

# **Additel HART Communicator Mode User Manual**

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## **1. Overview of the HART Communicator Mode**

The Additel HART Communicator mode is the specific implementation of HART Foundation Device Description Technology (hereinafter referred to as DD technology).

HART smart transmitters are available in many types and can be functionally complex. With the exception of a few general commands and common commands specified by the HART Foundation, most functions of HART smart transmitters can only be accessed through special commands of each transmitter.

Transmitter manufacturers generally do not disclose these special commands, but these commands can be obtained through the DD technology framework proposed by the HART Foundation. The Additel HART Communicator mode provides DD technology support by parsing the machine-readable DD file and obtaining the functional description of a specific transmitter. This provides users with all the functions of HART capable transmitters.

The DD file is an encrypted file provided by the transmitter manufacturer, which describes the composition of the user interface that interacts with this type of transmitter. The DD file contains communication instruction information, special operation procedures, and translation information. Because of this, the directory structure of different transmitter interfaces varies, and the text translation is also usually different.

## **2. Communicator mode and automatic calibration mode**

### **2.1 Communicator mode (Based on HART Foundation DD Technology)**

- (1) Using the HART Communicator mode, users can obtain all the functions of the transmitter. However, because the HART Communicator is based entirely on the DD files provided by each transmitter manufacturer, the directory structure is complex and the directory structure of different transmitters is inconsistent making it difficult to quickly locate the target transmitter function. The DD file of the transmitter is typically developed in the English language which may cause difficulties for users of

another language.

- (2) The HART Communicator mode needs to be equipped with a complete DD technology framework equivalent to starting a whole set of DD technology engines in the device. Not all embedded product hardware systems can be supported by the technical framework.

At present, only the ADT 761A and ADT 875 are equipped with HART Communicator mode.

## **2.2 Automatic calibration (Based on Additel DD Technology)**

For Additel products that cannot be equipped with the Additel HART Communicator Mode, Additel provides the HART Automatic Calibration Mode.

The HART Automatic Calibration Mode is based on the Additel DD technology independently developed by Additel, which supports reading, writing and tuning of some general parameters of pressure and temperature transmitters.

The Additel DD technology goes beyond the HART Foundation DD technology framework. On the one hand, it

simplifies the HART Foundation's DD technology framework, allowing the HART Automatic Calibration Mode to be more widely applied to different restricted product platforms. On the other hand, thanks to its advanced design, the Automatic Calibration Mode provides users with a unified user interface which supports multiple languages and solves the inconvenience caused by the communicator mode.

Since the automatic calibration mode only accesses the reading, writing and tuning functions of general parameters, it is not possible to access all the functions of the transmitter.

Note: Due to more complicated settings and calibration instructions of temperature transmitters, some older Additel products cannot support the configuration and calibration of temperature transmitters.

### **3. Additel HART Communicator Mode Introductions**

Use the following four step method to utilize Additel's HART Communicator Mode:

- (1) Connect the HART transmitter (check with the transmitter manufacturer for wiring details)
- (2) Start the HART Communicator and parse the DD file of the transmitter

(3) Modify the parameters and/or execution method of the transmitter

(4) Exit the HART Communicator and synchronize the data

### **3.1 Connecting the HART Transmitter**

After correctly connecting the HART transmitter and selecting the power supply method, use the HART polling function to find the transmitter, then click the corresponding transmitter to establish the connection. After the connection is complete, the system is in HART Automatic Calibration Mode.

For additional details on connecting to HART transmitters, please refer to the corresponding Additel product manual.

### **3.2 Starting the HART Communicator**

According to the corresponding Additel product manual, click the HART Communicator icon to start the HART Communicator mode.

HART Communicator requires device-specific DD files. If there is no DD file corresponding to the device in the DD library of the Additel device, the HART Communicator mode cannot be used. Please contact Additel for help with adding the DD file to your device.

After the HART Communicator is started, the system will pop up a window indicating the startup process of the Communicator as shown in Figure 1 (the figures used in this manual are typically from the ADT875 interface). The duration of this process depends on the complexity of the DD file of the corresponding HART transmitter. Please wait patiently for the start-up process of the Communicator to complete.



