User's Manual

375 FIELD COMMUNICATOR

375 FIELD COMMUNICATOR

NOTICE

Read this User's Manual before working with the Model 375 Field Communicator. For personal and system safety, and for optimum product performance, thoroughly understand the contents before using or servicing this product.

For equipment service needs, contact the nearest product representative.

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SECTION 1 INTRODUCTION

USING THIS MANUAL

The sections in this manual provide the following information on the 375 Field Communicator.

Section 2: Learning the Basics contains information on settings, types of storage, IrDA® communication, using ScratchPad, maintenance, managing files and storage.

Section 3: HART Functionality contains information on starting the HART® application, establishing communication with connected HART devices, and configuring the HART application.

Section 4: Fieldbus Functionality contains information on starting the fieldbus application, establishing communication with connected fieldbus devices, viewing the Live Device List, block lists, and configuring the fieldbus application.

Section 5: Troubleshooting provides solutions to the most common 375 Field Communicator operating problems.

Appendix A: Reference Information provides physical, functional, and performance specifications.

Appendix B: Approval Information contains Hazardous Location Certifications, European directive information, and approval drawings.

SECTION 2 LEARNING THE BASICS

OVERVIEW

This section provides instructions on basic features and functions of the 375 Field Communicator. It also provides information on starting, shutting down, configuring, using the ScratchPad application, and maintaining the 375 Field Communicator. The functionality described in this section is based on system software version 1.8.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol. Other warning messages can be found in the Troubleshooting section of this manual.

⚠ IMPORTANT NOTICE

Ensure the battery pack and the 375 Field Communicator are properly aligned during assembly to prevent damage to the connector pins.

⚠ IMPORTANT NOTICE

During assembly/disassembly:
Do not pull up on the battery pack as this could damage the power supply connector. The System Card must only be inserted or removed by applying gentle pressure in line with axis of the card and socket. Do not pull upwards or press downwards on the card as this may cause damage to the card or the unit and void warranty.

⚠ WARNING

Contact with the touch screen should be made by blunt items only, preferably the stylus included with the 375 Field Communicator. The use of sharp instruments, such as screwdrivers, can cause failure of the touch screen interface.

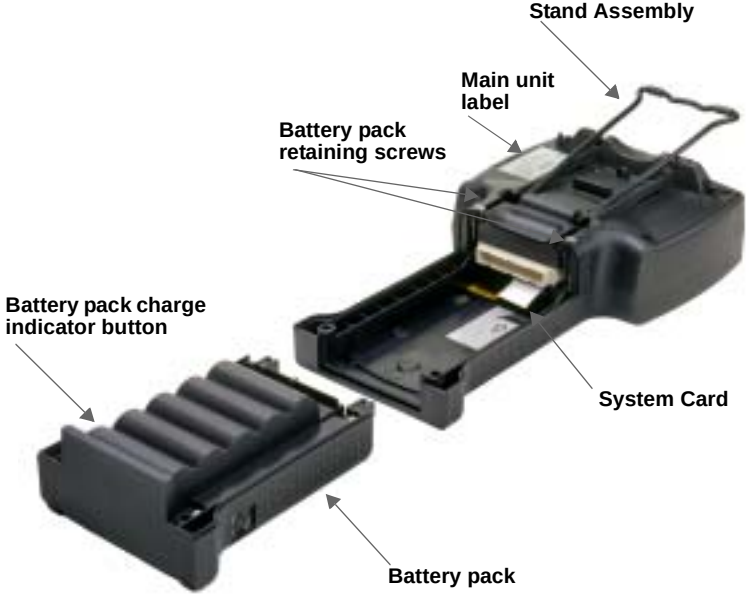
⚠ WARNING

Initiating a Re-Flash initiates reinstallation of the firmware and software from the System Card. This should only be performed under the direction of technical support personnel.

INSTALLING THE SYSTEM CARD AND THE BATTERY PACK

1. Place the 375 Field Communicator face down on a level, secure surface; see Figure 2-1.
2. Lock the stand into the hanger position. To pivot past the stand position, squeeze the stand together near the hinge.

Figure 2-1. Back side of the 375 Field Communicator



3. With the battery pack removed, place the System Card, with the card contacts facing up, on the main unit System Card guide ribs (located directly below the battery pack connector). Insert the System Card until it is firmly in place.
4. With the main unit still face down, ensure the tops of the two battery pack retaining screws are flush with the top of the battery pack.
5. Install the battery pack by aligning the sides of the battery pack and main unit and carefully sliding the battery pack forward until it is secure.

⚠ If the battery pack and main unit are not properly aligned, the connector pins can be damaged.

6. Tighten the two battery pack retaining screws until they are secure (do not overtighten). The tops of the screws should now be close to flush with the stand groove.

STARTING UP AND SHUTTING DOWN

Prior to using the 375 Field Communicator without the charger/power supply, fully charge the battery pack. A full charge is indicated by a solid green light on the charger/power supply. Charging may take up to two hours. The 375 Field Communicator may be used while charging. Before operating the 375 Field Communicator, ensure:

- The 375 Field Communicator is not damaged.
- The battery pack is fully seated.
- All screws are sufficiently tightened.
- An Expansion Module (EM) or Expansion Port Plug is in place.
- The communication terminal recess is free of dirt and debris.

Starting the 375 Field Communicator

Press and hold the on/off key until the Multifunction LED flashes to indicate the unit is powering (approximately two seconds). See Figure 2-2 for on/off key location.

During start-up, the 375 Field Communicator will automatically install any software upgrades available on the System Card. Once complete, the 375 Main Menu will be displayed. After starting the 375 Field Communicator, you can choose to:

- Launch the HART or FOUNDATION fieldbus Applications (if licensed)
- Configure/view Settings
- Enter Listen for PC
- Launch the ScratchPad application

Shutting down

While applications are open, the on/off key is disabled. You must exit to the 375 Main Menu before using the on/off key. To shut down the 375 Field Communicator press and hold the on/off key until the display turns off (approximately three seconds).

You can also power the 375 Field Communicator off by simultaneously pressing the backlight adjustment key and the function key until the display turns off. This is a mechanism by which the power down is accomplished in the hardware (similar to removing the power to a PC using a switch). This is not the recommended way of shutting off the 375 Field Communicator.

BASIC FEATURES AND FUNCTIONS

Figure 2-2. 375 Field Communicator diagram

Using the keypad

The 375 Field Communicator keypad and touch screen have nearly total functional redundancy.

On/off key

The on/off () key is used to power on and off the 375 Field Communicator.

Arrow navigation keys

Four arrow navigation keys allow you to move through the menu structure of the applications. Press the right arrow navigation key () to navigate further into the menu.

Enter key

The enter () key allows you to launch the focused item or to complete an editing action. It does not navigate you through a menu structure. For example, if you have the **Cancel** button in focus (highlighted) when you push the enter key, you will be choosing to cancel out of that particular window.

Tab key

The tab () key allows you to move between selectable controls.

Alphanumeric keypad

The alphanumeric keypad allows you select to both letters, digits, and other characters, such as punctuation marks. It can perform a selection of options and data entry in either numeric or alphanumeric modes. The 375 Field Communicator will automatically determine the mode depending upon the input necessary for the particular field.

When in alphanumeric mode, to enter text press the desired keypad button in quick repetition to scroll through the options to achieve the appropriate letter or number. For example, to type the letter Z, press the 9 key quickly four times; see Figure 2-3.

Figure 2-3. Keypad button functionality example

Backlight adjustment key

The backlight adjustment () key allows you to adjust the intensity of the display. There are four different settings. Intensity impacts the battery life of the 375 Field Communicator. Expect a shorter battery life for higher intensities; see “Backlight” on page 2-11 for settings.

Function key

The function ( ) key allows you to enable alternate functionality on select keys. The grey characters on the keys indicate the alternate functionality. When enabled, the orange multifunction LED light will appear and an indication button can be found on the Soft Input Panel (SIP). If the function key is enabled, press the key again to disable the functionality.

The alternate function on the Tab and alphanumeric 5 key (insert) will be activated in future releases of the 375 Field Communicator software.

Multifunction LED

The multifunction LED allows you to recognize when the 375 Field Communicator is in various states; see Table 2-1.

Table 2-1. Multifunction LED

Multifunction LED	Processing indication
Solid green	The 375 Field Communicator is on.
Flashing green	The 375 Field Communicator is in power saving mode. The display is off.
Solid green and orange	The Function key is enabled.
Blink green and orange	The on/off button has been held down long enough for power up.

Using the touch screen

The touch screen display allows you to select and enter text by touching the window. Tap the window once to select a menu item or to activate a control. Double-tap to move further into the menu level.

NOTE
All instructions in this manual are written for the touch screen.

⚠ The touch screen should be contacted by blunt items only, preferably the stylus included with the 375 Field Communicator. The use of sharp instruments, such as screwdrivers, can cause failure of the touch screen interface. Repair of the touch screen requires replacement of the entire 375 Field Communicator display assembly, which is possible only at an authorized service center.

Use the back arrow button () to return to the previous menu. Use the terminate button () in the upper right corner of the touch screen to end the application.

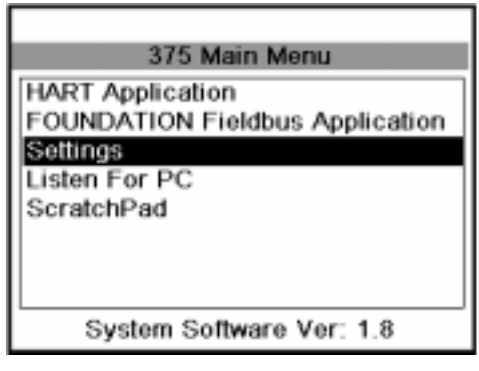
Using the Soft Input Panel (SIP) keyboard

The SIP keyboard allows for alphanumeric input using the touch screen. The SIP keyboard detects when you need to enter characters and will appear automatically as required.

VIEWING THE 375 MAIN MENU

The 375 Main Menu allows you to run the HART application, run the Settings menu, communicate with a PC, and launch the ScratchPad application.

Figure 2-4. 375 Main Menu example



Starting the HART application

From the 375 Main Menu double-tap **HART Application** to run the HART application. On startup, the HART Application will automatically poll for devices.

Starting the fieldbus application

From the 375 Main Menu double-tap **Foundation Fieldbus Application** to run the fieldbus application.

Running the Settings menu

From the 375 Main Menu double-tap **Settings** to view the Settings menu.The Settings menu allows you to set preferences for the 375 Field Communicator. The Settings menu also allows you to view system properties and license information. To access the 375 Field Communicator settings:

1. From the 375 Main Menu select **Settings**.
2. Select the desired setting from the Settings menu.

About 375

About 375 allows you to view the software property revisions of your particular 375 Field Communicator. If you need to call technical support personnel, have the System Software version, Communication and Diagnostic Circuitry (CDC) version, and the Operating System version on hand.

⚠ Launching the RE-FLASH initiates the reinstallation of the firmware and software from the System Card. This should only be performed under the direction of technical support personnel.

Backlight

The backlight setting allows you to adjust the intensity of the display. To adjust the backlight, drag the slider left to right. When you find an appropriate backlight setting select **OK** for this session only, **SET DEFAULT** to retain this setting upon start up, or **CANCEL** to exit without changes.

Clock

The clock setting allows you to set the date and time on the 375 Field Communicator. Configure the date by using the drop down menu. To configure the time, highlight the appropriate time field and use the arrows to scroll through values until you find the correct time. Select **OK** to close.

Contrast

The contrast setting allows you to adjust the lightest and darkest areas on a display screen.

To adjust the contrast, drag the slider left or right. The window will automatically adjust the contrast as you move the slider. When you find an appropriate contrast setting select **OK** for this use only, **SET DEFAULT** to retain this setting upon start up, or **CANCEL** to exit without changes.

NOTE
Temperature can affect contrast.

Event capture

The event capture setting allows you to turn on and off the event captures and also allows you to delete event capture (.rec) files. An event capture is a log of communication, input, and screen output that occurs between the 375 Field Communicator and a device (HART only).

1. Activate event capture in the settings menu by tapping the desired radio button. The radio button will be highlighted white when selected. To delete an event capture tap the **DELETE EVENT FILE** button.

With event capture enabled, starting the HART application will activate an event capture dialog box for you to enter a file name. Enter the name and tap **OK**. The file will be saved to a default location.

NOTE
While event capture is enabled, device warning messages will not appear.

Event captures are helpful in troubleshooting.

1. Create an event capture.
2. Transfer the event capture to a PC with the Programming Utility; see Programming Utility online Help for more information.
3. E-mail the event capture to technical support personnel who will then be able to view the specific communication.

