For examples of different relay activation options, see [Relay activation and hysteresis examples \(page 35\)](#).

Note that the hysteresis configuration has an effect on relay activation and deactivation. For more information on hysteresis, see [Relay hysteresis \(page 34\)](#). The effect of hysteresis is also described in the examples in [Relay activation and hysteresis examples \(page 35\)](#).

### 6.1.2 Relay hysteresis

If the measurement you are using to control the relay is likely to move back and forth close to the activation setpoint, you can set a hysteresis that prevents the relay switching on and off too frequently.

When hysteresis is used, the relay activates at the defined limit, but does not switch off immediately when the measurement moves back to the other side of the activation limit. Instead, with hysteresis, the relay remains active until the measurement crosses the relay activation/deactivation limit and the additional buffer value.

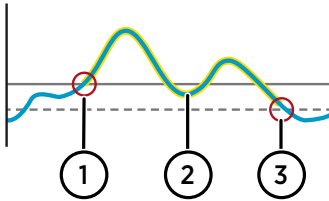


Figure 19 Behavior of relay that activates above limit, with hysteresis

- 1 Measurement goes above the relay activation limit (solid line —) and the relay activates.
- 2 Measurement falls below the activation limit, but stays above the hysteresis limit (dashed line - - -). The relay remains active.
- 3 Measurement falls below the hysteresis limit and the relay switches off.

### 6.1.3 Relay activation and hysteresis examples

Figure 20 (page 36) shows examples of different relay setpoint options, ranging from only one setpoint to different combinations of "above" and "below" setpoints. The effect of hysteresis is also described in the examples.

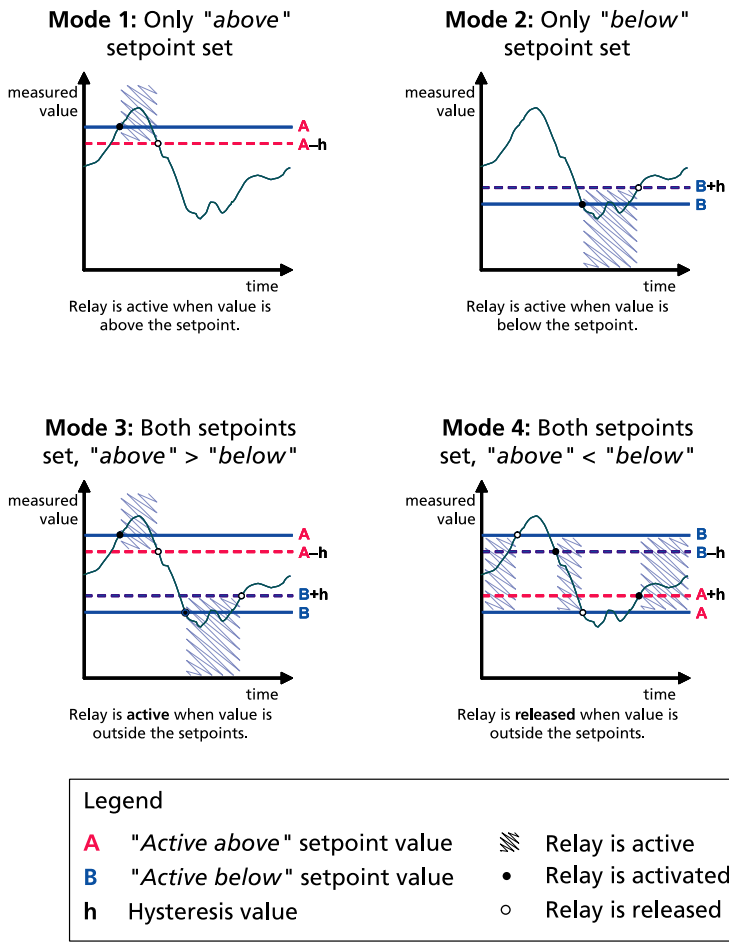


Figure 20 Relay activation and hysteresis examples

## 6.2 Setting relay activation limit without hysteresis

You can set the relay to activate when the probe measurement exceeds or falls below a set limit. When you configure a single setpoint for relay activation without hysteresis, the relay switches on or off immediately when the measurement moves over or below the setpoint.

