



HART 475 COMMUNICATOR

USER MANUAL



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Thank you for purchasing the HART series of handheld communicators. In order to use your HART Communicator well, please read all instructions carefully and keep the manual in a safe place for all users of this product.

一. Product list

Serial number	Product name	Quantity
1	HART Communicator	1
2	3100mAH Lithium battery (built-in)	1
3	Dedicated test line	1
4	Charger,	1
5	250 ohm resistor	2
6	User manual	1

二. Production Introduction

HART series manual operators are suitable for the communication operation of HART protocol intelligent transmitter, compatible with HART375 and HAR475. Its with excellent compatibility. This manual introduces the basic use, connection and operation of field communicator.

This manual operator can be conveniently connected into the current circuit of 4~20mA HART protocol instrument to communicate with HART protocol

instrument, configure the set parameters of HART instrument, read the test value and set value of the instrument, and diagnose and maintain the instrument. This manual operator supports the first main device of HART protocol, as well as the point-to-point and multi-point communication mode of HART protocol.


三. Working Environment

- Power supply: 3.7V 3100mAh lithium battery.
- Operating temperature range: 0°C~+50°C
Storage temperature range: -20°C~+55°C

Note: Exploding the device in the sun will significantly shorten the life of the LCD panel and accelerate the aging of the button panel.

四. Keyboard Introduction

There are 21 keys in this HART Communicator. The table below lists the functions of each key.

Button name	Features
“0~9”“.”key	Enter numbers and corresponding
	power supply
“Back”	Cancel current operation
灯	Screen brightness adjustment
“Delete”	Delete the input
Left, right, up, down keys	Select and combine key parameters
“_”“<”“>”	Select and combine key parameters
“Enter”	Enter

五. Establish Connection

5.1 Establish HART loop connection

The communicator can be connected to the remote control room or the instrument on the spot to communicate with the instrument independently.

There is 250 Ω resistance in internal set of communicator, and can be freely connected or disconnected. Set as connecting internal resistance, there is no need to connect external resistance. When set to disconnect the internal resistance, the external resistance should be connected. The resistance can be connected in parallel to the HART instrument or to the load resistance. The connection mode is shown in the figure below. Connection leads are non-polar.

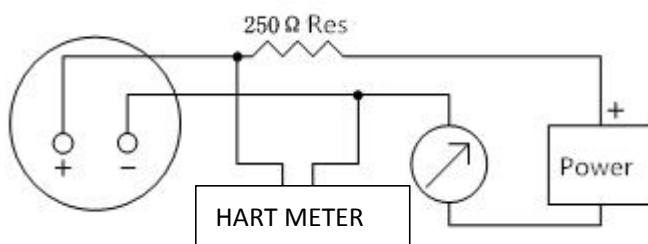


Figure7-1 Connected to a 250 ohm resistance

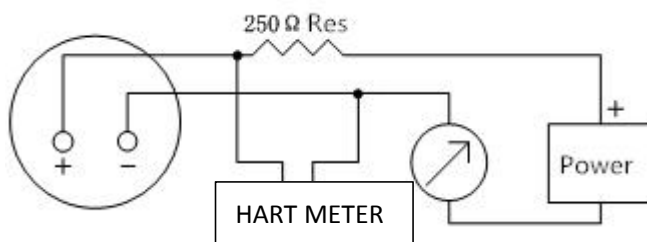


Figure7-2 Connect to the HART loop

When the communicator is set to connect the internal resistance, no external connection resistance is required. The connection mode is shown below. Connection leads are non-polar.

