

**USB HART® Modem  
(HM-USB-ISO)  
User Manual**



**Introduction**

The USB HART Modem (HM-USB-ISO) provides the physical connection required for software to communicate with wired HART devices/networks.

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## Installation

### Step 1) Install Software Drivers

Before using the USB HART Modem a USB Virtual Serial Port Driver must be installed on the Windows PC/Laptop/Tablet, one is supplied on the enclosed CD. Alternatively, it can be downloaded using

[http://www.hart-expert.co.uk/wp-content/uploads/USB\\_HART\\_Modem\\_Virtual\\_Serial\\_Port\\_Driver.zip](http://www.hart-expert.co.uk/wp-content/uploads/USB_HART_Modem_Virtual_Serial_Port_Driver.zip)

If using the CD insert it into your MS Windows PC and then the USB Virtual Serial Port driver will install automatically if “AutoPlay” is enabled on your PC. If it doesn’t install automatically open/run “setup.exe” on the CD.

If using the CD, after the USB Virtual Serial Port driver has completed installation the program “HM Test” will open ready for you to latter test your USB HART Modem connection. If you are not using the CD, HM Test can be downloaded from [http://www.hart-expert.co.uk/wp-content/uploads/HART\\_Modem\\_Test\\_Windows.zip](http://www.hart-expert.co.uk/wp-content/uploads/HART_Modem_Test_Windows.zip), but for now continue to Step 2.

### Step 2) Connect the USB HART Modem to your PC

Once the driver is installed, you can connect the USB HART Modem to a USB port on your PC. See the relevant section below based on your PC’s operating system.

#### a) Windows XP

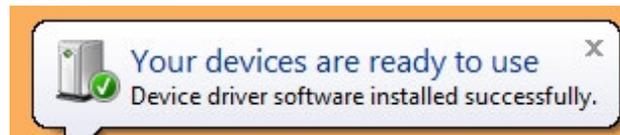
After the USB HART Modem is connected and the New Hardware Found wizard is finished, the following will appear at the bottom of the screen:



Note: A completion message may not appear on some systems.

#### b) Windows Vista and Windows 7

After the USB HART Modem is connected and the New Hardware Found wizard is finished, the following will appear at the bottom of the screen:



Note: A completion message may not appear on some system.

### Step 3) COM Port Number Assignment

After connecting the USB HART Modem and it still connected to the PC, go to Start → Settings → Control Panel → System → Hardware → Device Manager → Ports (COM & LPT), to see what com port number was assigned to the modem by the Windows operating system. The port labelled “USB Serial Port (COM?)” shows the assigned port number, where ? is the assigned COM port number.

This port number assignment can be changed by the user. From the “Device Manager” menu, select the USB Serial Port you wish to change. From the “Properties” page, select “Port Settings”. Then select “Advanced”. The COM port number can be set in the range 1-256. However, we recommend you leave it at the automatically assigned port number unless you know what you are doing and have a reason to change it.

### Step 4) Connect to HART device/network

The modem can be connected in one of two ways: across the loop load resistor (A – B) or across the HART transmitter terminals (C – D). See the relevant Figure 1a, 1b or 1c below.

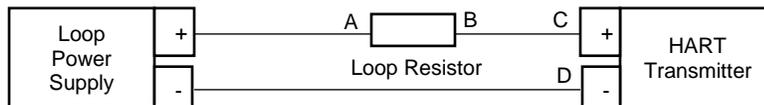


Figure 1a. Loop Powered HART Transmitter Connection

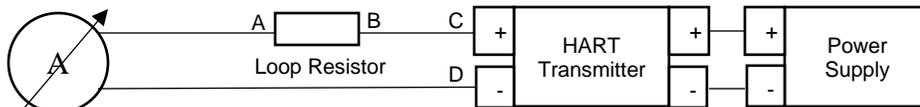


Figure 1b. 4-Wire HART Transmitter Connection

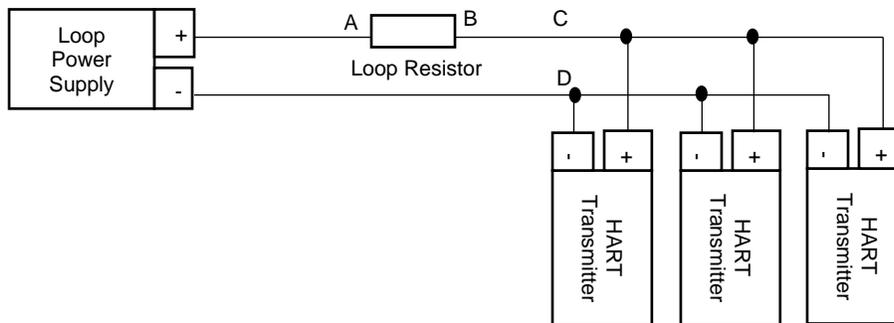


Figure 1c. Multi-drop HART Transmitter Connection

### Step 5) Power the HART device/network

No external power sources are required for the USB HART Modem (HM-USB-ISO) as power is derived from the USB connection to the PC. However, as shown in Figures 1a, 1b and 1c (above) the HART device should be powered as per the manufacturer’s instructions.