The screenshot shows a configuration window for a relay. It includes a toggle for 'Relay output on/off' which is turned on. Below this are several input fields, each with an information icon (i) to its left: 'Output parameter' is set to 'CO<sub>2</sub>', 'Activate above' is set to '500', 'Activate below' is empty, 'Hysteresis' is set to '0', and 'Error output state' is set to 'Inactive'.

Figure 21 Relay settings example: one setpoint without hysteresis

To define a single setpoint for relay activation when the measurement exceeds the defined activation limit (**Activate above**) without using hysteresis:

- ▶ 1. Select to access Insight main menu.
2. In the **Configure Device** menu, select either relay A or relay B.
3. Enable the relay output by setting **Relay output on/off** to ON.
4. Select the measurement parameter that is used to control the relay with the **Output parameter** dropdown.

The parameter options depend on the connected probe. Note that the parameter units are defined in the **Settings** menu: see [Unit settings \(page 26\)](#).

5. Enter the activation limit value in the **Activate above** field.



With this configuration, there is no hysteresis buffer. The relay activates or switches off immediately after passing this point.

6. Leave the **Activate below** field empty and set the **Hysteresis** field value as **0** (no hysteresis).
7. Select the **Error output state** for the relay.
8. Select **Save** to store the configuration.

## 6.3 Setting relay activation limit using hysteresis

If the measurement you are using to control the relay is likely to move back and forth close to the activation setpoint, you can set a hysteresis that prevents the relay switching on and off too frequently.

When hysteresis is used, the relay activates at the defined limit, but does not switch off immediately when the measurement moves back to the other side of the activation limit. Instead, with hysteresis, the relay remains active until the measurement reaches the defined tolerated variation limit.

The screenshot shows a configuration window for a relay. It includes a toggle for 'Relay output on/off' which is turned on. Below it, the 'Output parameter' is set to 'CO2'. The 'Activate above' field is empty, while 'Activate below' is set to '100'. The 'Hysteresis' field is set to '20'. Finally, the 'Error output state' is set to 'Inactive'. Each input field has an information icon (i) to its left.

Relay output on/off	<input checked="" type="checkbox"/>
Output parameter	CO <sub>2</sub>
Activate above	
Activate below	100
Hysteresis	20
Error output state	Inactive

Figure 22 Relay settings example: one setpoint with hysteresis

To define a single setpoint for relay activation when the measurement falls below the defined activation limit (**Activate below**) using hysteresis:

1. Select to access Insight main menu.
2. In the **Configure Device** menu, select either relay A or relay B.
3. Enable the relay output by setting **Relay output on/off** to ON.
4. Select the measurement parameter that is used to control the relay with the **Output parameter** dropdown.

The parameter options depend on the connected probe. Note that the parameter units are defined in the **Settings** menu: see [Unit settings \(page 26\)](#).

5. Enter the activation limit value in the **Activate below** field.
6. Leave the **Activate above** field empty.
7. Enter the hysteresis value in the **Hysteresis** field.
8. Select the **Error output state** for the relay.

9. Select **Save** to store the configuration.

With this configuration, the relay activates when measurement falls below the value entered in the **Activate below** field (100 ppm in this example). When the measurement returns above the **Activate below** limit, the relay does not switch off until it has reached the combined value of the activation limit and hysteresis buffer (120 ppm in this example). For further examples on the effect of hysteresis, see [Figure 20 \(page 36\)](#).