Figure 1 – Stating the HART Communicator

### **3.3 Modifying the parameters and/or execution method of the transmitter**

The Additel HART Communicator Mode presents the transmitter functions to the user according to the DD file provided by the transmitter manufacturer.

#### **3.3.1 Directory Tree of the Communicator Mode**

After entering the Communicator Mode, the home page will contain up to five menu items shown below. Although the specific display text and included functions of the directory items are specified by the DD file, the HART Foundation stipulates the functions of the five basic root directory items, as follows:

- 1) ROOT\_MENU (root directory): The transmitter manufacturer must provide this directory, which should contain all the functions of the corresponding HART device. It is recommended that users operate in this directory.
- 2) DIANOSTIC\_ROOT\_MENU (diagnostic root directory): supports transmitter diagnostic functions.
- 3) PROCESS\_VARIABLE\_ROOT\_MENU (process variable root directory): provides information about the

process quantity of the transmitter.

4) DEVICE\_ROOT\_MENU (device root directory): provides access to the transmitter setting functions.

5) MAINTENANCE\_ROOT\_MENU (maintenance root directory): support transmitter maintenance\calibration functions.

Considering that the ROOT\_MENU (root directory) contains all the functions of the transmitter, it is recommended that users operate in this directory. Generally, this directory will contain all the contents of the above directories 2-4. The ROOT\_MENU will display with the name specified in DD when presented to the user, so the name may be different in each DD, but its position is fixed as the first menu in the communicator mode. The user can position the ROOT\_MENU menu item, according to this.

To obtain the directory tree structure in a specific transmitter communicator mode, please contact the transmitter manufacturer. Such as Yokogawa EJX110A HART user manual, provides the corresponding directory tree, see Figure 2.



### 3.3.2 Common sub-functions of the Communicator

In the Communicator Mode, the system will provide up to 4 sub-functions:



Communication status : This function will display the communication status of the HART device.



Device status: This function will display the status of the HART transmitter.



Help information: If the DD provides help information for the specified item, this function icon will be displayed.



Return to the reference source interface: The user can return to the product main interface by using this function to perform the necessary reference source control operations.

### 3.3.3 Modifying and sending transmitter parameters

Conventional transmitter parameters can be established through the “modifying and sending” operations.

Users can find the corresponding editable parameters according to the directory tree provided by the manufacturer, or browse the directory structure, and click to edit them.

After editing, the modified items will be marked with a yellow background, see Figure 3. At this point, click the send button  and the system will send all the modified items to the transmitter. If the sending process is successful, the yellow background color of the project will be cleared. If the sending process fails, the system will give an error prompt based on the DD file and the specific communication results (see figure 4) and revert the modified items to the previous settings.