License

Licensing can be viewed when you turn on the 375 Field Communicator and in the license settings menu. The license setting allows you to view the license on the System Card. The HART application license is standard in every 375 Field Communicator. Other licenses available include the FOUNDATION fieldbus application and Easy Upgrade option. Unlicensed features cannot be accessed.

Memory

The memory setting allows you to view available free space in the System Card, Internal Flash, RAM, and Expansion Module (if installed).

Power

The power setting allows you to specify power management and to view battery/charge status.To specify the power management settings select the time interval from the drop down menus.

The power saving mode will turn off the backlight, the display and reduce power consumption to a minimum. The green multifunction LED light will flash while in power saving mode. To exit out of the power saving mode press any key or tap the touch screen. The 375 Field Communicator will return to the previously running mode.

The auto-off will turn off the 375 Field Communicator after the specified duration of inactivity.

NOTE
The auto-off functionality will be disabled automatically during certain operations to prevent the unintentional loss of data.

When you determine an appropriate power management setting select **OK** for this session only, **Set Default** to retain this setting upon start up, or **Cancel** to exit without changes.

Power supply is indicated at the bottom of the screen. When on battery power, a percent charge remaining bar will be present. A message will appear when on external power.

Touch screen alignment

The touch screen alignment setting allows you to calibrate the touch screen with the display. Tap the cross hairs firmly and accurately at each location on the window. The target will continue to move until the touch screen is aligned. Touch screen alignment will be retained upon start up.

Exit to the 375 Main Menu

Double-tap **Exit to 375 Main Menu** if you want to return to the 375 Main Menu.

Communicating with a PC

IrDA communication with PCs

The 375 Field Communicator communicates with PCs using infrared technology. IrDA is the only PC interface supported for the transfer of device descriptions, software updates, configurations, event captures, and ScratchPad files.

IrDA communication can either be built into the PC, such as a laptop, or provided through an adapter such as a USB to IrDA adapter. Refer to your IrDA manual for installation and operating instructions.

Throughput for infrared communications with the 375 Field Communicator is approximately 4 kilobytes/second. Maximum recommended distance between the IrDA and PC is 18 inches.

Listen For PC

In Listen for PC, the 375 Field Communicator is under the control of a PC application for transferring data and managing device configurations. The PC application could be one of the following:

- AMS™ Suite: Intelligent Device Manager (version 6.2 or higher), software for managing instrumentation and valves in a process plant. Currently, AMS only supports HART configurations. In the future, it will also support FOUNDATION fieldbus configurations.
- 375 Field Communicator Easy Upgrade Programming Utility

To enter Listen for PC:

1. From the 375 Main Menu, select **Listen for PC**.
2. Align the 375 Field Communicator IrDA interface with the PC IrDA interface.
3. Complete the necessary transfer(s) using the Programming Utility or AMS Suite: Intelligent Device Manager; see the Programming Utility online Help for more information.
4. Tap **EXIT** to close the Listen for PC application.

If new system software was downloaded to the 375 Field Communicator System Card, an update of the Internal Flash will occur upon exit.

Transferring HART configurations using AMS Suite: Intelligent Device Manager

A Handheld Communicator Interface kit of the Intelligent Device Manager (version 6.2 or higher) option lets you use the 375 Field Communicator with AMS.

1. Align the 375 Field Communicator IrDA interface with the PC IrDA interface and then enter Listen for PC. A 375 Field Communicator icon will appear in the AMS Suite: Intelligent Device Manager to indicate that all configurations from the 375 Field Communicator can be accessed.
2. In the AMS Suite: Intelligent Device Manager double-click the 375 Field Communicator icon. The Expansion Module and Internal Flash folders are displayed. Once all of the configuration files are displayed, perform your tasks with the AMS Suite: Intelligent Device Manager.

Easy Upgrade Programming Utility

To add Device Descriptions (DDs) or system software upgrades you will need to have a System Card with the Easy Upgrade option. For more details on use, see the Programming Utility online Help.

All 375 Field Communicators come with the basic ability to transfer event captures and text files using the Programming Utility.

Using the ScratchPad application

From the 375 Main Menu double-tap **ScratchPad** to run the ScratchPad application. ScratchPad is a text editor that you can use to create, open, edit and save simple text (.txt) documents. You are able to transfer .txt files between a PC and the 375 Field Communicator using the Programming Utility. ScratchPad only supports very basic formatting. You can also launch the ScratchPad application from within the HART or fieldbus application by tapping the ScratchPad ( ) icon in the upper right corner of the display. This will automatically open the ScratchPad application.

Once ScratchPad is launched you can perform the following operations.

Figure 2-5. Open blank document in ScratchPad

Create a new document

From the Main Page in the ScratchPad application, tap the **NEW** button. An empty text window and SIP keypad will appear. You are now ready to enter text into your new document.

A new document can also be created within ScratchPad by tapping the New () icon in the toolbar or by selecting **File > New** from the menu.

Open an existing document

1. From the Main Page in the ScratchPad application, select the desired file located under File Name.
2. Tap the **OPEN** button. A text window and the SIP keypad will appear. You are now ready to edit your document.

You can also open a document by selecting **File | Open** from the menu bar or by tapping the Open () icon in the toolbar.

Enter text

Using the stylus, tap the desired letters from the SIP keyboard. Using the keypad, press the desired keypad button in quick repetitions to display the appropriate letter or number.

Select text

Drag the stylus over the desired text to highlight, or to select all of the text in the document tap **Edit | Select All...**.

Cut text

1. Select the text to be cut.
2. Tap **Edit** from the menu bar.
3. Tap **Cut** from the Edit menu.

You can also cut text by selecting text and tapping the Cut () icon in the toolbar.

Copy text

1. Select the text to be copied.
2. Tap **Edit** from the menu bar.
3. Tap **Copy** from the Edit menu.

You can also copy text by selecting text and tapping the Copy () icon in the toolbar.

Paste text

1. Copy the text to be pasted.
2. Tap **Edit** from the menu bar.
3. Tap **Paste** from the Edit menu.

You can also paste text by copying the text to be pasted and tapping the Paste () icon in the toolbar.

Undo text

1. In your document, tap **Edit** from the menu bar.
2. Tap **Undo** from the Edit menu.

Save a document

1. In your document, tap **File** from the menu bar.
2. Tap **Save** from the File menu.
3. Type the file name in the dialog box if your document is new.
4. Tap **OK**.

You can also save a document by tapping the Save ()icon in the toolbar.

Save a copy

To save a copy of the current document under another name:

1. In your document, tap **File** from the menu bar.
2. Tap **Save As...** from the File menu.
3. Type the copy file name in the dialog box.

Delete a document

There are three options for deleting a ScratchPad document:

Option 1

1. From the Main Page in ScratchPad, select the file to be deleted.
2. Tap **DELETE**.
3. A warning will appear telling you that the selected file will be permanently deleted. If you are sure you want to delete this file tap **Yes**.

Option 2

1. To delete from your document, tap **File > Delete**.
2. From the Delete File Page, tap the desired file to be deleted.
3. Tap **OK**.
4. A warning will appear telling you that the selected file will be permanently deleted. If you are sure you want to delete this file tap **Yes**.
5. Tap **EXIT** when you are finished deleting files.

Option 3

Delete the .txt file from the Programming Utility. See the Programming Utility online Help for more information.

Exiting ScratchPad

1. In your document, tap **File** from the menu bar.
2. Tap **Exit** from the File menu.
3. Tap the **EXIT** button from the Main Page.

MANAGING STORAGE

Types of storage

The 375 Field Communicator memory consists of four components:

1. Internal Flash—32MB non-volatile RAM. The Internal Flash memory stores the OS and system software. It also stores the following:

- Up to 25 HART configurations
- HART event captures
- FOUNDATION fieldbus statistics
- User generated text files

The optional Configuration Expansion Module (spare part number 00375-0043-0001) will allow you to store more than 25 configurations if needed; see below for more information.

2. System Card (SC)—an internal Secure Digital Card with non-volatile Flash memory. A copy of installable 375 Field Communicator system software exists on every System Card. The System Card also contains all HART and FOUNDATION fieldbus Device Descriptions.
3. RAM—32MB used only for program execution
4. Expansion Module (EM)— an optional removable memory card that snaps into the Expansion Port on the side of the 375 Field Communicator. The Configuration Expansion Module can store in excess of 500 HART configurations.

MAINTENANCE

Any maintenance, repair, or replacement of components not listed below must be performed by specially trained personnel at authorized service centers. You can perform common maintenance procedures on the 375 Field Communicator, as described below:

- Cleaning the exterior. Use only a dry lint-free towel or dampen the towel with a mild soap and water solution.
- Charging, removing, and replacing the battery pack
- Removing and replacing the System Card
- Removing and replacing the Expansion Module or Expansion Port Plug
- Removing and replacing the stand assembly
- Ensuring that all exterior screws are sufficiently tightened
- Ensuring that the Communication Terminal recess is free of dirt and debris (does not require disassembly).

Battery Information

Checking the charge remaining

Use the Settings menu to check the charge remaining; see “Power” on page 2-13.

You can also check the battery charge remaining before you insert a spare battery pack.

1. Remove the battery pack from the 375 Field Communicator; see “Removing the System Card and battery pack” on page 2-23.
2. Turn the battery pack over and press the battery pack charge indicator button. The indication lights will illuminate based upon the amount of charge remaining in the battery. Each light represents 20 percent of charge remaining. The battery is fully charged when all of the indicator lights are illuminated.

Charging the battery

The battery can be charged while attached to the 375 Field Communicator or charged separately. The indication light on the charger will be green when fully charged, amber when charging, cycle between amber and green when pulse charging, and red if it is unable to charge.

Do not attempt to charge the battery pack in hazardous areas. To charge the 375 Field Communicator battery:

1. Plug the recharger/power supply into a power outlet.
2. Plug the power supply/charger connection into the 375 Field Communicator. The 375 Field Communicator is fully operable while the battery is recharging.

NOTE
The recharger/power supply may remain connected to the battery pack once it is fully charged. An overcharge condition will not occur.

Removing the System Card and battery pack

Remove the System Card and battery pack:

1. Place the 375 Field Communicator face down on a level, secure surface.
2. Loosen the two battery pack retaining screws until the top of each screw is flush with the top of the battery pack.
3. ⚠ Slide the battery off the main unit. Do not pull up on the battery pack as this could damage the power supply connector.
4. ⚠ Grasp the System Card and slide it straight out of the main unit. Do not pull up on the System Card as this could damage the card or the System Card socket.

Running a self test

There is no need, nor is it possible, to perform a manual self test with the 375 Field Communicator. Testing features are done automatically. A warning message will occur if a fault condition is found during these tests.

Working in an Intrinsically Safe (IS) area

The battery pack can be replaced in an Intrinsically Safe area. The Expansion Module can be installed in an Intrinsically Safe area while the 375 Field Communicator is still running.

Calibrating

It is not necessary or possible to calibrate the 375 Field Communicator. The 375 Field Communicator is a communication interface that communicates digitally with HART and FOUNDATION fieldbus devices. Voltage measurements made by the 375 Field Communicator are for use in detection of power or noise on a network, and are for reference purposes only. Your 375 Field Communicator is not applicable to NIST standards and is not subject to calibration.

Waste disposal

If it ever becomes necessary to discard any part(s) of the 375 Field Communicator, adhere to the waste-disposal regulations applicable in your locality.

SECTION 3 HART FUNCTIONALITY

OVERVIEW

This section provides instruction on basic HART functionality of the Model 375 Field Communicator. It is based on the operation of the HART Application version 1.0.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol. Other warning messages can be found in the Troubleshooting section of this manual.

⚠ WARNING

If you choose to ignore all field device status messages, every message from nuisance to critical will be ignored.

⚠ WARNING

Voltage measurements are for reference purposes only. Do not make critical process control decisions based upon this voltage.

BASIC FEATURES AND FUNCTIONS

Interpreting the HART icon

A beating hollow heart icon is displayed when the 375 Field Communicator is communicating with a live HART device (♡). A solid beating heart will replace the hollow heart icon when communicating to a HART loop with a device in burst mode. The HART logo is displayed during periods when communication is not occurring. This is common when only static parameters are listed.

STARTING THE HART APPLICATION

To start the HART application:

1. Turn on the 375 Field Communicator. The 375 Main Menu is displayed with HART as the default application.
2. Double-tap **HART Application**. If a live HART device is connected to the 375 Field Communicator, the HART Application main menu will be displayed automatically with key parameters from the connected device. If a device is not connected, the HART Application main menu is displayed after a few seconds. To navigate back to the 375 Main Menu press the back arrow button. From the HART Application main menu you can choose Offline, Online, or Utility functions. The rest of this section will guide you through the HART Application menus and functions.

Using Fast Key sequences

The Fast Key sequence is a sequence of numerical button presses, corresponding to the menu options that lead you to a given task. The Fast Key sequences are identical to the sequences used on the 275 HART Communicator. See your field device documentation for fast key sequence options.