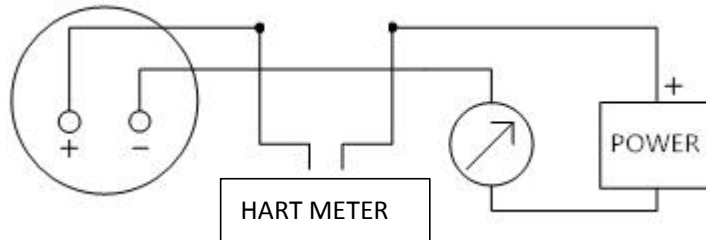


Figure 7-3 Connection Guidance with no external resistance

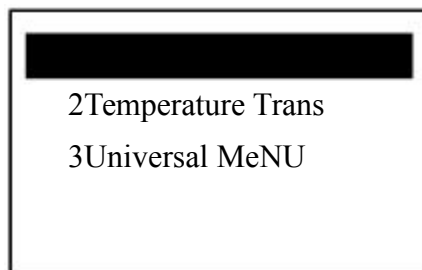
5.2 Turn on and Turn off HART 475

First, check if the battery of communicator has been equipped well. After the meter loop is connected correctly, hold down the power button for three seconds and the LCD screen is lit to indicate that the device has been working.

Hold down the power button for three seconds in the startup state, and press the confirm button after the prompt appears. The shutdown is complete and the screen is closed.

六. Function Introduction

Once connected to the device, you will be taken to the menu type selection interface, which has three options:



When the loop equipment is a pressure, differential pressure and pressure or differential pressure instrument, please select the first “pressure menu”; when the loop equipment is a temperature meter, please select the second “temperature menu”; For the other HART devices Please select the third "Universal Menu".

6.1 Menu Number

There are 6 selections : 1 online device, 2 polling device, 3 battery power, 4 local information, 5 language, 6 resistance connection

For any type of meter, you can always return to the item menu by pressing the left arrow key or the "Back" key several times. If entering the on-line service again, the handheld device needs to be reconnected to the onn-line meter again.

1 On line Device 2 Polling Device 3 Battery Power 4 Device Info
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1 Language 2 Resistance Connection

6.2 Main Menu

When communicator has been connected to HART instrument, it can enter into Main Menu through Universal Menu .

1 Process Var 2 Diagnosis 3 Basic Setup 4 Detailed Setup

6.3 Reading process variable

Select the first item in the main menu to enter the function of reading process variables. The process variables listed in this menu include principal variables, output current and percentage value, etc., and are updated in real time with each communication

1 Master variable	***	Kpa
Current	***	mA
Percentage	***	%

6.4 diagnosis and maintenance

Select the second item from the main menu to enter the diagnosis and maintenance menu, which includes options for equipment self-inspection, loop current detection, and meter calibration. Selecting equipment self-inspection, it can achieve equipment self-inspection, and report the test results. Selecting circuit current detection, the transmitter can output a fixed current signal to verify whether the whole circuit is normal. Select calibration, can carry out sensor calibration and analog current output calibration.

2 Loop Current Set
3 Calibration

6.5 basic Settings

Select the third item from the main menu to enter the basic Settings menu, which allows you to alter some common information, and more configuration parameters will be provided in the detailed Settings. Menu items have three states, one is the sub-menu, press the right arrow key to enter the sub-menu; Second,

display variables, some variables can only read, some can write operations;The third is to perform a series of operations to complete a specific function, the user only need to complete according to the operation steps.

- 2 Device Type
- 3 Serial Number
- 4 Tag Number

- 6 Version
- 7 Polling Address

6.6 detailed Settings

Select the fourth item in the main menu to enter the detailed Settings menu, which provides more configuration information. For different HART devices, the detailed Settings are quite different.Only through the registered device, its special functions can be complete.

- 2 Signal
- 3 Material Info
- 4 Sensor Info

- 6 Recover

七. Common Function Operation Example

7.1 set the unit of pivot variable

Click the following operation to enter the unit function of setting pivot variables:
(4 detailed Settings) → (2 signal conditions) → (1 user range unit)

7.2 set the upper limit of the range

The upper limit of the range can be set by following:

(4 detailed Settings) → (2 signal conditions) → (2 user range upper limit)

7.3 set the lower limit of the range

The lower limit function of the set range can be entered by following operations:

(4 detailed Settings) → (2 signal conditions) → (3 lower limit of user range)

7.4 setting damping

Press the following operation to enter the setting damping function:

(4 detailed Settings) → (2 signal conditions) → (4 damping)

7.5 output current fine-tuning

Press the following operation to enter the output current fine-tuning function:

(2 diagnosis and maintenance) → (3 calibration) → (1 output fine-tuning)

Note: the output current fine-tuning function can only be performed when HART instrument leaves the factory and is tested periodically. The use of this function requires the authorization of the HART instrument owner, otherwise the output error of HART instrument may be increased.

