MiCROLiNK HM+

101-0097

HART Protocol Modem
HART to Modbus Accumulator
USB, RS-485 or RS-232 Communications Port
DIN Rail Mount

Quick Start Guide

Features

MicroLink-HM+ can be used as a USB / RS-485 / RS-232 HART protocol modem or as a HART to modbus accumulator

- As a HART modem, MicroLink-HM+ is compatible with most HART configuration software that uses a serial COM port for communications. The managed HART protocol modem eliminates the Request-To-Send and Carrier-Detect handshake lines for maximum software compatibility.

- As a HART to Modbus accumulator, MicroLink-HM+ can be configured to poll 1 to 16 HART devices, storing variable data into Modbus registers - up to 4 variables per HART device.

- HART variable data is stored as 16-bit integer and single precision floating point.

- Use standard modbus-RTU commands to read HART variable data and write settings.

- HART protocol standard 1200 baud odd parity or up to 57,600 with odd, even or no parity. MicroLink-HM handles baud rate and parity conversions to allow connection to equipment that cannot be set to 1200 baud.

- Wide 5 to 30 Vdc power supply range.

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USB Driver Pre-Installation

The USB drivers should be installed before the MicroLink-HM modem is connected to the PC's USB port. After the drivers are installed, Windows will automatically detect the modem when it is connected to the USB port and complete the setup.

Important!

Install USB driver before connecting to the USB port.

To pre-install the drivers, run **Msetup.exe** from the included CD. The CD will auto-run this file if the Windows autorun feature is enabled for your CD drive.
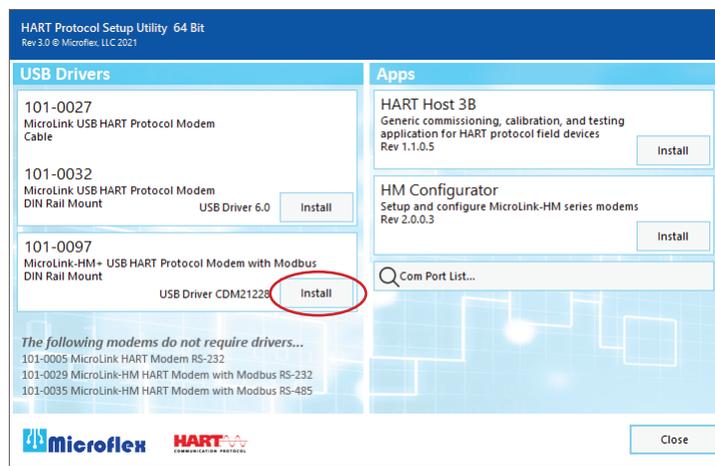

Figure 1. Msetup.exe HART Protocol Setup Utility

Click the **Install** button in the 101-0097 window to pre-install the USB drivers. The driver installer will guide you through the setup process.

Installers can also be run manually from the CD, without running Msetup, by running **CDM21228_Setup.exe**.

Don't have a CD drive?
Download the HART Protocol CD image from **www.microflx.com/pages/support**

Running the file will self-extract the compressed files and start the Msetup.exe HART Protocol Setup Utility.

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Installing HM Configurator App

MicroLink-HM modems are configured using the HM Configurator App. The app is included on the CD and is available as a free download from www.microflx.com.

Run the Msetup.exe HART Protocol setup utility as described in the *USB Driver Pre-Installation* section in this manual.

Click the **Install** button in the HM Configurator window to start the installation. The setup wizard will lead you through the installation.

After Installation, the HM Configurator icon will be added to your system.

Wiring Connections

Power Supply

The USB port can power the modem eliminating the need for an external power supply. This allows the MicroLink-HM+ to be configured with only a USB connection.

If the USB port is not connected, MicroLink-HM+ requires an external power supply in the 5 volt to 30 volt DC range. Typical operating current is 8.8mA at 12V and 5.2mA at 24V.

HART Loop

MicroLink-HM+ provides electrical isolation between the HART loop and modem - making it safe to ignore grounding and polarity issues. HART protocol requires a loop resistance between 230 and 600 ohms, typically 250 ohms, as shown in the diagram below. Refer to your equipment installation instructions for details on connecting a HART master or configuration device to the loop. MicroLink-HM+ can be used on point-to-point single device loops as well as multi-drop loops.

Connection to a HART loop is not required for MicroLink-HM+ configuration but it will allow you to verify HART communications with the HART device and verify configuration setup using the HM Configurator app.

RS-485 / RS-232 Communications Port

To use the communications port for RS-485 protocol connect the **A** and **B** terminals to the RS-485 inverting and non-inverting bus and the bus ground to the **G** terminal.

To use the port for RS-232 protocol connect **TX**, **RX**, and **G** to the mating RS-232 serial port. **TX** is MicroLink-HM+ output or transmit, **RX** is RS-232 input or receive, and **G** is ground.

Use the HM Configurator app to set the protocol, parity, BAUD rate, and Modbus address.