Setting up Hot Key options

The Hot Key menu is a user-definable menu that can store shortcuts for up to 20 of your most frequently performed tasks. For example, if you change device tags and damping often, you can add options for these functions to the Hot Key menu. Once you are Online the Hot Key will automatically appear in the toolbar. To add a custom option to the Hot Key menu:

1. With the Online menu or any of the submenus open, select the option you want to add to the Hot Key menu.
2. Tap and hold the Hot Key (). The Hot Key Configuration window shows the new option you are adding.
3. Tap **ADD**.
4. Tap **ALL** to add the Hot Key option for all devices supported by the Communicator, or tap **ONE** to add the Hot Key option only for the device type to which you are currently connected.
5. If the message “Mark as read only variable on Hot Key menu” displays, choose one of the following:

- **YES**: The variable for this option is read-only, meaning users can view but not change its value.
- **NO**: You can view as well as change the value for this variable.

6. Respond to the message “Display value of variable on Hot Key menu?” by choosing one of the following:

- **YES**: The value of this variable will appear on the Hot Key menu.
- **NO**: The Hot Key menu will show the name of the variable but not its value.

7. Tap the **EXIT** button on the Hot Key Configuration window to return to the original menu. The new option is added to the Hot Key menu.

Executing Hot Key options

To use a Hot Key option, you must first properly connect the 375 Field Communicator to a device. You can access the Hot Key menu from any online window. To use a Hot Key option:

1. Connect the 375 Field Communicator to a HART loop or device.
2. Tap the Hot Key. The Hot Key menu is displayed.
3. Double-tap the desired option.

Removing Hot Key options one at a time

To remove individual Hot Key options:

1. Tap and hold the Hot Key (). The Hot Key Configuration window will appear.
2. Select the menu option you want to remove.

NOTE
Range Values is a predefined option and cannot be removed. It provides quick access for viewing or changing the range for a device.

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3. Tap the **DEL** button.
4. When you are done, tap **EXIT** to close the Hot Key Configuration window.

Removing all Hot Key options

To remove all Hot Key options currently defined:

1. From the HART main menu, double-tap **Utility**.
2. From the HART Utility menu, double-tap **Configure HART Application**.
3. From the Configure HART Application menu, double-tap **Storage Cleanup**.
4. From the Storage Cleanup menu, double-tap **Hot Key Menu**.
5. Tap **YES** if you are sure you want to delete all the items from the Hot Key menu.

WORKING OFFLINE

The Offline menu allows you to create offline configurations, view and change device configurations stored on the 375 Field Communicator.

There are two types of configurations: device configuration and user configuration. A HART configuration created from a HART device will initially be saved as a **device** configuration. A HART configuration created Offline will be saved as a user configuration. A HART configuration transferred to a 375 Field communicator from another program will be saved as a **user** configuration. Editing a device configuration within the 375 Field Communicator will change it to a user configuration.

The concept of partial or standard configurations does not apply to the 375 Field Communicator. All configurations are full configurations.

Creating new configurations (Offline)

Creating a new configuration allows you to create a user configuration for a specific device type and revision. To create a new HART device configuration while working offline:

1. From the HART Application main menu, double-tap **Offline**.
2. From the Offline menu, double-tap **New Configuration**. The manufacturer names of the installed Device Descriptions are listed.
3. Double-tap the desired manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired model to expand the list. The device revisions available for the selected model are listed.
5. Double-tap the desired device revision.

6. If a warning appears, thoroughly read the warning, tap **CONT**. to accept the warning and proceed, or tap **EXIT** to end creating a new user configuration.
7. Mark the configurable variables you want sent to the HART device. Double-tap **Mark all > OK** to have all variables marked. Double-tap **Unmark all > OK** to clear the marks from all variables. A "+" symbol indicates a mark to send. A "*" symbol indicates a parameter has been edited.To mark and edit variables individually:
   a. Double-tap **Edit individually** to configure specific variables before sending them to a device.
   b. Scroll through the list of variables and select the variable you want to mark or edit.
   c. To change the value for the selected variable, tap **EDIT**, change the value, and tap **ENTER**.
   d. To mark the selected variable, tap **MARK**. A "+" symbol indicates a mark to send. A "*" symbol indicates a parameter has been edited.
   e. Repeat steps b through d for other variables as necessary and tap **EXIT** when you are finished.
8. To save a new configuration, double-tap **Save as...** (The SAVE button will automatically bring you to the Save as... menu.)
   a. To change the location where the configuration is saved, double-tap **Location**, select an option, and tap **ENTER**.
   b. To specify a name for the configuration, double-tap **Name**, enter the name, and tap **ENTER**.
   c. Tap **SAVE**.

Opening saved configurations (Offline)

Once opened, a saved configuration allows you to edit, copy to, send, delete, rename, and compare to other saved configurations. To open a saved configuration:

1. From the HART Application main menu, double-tap **Offline**.
2. From the Offline menu, double-tap **Saved Configuration**.
3. Double-tap the storage location from where you saved the configuration—Internal Flash Contents or Configuration Expansion Module Contents.
4. Double-tap the desired configuration to open the menu selection.

   The FILTR button opens a menu that provides both sort and tag filter options. These options allow you to customize your view of saved device configurations.

   Sort allows you to group and display device configurations according to your choice of name, tag, or descriptor.

   Tag Filter allows you to customize your group for viewing according to what you entered with Sort by picking characters from the device name, tag, or descriptor.

   When setting up a filter, you can use two special characters: the period (.) and the asterisk (*). The period replaces a single character of any value. The asterisk is used to represent a string of alphanumeric characters of any value.

   For example, if you want to list all configurations that have a tag or name of P - 001 to P - 300. You would enter “P - *” in the filter. If you want to

list configurations that have a tag or name that begins P- 0 and ends with a 7, set the filter to P - 0.7.

The XPAND button allows you to view the tag, manufacturer, device type, descriptor, and the configuration type. Tap **CMPRS** to return to the previous compressed screen.

Choose from the following menu options:

Edit a saved configuration (Offline)

Edit a saved configuration while working offline:

1. From the Saved Configuration menu, double-tap **Edit**.
2. If a warning appears, thoroughly read the warning, tap **CONT**. to accept the warning and proceed, or tap **EXIT** to end creating a new unit configuration.
3. Mark the configurable variables you want saved in the HART configuration. Double-tap **Mark all > OK** to have all variables marked. Double-tap **Unmark all > OK** to clear the marks from all variables. To mark and edit variables individually:
   a. Double-tap **Edit individually** to configure specific variables before sending them to a device.
   b. Scroll through the list of variables and select the variable you want to mark or edit.
   c. To change the value for the selected variable, tap **EDIT**, change the value, and tap **ENTER**.
   d. To mark the selected variable, tap **MARK**. A “+” symbol indicates a mark to send. A “*” symbol indicates a parameter has been edited.
   e. Repeat steps b through d for other variables as necessary.
4. Tap **SAVE** to return to the Contents menu.

Copy a saved configuration (Offline)

Copy to... allows you to copy a saved configuration to a new storage location.

1. From the Saved Configuration menu, double-tap **Copy to...**.
2. Choose the storage location from which you want to open the configuration—Internal Flash or Configuration Expansion Module and tap **ENTER**.
3. Double-tap **Name** and enter the name of the configuration.
4. Tap **SAVE** to copy to a new location.

Send a saved configuration to a connected device

Send allows you to send the selected configuration to a connected device. From the Saved Configuration menu, double-tap **Send**. The 375 Field Communicator will then send the configuration to a connected device that is compatible with the configuration.

Delete a saved configuration (Offline)

Delete allows you to remove configurations one at a time. To delete a configuration from the 375 Field Communicator storage:

1. From the Saved Configuration menu, double-tap **Delete**.
2. Tap **Yes** to confirm the deletion.

Rename a saved configuration (Offline)

Rename allows you to change the name of a saved configuration. To rename a saved HART configuration:

1. From the Saved Configuration menu, double-tap **Rename**.
2. Double-tap the file you want to rename.
3. Enter the new file name and tap **ENTER**.
4. Tap **SAVE**.

Compare two saved configurations (Offline)

Any two configurations can be compared. However, in order to compare two configurations of the same field device, the following conditions must be met:

- Device type (including manufacturer), device revision, and DD revision must match exactly. A dialog box will appear if the configuration is different, however, you will not be told the differences.
- Configurations can only be compared against other configurations containing the same set of variables. The 375 Field Communicator notifies you if this condition is not met.

The format of data storage must match exactly. The 375 Field Communicator notifies you if this condition is not met.

1. From the Saved Configuration menu, double-tap **Compare**.
2. Choose the storage location—Internal Flash or Configuration Expansion Module and tap **ENTER**.
3. Double-tap **Name** to select the configuration file.
4. Double-tap the desired file to compare.
5. Tap **COMP** to compare the configurations.
6. Tap **OK** when you are finished reading the window.

WORKING ONLINE

The online mode displays data for the HART device to which you are connected. The Online menu displays critical, up-to-date process information that is continuously updated, including device setup, primary variable (PV), analog output (AO), lower range value (LRV), and upper range value (URV).

For information about intrinsically safe connections see Appendix B “Approval Information”.

A HART configuration created from a connected HART device will initially be saved as a 375 **device** configuration. Editing a device configuration within the 375 Field Communicator will change it to a 375 **user** configuration.

The 375 Field Communicator can communicate with a transmitter from the control room, the instrument site, or any wiring termination point in the loop.

Connecting to a HART loop

Connect the 375 Field Communicator with the appropriate connectors in parallel with the instrument or load resistor. The HART connections are not polarity sensitive.

In order for the 375 Field Communicator to function properly, a minimum of 250 ohms resistance must be present in the HART loop.

NOTE
Dynamic variables shown while online represent the digital data being sent from the device.

There are three terminals on the top of the 375 Field Communicator. Two of them are red and one of them is black. Each red terminal is a positive connection for its protocol. The black terminal is a common shared by both protocols. There is an access door to ensure that only one pair of terminals is exposed at any one time; see Figure 3-1. There are several markings to indicate which pair of terminals is for which protocol.

Figure 3-1. HART terminal access door

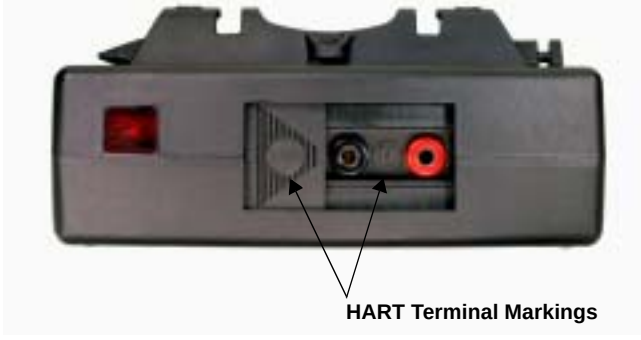


Figure 3-2 illustrates how to connect the 375 Field Communicator to a HART loop:

Figure 3-2. Connecting to a HART loop

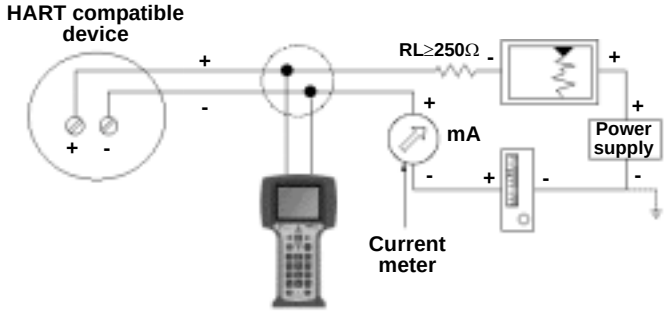
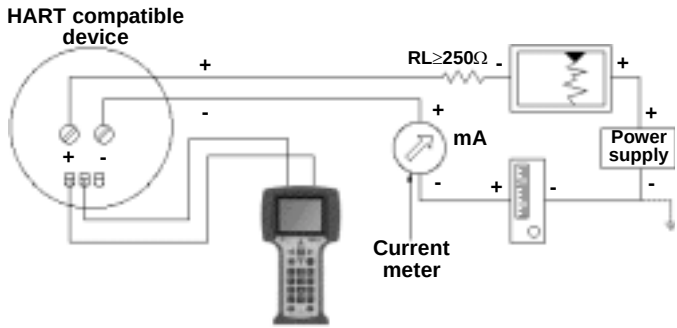
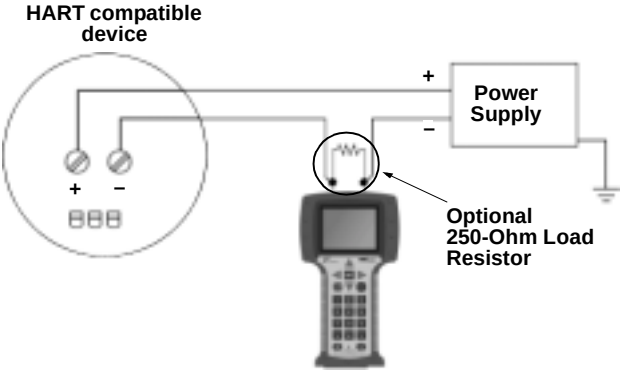


Figure 3-3 illustrates how to connect the 375 Field Communicator directly to terminals of a HART device:

Figure 3-3. Connecting directly to a HART device



The following diagram illustrates how to connect the optional 250-ohm resistor. Attaching a resistor is necessary if less than 250 ohms resistance is present in the HART loop.



