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# isHRT USB isHRT USBex the H@rt BluePack

MANUAL



**TH****RSIS**  
TECHNOLOGIES

# EU CERTIFICATE OF CONFORMITY

Hereby we declare that the devices referred to below in their design and construction, are in conformity with the essential safety and health requirements of the EC-Directive 2014/30/EU.

The products listed below comply with the provisions of EU Directive 2011/65/EU (RoHS) and its extensions (EU) 2015/863 and (EU) 2017/2102. Changes or modifications not approved by Thorsis Technologies void the validity of the declaration.

Device type	Order numbers
isHRT USB	14300-0102
the H@rt BluePack	14300-2002

## STANDARDS USED: EN 61326-1:2013

### Manufacturer

Thorsis Technologies GmbH  
Oststr. 18  
39114 Magdeburg  
Germany

Magdeburg, February 19th, 2021



Dipl.-Ing. Thorsten Szczepanski,  
General Manager

# EU CERTIFICATE OF CONFORMITY isHRT USBex

Hereby we declare that the device referred to below in its design and construction, is in conformity with the essential safety and health requirements of the EC-Directive 2014/30/EU.

The product listed below comply with the provisions of EU Directive 2011/65/EU (RoHS) and its extensions (EU) 2015/863 and (EU) 2017/2102. Changes or modifications not approved by Thorsis Technologies void the validity of the declaration.

Device type	Order numbers
isHRT USBex	14300-0201

## STANDARDS USED: EN 61326-1:2013

### Manufacturer

Thorsis Technologies GmbH  
Oststr. 18  
39114 Magdeburg  
Germany

Magdeburg, February 19th, 2021



Dipl.-Ing. Thorsten Szczepanski,  
General Manager

The interface type isHRT USBex has been tested for the use in potentially explosive atmospheres according to the EC-Directive 2014/34/EU.

A DEKRA Certification Body has certified, that the device meets the provisions of the Directive in the essential health and safety requirements for the conceptional design and manufacturing of equipment, protection systems and devices set out in Annex II of the Directive, in account being taken of their intended use in potentially explosive atmosphere. The EC equipment type examination number is: BVS 21 ATEX E 038.

The responsible Certification Body is:  
DEKRA Testing and Certification GmbH  
Dinnendahlstr. 9  
44809 Bochum  
Germany

The interface type was tested according to:  
EN 60079-0:2012+A11:2013 and EN 60079-11:2012-06.

 II(2)G [Ex ia Gb] IIC



ATTENTION: Intrinsically safe device: Only the HART connector (test clips) can be led into the explosive area. The device isHRT USBex is never to be used in a potentially explosive area. An unauthorised opening of the device terminates the operating license for the use in hazardous area.

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## 1. isHRT USB – HART on USB

The interface isHRT USB is designed to provide a communication link between a desktop computer or PC notebook and the HART field device. The PC can be taken into the field and connected with the HART network within seconds thanks to the USB plug & play features.

Mobile data acquisition as well as parameterization are preferred operational areas.

The modem can work as primary as well as secondary Master and features galvanic decoupling from the HART line.



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### 1.1 Delivery content

USB-HART-Modem “isHRT USB”, HART-Driver, isHRT CommDTM, PACTware and documentation in German and English on CD.

## 1.2 Technical details

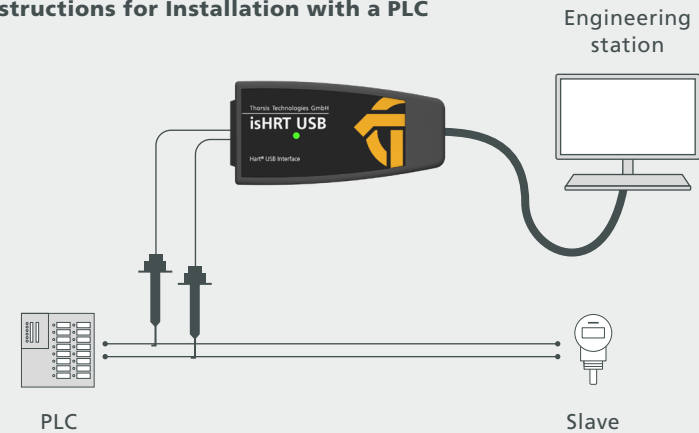
Interface	isHRT USB
Modem Chip	DS8500
Connector	2-pole current terminal
Transmission rate	1200 Bit/s (600 Bit/s optional)
Temperature range	$0^{\circ}\text{C} \leq T_{\text{amb}} \leq 50^{\circ}\text{C} / 32^{\circ}\text{F} \leq T_{\text{amb}} \leq 122^{\circ}\text{F}$
Size (WxDxH) in mm	97 x 47 x 24
Weight	158 g
Cable length	≈1,5 m USB & HART
Driver software	Windows XP, Vista, Windows 7,8 & 10 Simatic PDM© Siemens, HCF-Server Emerson AMS Device Manager
Compatible with	PACTware Endress+Hauser FieldCare ABB Asset Vision Basic

### 1.3 Connecting the hardware – isHRT USB

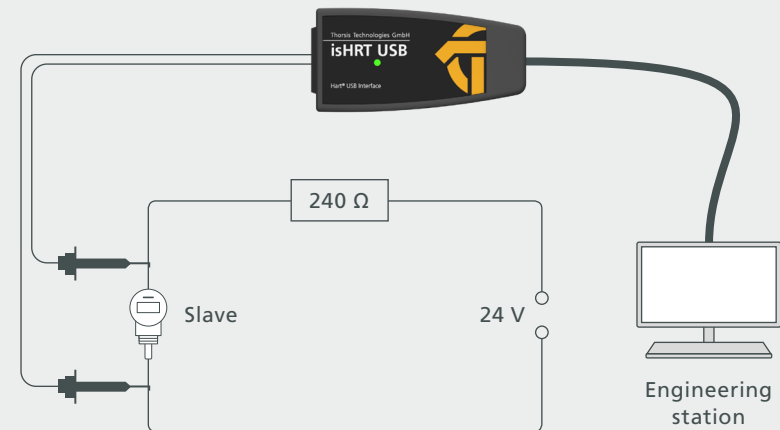
The interface can be connected to the HART network with the pin test clips directly. With the integrated USB cable the interface can be connected with the PC/notebook.

The device is equipped with a green LED, which indicates the operating state. It lights up when the software is initialized. When the software stops working with the device, the LED is switched off.