# 7. Calibration and adjustment

## 7.1 Calibration overview

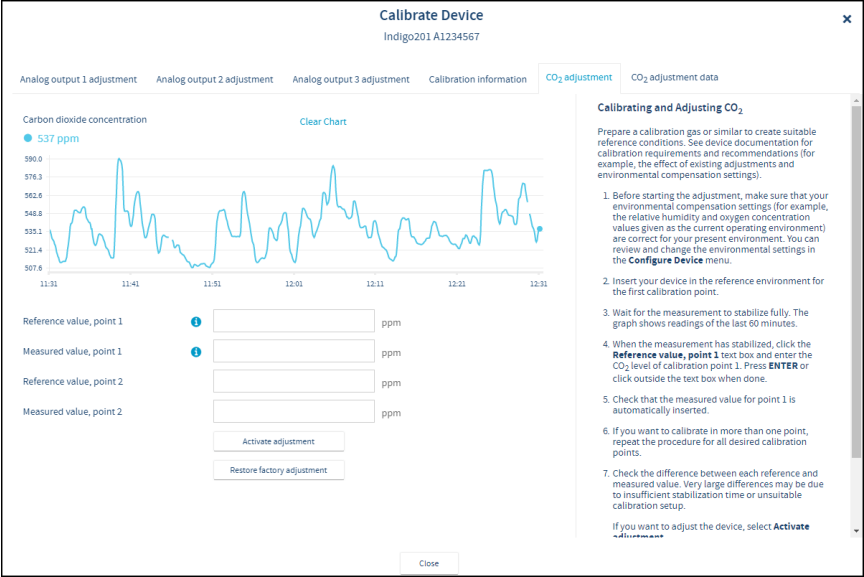


Figure 23 Calibration menu main view example (CO<sub>2</sub> probe)

The **Calibrate** menu in Insight PC software contains options for calibrating and adjusting the measurement of the probe you have connected to the transmitter, and testing and adjusting the analog output channels of the transmitter. You can also view the current adjustment and restore the probe's factory adjustments.




The range of available options (for example, environmental compensations and the number of adjustment points) varies depending on the features of the connected probe.  
The menu examples presented here are examples of calibration options that are available when a CO<sub>2</sub> probe is connected to the transmitter.



**CAUTION!** Before adjusting a probe's measurement, make sure that you have familiarized yourself with the probe-specific calibration requirements such as possible adjustment limits and environmental compensation interdependencies. See the user documentation of the probe for probe-specific information.



## Starting calibration

To open the calibration menu, select  to access Insight main menu. In the main menu, select **Calibrate**.

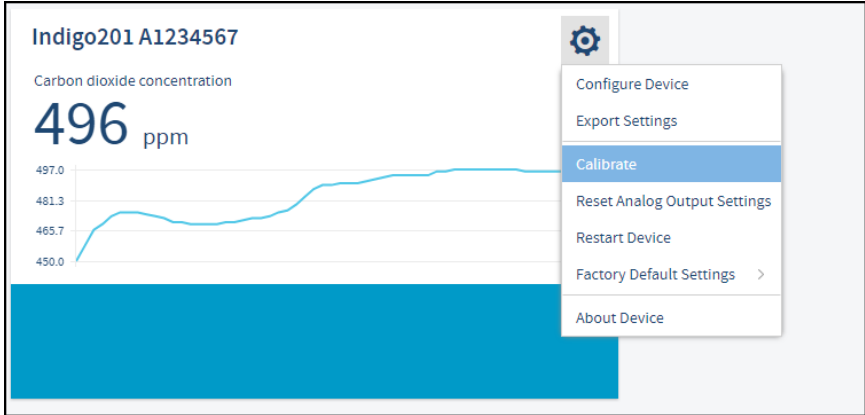
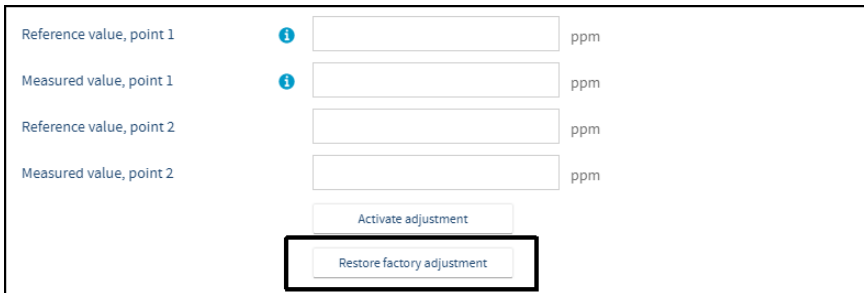


Figure 24 Calibration menu selection

## Restoring factory adjustment

Before adjusting the probe measurement, remove any possible earlier adjustments with the **Restore factory adjustment** selection.