To temporarily install the optional 250-ohm load resistor:

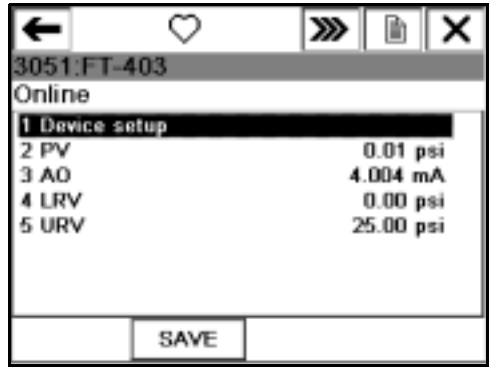
1. Insert the load resistor into the lead set jacks.
2. Open the loop to allow connection of the resistor in series in the loop.
3. Close the loop using the lead set connectors.

VIEWING THE ONLINE MENU

The Online menu is the first menu to appear when connecting to a HART compatible device. It is structured to provide important information about the connected device. This menu displays critical, up-to-date device information including primary variable, analog output, lower range value, and upper range value. See your field device user's manual for more information.

Because of the important information provided in the Online menu, some menus provide instant access to this window. When access is available, the HOME button appears to return you to the Online menu.

Figure 3-4. Online menu example



Once you have made changes to the parameters, you may send them to the device. An asterisk will appear next to the parameter name of any un-sent item.

The configuration parameters for devices vary widely from device to device and are defined in the device description. Refer to your field device user's manual for more information. To view process information for a connected device:

1. Connect the 375 Field Communicator to a HART loop or directly to the device.
2. Push the on/off button to turn on the 375 Field Communicator.
3. Double tap **HART Application**. The Online main menu will be displayed automatically.
4. You can view more information about these parameters by choosing the following Online menu options:

Viewing the Device Setup submenu

The Device Setup menu accesses every configurable parameter of the connected device.

The Online menu displays critical process information that is continuously updated. If the primary variable and related engineering units are too long, they will not appear on the Online menu. Double-tap to view the item and the related engineering units when it appears truncated on the Online menu.

Double-tap **Device setup** to view the process variables, diagnostics and service, basic setup, detailed setup, and review:

Process Variables (PV)

The PV menu lists all process variables and their values. Process variables are continuously updated when this screen is displayed.

Diagnostics and service

The Diagnostics and Service menu offers device and loop tests as well as calibration options. The diagnostics and service operations that are available vary widely from device to device and are defined in the device description.

Test device menu lists the status as well as self and master test of the device. Test device initiates a diagnostic routine at the device and can report an electronics failure, as well as other failures that can affect performance.

Loop test is used to set the output of the device at a specified analog value, and may be used to test the integrity of the loop and the operation of indicators, recorders, or similar devices in the loop.

Calibration is used to perform such operations as performing a sensor trim, D/A trim, and scaled D/A trim.

Basic setup

The Basic setup menu provides quick access to a number of configurable parameters including tag, unit, range values, and damping.

The options available in the Basic setup menu are the most fundamental tasks that can be performed with a given device. These tasks are a subset of the options available under the Detailed setup menu.

The *Tag* alphanumeric identifies a specific device. Changing units affects the engineering units that are displayed. Reranging changes the analog output scaling. Changing damping effects the response time of the transmitter and is often used to smooth the output when there are rapid input variations.

Detailed setup

The Detailed setup menu provides access to every editable device parameter and all device functions. The Detailed setup menu varies widely from one HART compatible device to another. Functions in this menu can include tasks such as characterization, configuration, and sensor and output trims.

Review

The Review menu lists all of the static parameters read from the connected device, including information about the device and sensor setup and limitations. It also includes information about the connected device such as tag, materials of construction, and device software revision.

Configuring the HART application

Changing the HART polling option

Use the HART polling option to configure your 375 Field Communicator to automatically search for all or specific connected devices. Most HART device installations contain one device per loop and the device address equals zero.

To have more than one device per loop, wire the devices in parallel and placed into “Multidrop” mode. This mode is enabled by changing the address from zero to any address between 1 — 15. After the mode is enabled, the analog output of each device is fixed and no longer represents any variable.

To change the polling option:

1. From the HART main menu, double-tap **Utility**.
2. Double-tap **Configure HART Application**.
3. Double-tap **Polling**.
4. Select one of the following polling options:

- **Never Poll** - Connects to a device at address 0 and if not found, it will not poll.
- **Ask Before Polling** - Connects to a device at address 0 and if not found, you will be asked if you want the communicator to poll for devices at addresses 1–15.
- **Always Poll** - Connects to a device at address 0 and if not found, the communicator will automatically poll for devices at addresses 1–15.
- **Digital Poll** - Polls addresses 0–15, regardless if a device is found at address 0. To find individual device addresses, use this option to find each connected device in the loop and list them by tag number.
- **Poll Using Tag** - Allows you to enter the tag of the device. You will be prompted to enter a tag name upon starting the HART Application.

- **Poll Using Long Tag** - Allows you to enter the long tag of the device. You will be prompted to enter a tag name upon starting the HART Application. (Only supported in HART Universal revision 6 devices.) Double-tap when the tag is truncated to display the full tag.

5. Tap **Enter**.

Refer to your device-specific manual for information about changing a device polling address.

Changing ignored status messages

The 375 Field Communicator displays status messages from the HART device it is communicating with. The Ignore Status option lets you specify the number of field device status messages that are ignored, extending the time between displayed messages. The default is 50 messages. If you choose to ignore all field device status messages, every message from nuisance to critical will be ignored.

To change the number of ignored status messages:

1. From the HART main menu, double-tap **Utility**.
2. Double-tap **Configure HART Application**.
3. Double-tap **Ignore Status**.
4. Enter the number of status messages you want ignored before the next message is displayed. You can specify a number from 50 to 500.
5. Tap **ENTER**. All field device status messages will be ignored until the quantity specified has been reached.

Storage Cleanup

The Storage Cleanup menu lets you delete the following items:

- **Internal Flash -** By selecting **YES** you will remove all configurations saved in the Internal Flash.
- **Configuration Expansion Module -** By selecting **YES** you will remove all configurations saved in the Configuration Expansion Module.
- **Hot Key Menu -** By selecting **YES** you will delete all items from the Hot Key menu.

Viewing available Device Descriptions

HART Device Descriptions enable the 375 Field Communicator to recognize and configure specific HART-compatible devices. To view the currently installed HART Device Descriptions:

1. From the HART main menu, double-tap **Utility**.
2. Double-tap **Available Device Descriptions**. The manufacturer names of the installed Device Descriptions are listed.
3. Double-tap the desired manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired model to expand the list. The device revisions available for the selected model are listed.

Simulating an online connection to a HART device

The 375 Field Communicator has a simulation mode that allows you to simulate an online connection to a HART-compatible device without actually connecting to a device. Simulation mode is a training tool that helps you become familiar with devices before configuring them in a critical environment. A simulated configuration cannot be saved. Not all DDs have been optimized to run under simulation.

To simulate a connection to a HART device:

1. From the HART main menu, double-tap **Utility**.
2. Double-tap **Simulation**. The manufacturers with device descriptions installed on the 375 Field Communicator are listed.
3. Double-tap the desired manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired model to expand the list. The device revisions available for the selected model are listed.
5. Double-tap the desired device revision. Refer to the device manual to determine the device revision.
6. If a warning appears, thoroughly read the warning, tap **CONT**. to accept the warning and proceed, or tap **EXIT** to end creating a new unit configuration. (This warning will not appear if your device is tested.) The online menu for the simulated device is displayed. You can now use the 375 Field Communicator as if it were connected to the selected device and perform any online task.

Viewing HART diagnostics

DC voltage measurement (HART terminals)

To check the device voltage:

1. From the HART main menu, double-tap **Utility**.
2. Double-tap **HART Diagnostics**.
3. ⚠ Double-tap **DC Voltage Measurement**. The DC voltage measurement is displayed. Tap **OK** when done viewing the measurement. Exit the HART Terminal Voltage menu and re-enter to refresh the screen. Voltage measurements are for reference purposes only.

Disconnecting from a HART device

Prior to disconnecting be sure to check the following items:

- Determine if you want to save as a configuration.
- Verify methods (e.g., calibration, loop test) are complete.
- Resolve any un-sent data to the device.

SECTION 4 FIELDBUS FUNCTIONALITY

OVERVIEW

This section provides instruction on basic fieldbus functionality for the 375 Field Communicator. It is based on the operation of FOUNDATION Fieldbus Application version 2.0.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

⚠ WARNING

There could be a Database Mismatch. Ensure all safety precautions and work procedures have been followed.

If this segment is connected to a Host System, the changes made with the 375 may not be recorded in the Host System's permanent data base. Verify the changes in the database. Otherwise, this could cause unpredictable results and, depending upon your application, process disruption leading to property damage, serious injury, or death.

⚠ WARNING

Process control could be affected. Changing device parameters could adversely affect the control of your process.

Ensure all safety precautions and work procedures have been followed. Put control loop in Manual/Out of service before applying changes. Verify output before returning control loop to Auto. Failure to do so could result in property damage, death or serious injury.

BASIC FEATURES AND FUNCTIONS

Link Active Scheduler (LAS)

All segments have one and only one Link Active Scheduler (LAS). The LAS operates as the bus arbiter for the segment. The 375 Field Communicator is set up to always be the last node to become the LAS on a segment.

The devices that are capable of becoming the LAS are called link master devices. All other devices are referred to as basic devices. When a segment first starts up, or upon failure of the existing LAS, the link master devices on the segment bid to become the LAS. The link master that wins the bid (i.e., the one with the lowest address) begins operating as the LAS immediately upon completion of the bidding process. Link masters that do not become the LAS can act as LAS backups by monitoring the segment for failure of the LAS and then bidding to become the LAS when a LAS failure is detected.

Although the 375 Field Communicator is capable of becoming the LAS, it does not maintain the communication schedule and should not be thought of as a backup LAS.

Only one device can communicate at a time. Permission to communicate on the bus is controlled by a centralized token passed between devices by the LAS. Only the device with the token can communicate. The LAS maintains a list of all devices that need access to the bus. This list is called the Live Device List; see “Displaying the Live Device List” on page 4-11.

Device Interoperability

The 375 Field Communicator is designed to operate with a wide range of FOUNDATION fieldbus devices independent of device manufacturer. Device interoperability is achieved through the use of Device Description Language (DDL) technology supported by the Fieldbus Foundation.

Basic testing is performed on all DDs. In addition, each device manufacturer is asked to certify that they have thoroughly tested their device(s) with the 375 Field Communicator. If certification is not received, a warning message will display when you attempt to access an untested device.

LAS Hierarchy

When a 375 Field Communicator is connected to a live fieldbus segment, it joins the fieldbus segment but not as the LAS. This means that, although the 375 Field Communicator can view and edit device parameters, the control of the segment is still handled by the node that is designated the LAS for the segment. You can also read and write if there is another LAS. Prior to connecting to a host system review the 375 Field Communicator Host System Interoperability on www.fieldcommunicator.com.

ST_REV

ST_REV is a block parameter that increments each time a block configuration has changed. While a list of parameters is displayed, the 375 Field communicator will continuously read the ST_REV of that particular block. If it sees the ST_REV counter has incremented, it knows that there has been a change to the block, and it will automatically refresh (reread) all of the block parameters. Thus, there would only be a very short period of time before a change made by another host would appear on the 375 display.

Modes

The Resource, Transducer, and all function blocks in the device have modes of operation. These modes govern the operation of the block. Every block supports both automatic (AUTO) and out of service (OOS) modes. Other modes may also be supported.

Types of Modes

For the procedures described in this manual, it will be helpful to understand the following modes:

AUTO

The functions performed by the block will execute. If the block has any outputs, these will continue to update. This is typically the normal operating mode.

MAN

In this mode, the output of the block can be manually overwritten for testing purposes.