#### 1. Instructions for Installation with a PLC



#### 2. Instructions for Installation with a 24 V power source



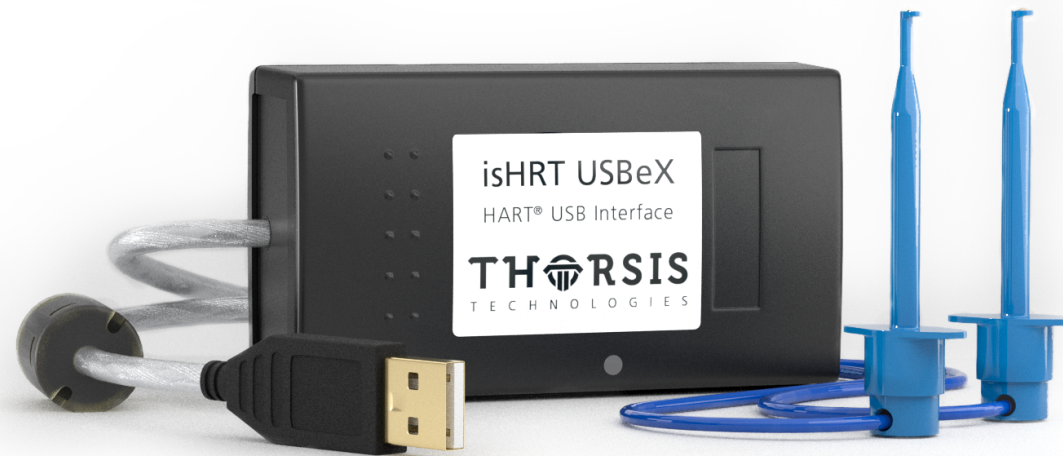
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## 2. isHRT USBaX – HART on USB

The interface isHRT USBaX is designed to provide a communication link between a desktop computer or PC notebook and the HART field device. The PC can be taken into the field and connected with the HART network within seconds thanks to the USB plug & play features. Mobile data acquisition as well as parameterization are preferred operational areas.

The modem can work as primary as well as secondary Master and features galvanic decoupling from the HART line.

For the use in hazardous areas we deliver an intrinsic safe, ATEX certified version: isHRT USBaX. It is functionally equivalent to the standard type.



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### 2.1 Delivery content

USB-HART-Modem "isHRT USBaX", HART-Driver, isHRT CommDTM, PACTware and documentation in German and English on CD.



## 2.2 Technical details

Interface	isHRT USBex <sup>(1)</sup>
HART Modem Chip	DS8500
Connector	2-pole current terminal
Transmission rate	1200 Bit/s (600 Bit/s optional)
Safety engineering data	Parameters of non-intrinsically safe circuits (USB connector)
	$U_m$ AC 253 V
	Output parameters of intrinsically safe circuit (Hart connector)
	$U_o$ DC 2,5 V
	$I_o$ 3 mA
	$P_o$ 2 mW
	$C_o$ 1000 $\mu$ F
	$L_o$ 100 mH
	Input parameters of intrinsically safe circuit (Hart connector)
	$U_i$ DC 30 V
	$L_i$ = negligible
	$C_i$ = negligible
Temperature range	0° C ... 50° C / 32° F ... 122° F
Size (WxDxH) in mm	89 x 50 x 24
Weight	243 g
Cable length	≈1,8 m USB & ≈1,5 m HART
Driver software	Windows XP, Vista, Windows 7,8 & 10
Compatible with	Simatic PDM© Siemens, HCF-Server, Emerson AMS Device Manager, PACTware, Endress+Hauser FieldCare, ABB Asset Vision Basic

<sup>(1)</sup> valid for isHRT USBex devices as of production date 2021.

## 2.3 Connecting the hardware – isHRT USBx

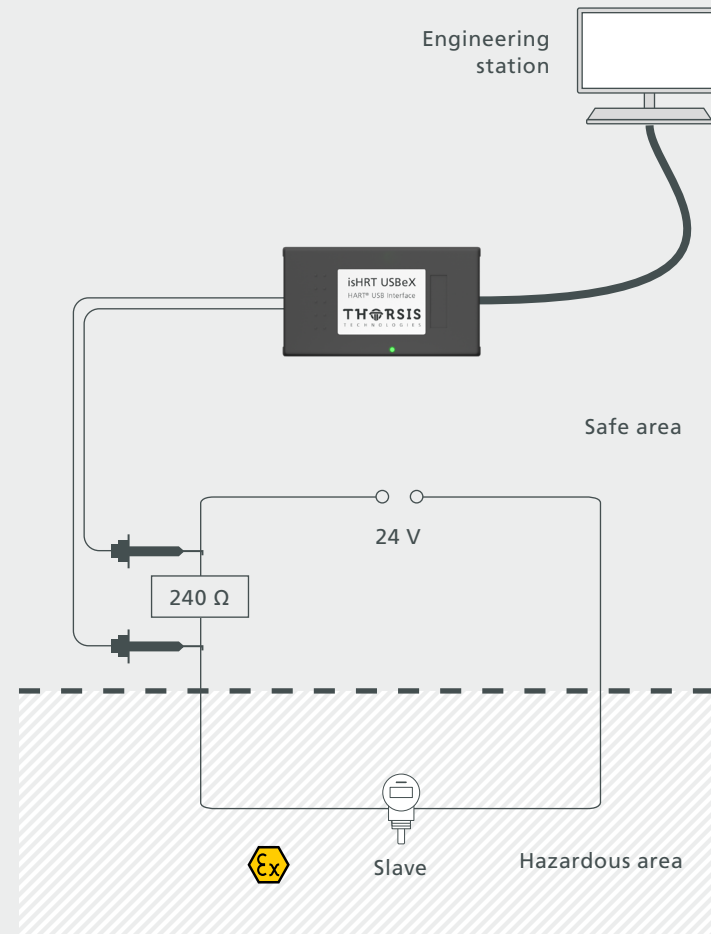
The interface can be connected to the HART network with the pin test clips directly. With the integrated USB cable the interface can be connected with the PC/notebook.

The device is equipped with a green LED, which indicates the operating state. It lights up when the software is initialized. When the software stops working with the device, the LED is switched off.



**ATTENTION:** Intrinsically safe device: Only the HART connector (test clips) can be led into the explosive area. The device isHRT USBx is never to be used in a potentially explosive area. An unauthorised opening of the device terminates the operating license for the use in hazardous area.

### 2. Instructions for Installation with a 24 V power source



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### 3. the H@rt BluePack – HART on Bluetooth / USB

“the H@rt BluePack” is a versatile interface which supports wireless (Bluetooth) and wired (USB) access to a HART network. It can be employed as an up-to-date replacement for the still widely used RS-232-HART modem solutions. Additionally to its modem capabilities the H@rt BluePack runs an embedded HART master stack.

The active HART master stack guarantees compliance with the HART timing requirements regardless of the speed of the PC host application or the data transmission quality between the host and the Bluetooth device. This can be of considerable advantage if using

the interface in multi-master environments or in connection with burst-mode slaves. The stack can be configured to work as primary or secondary master.