The screenshot shows the 'Restore factory adjustment' screen. It contains four input fields for reference and measured values at two points, each followed by a 'ppm' unit. Below these fields are two buttons: 'Activate adjustment' and 'Restore factory adjustment'. The 'Restore factory adjustment' button is highlighted with a red rectangle, indicating it is the selected option.

Figure 25 Restore factory adjustment selection



Always restore factory adjustment before entering a new adjustment. This prevents any possible earlier adjustments having an effect on the new adjustment you make.

## 7.2 Environmental compensation

When making adjustments, you can enter information about the environment in which you perform the adjustment. This allows compensating for environmental factors that have an effect on the measurement (for example, temperature, pressure, or background gases).


The selection of environmental compensations available in the Indigo transmitter configuration menus depends on the features and configuration of the connected probe. If the probe you have connected to the transmitter supports environmental compensations, the configuration options are shown in the Insight PC software **Configure Device** menu. For information and instructions on the environmental compensation features of the probe, see the user documentation of the probe you are using.

Figure 26 Environmental compensation configuration example with CO<sub>2</sub> probe

## 7.3 CO<sub>2</sub> probe adjustment example

Prepare a calibration gas or similar to create suitable reference conditions. See device documentation for calibration requirements and recommendations (for example, the effect of existing adjustments and environmental compensation settings).

To adjust the CO<sub>2</sub> measurement of the probe that is connected to the transmitter:

- ▶ 1. Before starting the adjustment, make sure that your environmental compensation settings (for example, the relative humidity and oxygen concentration values given as the current operating environment) are correct for your present environment. You can review and change the environmental settings in the **Configure Device** menu.
2. To open the Insight PC software calibration menu, select  to access Insight main menu. In the main menu, select **Calibrate**.

3. Select **CO<sub>2</sub> adjustment**.
  4. Insert the probe in the reference environment for the first calibration point.
  5. Wait for the measurement to stabilize fully. The graph shows readings of the last 60 minutes.
  6. When the measurement has stabilized, click the **Reference value, point 1** text box and enter the CO<sub>2</sub> level of calibration point 1. Press **ENTER** or click outside the text box when done.
  7. Check that the measured value for point 1 is automatically inserted.
  8. If you want to calibrate in more than one point, repeat the procedure for all desired calibration points.
  9. Check the difference between each reference and measured value. Very large differences may be due to insufficient stabilization time or unsuitable calibration setup.
- If you want to adjust the device, select **Activate adjustment**.  
To exit without taking the adjustment in use, select **Close**.
10. After calibrating your device, update the information in the **Calibration information** tab.