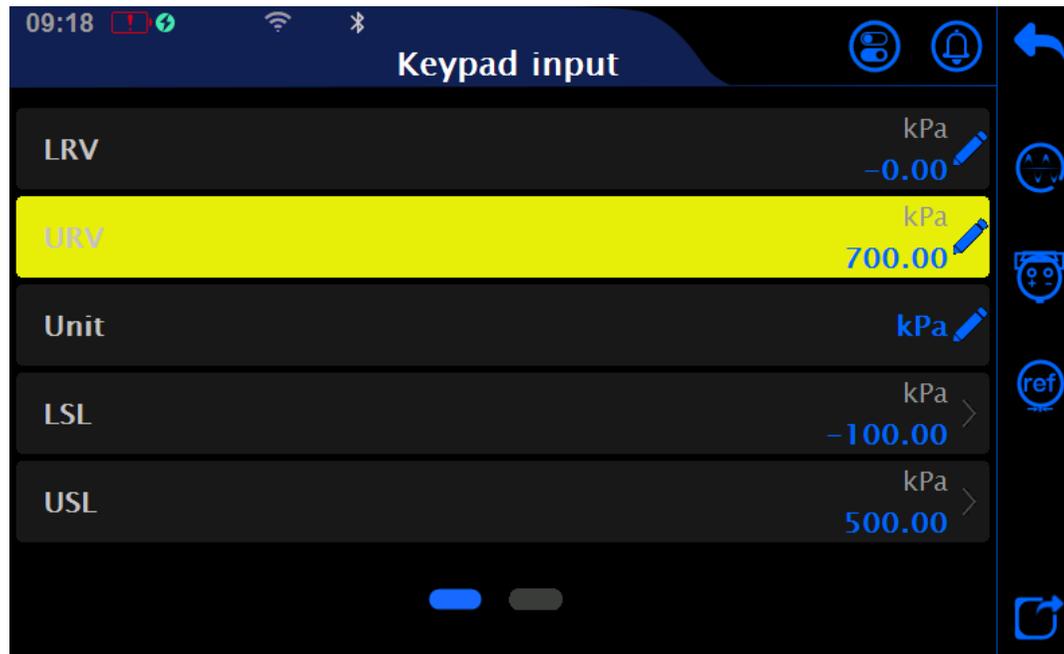


Figure 3 - Sending Transmitter Parameters

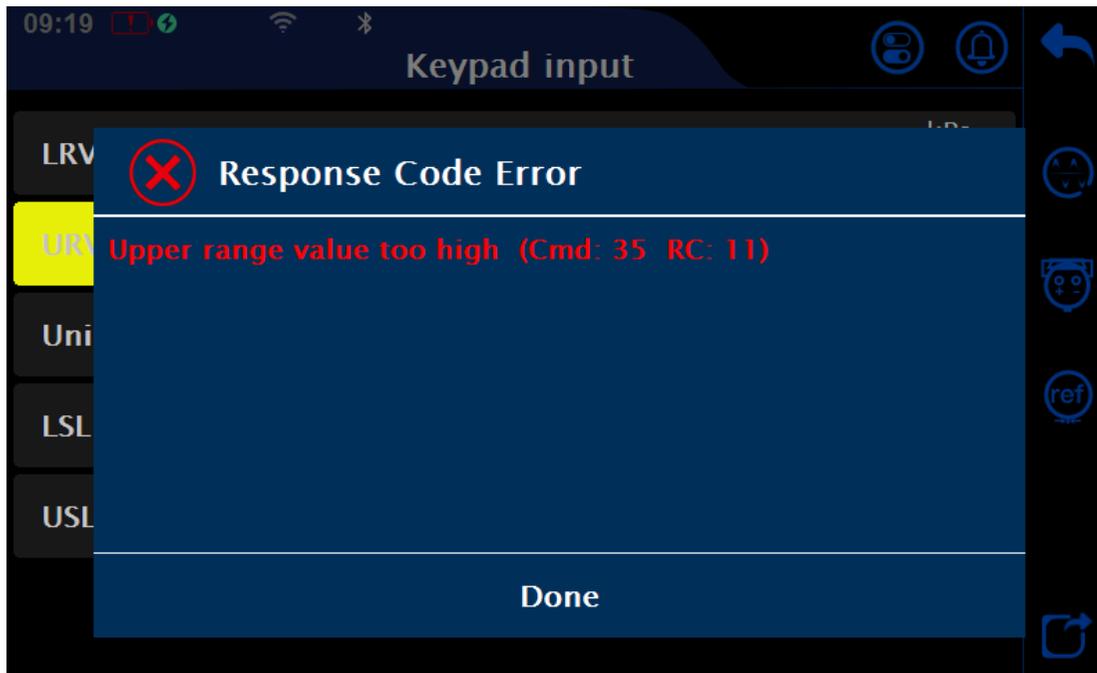


Figure 4 - Error Prompt for Sending Parameters Failure

### **3.3.4 Execution Method**

To ensure the reliability of this somewhat complicated process, the transmitter manufacturer provides the corresponding setting process, which is called the method (DD term Method). The specific process of the method execution is completely described by the DD file of the transmitter manufacturer. After entering the process, the upper right button (back or previous step) and the lower right button (next or OK) of the window will be presented according to the DD file, as shown in Figure 5. The user needs to set up the transmitter in accordance with the prescribed process of the transmitter manufacturer.

Note: The method will only send the settings to the transmitter after the final execution is successful.