The interface can be powered via the USB connection or 3 replaceable AAA cells. If operating in battery mode it can be powered down by an on/off-button. To increase the life span of the batteries the device switches to sleep mode if no Bluetooth communication takes place. The activity on the HART network is indicated by one LED.



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## 3.2 Delivery content

HART-Bluetooth Modem “the H@rt BluePack”, HART-Driver, isHRT CommDTM, PACTware and documentation in German and English on CD.

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## 3.1 Technical details

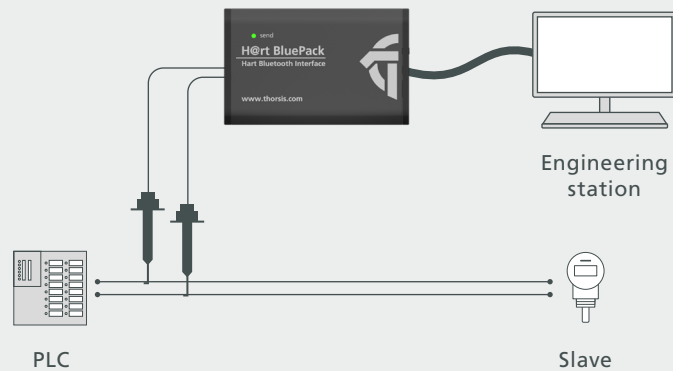
Interface	the H@rt BluePack
Bluetooth Modem	WT11 (Bluegiga)
HART Modem Chip	DS 8500
Connector	2-pole current terminal / Mini-USB
Transmission rate	USB: 12Mbit/s; HART: 1200 Bit/s; Bluetooth: up to 2,1 Mbit/s
Power supply	3 x AAA Batteries or USB-cable
Size (WxDxH) in mm	84 x 54 x 26
Weight	106 g (without Batteries)
Cable length	≈1,5 m
Driver software	Windows XP, Vista, Windows 7, 8, 10 Simatic PDM© Siemens, HCF-Server Emerson AMS Device Manager PACTware Endress+Hauser FieldCare ABB Asset Vision Basic
Compatible with	

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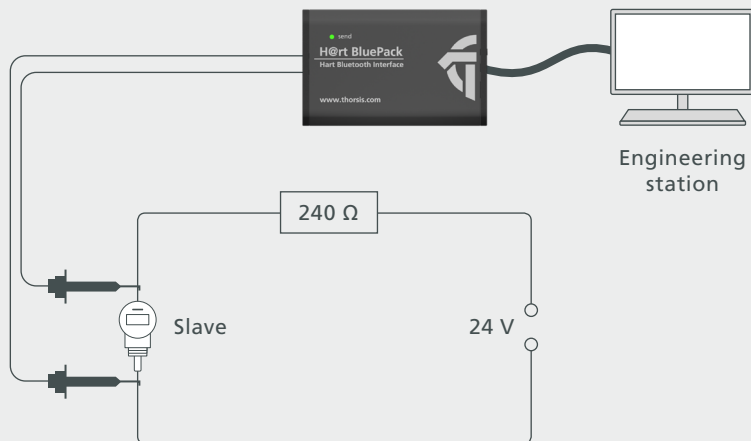
### 3.3 Connecting the hardware – the H@rt BluePack