## 7.4 Analog output adjustment

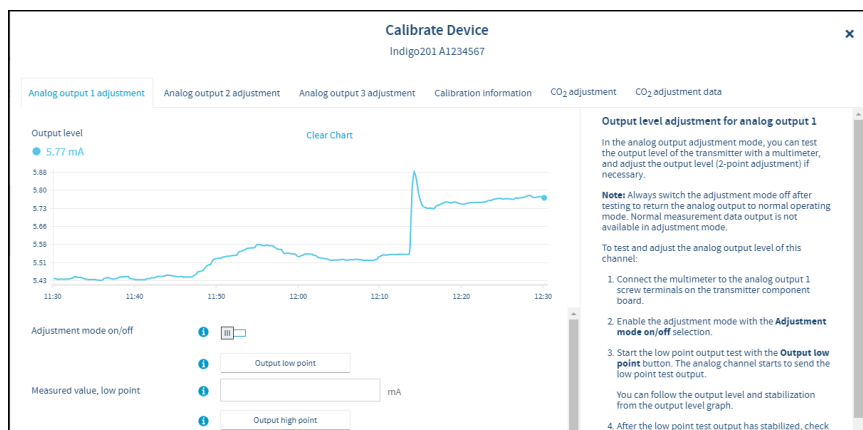


Figure 27 Insight analog output adjustment view example

If the analog output appears to be inaccurate, you can test and adjust the output level in the Insight PC software calibration menu. Note that each of the 3 analog output channels is adjusted separately. To carry out the adjustment, you need a multimeter (or an alternative method for reading the analog output level) to verify the transmitter test output level.

During the adjustment, the output of the transmitter's analog output channels is forced to a fixed current or voltage level. The adjustment is a 2-point adjustment with a low point test output and a high point test output: the fixed test output levels are listed in [Table 4](#) (page 44).

Table 4 Transmitter analog channel fixed test output levels

Current and voltage test output points	Fixed test output level
Low point test output for current output	4 mA
High point test output for current output	20 mA
Low point test output for voltage output	1 V
High point test output for voltage output	10 V

For adjustment instructions, see [Analog output adjustment example](#) (page 44).



**CAUTION!** Always switch the Insight analog output adjustment mode off after testing or adjusting to return the output to normal operating mode. Normal measurement data output is not available in adjustment mode.

## 7.4.1 Analog output adjustment example




**CAUTION!** Always switch off the transmitter power supply when connecting or disconnecting screw terminal wiring. Do not energize the transmitter power supply when wiring is not connected.



**CAUTION!** Always switch the Insight analog output adjustment mode off after testing or adjusting to return the output to normal operating mode. Normal measurement data output is not available in adjustment mode.

To test and adjust the voltage output level of analog output 1:

- ▶ 1. Switch off the transmitter power supply and open the transmitter cover.
2. Connect the multimeter wiring to analog output 1 screw terminals and close the transmitter cover.
3. Power on the transmitter and connect the transmitter to Insight PC software.
4. To open the calibration menu, select  to access Insight main menu. In the main menu, select **Calibrate**.
5. Select **Analog output 1** and enable the adjustment mode with the **Adjustment mode on/off** selection.

6. Start the low point output test with the **Output low point** button. The analog channel starts to send the low point test output (1 V in this example).
7. After the low point test output has stabilized, check the multimeter reading. Enter the reading of the multimeter in the **Measured value, low point** field.
8. Start the high point output test with the **Output high point** button. The analog channel starts to send the high point test output (10 V in this example).
9. After the high point test output has stabilized, check the multimeter reading. Enter the reading of the multimeter in the **Measured value, high point** field.
10. Select **Activate adjustment** to save the corrections to the output level.

The corrections are shown in the **Low point offset** and **High point offset** fields.

11. To verify that the output level of the transmitter is now accurate, repeat the low point and high point output tests and check that the multimeter reading matches the test output.

The adjustment date and information about the adjustment can be entered in the **Calibration date** and **Calibration text** fields.

12. Disable the adjustment mode with the **Adjustment mode on/off** selection and select **Close** to exit the calibration mode.
13. Switch off the power supply, remove the multimeter wiring and replace the analog output wiring.
14. After completing the wiring, close the transmitter cover and switch on the power supply.

## 8. Maintenance and troubleshooting

### 8.1 Cleaning

You can clean the Indigo transmitter body by wiping it with a moist cloth. Standard cleaning agents can be used.



Refer to the probe-specific cleaning instructions when cleaning the probe connected to transmitter. Do not spray anything directly on the probe, since that may deposit impurities on the sensor.

### Chemical tolerance

The following chemicals can be used to clean the transmitter:

- $\text{H}_2\text{O}_2$  (6000 ppm), non-condensing
- Alcohol-based cleaning agents such as ethanol and IPA (70 % Isopropyl Alcohol, 30 % water)
- $\text{Ca}(\text{ClO})_2$  (calcium hypochlorite) max. 0.5 %
- QAC (quaternary ammonium cations) max. 0.5 %



Avoid exposing the transmitter to chemicals for unnecessarily long periods of time. Do not immerse it in a chemical, and wipe chemicals off the surfaces after cleaning.