Out of Service (OOS)

The functions performed by the block will not execute. If the block has any outputs, these will typically not update and the status of any values passed to downstream blocks will be “BAD”. Before you make changes to the configuration of the block, change the mode of the block to OOS. When the changes are complete, change the mode back to AUTO.

Other Types of Modes

Other types of modes are Cas, RCas, ROut, IMan and LO. For more information; see the Emerson Process Management, Rosemount Division Function Block manual, document 00809-0100-4783.

Locating Mode Parameters

In the Resource and Transducer blocks, the mode parameters are normally found in the Process menu. In all other Function blocks, they are found in the Common Config. menu. The Mode parameters will also be included in the All parameter list; see “Working with Device Blocks” on page 4-13.

⚠ Changing Modes

A warning message may appear whenever the mode of any block is included in a list of parameter changes to be sent to a device. Press YES to send the change, or NO to not send the change.

To change the operating mode, set the MODE_BLK.TARGET to the desired mode. After a short delay, the parameter MODE_BLOCK.ACTUAL should reflect the mode change if the block is operating properly.

Permitted Modes

It is possible to prevent unauthorized changes to the operating mode of a block. To do this, configure MODE_BLOCK.PERMITTED to allow only the desired operating modes. It is recommended to always select OOS as one of the permitted modes.

STARTING THE FIELDBUS APPLICATION

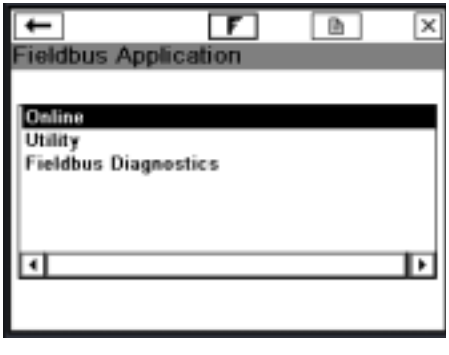
⚠ A general warning message may appear upon starting the Fieldbus Application when an LAS is detected on the segment. Select YES to proceed to the Live Device List, NO to return to the 375 Main Menu, or HELP to get more information on the warning.

To start the fieldbus application:

1. Turn on the 375 Field Communicator. The 375 Main Menu is displayed; see Figure 4-1.
2. Double-tap **FOUNDATION Fieldbus Application**. If a live fieldbus device is connected to the 375 Field Communicator, the Fieldbus Application main menu will briefly display followed by the Live Display List.

   If insufficient voltage is detected, a warning will appear saying “No FF Segment Voltage Detected. Press OK to go to the FF Main Menu.” Press OK to navigate to the Fieldbus Application main menu.

Figure 4-1. Fieldbus Application menu screen example



A connection warning message may appear if no communication is detected. This means that an LAS is not recognized by the segment and typically occurs when connecting to a single device.

To navigate back to the 375 Main Menu, press the back arrow button. From the Fieldbus Application main menu you can choose Online, Utility or Fieldbus Diagnostic functions. The rest of this section will guide you through the Fieldbus Application menus and functions.

Digital communication is susceptible to electrical noise; follow proper wiring instructions.

WORKING ONLINE

The online menu displays data for the device to which you are connected. The Online menu displays critical, up-to-date process information, including the segment Live Device List, block lists, and parameter functionality. For information about intrinsically safe connections see Appendix B “Approval Information”.

NOTE
It is normal for processes to take longer the greater the amount of scheduled communication. This is influenced by the number of devices and the control methods in place.

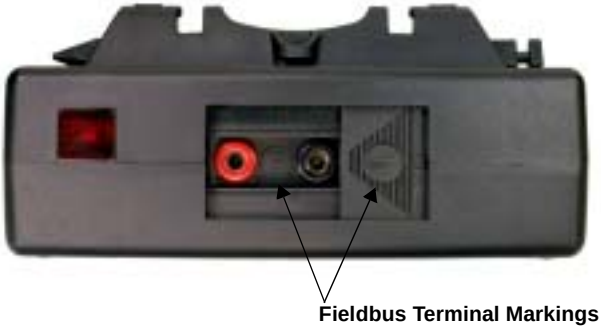
Connecting to a fieldbus loop

Connect the 375 Field Communicator with the appropriate connectors in parallel with the instrument. Due to measurement circuitry the 375 Field Communicator fieldbus connections are polarity sensitive. If connected incorrectly, an error message will display.

NOTE
Dynamic variables shown while online represent the digital data being sent from the device.

There are three terminals on the top of the 375 Field Communicator. Two of them are red and one of them is black. Each red terminal is a positive connection for its protocol. The black terminal is a common shared by both protocols. There is an access door to ensure that only one pair of terminals is exposed at any one time; see Figure 4-2. There are several markings to indicate which pair of terminals is for which protocol.

Figure 4-2. Fieldbus terminal access door

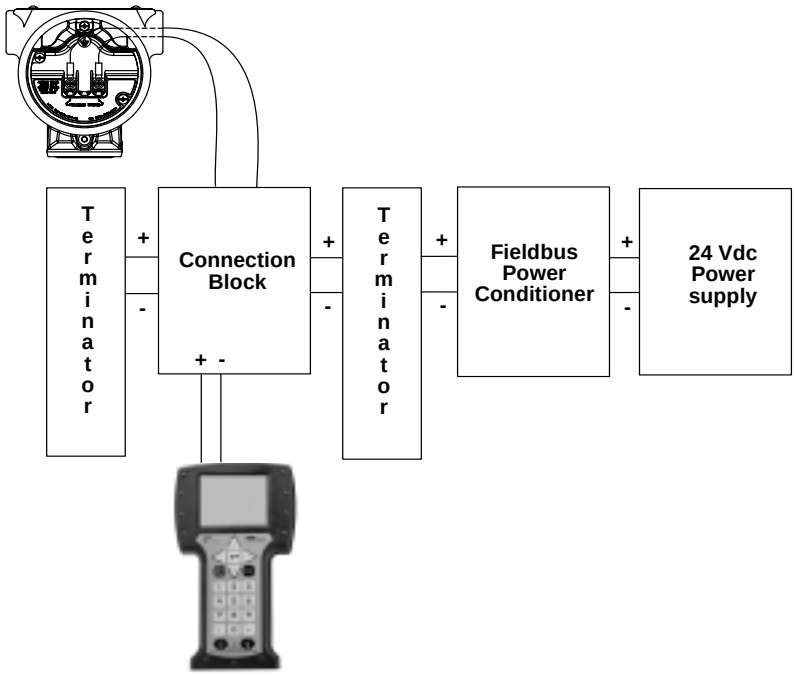


Bench hook-up

The following diagram illustrates one method of connecting the 375 Field Communicator on a bench.

For segments that are limited in size, the power conditioner and terminators can be contained in a single wiring block.

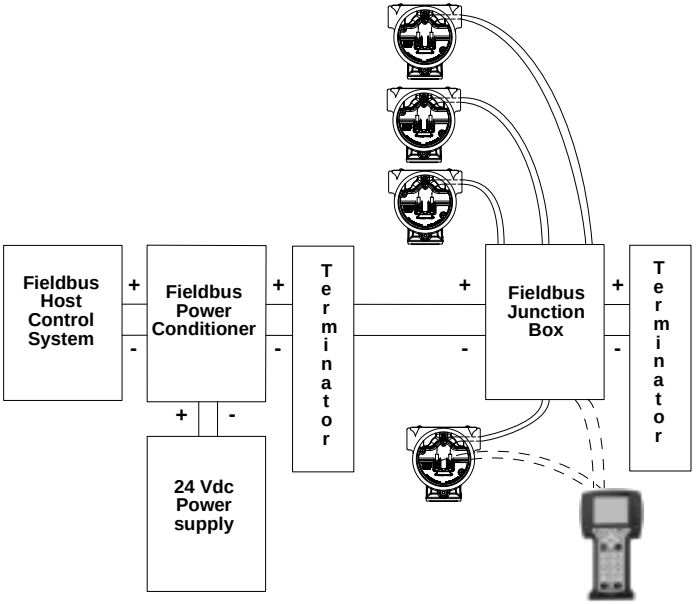
Figure 4-3. Bench wiring diagram example



Field hook-up

The following diagram illustrates one method of connecting the 375 Field Communicator to a fieldbus segment. The 375 Field Communicator can be connected at any convenient place along the bus (segment). In the field, this is typically done at the device or at the fieldbus junction box.

Figure 4-4. Field wiring diagram example



NOTE

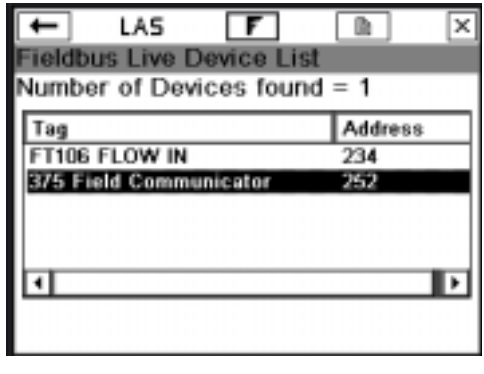
The 375 Field Communicator draws approximately 17 ma from the fieldbus segment. Be sure that the power supply or barrier on the fieldbus segment has the capacity to provide this additional current. If a heavily loaded fieldbus segment is drawing near the capacity of the segment's power supply, connecting the 375 may result in loss of communication.

Displaying the Live Device List

To display the active devices on a Fieldbus segment (Live Device List):

1. Connect the 375 Field Communicator to a Fieldbus segment.
2. Turn on the 375 Field Communicator.
3. On the main menu, double tap **FOUNDATION Fieldbus Application.**
4. On the Fieldbus Application menu, choose **Online**. The Fieldbus Live Device List displays. If a live fieldbus device is connected to a host acting as the LAS, a precautionary message will appear, then the Live Device List will be displayed automatically with key parameters from the connected device. If an existing host control system or a device capable of being the LAS is not connected, the 375 Field Communicator will act as a temporary LAS on the segment and produce a warning message. After reading and following the message instructions, press **OK** to display the Live Device List.

Figure 4-5. Live Device List screen example

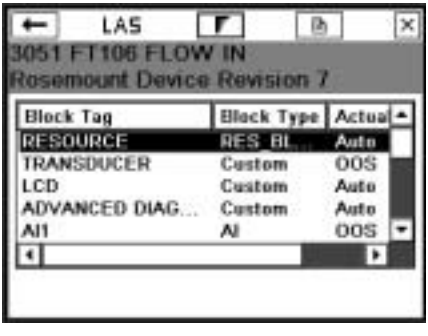


Displaying the Block List

The Block List view lists the block tag, block type, and actual mode of the device blocks, as well as Schedule, Advanced, and Detail information contained in a particular device. Consult your device manual or the Fieldbus Foundation for more information on blocks. FOUNDATION fieldbus menu trees will be on www.fieldcommunicator.com as they become available. To view the Block List:

1. From the Fieldbus Application menu, choose **Online**. The Fieldbus Live Device List will appear.
2. Double tap the device you want to work with. A status line appears on the bottom of the screen to indicate connection progress.

Figure 4-6. Block list screen example



Working with Device Blocks

The block menu is a submenu of the block list. Block menus display block information for the fieldbus device to which you are connected.

If the DD is not installed in your 375 Field Communicator a DD error will appear. New DDs will be made available on a regular basis; see “Easy Upgrade Programming Utility” on page 2-16.

Devices that do not support transducer block menus within the DD will have the following selections: All, Process, Status, Other. If Methods are incorporated into the transducer block they will be displayed as either Diagnostic Methods or Calibration Methods. Tap **All** to display all of the parameters for the desired block. ALL display call up times may take several minutes. It is recommended you use this only if you are unable to find your desired selection elsewhere.

If the device DD supports menus, you can display the block menu by performing the following steps:

1. Display the block list; see page 4-12.
2. Double tap the desired block tag and the block menu will appear.
3. From the block menu double tap the desired parameter group label category.

NOTE

The Block mode must be in the appropriate state to accept parameter changes. Typically the mode is MAN or OOS.

Parameter Functionality

Shaded areas indicate values that cannot be changed. In initial versions of the Fieldbus Application you will be able to edit only the resource, transducer, and I/O blocks. You will be able to open and view all other blocks, however, you will not be able to edit them.

Modified Parameters

An asterisk will appear next to a modified parameter which has not yet been sent to the device.

Displaying block parameters for fieldbus devices

To display the parameters for fieldbus devices:

1. Display the Live Device List; see page 4-11.
2. Double tap a device on the Live Device List to view the blocks in that device.
3. Double tap the desired block.
4. Double tap the desired parameter group. The parameters and their current values are displayed. Shaded areas indicate values that cannot be edited.