#### USB

##### 1. Instructions for Installation with a PLC

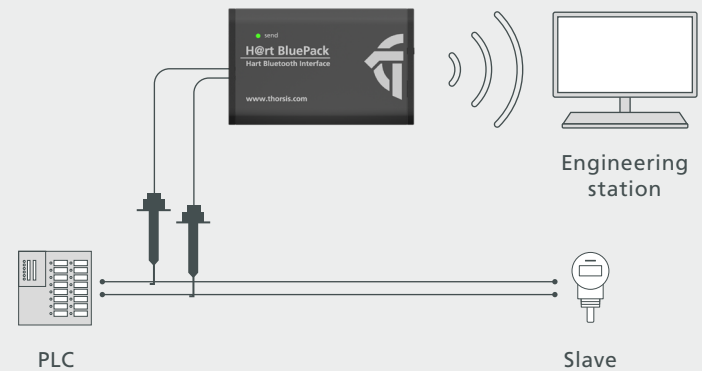


##### 2. Instructions for Installation with a 24 V power source

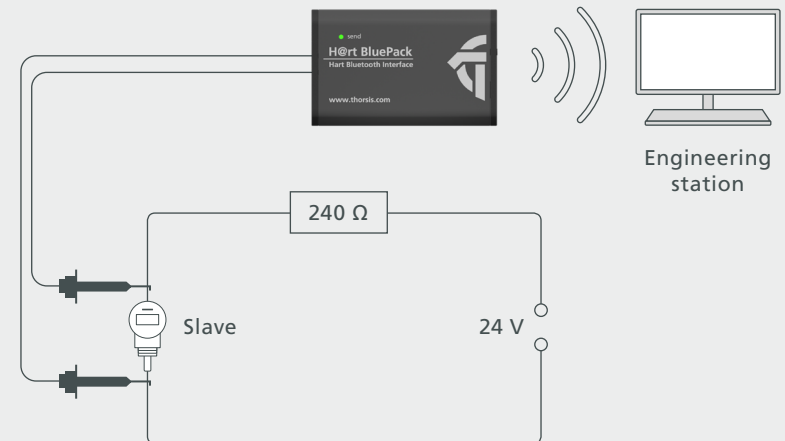


#### Bluetooth

##### 1. Instructions for Installation with a PLC



##### 2. Instructions for Installation with a 24 V power source

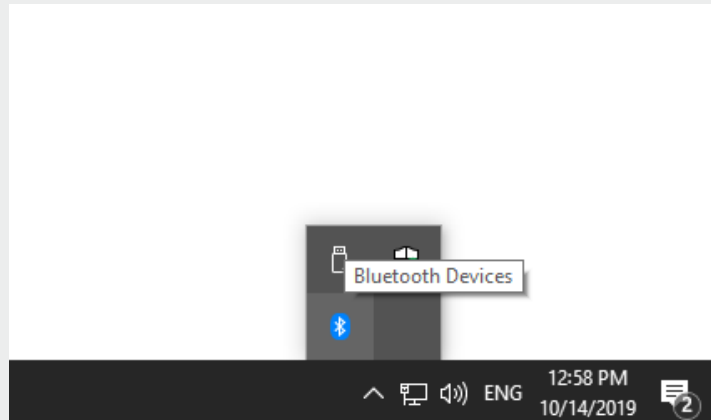


### 3.3.1 Coupling the H@rt BluePack via Bluetooth

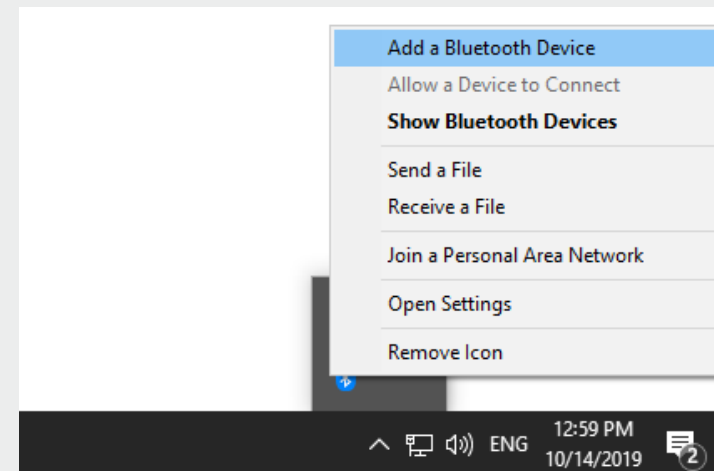
To be able to use the H@rt BluePack, it must first be coupled to the host computer. This step is necessary only once. First, insert the 3 AAA batteries. Activate the H@rt BluePack by briefly pressing the button next to the mini USB socket.

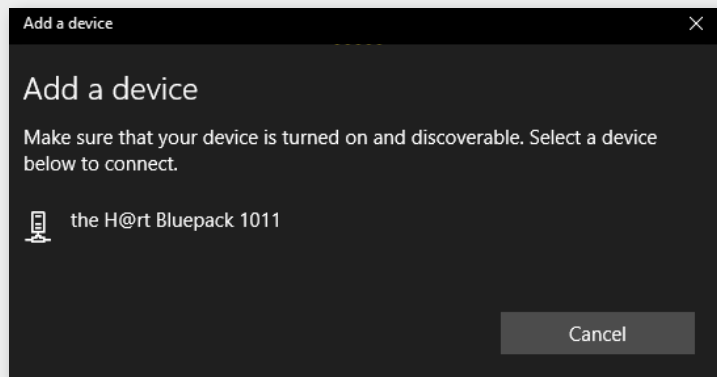
After power on, the device is visible for one minute to other Bluetooth devices (see chapter 2.3).

Activate Bluetooth in the Control Panel of your computer. Click on the Bluetooth icon in the taskbar to open the context menu

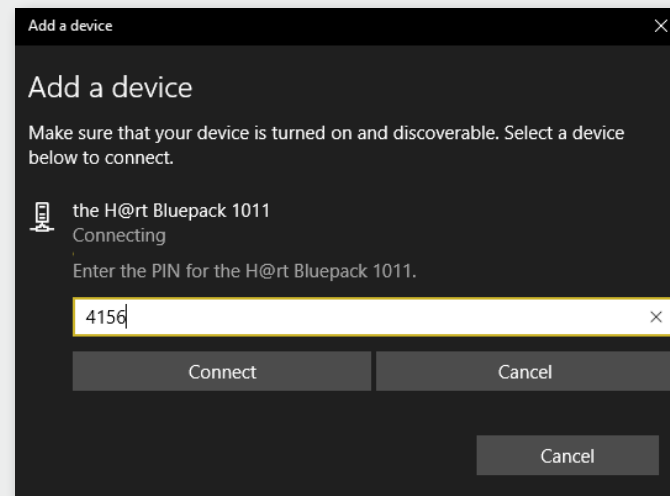


Click on "Add a Device"  
("Add a Bluetooth Device" in Windows 10)

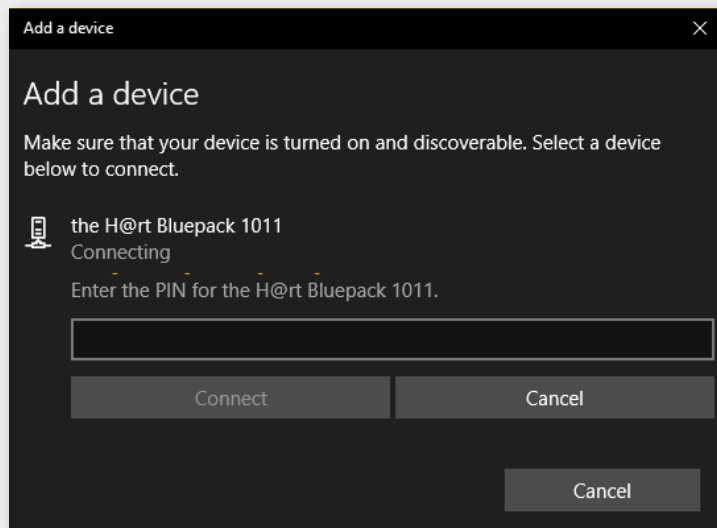




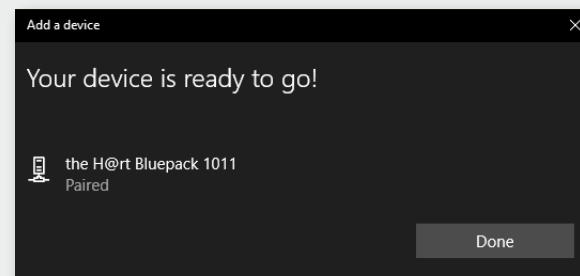
Select the H@rt BluePack from the list.



In the appropriate dialog box, enter the four-digit “key” of the device, located on the sticker at the front of the device.



Now you will be prompted to enter the PIN



The device is ready for use as soon as you can read “Paired” under the H@rt BluePack.

The device is now paired with your PC.

The COM interface displayed is necessary for the later configuration. But you can also display this through the Control Panel/Bluetooth/network devices later.

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## 3.4 Operation of the unit

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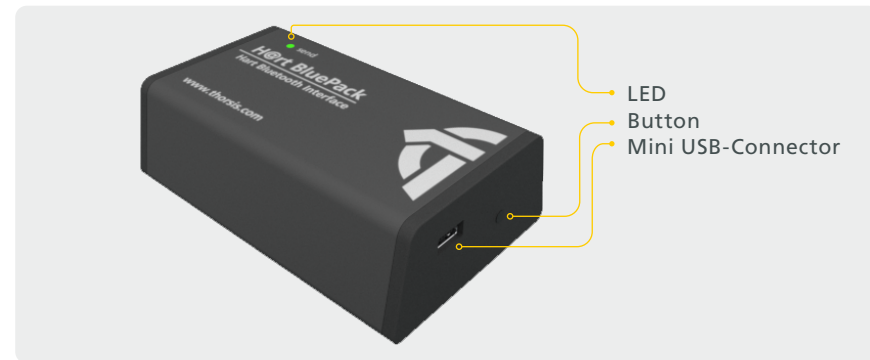
### 3.4.1 Battery operation

#### 2.3.1.1 Switch on the device

- There is a button at the front of the device, which can be used to switch the device on. Switching on is signaled by the LED blinking three times. After switching on, the device is ready for a Bluetooth connection.
- The LED flashes briefly at regular intervals to indicate whether the device is switched on or off.