### 8.2 Replacing probes



**CAUTION!** Only connect compatible measurement devices to the transmitter. Attempting to connect incompatible devices or cables can damage the equipment. Refer to transmitter specifications for compatibility information.



If you want to configure the probe settings, such as purge interval, you must do that before attaching the probe to the transmitter. To configure the probe, you can use the free Vaisala Insight PC software. For more information, see your probe's user guide and visit [www.vaisala.com/insight](http://www.vaisala.com/insight).

You can replace probes both when transmitter power is on and when it is off. There is no need to disconnect any wires from the transmitter; just detach the probe from the probe cable connector (5-pin M12).

The measurement parameters and outputs will behave differently depending on whether the new probe's parameters are the same as the parameters of the old probe:

- If you replace a probe with a new one that has the same measurement parameters as the removed probe, the transmitter will continue to show those measurements once it detects the new probe. Outputs will give an error notification, which will disappear when the new probe is detected.
- If you replace a probe with a new one that has different measurement parameters as the removed probe, you need to reconfigure the measurement parameters and outputs for the new probe.

## 8.3 Troubleshooting

Problem	Possible Cause	Remedy
USB connection to Insight PC software cannot be established	USB connection has been disabled with the DIP switch on the transmitter component board.	See the instructions in <a href="#">Disabling and enabling USB functionality with DIP switch (page 27)</a> .
Functionalities are not available in Insight PC software.	Insight PC software is in <b>Basic Mode</b> . Certain functionalities are only available in <b>Advanced Mode</b> .	Change the user mode from <b>Basic Mode</b> to <b>Advanced Mode</b> in the Insight PC software main view <b>Settings</b> menu.
Measurement performance affected after calibration.	Probe has not been switched from calibration mode to normal operating mode in the Insight PC software.	Open the calibration menu in the Insight PC software ( <b>Configure Device &gt; Calibrate</b> ). Exit the calibration menu with the <b>Close</b> selection, and ensure that you confirm closing the calibration mode when exiting with the <b>Yes</b> selection.
Analog output appears incorrect.	The analog output channel <b>Adjustment mode</b> has not been switched off after adjustment.	Open the analog output adjustment menu in the Insight PC software and switch the adjustment mode off. See <a href="#">Analog output configuration overview (page 28)</a> . Note that each of the 3 analog outputs has its own configuration menu.

## 8.4 Display messages

The following table lists the display messages that Indigo 201 uses to inform you about the transmitter's state.

In addition to the Indigo transmitter messages, the connected probes have probe-specific messages that are also shown on the display. Messages from the connected probe start with **Probe:**. For more information on the probe-specific messages, see the probe's documentation.

Table 5 Indigo transmitter messages shown on display

Display message	Description	Recommended action
<b>Errors</b>		
<b>Low supply voltage</b>	The supply voltage is below the minimum (range: 15 ... 30 VDC or 24 VAC $\pm 10\%$ 50/60 Hz).	The error clears when the supply voltage returns to the specified range. Check your power supply and restart Indigo if needed.
<b>No legal measurement probe</b>	The connected probe is not compatible with Indigo or a restriction (probe name or serial number) on allowed probes is in place.	Check your probe's Indigo compatibility and possible restrictions on allowed probes.
<b>Analog output 1 out of range</b>	The output of analog output 1 has gone out of range.	The error clears when the output returns to range. Check the analog output configuration.
<b>Analog output 2 out of range</b>	See above	See above
<b>Analog output 3 out of range</b>	See above	See above
<b>Warnings</b>		
<b>Outputs configured for different probe</b>	An analog output configuration already exists in Indigo, and the settings cannot be received automatically from the probe you are connecting.	Configure the analog output settings for the new probe manually, or reset the analog output settings in Indigo to enable automatic receiving of analog output settings.
<b>No measurement probe</b>	The measurement probe is not connected, or the probe is connected poorly and cannot be recognized by Indigo.	Check that you have fastened the probe correctly with the locking wheel.
<b>Notifications</b>		
<b>Probe connected:</b>	Indigo displays the name of the connected probe.	
<b>Waiting for measurements</b>	The connected probe is preparing measurements (for example, at start-up or after a probe restart).	