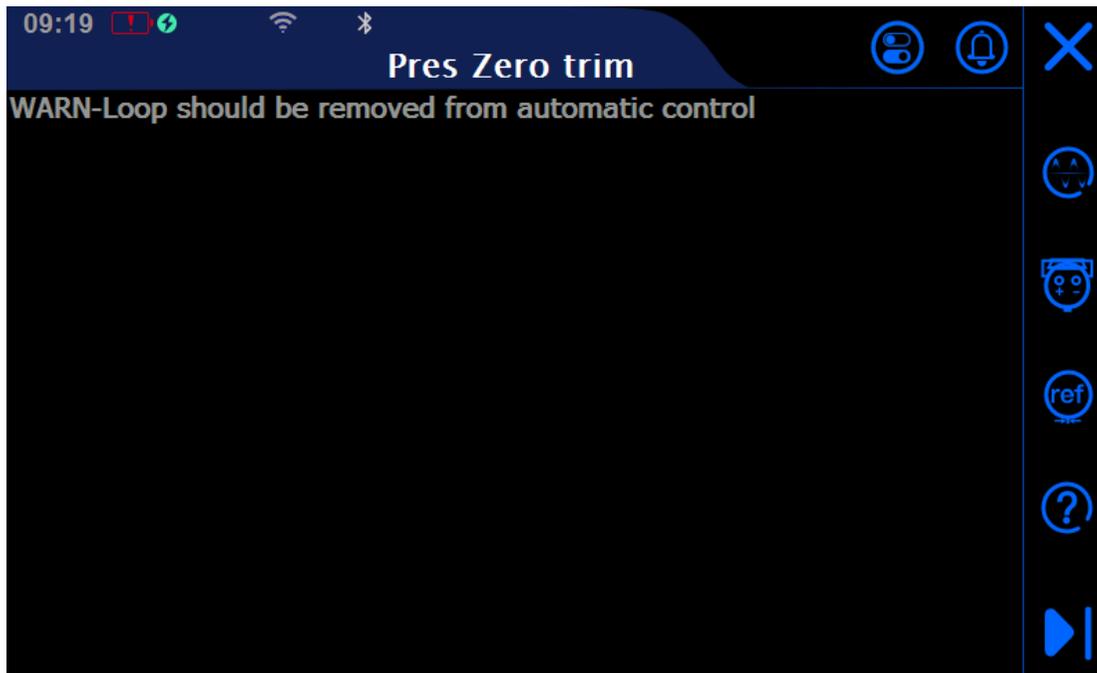


Figure 5 - Execution Method

### **3.3.5 Shortcut for Entering the Reference Source Value**

In the editing interface, the user can directly copy the reference source value to the edit box. This operation helps to save time when performing calibration or range migration. The specific operations are as follows:

(1) ADT875 shortcut typing operation:

Click the reference source at the bottom of the interface, and its value will be directly filled into the edit box, as shown in Figure 6.

(2) ADT761A shortcut typing operation:

Click the “control center”, select the pressure module or mA signal measurement value, the selected value will be copied directly to the edit box of the Communicator, see Figure 7.