#### Two different operating modes are signaled:

1. In the first minute after power up, the device is visible to other Bluetooth devices, i.e. the H@rt BluePack can be paired with other devices. This operating mode is indicated by two short flashes of the LED every 4 seconds.
2. One minute after switching on the device becomes invisible to other Bluetooth devices, so they can no longer find the H@rt BluePack and thus no longer be paired to it. Of course, devices that are already paired can continue to connect to the H@rt BluePack. In this operating mode the LED flashes briefly every 10s.



#### 2.3.1.2 Switch off the device

To switch off, press the button on the front of the device until the LED switches on (approx. 3 seconds).

The LED signals the switch-off process by gradually darkening.

When the LED is completely dark, the device is switched off.

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### 3.4.2 USB operation

- As soon as the device is connected to a PC via USB, the device is switched on and active – the button has no function when the power is supplied via a USB cable.
- Communication with the device can take place via USB or via Bluetooth. It is also possible to pair with other Bluetooth devices at any time.
- The use of USB power supply adapters for the power supply of the H@rt-BluePack is not possible.



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## 4. Installation of the driver software

The driver software should be installed before connecting the device.  
Otherwise, the operating system can not find the interface to the associated driver.

The driver software package isHRT Multidriver contains a Dynamic Link Library (DLL) which allows the access to the HART firmware under the operating systems Windows 7, 8 und 10.  
The actual operating system is detected automatically by the driver DLL.

The configuration of the interface can be done with the configuration software isHRT Driver Configurator which is installed into the Thorsis Technologies directory of the Start Menu.

### Installation process:

- Login as administrator
  - Insert the installation CD-ROM
  - The setup starts with an autoroutine; proceed according to the instructions displayed on the screen.
- Should Autorun be disabled on your machine, run the **"isHRT\_Driver\_Setup.exe"** on the installation CD.  
The installation is done in the standard program directory of the target machine under:  
**"C:\Program Files (x86)\Thorsis Technologies\isHRT Driver 64bit"**.

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## 5. Installation of the isHRT CommDTM

The operation of the software isHRT FDT requires the correct installation of the HART interface isHRT USB and isHRT USBx respectively.

The driver software delivered with our interface permits the access to the HART Firmware.

The interface between application and HART firmware comes in the shape of a Dynamic Link Library (DLL).

The delivered software isHRT FDT supports the operating systems Windows Vista, XP and Windows 7, 8, 10 (32-bit/64-bit).

It is placed on the enclosed CD.

**The installation follows the steps mentioned below:**

- Insert the installation CD into your drive.
- Start **"isHRT CommDTM v2 Setup.exe"** and proceed according to the instructions displayed on the screen.

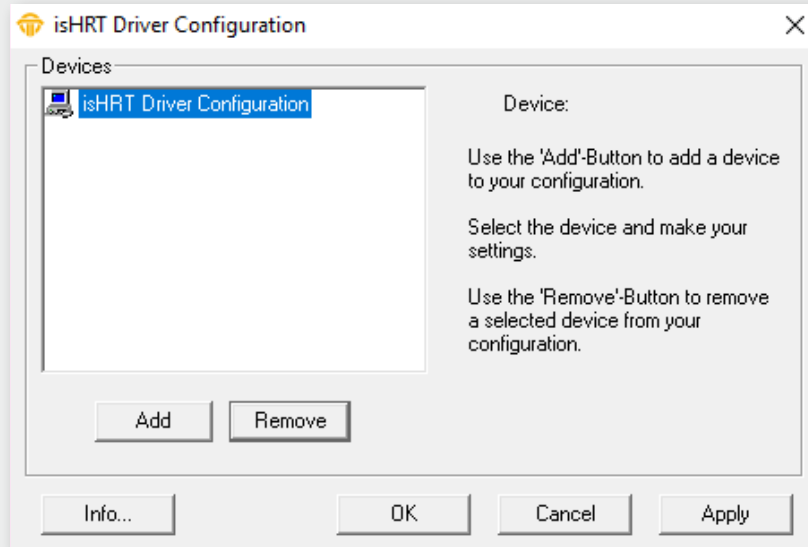
The software is installed in the default program directory of your computer under the subdirectory:

**"C:\Program Files (x86)\Thorsis Technologies\isHRT CommDTM".**

Install the driver before connecting the modem!

Otherwise the modem may not be recognized correctly.

## 6. Configuration and commissioning

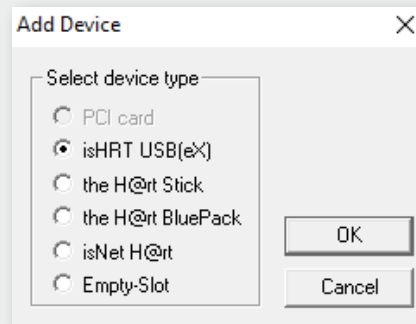


The configuration software isHRT Driver Configurator is provided in order to adapt the DLL access to your hardware. It is installed in the Start Menu. This dialog based application allows the easy addition and removal of HART interfaces. It also checks the available resources of the system.

A device number is assigned to each USB interface which enables the software to address it. Empty devices can be included in order to allow gaps in the enumeration of devices; see section „6.3 Add an empty slot“ auf Seite 22.

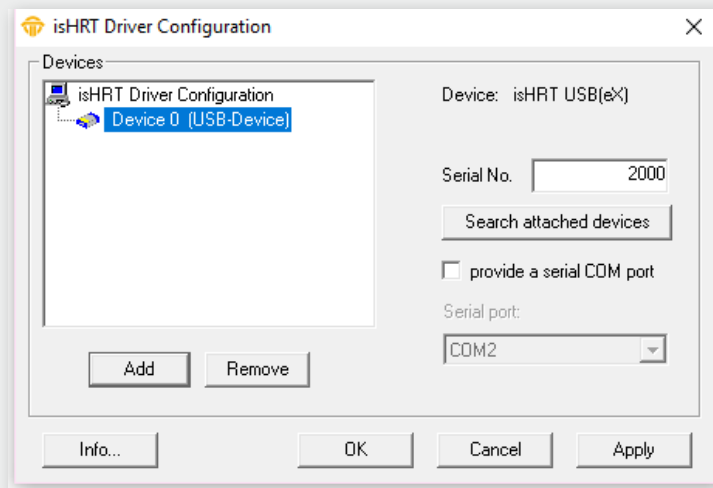
Run this program as an administrator.

## 6.1 Add a USB device



Please press the button "Add", choose the device type you would like to add. Press "OK", then make your settings.