Changing and sending parameter data

To change the values for parameters:

1. Display the parameters for fieldbus devices.
2. Double tap the desired parameter.
3. Change the value for the parameter. (Tap **HELP** to view a description of the parameter.)
4. Tap **OK** to acknowledge the parameter change. Repeat these steps for other parameters as necessary. A “*” symbol

indicates a parameter has been edited.

5. Tap **SEND** to commit your changes to the connected fieldbus device.

Running methods (e.g., calibrations, sensor trim, diagnostic, etc.)

Select submenu choices as appropriate. Different devices have different methods associated with them. The selections on these menus vary accordingly.

1. Display the Live Device List; see page 4-11.
2. Double tap a device from the Live Device List.
3. Double tap the desired block (typically methods are run in the Transducer block).
4. Double tap **Methods**.
5. Double tap the type of method you want to run, e.g., calibration, diagnostic. Follow the navigation screens to run the method.

Displaying Device status

To display device status:

1. Display the Live Device List; see page 4-11.
2. Double tap a device from the Live Device List.
3. Double tap the desired block.
4. Double tap **Status**. Status parameter(s) will be displayed.

Other Block List selections

Detail Menu

To view the Detail menu:

1. Display the Live Device List; see page 4-11.
2. Double tap the device you want to work with.
3. Scroll down the block list and double tap **Detail**. Double tap one of the following options:

- **Physical Device Tag** designates a field device's role in the system. It is not recommended to change the device tag when the device is connected to a control system. Changing the Physical Device Tag on a device which is on an active segment could have unpredictable results.

- **Address** is the data link layer node address of the device. The Host Control System has the ability to assign an address to a device when it is connected to a segment. If the 375 Field Communicator is not the LAS on the segment, changing the address could have unpredictable results. It is not recommended to change the address when the device is connected to a control system. The following should be taken into consideration when assigning device addresses:

    - Valid device addresses for fieldbus devices are 20 through 247 with the exception of the addresses between V(FUN) and V(FUN) + V(NUN)-1 as defined for the 375; see “Polling” on page 4-18. These parameters are available in the Polling menu.

    - Addresses between 16 and 19 are usually reserved for host systems. A device should **not** be assigned in this address range.

    - Addresses below 16 are not available.

    - Addresses between 248 and 251 are temporary addresses. Devices without a Tag or address will come up on the segment at these addresses.

    - Addresses in the range 252 to 255 are reserved for visitors such as the 375 itself.

- **Device ID** is the unique number identifier for each device. It is set by the device manufacturer and cannot be changed.
- **Device Revision** is the manufacturer revision number. It is used by an interface device to locate the DD file for the resource and cannot be changed.

4. Using the SIP keyboard, enter the new information. Tap **OK**.

Changing the I/O block schedule

To change the schedule:

1. Display the Live Device List; see page 4-11.
2. Double tap the device you want to work with.
3. ⚠ Scroll down the block list and double tap **Schedule**. The I/O Block Schedule window will appear. Changing the I/O block schedule on a device which is on an active segment running control could have unpredictable results. Changing the I/O Block Schedule would typically be done on the bench (not connected to a control system) when you want to execute an I/O block to verify that the outputs of the block are being computed correctly.
4. Using the drop down menu, select the appropriate MacroCycle (1, 2, 5, or 10 seconds).
5. Tap to check the box next to the I/O blocks that are to be scheduled.
6. Tap **OK**. This will schedule the blocks and set the mode on these blocks to Auto.
7. After reading the note, tap **OK** to acknowledge that the I/O Block(s) were successfully scheduled.

Displaying advanced features

To view the advanced features, including Network Parameters:

1. Display the Live Device List; see page 4-11.
2. Double tap the device you want to work with.
3. Scroll down the block list and double tap **Advanced**. Double tap the desired Label to view label values.

You can save these values to an electronic file to better facilitate network troubleshooting. These files can be transferred to a PC using the Easy Programming Utility.

UTILITY

The Fieldbus Application Utility menu displays polling, link settings, and the available device description list installed on the 375 Field Communicator.

Polling

The V(FUN) is the first unpolled node address. V(NUN) is the number of unpolled node addresses. The addresses between V(FUN) and V(FUN)+V(NUN)-1 are not polled. The default value for V(FUN) is 200 and the default value for V(NUN) is zero.

The DeltaV System checkbox instructs the 375 Field Communicator to use the same polling scheme as DeltaV.

Enter the desired polling addresses in the appropriate field. Narrowing the range of devices being polled provides a quicker Live Device List refresh.

Link Settings

Slot Time

Select the default Slot Time of eight to allow the devices to be seen on the 375 Field Communicator Live Device List. It may be necessary to change the Slot Time to 16 in order to view older devices on the 375 Field Communicator Live Device List. For a list of the affected devices see www.fieldcommunicator.com.

Available Device Description List

To view fieldbus device descriptions installed on the 375 Field Communicator:

1. On the Fieldbus Application menu, double tap **Utility**.
2. Double tap **Available Device Description List**. Fieldbus device manufacturers are listed.
3. Double tap the manufacturer of the device you want to view. The models available for the manufacturer are listed.
4. Double tap the model of the device description you want to view. The device revisions available for the selected model are listed. Untested DDs are indicated by a  symbol.

FIELDBUS DIAGNOSTICS

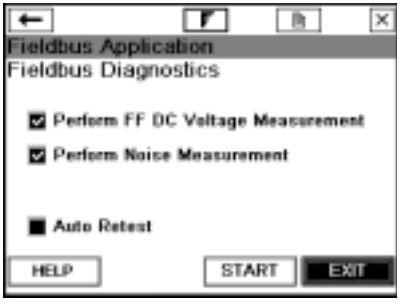
Fieldbus diagnostics run diagnostics for troubleshooting fieldbus networks. To view the Fieldbus Diagnostics menu:

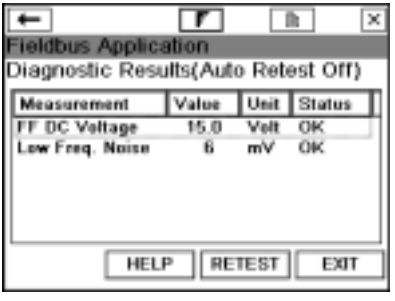
1. From the Fieldbus Application menu, double tap **Fieldbus Diagnostics**.
2. If a warning appears, read it and tap **OK** to acknowledge.
3. To perform a measurement, tap the check box beside your desired option(s). Tap **START** to view the Diagnostic Results.

To retrieve information about a test, highlight the test and press **HELP**.

If Auto Re-test was not selected on the Fieldbus Diagnostics screen, tap **RETEST** to perform a single re-test.

Figure 4-7. Fieldbus Diagnostics screen examples





Disconnecting from a Fieldbus Device

Prior to disconnecting or turning off the 375 Field Communicator be sure to check the following items:

- Verify methods (e.g., calibration) are complete.
- Resolve any un-sent data to the device.

SECTION 5 TROUBLESHOOTING

OVERVIEW

This section provides basic troubleshooting techniques for the Model 375 Field Communicator.

Below are methods for troubleshooting networks that are experiencing problems communicating between a field device and the 375 Field Communicator.

Troubleshooting suggestions

Answer the questions below and use the troubleshooting tables, Table 5-4 and Table 5-5, before calling technical support personnel.

- Does the control system have HART or fieldbus communication capabilities?
- Is it configured to communicate HART or fieldbus currently? Is it reporting communication problems? If not, stop communications on the control system and test communication with the 375 Field Communicator again.
- Is there a barrier installed?
- Is the barrier capable of passing along the signal?

Loops

Verify the HART loop current and voltage on the field device. Almost all field devices need at least 4mA and 12VDC to operate properly.

If there are multiple field devices on a multidrop loop then set the 375 Field Communicator to digital polling mode.

Inspection of the loop wiring can often times reveal problems. The shield is normally grounded at one end only, which is usually the control system.

Verify that the loop has a minimum of 250 ohms resistance. If there is not an external resistor, then normally, the total resistance is the resistance of the process-indicating device monitoring the loop. Check the manuals for the process-indicating device to determine its loop resistance. If the resistance of the process-indicating device is unknown it can be determined by knowing the current flow in the loop and the voltage across the process-indicating device.

The resistance can be calculated using the formula, Resistance = Voltage / Current. The 375 Field Communicator can be used to measure the voltage; see “DC voltage measurement (HART terminals)” on page 3-22.

Sample values

Loop Current Flow Minimum voltage for 250 ohms.

4 ma 1 Volt
8 ma 2 Volts
12 ma 3 Volts
16 ma 4 Volts
20 ma 5 Volts

If the voltage across the process-indicating device is greater than the value listed for a given current flow then the device has at least 250 of internal resistance. If the voltage is less than the value listed on the table for the given current flow, then more resistance needs to be added to the loop.

If an oscilloscope is available for use then use it to look for noise on the loop. It is necessary to use a a scope with differential mode capability or a battery powered/isolated scope to avoid grounding one side of the loop. Noise with a frequency of 500 Hz to 10,000 Hz is of particular interest, as this represents frequencies near the HART frequencies of 1200 and 2200 Hz.

Table 5-1. Troubleshooting table for HART protocol

Symptom	Possible Causes	Solution
Intermittent communication	Insufficient loop current and voltage at the field device terminals.	Verify that there is at least 4mA and 12V DC at the field device terminals; see “DC voltage measurement (HART terminals)” on page 3-22.
	Noise on the field loop	
	Noise or signal distortion from the control system (i.e., noise from the power supply powering field devices or front end analog circuitry inside of control system may be distorting the HART signal.	
	Poor wiring	Check wiring terminations and exposed signal wire for damage.
No communication with field device.	Insufficient loop resistance at the HART frequencies.	Add an additional 250 ohm resistor in series in the loop. Place the leads across the resistor and verify if communication has been restored.
	Insufficient loop current and voltage at the field device terminals.	Verify that there is at least 4mA and 12V DC at the field device terminals; see “DC voltage measurement (HART terminals)” on page 3-22.
	Field device may be set to HART address other than zero (multi-drop mode).	Change Polling mode to something other than never poll, e.g., Digital Poll.
Control system is communicating HART, but the 375 is not communicating properly.	HART communication is being prevented by the control system.	Stop HART communications on the control system and verify if communication between the field devices and the communicator is restored.

Table 5-2. Troubleshooting table for fieldbus protocol

Symptom	Possible Causes	Solution
No communication with field device.	The 375 is connected to a segment with DeltaV and the device on the same segment is being commissioned using DeltaV.	The 375 will be unable to communicate with this device until you go offline and then back online.
Connection to a segment in a bench configuration and the Live Device List remains blank (even the 375 Field Communicator does not appear).	This issue is caused by the speed at which certain LAS enabled devices are attempting to run the segment.	Establish communication by putting the 375 on the segment first and then adding the device(s). By putting the 375 on first, it will remain the LAS and control the communication.
Unable to change the address of a device.	The 375 is unable to change the address of a device that is currently the LAS.	Establish communication by putting the 375 on the segment first and then adding the device(s). By putting the 375 on first, it will remain the LAS and allow the address change.
The 375 does not remain the LAS on a segment.	A Host takes over as the LAS.	When a Host is established on a segment, it will take over as the LAS. No action is required.
	A backup LAS takes over as the LAS. The lower the address and Slot Time of the device, the more likely this will occur.	See “Slot Time” on page 4-19 and “Other Block List selections” on page 4-15.

ERROR AND STATUS MESSAGES

General Error Messages	Description
License file check failed - error code x. Please contact service center to resolve this problem. Press **OK** to turn off. (Where x indicates the test that failed.)	License file check failed during power- up
Battery power is less than 5%. You must recharge the 375 battery, switch to a spare battery pack, or use external power. Press **OK** to turn off.	The power-up battery check detects the battery charge is below five percent while on battery.
Battery power is less than 20%. You may need to recharge the 375 battery, switch to a spare battery pack, or use external power.	The power-up battery check detects the battery charge is below 20%, and more than or equal to 5% while on battery.
Communication circuit is not responding.	CDC is not responding during the power-up
Warning: System incompatibility detected - error code x. You may start Listen for PC and use the 375 Programming Utility to resolve this. Or You may turn off your 375 and contact service center to resolve this. (Where x is an error code indicating what the incompatibility detected was or related errors.)	Hardware version or Operating System is not compatible.
Installation file is corrupt - error code x. Please call service center to resolve this problem. Press OK to turn off.	The installation is corrupt.
The 375 needs to update its software. Battery power must be more than 20% to allow for this update. You must recharge the 375 battery, switch to a spare battery pack, or use external power. Press OK to turn off.	This message occurs when on battery, and the battery percentage is less than 20% before attempting to launch program loader:
This 375 is not licensed for HART.	You are not licensed for HART functionality.
This 375 is not licensed for FOUNDATION Fieldbus.	You are not licensed for FOUNDATION fieldbus functionality.
The 375 does not detect a System Card. Please make sure your System Card is properly installed in its slot. Press OK to turn off.	This message occurs when the System Card is not properly installed in its slot.