Display message	Description	Recommended action
<b>Unable to measure all parameters</b>	Some of the measurements you have configured to be displayed are currently not available. This can be caused, for example, by the probe heating feature: parameters that are affected by heating cannot be shown while the heating cycle is ongoing.	
<b>Analog output [output] calibration in progress</b>	The analog output (1–3) identified in the message is being calibrated. See <a href="#">Analog output adjustment (page 43)</a> .	
<b>Analog output [output] test active</b>	Test output is being sent from the analog output (1–3) identified in the message. See <a href="#">Analog output adjustment (page 43)</a> .	

## 9. Technical data

### 9.1 Specifications

Table 6 Indigo-compatible probes

Measurement type	Probe models
Humidity and temperature	HMP1, HMP3, HMP4, HMP5, HMP7, HMP8, HMP9
Temperature	TMP1
Dew point	DMP5, DMP6, DMP7, DMP8
Carbon dioxide	GMP251, GMP252
Vaporized hydrogen peroxide	HPP271, HPP272
Moisture in oil	MMP8

Table 7 Indigo201 inputs and outputs

Property	Description/value
Insight PC software configuration access <sup>1)</sup>	USB-C port on transmitter (compatible with generic USB cables)
Power supply input	15 ... 30 V DC <sup>2)</sup> 24 V AC $\pm 10\%$ 50/60 Hz
Relay contacts x 2	Max. switching power 30 W Max. switching current 1 A Max. switching voltage 40 V DC / 28 V AC
Three analog outputs (voltage or current)	Voltage: 0 ... 1 V, 0 ... 5 V, 0 ... 10 V, 1 ... 5 V, scalable, min. load 1 k $\Omega$ Current: 4 ... 20 mA, 0 ... 20 mA, scalable, max. load 500 $\Omega$
Accuracy of analog outputs at 20 °C	$\pm 0.1\%$ full scale for 0 ... 10 V and 0 ... 20 mA

1) Vaisala Insight software for Windows® available at [www.vaisala.com/insight](http://www.vaisala.com/insight).

2) When used with the HMP7 probe, the minimum required power supply input is 18 V DC.

Table 8 Indigo200 operating environment

Property	Specification
Operating temperature	With display –20 ... +60 °C (–4 ... +140 °F) Without display –40 ... +60 °C (–40 ... +140 °F)
Storage temperature	–40 ... +70 °C (–40 ... +158 °F)
Chemical tolerance	Temporary exposure during cleaning: <ul style="list-style-type: none"> <li>• H<sub>2</sub>O<sub>2</sub> (6000 ppm, non-condensing)</li> <li>• Alcohol-based cleaning agents such as ethanol and IPA (max. 70 % concentrate)</li> </ul>
IP rating	IP65: Dust-tight. Protected from water jets from any direction.
Indoor/outdoor use	Indoor use

Table 9 Indigo200 compliance

Property	Specification
EMC compatibility	EN 61326-1, industrial environment
Compliance marks	CE, RCM

Table 10 Indigo200 mechanical specifications

Property	Specification
Housing material	PC/ABS plastic
Display window material	PMMA plastic
Connection screw terminals	26 AWG ... 20 AWG
Weight	402 g (14.2 oz)
Dimensions (H×W×D)	149 × 135 × 43 mm (5.87 × 5.31 × 1.7 in)