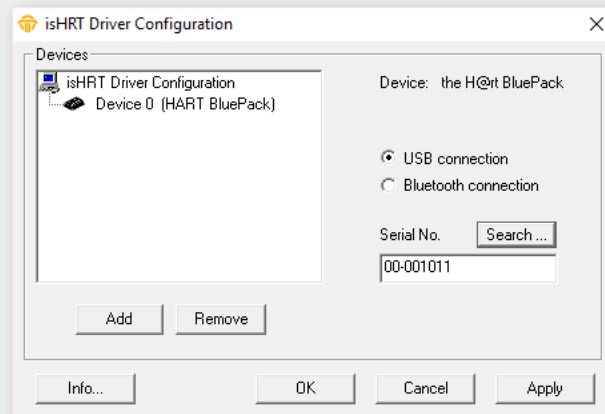
The device has a unique serial number for clear identification. The number is located on the bottom of the case. The configuration software offers the possibility to search automatically for all attached devices and to detect their serial numbers. Please fill in the number in the intended field.



The device can work like a serial modem under the operating systems Windows 7, 8 und 10. In order to facilitate this, it offers a serial COM-port so that already existing applications can be used without any changes. The serial COM-port can be selected. The configuration software checks the available COM-ports to avoid an address conflict.

Finish your settings by clicking "OK".

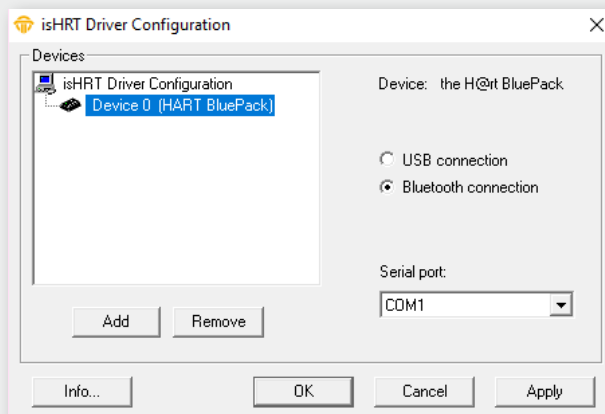
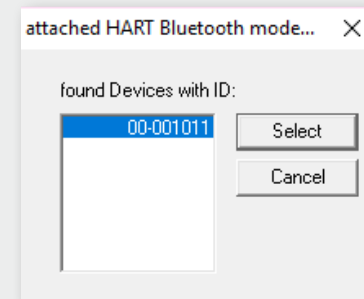
## 6.2 Add a Bluetooth device



When you add a Bluetooth device, you can choose between USB and Bluetooth connection.

If you select a USB connection, you must enter the serial number or can let the program automatically search for a connected the H@rt-BluePack.

Click on "OK"

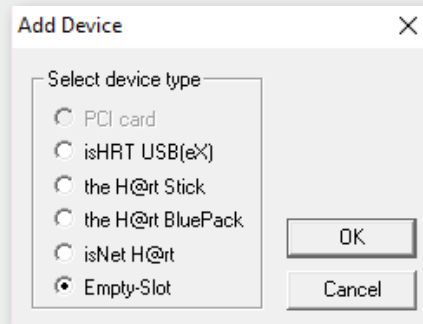


When selecting a Bluetooth connection, you must select the assigned COM port. You can also do this under Control Panel / Bluetooth / network access devices.

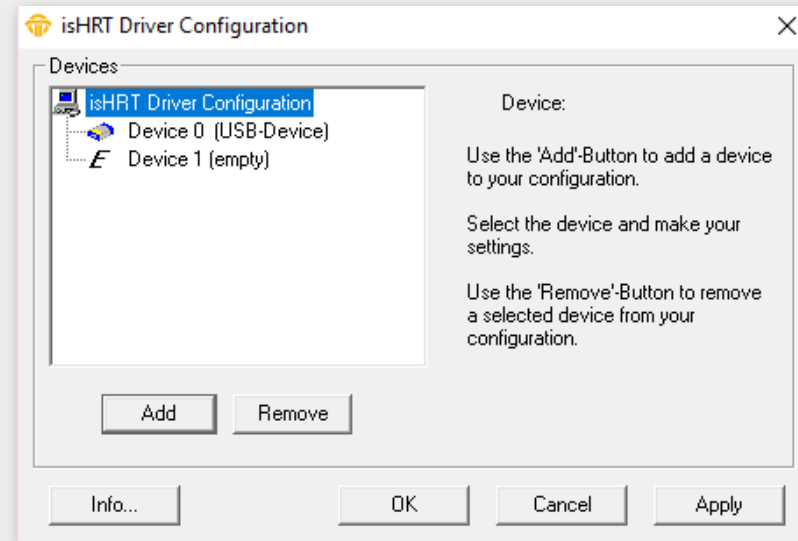
Click on "OK"

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### 6.3 Add an empty slot



The empty device does not contain any resources. It serves as a substitute for device numbers not yet assigned. Using empty slots enables a free enumeration of devices by inserting empty devices between existing ones.



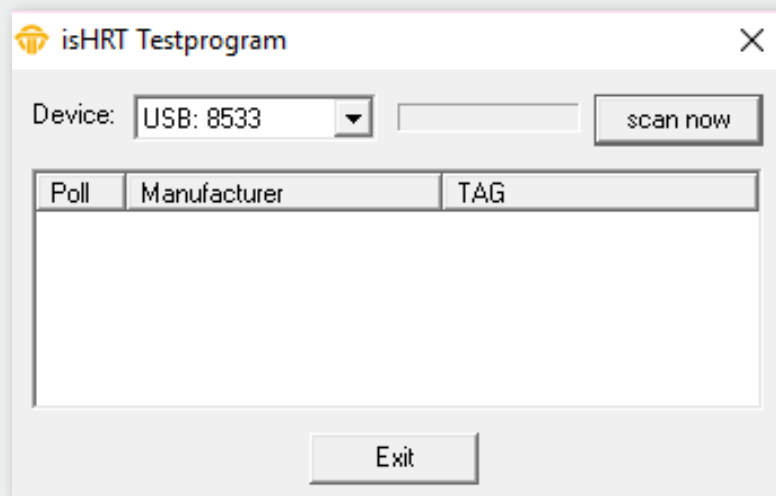
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### 6.4 Removal of a device

Mark the device you wish to remove and press the button "Remove". You can then remove the device from the USB port.

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## 7. isHRT Test



The correct installation and functionality of isHRT USB can be checked with the test application “isHRT Testprogram” in the driver software.

The program searches for connected HART slaves.