**Step 6) Connection Test Software (Optional Step)**

Now that you have installed the USB Virtual Serial Port driver (step 1), connected the modem to the PC (step 2), checked the assigned COM port number (step 3), connected the modem to your HART device (step 4), powered up your HART device (step 5), you are now ready to communicate with your HART device/network.

If the program HM Test didn't automatically start after installing the USB Virtual Serial Port driver, launch the program from the CD or from the installed icon. Click the "Set COM Port" button and select the COM port number that was assigned to the USB modem by Windows. Then select "Poll HART Network" to connect to a HART device/network. The program sends HART Command 0 to determine what transmitters are connected to the network. The "Status" box will indicate successful (or otherwise) communication to the HART device/network. If the test failed click the button "COM Troubleshooter" for help, or consult the "Troubleshooting" section of this manual.

**Step 7) Set the COM port number in your HART configuration software**

Open your HART configuration software and with reference to the supplier's literature, set the communication port to the COM port number noted in step 3.

You are now ready to configure your HART devices. You are also invited to try our HART Communicator software free for 10 days, please see <http://www.hart-expert.co.uk/online-shop/hart-communicator-software-free-10-day-trial-windows-pcs>

**Troubleshooting**

A Windows PC remembers all USB devices ever connected to it. Depending on settings, windows may only try to locate the USB driver files the first time a USB device is connected to the computer. If Windows finds the correct driver files it copies them to the hard disk for future use and then installs the USB driver. However, Windows only installs the driver for the specific USB port you connected HM-USB-ISO to. Hence, if you connect HM-USB-ISO to another USB port on the same computer Windows will need to re-access the driver files it stored on the hard disk and install the drivers for that specific USB port. If the correct driver is not available when HM-USB-ISO is connected Windows may disable the device. Once disabled it doesn't matter if you disconnect and reconnect HM-USB-ISO (even on a different USB port), Windows will remember the USB device is disabled and will ignore it. Follow the steps below to fix installation issues.

**1) Check if the HM-USB-ISO drivers were installed successfully:**

Note: Two drivers are installed when HM-USB-ISO is properly installed, the first is a "USB Serial Converter" driver, the second is a "USB Serial Port" driver. We must check both drivers installed correctly:

- a) Reboot (restart) your PC.
- b) Connect HM-USB-ISO to a USB port
- c) Go to "Device Manager" and make sure under the "View" menu of "Device Manager" you have selected "Devices by Type".
- d) Expand "Universal Serial Bus Controllers"

- e) If the “USB Serial Converter” driver installed correctly you should see an entry called “USB Serial Converter”.
- f) Expand “Ports (COM & LPT)”
- g) If the “USB Serial Port” driver installed correctly you should see a port called “USB Serial Port (COMX)” (where X is the assigned COM port number.

If the drivers did not install correctly it will have a red cross in the symbol and the device will not be listed under “Ports (COM & LPT)” but will instead be listed under “Other devices” as “USB Serial Port”.

## 2) Correcting basic installation problems:

Note: Two drivers are installed when HM-USB-ISO is properly installed, the first is a “USB Serial Converter” driver, the second is a “USB Serial Port” driver. We must remove both drivers (if both installed) and then re-install them.

- a) Connect HM-USB-ISO to a USB port.
- b) Go to “Device Manager” and make sure under the “View” menu of “Device Manager” you have selected “Devices by Type”.
- c) Expand “Ports (COM & LPT)”
- d) Right click on any entries called “USB Serial Converter” and select “Uninstall”.
- e) Expand the section “Universal Serial Bus Controllers”.
- f) Depending on how far installation got before it encountered problems you may see a device called “USB Serial Converter” or “USB High Speed Serial Converter” or “USB Serial port”. Right click on any matching entries and select “Uninstall”.
- g) If it exists, expand “Other devices”
- h) Right click on any entries called “USB Serial Port” and select “Uninstall”.
- i) Disconnect HM-USB-ISO
- j) Restart/Reboot your PC
- k) Follow the “Installation Instructions” in this user guide.

## 3) Correcting hard to resolve installation problems:

Note: Two drivers are installed when HM-USB-ISO is properly installed, the first is a “USB Serial Converter” driver, the second is a “USB Serial Port” driver. In this section we will manually force the loading of the correct drivers. You will need from our website the latest driver file, you should save this file on your desktop. If the file is a zip file please extract the contents from the zip file to your desktop.