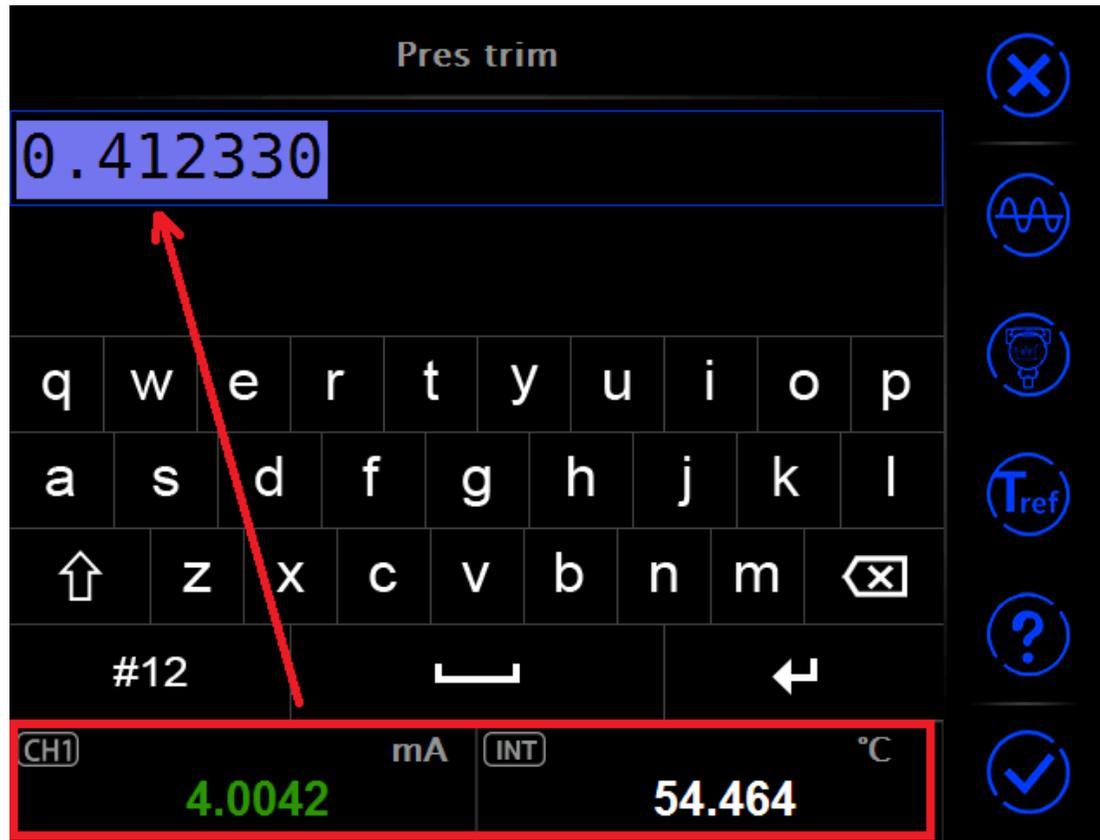


Figure 6 - ADT875 Shortcut for Entering Values

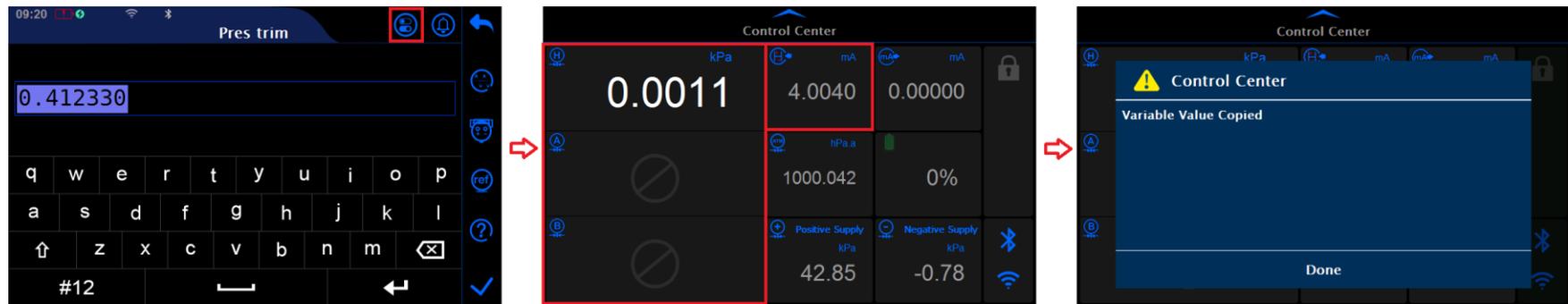


Figure 7 - ADT761A Shortcut for Entering Values

### 3.4 Exiting the HART Communicator and synchronizing data

After the configuration of the HART transmitter is completed, click the back icon to the main interface to exit the HART Communicator mode. After exiting, the system will synchronize the HART Foundation DD database and Additel DD database to ensure data consistency. After that, the system will run in HART automatic calibration mode.

#### 4. Frequently Asked Questions

**Question #1)** Why does the HART Communicator not have translations other than English and why do I see various text types interspersed?

**Answer:** The user interface of the HART Communicator Mode is described by the DD file provided by the transmitter manufacturer. If the DD file does not translate the corresponding menu item, the menu description of the Communicator Mode will only be presented in English.

**Question #2)** How does one upgrade the HART DD library?

**Answer:** The HART DD library can be updated by using a standard U disk upgrade from Additel. Please contact Additel to obtain the DD library upgrade package.

**Question #3)** What is included in the Additel DD library?

**Answer:** The ADT875 includes the temperature transmitter and pressure transmitter DD libraries registered by HART Foundation by default. The ADT761A includes the pressure transmitter DD library registered by HART Foundation by default.