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## 8. FDT Communication-DTM isHRT CommDTM

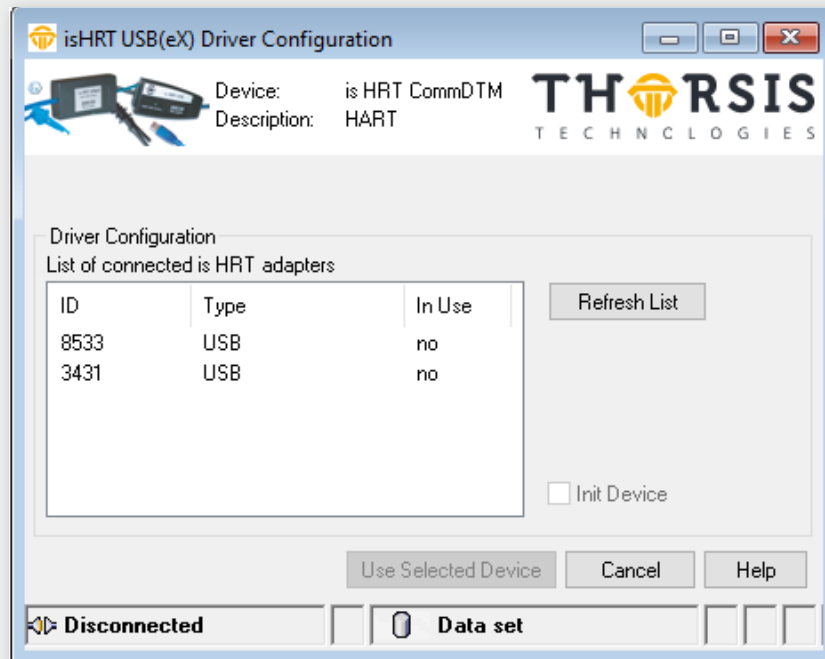
The isHRT CommDTM is a CommDTM for the interfaces isHRT USB and isHRT USBEX. The DTM offers communication access via the isHRT Channel as explained earlier. This chapter describes the configuration of the isHRT CommDTM. The configuration can be accessed by selecting the function “Channel Configuration” offered by the isHRT CommDTM. The configuration dialog is only available in offline mode, i.e. the DTM is not connected.

The software isHRT CommDTM can be integrated into any stand-alone frame application (e.g. PACTware, FieldCare). After the installation of the software (see “5. Installation of the isHRT CommDTM” auf Seite 18), the CommDTM is ready for use. In order to actually use the CommDTM, it is necessary to start the frame application. Then, the device catalogue of the Frame Application has to be updated.

Now, the isHRT CommDTM is registered and ready for work.

## 9. Offline configuration isHRT CommDTM

### 9.1 Driver configuration



This dialog is used to select one of the connected HART communication interfaces of Thorsis.

#### List of connected isHRT devices

The table shows the properties of the found isHRT devices (HART communication interfaces).

#### Refresh List

Refresh the list of devices.

#### Init Device

If you check this field the selected isHRT device is initialized (the green LED of the device lights). This is useful to find the selected isHRT device if more than one devices are connected.

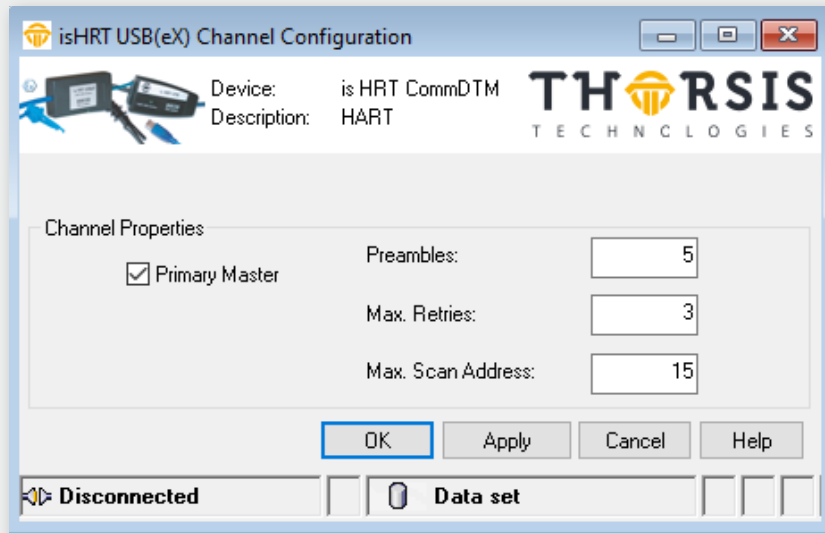
#### Use Selected Device

This button closes the dialog.

The selected device is used for communication.



## 9.2 Channel Configuration



The dialog is used to configure the channel.  
The following options are available.

### Primary Master

The parameter Primary Master specifies whether the HART master operates as the primary master or as a secondary master on the bus.

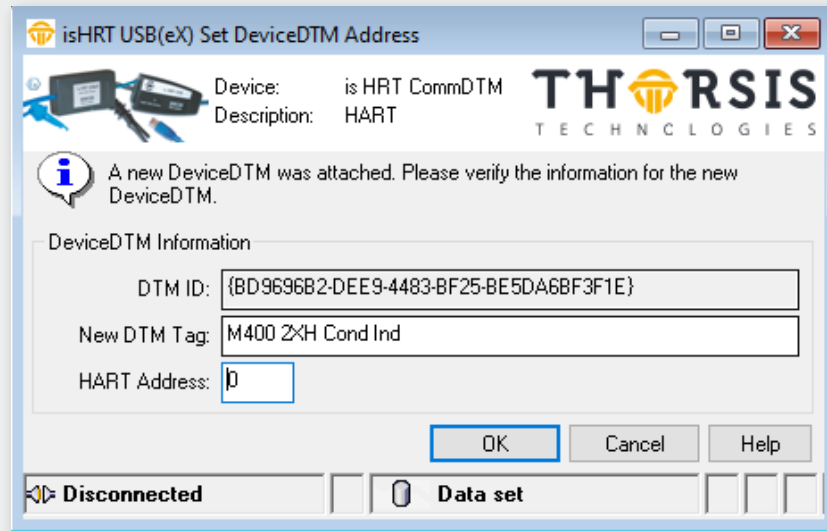
### Preambles

The default setting for the number of preambles for communication with HART bus devices. This value is used to establish the initial connection to a HART device. The number of preambles to use for communication with the device is read from the device itself and used for communication afterwards.

### Max. Retries

This parameter specifies how often the HART master retries to transmit information in case of an error.

### 9.3 Connecting DeviceDTMs



When a DeviceDTM is connected to the isHRT CommDTM then an ActiveX is opened, that allows to set the tag and the slave address of the DeviceDTM.

#### DTM ID

This is the unique ID of the DeviceDTM from the frame application. It may vary among different frame applications.