- a) Reboot your PC
- b) Connect HM-USB-ISO to a USB port.
- c) Go to “Device Manager” and make sure under the “View” menu of “Device Manager” you have selected “Devices by Type”.
- d) Expand the section “Universal Serial Bus Controllers”.
- e) Right click on “USB Serial Converter” and select “Update Driver”, a new window will open titled “Hardware Update Wizard”.
- f) Select the bullet item “Install from list or a specific location (Advanced)”, click the “Next” button
- g) Select the bullet item “Don’t search. I will choose the driver to install”, click the “Next” button
- h) Click on “Have Disk”, then click “Browse”.
- i) Browse to the driver folder on your desktop and select the file “ftdibus.inf”, click “Open” then click “OK”.

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- j) Under “Model” select “USB Serial Converter” and press “Next”
  - k) Windows will now install the USB Converter driver. Depending on your Windows settings you may be notified that the driver is not Windows/Microsoft tested. If so you will be asked if you want to continue. You must select “Continue” to install the driver. The “Hardware Update Wizard” window will close after it has finished the installation.
  
  - l) In Device Manager expand the section “Ports (COM & LPT)”.
  - m) Right click on “USB Serial Port (COMX)” and select “Update Driver”, a new window will open titled “Hardware Update Wizard”.
  - m) Select the bullet item “Install from list or a specific location (Advanced)”, click the “Next” button
  - n) Select the bullet item “Don’t search. I will choose the driver to install”, click the “Next” button
  - o) Click on “Have Disk”, then click “Browse”.
  - p) Browse to the driver folder on your desktop and select the file “ftdibus.inf”, click “Open” then click “OK”.
  - q) Under “Model” select “USB Serial Port” and press “Next”
  - r) Windows will now install the USB Serial Port driver. Depending on your Windows settings you may be notified that the driver is not Windows/Microsoft tested. If so you will be asked if you want to continue. You must select “Continue” to install the driver. The “Hardware Update Wizard” window will close after it has finished the installation.
  
  - s) Please refer to the section above titled “Check if the HM-USB-ISO drivers were installed successfully” to confirm the drivers are now correctly installed.

#### **4) HM-USB-ISO is installed correctly but I still can’t communicate to HART devices:**

Verify the following:

- a. The COM port number assigned to USB HART Modem (Installation Step 3) has been set in your HART Communication application (Installation Step 7)
- b. Loop power supply is on (Installation Step 5)
- c. Loop resistance is between 250 ohms and 1Kohms
- d. Loop current is within HART limits
- e. If multi drop configuration, all transmitters in the loop have unique addresses
- f. USB HART Modem’s HART connection is across the loop resistor or across the transmitter terminals (see diagrams in step 4)
- g. The USB HART Modem’s USB connector is seated firmly in the PC’s USB connector

**Warranty**

The USB HART Modem (HM-USB-ISO) is warranted for 1 year for materials and workmanship. Contact HART Expert Ltd (UK) or ProComSol Ltd (USA) if having trouble. In the unlikely event that you will need to return a modem for a repair/replacement, an RMA (Return Material Authorization) number from HART Expert or ProComSol is required for all returned items.

**Specifications:****Enclosure**

Material	High strength ABS Plastic
Dimensions	70mm x 51mm x 20mm
Total Unit Weight	85 g

**Cables**

HART Cable Length	1.2 m
HART Cable Connectors	Mini-Grabber
USB Cable Length	0.5 m
USB Cable Connector	USB Type A

**HART**

Interface	Capacitive and transformer coupling
Output	600 mVpp
Leakage	< 10 uA
Isolation Voltage	1500 Vdc
Connections	Across loop resistor or HART field device
Specifications	HART 4, HART 5, HART 6, HART 7, HART Physical Layer Spec HCF_SPEC-54
HART Foundation	Registration Number L2-06-1000-070

**Computer**

Operating System	Windows 32 and 64 bit versions: NT, 2000, XP, Vista, 7, 8, 8.1, and 10
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**USB**

Specifications	USB 1.1, USB 2.0, backward compatible with USB 3.0 and SS USB
Power	USB port provides power to unit
Current Draw	20mA

**Environmental**

Operating Temperature	0 deg.C to 50 deg.C
Storage Temperature	-40 deg.C to 85 deg.C
Humidity	0% to 99% (non-condensing)

**Compliances**

CE Certification	EN 61326 (EMC)
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**Contact Information**

Supplied by HART Expert Ltd [www.hart-expert.co.uk](http://www.hart-expert.co.uk)

Designed and Produced by ProComSol Ltd [www.procomsol.com](http://www.procomsol.com)

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