With the MicroLink-HM+ modem connected as shown in Figure 2, run the HM Configurator app to change settings and monitor data. Refer to the HM Configurator manual and the MicroLink-HM+ manual, included on the CD, for details.
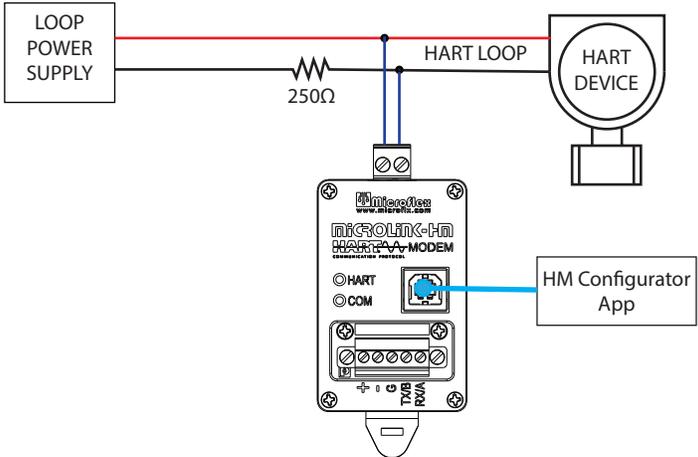

Figure 2. Minimum connections for MicroLink-HM+ setup using the HM Configurator app

The HM Configurator app can connect to the MicroLink-HM+ serial port (RS-485 or RS-232) or the USB port. By default the serial port is set to RS-485 protocol. To change to RS-232 protocol connect using the USB port.

HM Configurator will try to connect using the last known baud rate and parity. If it does not connect, it will try all possible baud rates and parity settings to complete the connection.

HART Protocol Modem Mode

USB port in HART Mode

If MicroLink-HM+ receives a HART protocol packet over USB it will be passed through to the HART loop. If Modbus polling is enabled, **Fill Modbus Registers** is selected, polling will pause and the modem will switch to HART mode. The USB port always communicates at the HART protocol 1200 BAUD, odd parity so no special settings are required to use the USB port for HART communications.

RS-485 / RS-232 port in HART Mode

The standard settings for HART protocol are 1200 BAUD odd parity. Typically these settings will be required for most HART protocol software.

The HART modem inside the MicroLink-HM+ will always use 1200 BAUD odd parity for communications over the HART loop - regardless of the port settings.

All transmitted HART commands will be converted to 1200 BAUD odd parity before being transmitted onto the HART loop. HART received data will be converted to the port settings BAUD and parity before being transmitted through the serial port.

Use the HM Configurator app to configure the serial port if necessary.

Modbus Accumulator Mode

In Fill Modbus Register mode, MicroLink-HM+ will continuously poll up to 16 HART devices and fill modbus register tables with HART device variable data.

Standard Modbus-RTU commands (command 3) can then be used to read the HART device data.

Modbus Register Assignments

Modbus register assignments and details can be found using the HM Configurator app or in the HM Configurator app manual. Both are included on the CD.

Auto Switching between HART Protocol and Modbus Protocol

If configured to Fill Modbus Registers and a HART packet is received on the USB or RS-485/RS-232 port MicroLink-HM+ will temporarily switch to HART modem mode and pause polling HART devices.

In the same way, if the modem is receiving HART protocol commands and then a Modbus command is received, MicroLink-HM+ will switch to Modbus protocol.

A packet type is identified by monitoring the first byte received in a new packet. HART protocol packets always begin with a hex FF preamble character and modbus packets begin with the slave address.

If **Fill Modbus Registers** is enabled, and no HART commands are received for 60 seconds, or if a modbus slave address is received, MicroLink-HM+ will exit HART modem mode and resume polling and filling modbus registers.

Setup for Modbus Polling

Connect the MicroLink-HM+ USB port to the PC running the HM Configurator app to test and make configuration settings.

Modbus Port

Configure the serial port for you application. By default it will be configured for RS-485 protocol at 1200 BAUD odd parity.
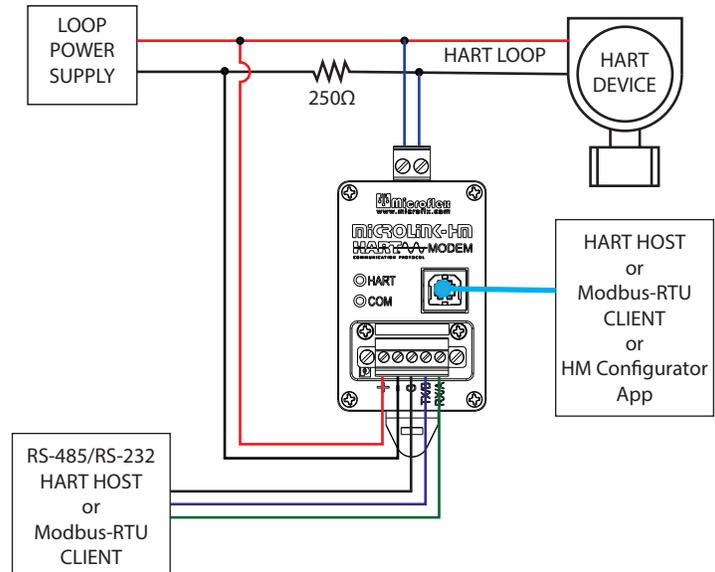
Figure 3. MicroLink-HM+ Connections for Modbus=RTU applications

Additional Information

For additional information refer to the ***Installation, Operation, & Specifications Manual*** included on the MicroLink-HM+ CD in a PDF format. The manual can also be viewed using the HM Configurator program.

Help>View Manuals (pdf)>101-0097 MicroLink-HM+

Visit www.microflx.com for downloads and additional information.

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