#### New Tag

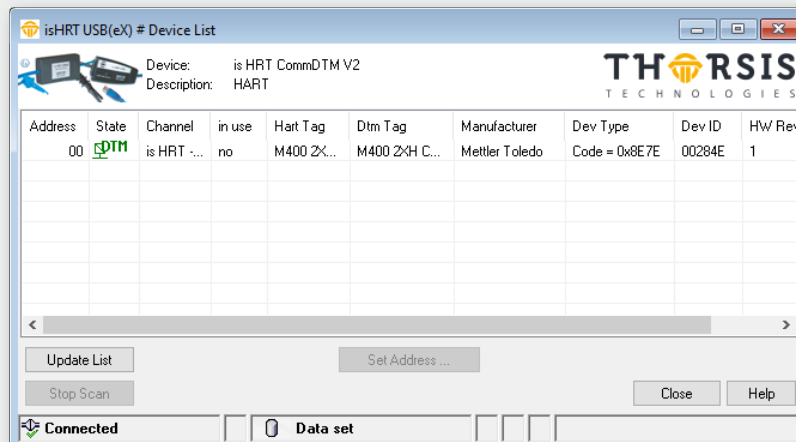
This parameter is set as new tag in the DeviceDTM.

#### New Address

This is the address of the device that the DeviceDTM should communicate with. This number is the poll address. The long address with device and manufacturer ID is acquired from the device when the connection is established.

## 10. Online Configuration of the isHRT CommDTM

### 10.1 Device List



The isHRT CommDTM offers in addition to the function ScanRequest an own ActiveX to scan the HART bus for devices. This ActiveX provides information about HART devices (vendor, type, channel information) that are connected to the HART networks. If this ActiveX is called in an offline situation, it provides a list of Child-DTMs, all with no associated device.

The list of connected devices displays the essential information about the devices on the HART bus.

This information has the following meaning:

#### Address

The poll address of the device.

#### State

The State field is used to display an icon, that reflects the state of device configuration. The following icons are possible:



This entry represents a Child-DTM.

This DTM is not associated to any existing HART device.



This entry represents an existing HART device.

No Child-DTM is configured for this device.



This entry represents a HART device which is configured with a Child-DTM

#### Channel

This is the used channel of the isHRT CommDTM.

**In Use**

The DTM/device is used in a communication connection.

**Hart Tag**

The tag of the device stored in the device itself.

**DTM Tag**

The tag of the DeviceDTM.

**Manufacturer**

The manufacturer of the device.

**Dev Type**

The device type of the HART device.

**Dev ID**

The device ID of the HART device.

**HW Rev**

The hardware revision of the device.

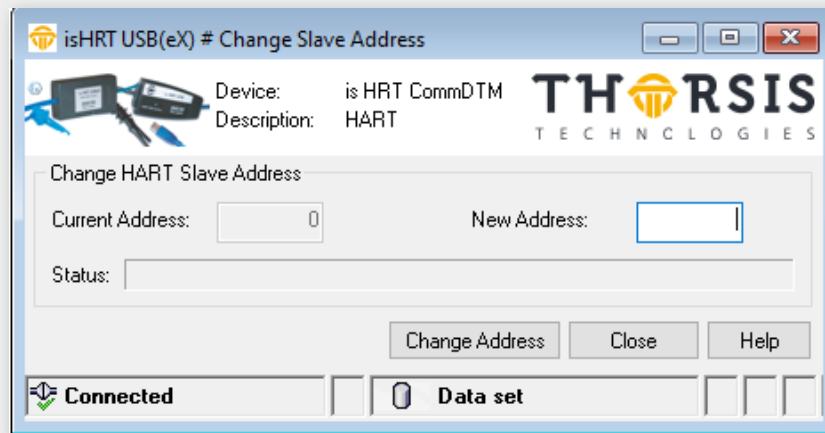
**SW Rev**


The software revision of the device.

The “Update List” button starts a new scan for devices on the HART bus. The list will be dynamically updated during the scan whenever a device is found. During the scan, which usually takes some time to complete, the button “Stop Scan” is activated. It can be used to stop the scan.

The button “Set Address” is used to open the ActiveX to change the address of the selected DTM and/or slave device.

## 10.2 Changing Polling Address



This ActiveX can be used to change the poll address of a HART interface. This Menu is only available for  Slaves without Device DTM.

### Source address

This is the current address of the device on the HART bus. The content of this field is set automatically when the ActiveX is opened.

### Target address

This is the desired new address for the device.

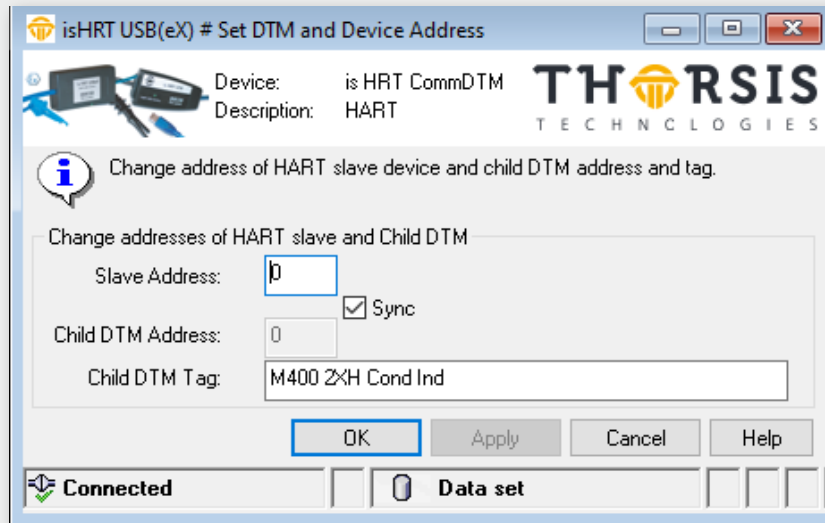
### Change address

Pressing this button starts the address change.

### Status

Displays the status of the address change.

### 10.3 Changing Polling Address, DeviceDTM Address and Tag



The new device address must not be in use and no DeviceDTM may have open connections to the source address. The isHRT CommDTM checks these requirements before the address change is attempted. If any of these requirements is not fulfilled or the change of address itself fails for other reasons, then an error message is displayed in the status field.

With the help of this ActiveX it is possible to change the address of a HART slave device together with the address of a connected DeviceDTM. This ActiveX is opened by the "Set Address" button in the device list ActiveX for list entries that represent devices with assigned DTMs.

#### Slave address

The new address for the HART slave device.

#### Sync

Keep the values in the slave address and DTM address fields the same.

#### Child DTM address

The new address for the Device DTM.

#### Child DTM Tag

The tag of the Device DTM

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## 11. Document History

Version	Date	Description
1.0	Apr. 12th, 2018	initial version
1.1	Oct. 22th, 2019	new texts & images
1.2	Dec. 15th, 2020	content update
1.3	Feb. 19th, 2021	content update

© last change on February 19th, 2021