HART Error and Help Messages	Description
"Poll Using Long Tag" allows the user to enter the long tag of the device they want to connect to	This is a help message.
"Poll Using Tag" allows you to enter the tag of the device you want to connect to	This is a help message.
Enter Device Long Tag	This is a help message.
Enter the long tag that corresponds to the device you want to connect to	This is a help message.
Hart Application Error... “hc.ddl device revision x not found.”...Refresh System Card...See User's Manual and Programming Interface for details	This error message appears when an expected version of hc.ddl is not found.
Hart Application Error... “registry failure”...Reinstall System Files...See User's Manual for details	This error message appears when the information describing the location of the DD's is not found in the registry.
Voltage is currently detected at the Fieldbus Terminals. Reconfigure unit and try again.	This error message appears when the HART app found voltage on the FF connector during initialization and during reconnection to a device.
CDC Error...“failure while switching to HART”...Reinstall System Files...See Users’s Manual for details	This error message appears when the HART app fails to put the CDC in HART mode for talking to a HART device.
DD Error…"tokenizer mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y...Reinstall DD…See Programming Interface for details	This error message appears when the version of the tokenizer used to tokenize the DD is not what the HART app expects.
DD Error…"linker mismatch"...DD version x.y; HART app version x.y...Reinstall DD…See Programming Interface for details	This error message appears when the version of the linker used to link the DD is not what the HART app expects.
DD Error…"developed-to mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*> …See Programming Interface for solution.	This error message appears when the DD was developed and tested using a later HART app revision.
Warning: this DD is untested with the current Hart App ver <*manufacture name, device name, dev. rev. #, and DD rev. #*>…you may experience unexpected or inappropriate results…See Programming Interface for details on DD updates…Do you want to accept these risks and proceed?	This warning message appears when the DD was not tested and verified with the HART app.
DD Error…"tested-to sequence mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y…See Programming Interface for solution	This error message appears when the DD was tested with a previous version but not with this version of the HART app

DD Error…"developed-to mismatch"...DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y...Reinstall DD…See Programming Interface for details	This error message appears when the DD was developed using a later HART app revision.
DD Error…"DD header file corrupted"...Reinstall Device version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*> …See Programming Interface for details	This error message appears when there is a check sum error in the DD header file.
Hart Application Error…"data compression dll is missing"…Reinstall System Files...See User's Manual for details	This error message appears when the data compression component can not be located.
Hart Application Error…"data compression dll is corrupted"…Reinstall System Files...See User's Manual for details	This error message appears when a required functionality is missing from the data compression component.
Memory Error…"data compression memory allocation error"…Restart Unit...See User's Manual for further details	This error message appears when HART app is unable to acquire enough memory for data compression.
DD Error…"failure while opening DD"...Reinstall Device Type x Device Rev x dd Rev x…See Programming Interface for details	This error message appears when the system can not open the DD file.
DD Error…"failure while uncompressing DD"...Reinstall Device revision <*manufacture name, device name, dev. rev. #, and DD rev. #*> …See Programming Interface for details	This error message appears when an error is detected while uncompressing the DD.
Communication Error…"unexpected return value"…See User's Manual for solution	This error message appears when an unexpected value returned from a function call.
DD Error…"DD file corrupted"...Reinstall Device revision <*manufacture name, device name, dev. rev. #, and DD rev. #*>…See Programming Interface for details	This error message appears when the checksum of the DD does not match with that described in the DD header file.
Forward Compatibility Blocked…DD Device Type x Device Rev x dd Rev x cannot be used in forward compatibility mode…x… Do you wish to proceed in forward compatibility mode?	This error message appears when the HART app attempts to use a DD to run in forward compatibility mode and finds that the DD is prevented from running in forward compatibility mode
DD Not Installed…DD device type x device rev x is not installed on the System Card…See Programming Interface for details on DD updates…Do you wish to proceed in forward compatibility mode?	This error message appears when the DD for the connected device is not in the unit.

Fieldbus Error and Help Messages	Description
DDP Error 1: Unable to load DD. Press OK to return to Block List	Using Easy Upgrade, check to see if this DD is available to load into your 375 unit. If not, contact the device manufacturer.
There has been a loss of communication with one or more devices on the segment. Press OK to return to the Live Device List.	Check connection to fieldbus devices.
“The 375 has been disconnected from the segment. Press RETRY to attempt to reconnect to the segment." Press CANCEL to return to the FF app main menu. Press EXIT to exit the FF App."	Verify that the 375 lead set is still securely connected to the FF Segment and press RETRY.
SM ERROR: FAILED RESPONDER IDENTIFY	There is a problem sustaining communications with the device. Contact 375 Field Communicator customer support personnel.
FFLIB: Incompatible DD Static Description	The Device Description (DD) does not match the actual device correctly. Use the 375 Easy Upgrade to see if a new DD is available for that device. Contact 375 Field Communicator customer support personnel.
FBLIB: Device Upload aborted	Communications with a device has timed out. This should normally not happen. Contact 375 Field Communicator customer support personnel.
FMS OTHER: Parameter Check	The parameter being entered is invalid for this device. Check with the device supplier. Make sure the value entered is valid for that specific device parameter.
FMS OTHER: Exceeds Parameter Limits	The parameter being entered is outside the range of valid values for the device parameter. Check with the device supplier. Make sure the value entered is in the correct range for that device parameter
FMS OTHER: Wrong Mode For Request	The block is in the wrong mode to accept the parameter change being requested. See “Modes” on page 4-4 for information on how to change block modes.
SM ERROR: REMOTE ERROR INVALID STATE	An attempt to change the address of the device serving as the LAS on the segment is being made. Changing the device address of the LAS is not recommended.

REQUIRED INFORMATION FOR TECHNICAL ASSISTANCE

Before you call for technical support personnel, have a detailed description of the issue including the following (if applicable) information:

- Manufacturer and model of control system (if applicable)
- 375 Field Communicator system software revision
- Manufacturer ID number or name and model revision of field device (As displayed on the 375, exact spelling if possible.)
- Have the User's Manual for the field device available.
- Does communication work when certain devices or processes are not running?
- What is the total cable length run from the termination panel to the field device?
- What is the message on the 375 Field Communicator when attempting to communicate with a field device (i.e., device not found)?
- What is the serial number of the 375 having the communication issue?
- Is the device in burst mode?
- What is the loop impedance in the device loop? (Resistance value)
- Can the 375 talk to the Field Device?
- Can the AMS Suite: Intelligent Device Manager talk to the Field Device?
- Is the Field Device address set to "0"?
- Is there more than (1) Field Device on the loop?
- Is there another master (primary or secondary) on the loop? (i.e., Control system, Multiplexer, etc.)

- Does the Control system support HART or fieldbus communications?
- If a HART multiplexer is being used, what is the manufacture and model?
- What is the approximate Field Device loop length? (Length of the wire)
- Are there any error messages being displayed?
- What task is being performed when the communication problem occurs?
- Are you having communication problems with multiple Field Devices?

Contacting Technical Support Personnel

Contact your supplier or go to the website, www.fieldcommunicator.com, for technical support contact information.

APPENDIX A REFERENCE INFORMATION

PROCESSOR AND MEMORY SPECIFICATIONS

Microprocessor 80 MHz, max 133 MHz Hitachi® SH3

Memory

Internal Flash
32 MB

System Card
128 MB (or higher) Secure Digital card

RAM
32 MB

Expansion Module
32 MB (or higher) Secure Digital card

PHYSICAL SPECIFICATIONS

Weight Approximately 2 lb. (950 grams) includes battery

Display 1/4 VGA (240 by 320 pixels) monochrome touch screen with a viewing area of approximately 6 cm by 8 cm (10 cm diagonal)
Base glass thickness 1.1 mm anti-glare
Dimensions 92 mm x 71.1 mm x 10 mm

Keypad

Twenty-five keys including four action keys, twelve alphanumeric keys, four alternate functionality keys, on/off, and 4 navigation (arrow) keys; membrane design with tactile feedback

POWER SUPPLY SPECIFICATIONS

Power supply voltage

6.0 V

Battery

Five rechargeable NiMh AA batteries

Not serviceable.

Battery operating time

Eight hours typical use

Power Supply/Charger

90-240 VAC, 50/60Hz,
US/UK/EU connection types included

CONNECTION SPECIFICATIONS

Battery Charger

2.5 mm jack

HART and Fieldbus Communication

Three 4mm banana plugs (one common terminal to both HART and FOUNDATION fieldbus.)

Personal Computer

IrDA port supporting up to 115 Kb/s

± 15 degrees recommended maximum angle from center line.

18 in. recommended maximum distance from center line.

IrDA requires Windows® 2000 or Windows XP

ENVIRONMENTAL SPECIFICATIONS

Usage

-10°C to +50°C (14°F to 122°F)

0% to 95%RH (non-condensing) for 0°C to +50°C (32°F to 122°F)

Charge

0°C to +40°C (32°F to 104°F)

Storage

-20°C to +55°C (-4°F to 131°F) with batteries (less than one month)

Storage without batteries

-20°C to +60°C (-4°F to 140°F)

Enclosure rating

IP51 (front)

Shock

Passes the 1-meter drop test onto concrete

ORDERING INFORMATION

Model	Product Description
375	Field Communicator[1]
Code	**Communication Protocol**
H	HART
F	HART and FOUNDATION fieldbus
Code	**Battery Type**
R	Rechargeable NiMH Battery Pack
Code	**Power Supply/Charger**
1	Power Supply/Charger (90-240 VAC, 50/60Hz, US/UK/EU connection types included)
9	Not Included[2]
Code	**Language**
E	English
Code	**Product Certifications**
KL	CENELEC/ATEX, FM, CSA Intrinsically Safe (includes FISCO as applicable)
NA	No Approval
Code	**Easy Upgrade[3]**
U	Easy Upgrade Option (includes unlimited upgrades to System Card for 3 year period)
9	Not Included
Code	**Options**
	Spare Battery Pack
B	Spare Rechargeable NiMH Battery Pack[4]
	Expansion Module
C	Configuration Expansion Module [5]

(1) Base Model 375 includes Field Communicator unit, System Card, Leadset with connectors, Carrying case, Getting Started Guide, User's Manual, 375 Resource CD, stylus and straps.

(2) This option should only be considered if the user already has a 375 Power Supply/Charger. Note: Only 375 Power Supply/Chargers are to be used with the 375 battery pack.

(3) The Easy Upgrade capability allows the user to add new System Application software and Device Descriptions (DDs) to the 375. To upgrade without this feature, the System Card would have to be sent a Service Center.

(4) A fully charged battery pack is capable of delivering power for eight hours of typical field use. If requirements exceed this specification, a second battery pack is recommended.

(5) The 375 is capable of storing a total of 25 configurations. For increased storage capacity, use the Configuration Expansion Module which is capable of storing in excess of 500 configurations.

Spare Parts List

Description	Part Number
Ruggedized 250 Ohm Load Resistor	00275-0096-0001
Rechargeable NiMH Battery Pack with Accessory Case	00375-0002-0011
Power Supply/Charger (90-240 VAC, 50/60Hz, US/UK/EU connection types included)	00375-0003-0011
Lead Set with connectors	00375-0004-0001
Mounting Straps	00375-0005-0002
Carrying Case (with straps)	00375-0005-0003
Accessory Case (clips to Carrying Case)	00375-0005-0004
Stylus (pack of 5)	00375-0006-0001
IRDA to USB Adapter(1)	00375-0015-0002
Expansion Port Plug	00375-0035-0001
System Card - HART® and FOUNDATION fieldbus	00375-0042-0002
System Card - HART with Easy Upgrade Option(2)	00375-0042-0003
System Card - HART and FOUNDATION fieldbus with Easy Upgrade Option(2)	00375-0042-0004
Configuration Expansion Module	00375-0043-0001
Stand and Utility Plate	00375-0044-0001
Getting Started Guide	00375-0045-0001
User's Manual	00375-0047-0001
Resource CD(3)	00375-0049-0001

(1) For use with AMS/375 Interface or 375 Programming Utility.

(2) Includes unlimited upgrades to System Card for 3 year period.

(3) Contains Programming Utility and System Software/DD database. This CD is updated on a quarterly basis.

APPENDIX B APPROVAL INFORMATION

OVERVIEW

This Appendix contains information on approved manufacturing locations, the European Directive, Hazardous Locations Certifications, and approval drawings for HART protocol.

All 375 Field Communicators come with the main unit label (see Figure B-1). Intrinsically Safe (KL option) 375 Field Communicators also have an additional label opposite the main unit label. If the 375 Field Communicator does not contain this label (NA option) then it is considered non-IS approved.