7.6 pivot variable zeroing

Click the following operation to enter the pivot variable zeroing function : (some instruments do not have this function)

(2 diagnosis and maintenance) → (3 calibration) → (3 sensor fine-tuning) → (1 zero calibration)

Note: the zero setting function of the principal variable can correct the zero deviation of the instrument output caused by the installation position, which can only be carried out when the HART instrument is first installed and the instrument cycle is verified. The use of this function requires the authorization of the HART instrument owner, otherwise the output error of HART instrument may be increased.

八. Polling instrument

After starting up, the communicator will automatically poll the online device with address 0. Select "polling device" from the project menu and it will enter the option of polling device. If there are multiple instruments on the line at the same time, you can ensure the communication with the required instruments through single point and polling. The first item in the menu is multi-point polling. The communicator will automatically poll all connected devices from address 0 to address 15. The second item in the menu is single-point polling. You can choose any address between 0 and 15 for communication.

1 Multipoint 2 Single Point

If polling to the meter, it will go directly to the main menu. Otherwise, go back to the original screen and re-select the polling address. Multi-point polling always operates only on the first instrument (the instrument with a small address), and single point polling only operate on the next instrument (the instrument with a large address). When several devices are connected in the same loop, each device

must set a different address.If the devices are with the same address, it may not be found by communicator,then a separate connection is required to modify the polling address of the device.HART protocol defines the communication mode of multiple devices connected in the same loop as multi-point communication mode. The current of the loop is no longer 4-20ma, but the sum of the output current of these devices.

九. Battery Power

Select the third item from the item menu to enter the display battery power function, which will detect the remaining battery power in the current communicator.When the battery power is too low, please replace the battery as soon as possible, otherwise, it will affect the use of commnunicator.

十. Instrument Information

The fourth item in the project menu can enter the local information interface.This interface can view the local version number and serial number information.

十一. Language selection

Select the fifth item from the item menu to enter language switch interface. This instrument is supporting English and Chinese both.

十二. Resistance Connection

Select item 6 from the item menu to enter the resistance connection selection screen. Can switch the connection or disconnection of the built-in resistance. Select item 1 as the internal resistance connection, and item 1 is shown as "connected"; no need external resistance connection / Select item 2 to disconnect the internal resistance connection. At this time, item 2 is shown as "disconnected".

十三. Common troubleshooting solutions

13.1 the communicator is not connected to the meter

- 1) check whether the loop equipment supports HART function.
- 2) check the size of the circuit load resistance, load resistance should be between 250 ~ 500 Ω .
- 3) check whether the connection of communicator and instrument is correct.
- 4) check whether the meter is powered correctly.
- 5) it is possible that the address of the instrument is not 0. Select "multi-point polling" and conduct polling to find the instrument.

13.2 press the power switch and there is no display

- 1) check whether the battery has been loaded.
- 2) check whether the battery is installed correctly.
- 3) check whether the battery is exhausted.

十四. Attention

14.1 for the first use, please read the instructions in detail to make the best use of your operator.

14.2 take good care of the products, keep them clean and dry, keep them free from dust and moisture, avoid being soaked or knocked, handle them gently and avoid man-made damage.

14.3 do not pull the data line to avoid the bad contact of the line and the unusable situation.

14.4 please press the keyboard lightly to avoid heavy hitting and extend the life of the keyboard.

14.5 batteries should be charged frequently to avoid battery exhaustion affecting the life.

14.6 in case of any failure of the equipment, the distributor or the manufacturer shall be contacted in time to solve the problem, and it is strictly prohibited to open the product without permission.

Thank you for your reading!