9.2 Dimensions

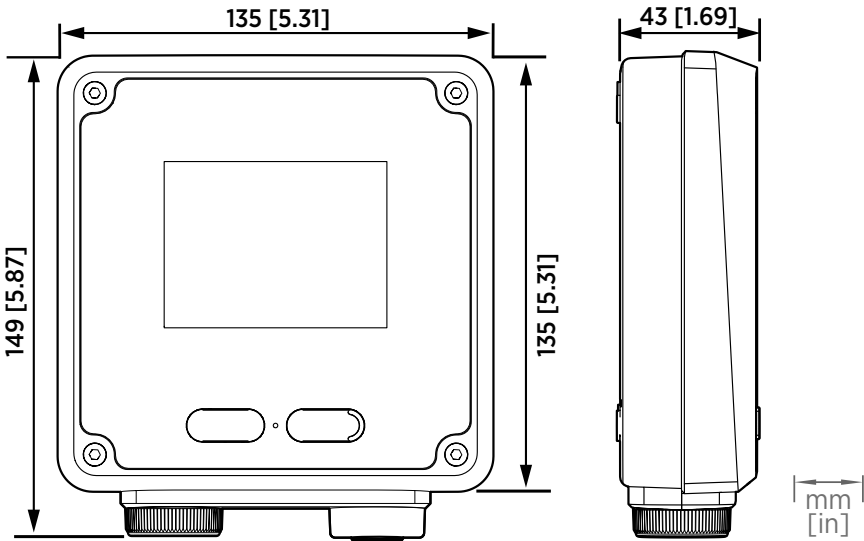


Figure 28 Indigo200 transmitter dimensions

9.3 Spare parts and accessories



Information on spare parts, accessories, and calibration products is available online at [www.vaisala.com](http://www.vaisala.com) and [store.vaisala.com](http://store.vaisala.com).

Table 11 Indigo200 spare parts and accessories

Description	Item code
USB-C connection cable (2 m, type C to A, for Insight PC software access) <sup>1)</sup>	273956
Probe connection cable, 1 m (3 ft 3 in)	INDIGOCABLE1M
Probe connection cable, H <sub>2</sub> O <sub>2</sub> compatible, 1 m (3 ft 3 in)	INDIGOCABLEHD1M5
Probe connection cable, 3 m (9 ft 11 in)	INDIGOCABLE3M
Probe connection cable, H <sub>2</sub> O <sub>2</sub> compatible, 3 m (9 ft 11 in)	INDIGOCABLEHD3M

Description	Item code
Probe connection cable, 5 m (16 ft 5 in)	INDIGOCABLE5M
Probe connection cable, H <sub>2</sub> O <sub>2</sub> compatible, 5 m (16 ft 5 in)	INDIGOCABLEHD5M
Probe connection cable, 10 m (32 ft 10 in)	INDIGOCABLE10M
Probe connection cable, H <sub>2</sub> O <sub>2</sub> compatible, 10 m (32 ft 10 in)	INDIGOCABLEHD10M
Universal mains power supply with EU/US/UK/AUS plugs	INDIGOPOWER24V

- 1) *Note that a USB-C cable is not included in Indigo200 deliveries by default. A generic USB-C cable (type C to A) can also be used.*

## 9.4 Recycling



Disposal of Vaisala products is to be done according to local laws and regulations. We encourage end-users to segregate the products from other waste at end-of-life and use best available recycling practices to minimize related environmental impacts.

Almost all of the parts in our products can be recovered as material or energy. If applicable, Vaisala recommends removing the battery unit before recycling the rest of the device as typical electronic waste. The battery unit can be recycled separately in accordance with local waste management practices and regulations. Integrated small sized batteries are typically left in place and removed by professionals at the recycling facilities.

### Indigo200 series transmitter disposal

Do not disassemble Indigo200 series transmitters for recycling. Dispose of the entire transmitter as electrical and electronical waste.



## 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 [www.vaisala.com/calibration](http://www.vaisala.com/calibration).

- Vaisala Online Store at [store.vaisala.com](http://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 [www.vaisala.com/contactus](http://www.vaisala.com/contactus).

## 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 according to local regulations.







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