APPROVED MANUFACTURING LOCATIONS

Emerson Process Management — Leicester, England (UK)

EUROPEAN DIRECTIVE INFORMATION

CE Compliance

CE compliance to 89/336/EEC and 94/9/EC (KL option only)

Electro Magnetic Compatibility (89/336/EEC)

Tested to specifications EN 61000-6-3 and EN 61000-6-2

ATEX Directive (94/9/EC) (KL option only)

Emerson Process Management complies with the ATEX Directive.

Specific ATEX Directive Information is located within this section and in the 375 Field Communicator Getting Started guide. See “Label Drawings” on page B-4 for more information.

Applicable standards EN 50014, EN 50020, and EN 50284.

Other important guidelines

Only use new, original parts.

Do not recharge the battery in hazardous areas.

Have repairs done only by qualified personnel.

Only charge or power using the 375 Power Supply.

HAZARDOUS LOCATIONS CERTIFICATIONS (KL OPTION ONLY)

North American Certifications

Factory Mutual (FM)

Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D and Class I, Zone 0, AEx ia IIC T4 (Ta = 50 °C) hazardous locations when connected as indicated in the control drawing 00375-1130. See the control drawing for input and output parameters.

Canadian Standards Association (CSA)

Intrinsically safe for use in Class 1, Zone 0, Ex ia IIC T4 hazardous locations when connected as indicated in the control drawing 00375-1130. See the control drawing for input and output parameters.

European Certifications

ATEX Intrinsic Safety

Certification No.: BVS 03 ATEX E 347 ⟨Ex⟩ II 2 G (1 GD)

EEx ia IIC T4 (-10 °C ≤ Ta ≤ +50 °C) CE 1180

HART Intrinsically Safe electrical parameters

Input Parameters	
U_i	= 30 Volt DC
I_i	= 200 mA
P_i	= 1.0 Watt
L_i	= 0
C_i	= 0
Output Parameters	
U_0	= 1.9 Volt DC
I_0	= 32 µA

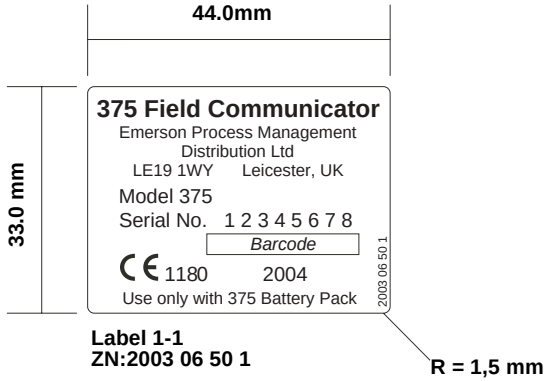
FOUNDATION fieldbus

Intrinsically safe FISCO					
U_{iIIC}	= 17.5 Volt DC	I_{iIIC}	= 215 mA	P_{iIIC}	= 1.9 Watt
U_{iIIB}	= 17.5 Volt DC	I_{iIIB}	= 380 mA	P_{iIIB}	= 5.3 Watt
U_0	= 1.9 Volt DC	I_0	= 32 µA		

Intrinsically safe Non-FISCO					
U_i	= 30 Volt DC	I_i	= 380 mA	P_i	= 1.3 Watt
U_0	= 1.9 Volt DC	I_0	= 32 µA		
L_i	= 0	C_i	= 0		

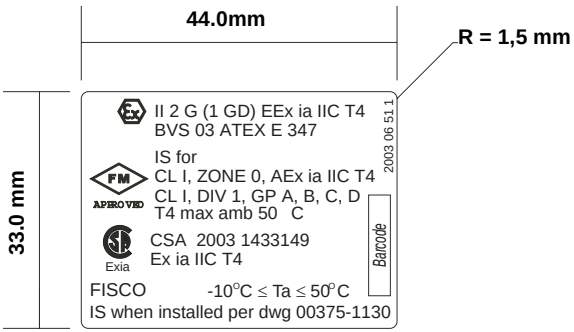
LABEL DRAWINGS

Figure B-1. All 375 Field Communicators will have a similar label to the one below.



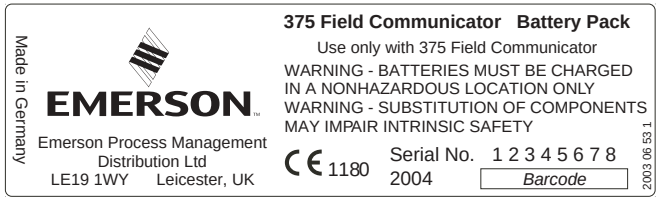
Label 1-1
ZN:2003 06 50 1

Figure B-2. Approval Ex label example (KL option only)



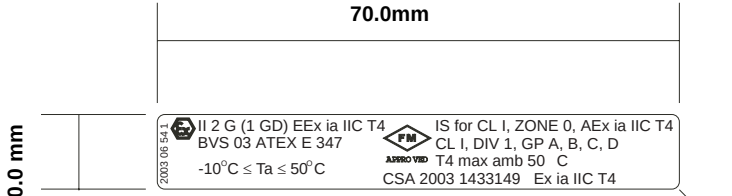
Label 1-2
ZN:2003 06 51 1

Figure B-3. Battery Pack Label example (all)



Label 4-1
ZN:2003 06 53 1

R = 1,5 mm



Label 4-2
ZN:2003 06 54 1

R = 1,5 mm

APPROVAL DRAWING

This approval drawing can also be found on the www.fieldcommunicator.com website.

DWG. NO. 00375-1130

TABLE 1 - FM ENTITY PARAMETERS

Input Parameter		Output Parameter	
Ui (Vmax) = 30 Vdc	Vt or Voc of loop must be <= 30 Vdc	Uo (Voc) = 1.9 Vdc	
Ii (Imax) = 200 mA	It or Isc of loop must be <= 200 mA	Io (Isc) = 32 uA	
Pi (Pmax) = 1 W		Po = 61 uW	
Ci = 0 uF	Device does not add capacitance to the loop	Ca = 100 uF	
Li = 0 mH	Device does not add inductance to the loop	La = 5600 mH	

Classification: T4

Max. Ambient temp: -10°C less than or equal to Ta less than or equal to +50°C

WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

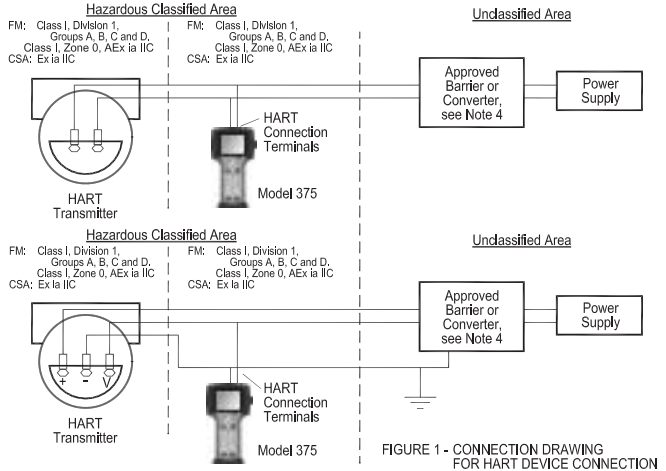


FIGURE 1 - CONNECTION DRAWING FOR HART DEVICE CONNECTION

Notes:

1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Associated Apparatus manufacturer's Installation drawing must be followed when installing the equipment.
3. Associated Apparatus and Model 375 Communicator must meet the following parameters :
   a) Uo, Voc or Vt of the barrier plus Voc of the Model 375 Communicator must be less than or equal to Ui (Vmax)
   b) Io, Isc or It of the barrier plus Isc of the Model 375 Communicator must be less than or equal to Ii (Imax)
   c) Po of the barrier plus Po of the Model 375 Communicator must be less than or equal to Pi (Pmax)
   d) Ca of barrier must be greater than or equal to Ci of the Model 375 Communicator plus Ci of the HART Transmitter plus Ccable
   e) La of barrier must be greater than or equal to Li of the Model 375 Communicator plus Li of the HART Transmitter plus Lcable
   f) La of Model 375 Communicator must be greater than or equal to Li of the HART Transmitter plus Lcable
   g) Ca of Model 375 Communicator must be greater than or equal to Ci of the HART Transmitter plus Ccable

FM:

4. The Associated Apparatus must be FM Approved.
5. HART Transmitter must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

CSA:

4. The Associated Apparatus must be CSA certified.
5. HART Transmitter must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1, Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

UNLESS OTHERWISE SPECIFIED TOLERANCES
X.X± ____ ∠ ±____
XX.X± ____
XXX.X± ____
R OR CHAM ____
UNIT OF MEASURE ____
DO NOT SCALE THIS DWG
ANSI Y14.5M

REVISIONS				
	B	EJH	30SEP04	20417

SUPERSEDES

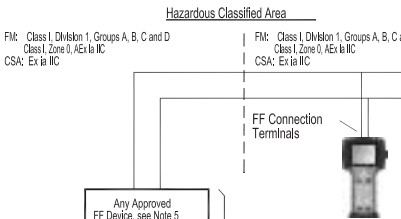
Emerson Process Management
Distribution Ltd
Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE	DESIGN
DWN.	EJH	24AUG04	
CHKD.	MJH	24AUG04	DWG. NO.
APVD.	VRM	24AUG04	00375-1130
SCALE	NONE	TOL A / REF C	SHEET 1 OF 4

REV B

DWG. NO. 00375-1130



For Non-FISCO installation

Ui (Vmax) = 30 Vdc
Ii (Imax) = 380 mA
Pi (Pmax) = 1.3 W
Ci = 0 uF
Li = 0 mH

Uo (Voc) = 1.9 Vdc
Io (Isc) = 32 uA
Po = 61 uW
Ca = 100 uF
La = 5600 mH

Leakage current:
less than or equal to 50 uA

Classification: T4

Max. Ambient temp:
-10°C less than or equal to Ta
less than or equal to +50°C

FIGURE 2 - CONNECTION DRAWING FOR FF Non-FISCO DEVICE CONNECTION

WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

Notes:

1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Associated Apparatus manufacturer's installation drawing must be followed when installing the equipment.
3. Associated Apparatus and Model 375 Communicator must meet the following parameters :
   a) Uo, Voc or Vt of the barrier plus Voc of the Model 375 Communicator must be less than or equal to Ui (Vmax)
   b) Io, Isc or It of the barrier plus Isc of the Model 375 Communicator must be less than or equal to Ii (Imax)
   c) Po of the barrier plus Po of the Model 375 Communicator must be less than or equal to Pi (Pmax)
   d) Ca of barrier must be greater than or equal to Ci of the Model 375 Communicator plus Ci of the HART Transmitter plus Ccable
   e) La of barrier must be greater than or equal to Li of the Model 375 Communicator plus Li of the HART Transmitter plus Lcable
   f) La of Model 375 Communicator must be greater than or equal to Li of the HART Transmitter plus Lcable
   g) Ca of Model 375 Communicator must be greater than or equal to Ci of the HART Transmitter plus Ccable

FM:

4. The Associated Apparatus must be FM Approved.
5. FF Device must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

CSA:

4. The Associated Apparatus must be CSA certified.
5. FF Device must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1, Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X± .XX± .XXX± ∠±
R OR CHAM
UNIT OF MEASURE
DO NOT SCALE THIS DWG
ANSI Y14.5M

REVISIONS				
B	EJH	30SEP04	20417	

SUPERSEDES

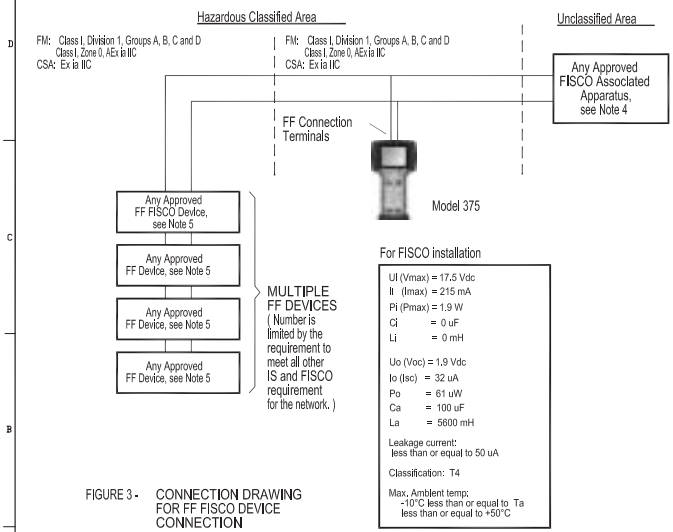
Emerson Process Management
Distribution Ltd
Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE
DSN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04
SCALE	NONE	

DESIGN
DWG. NO. 00375-1130
REV B
SHEET 2 OF 4

DWG. NO. 00375–1130



For FISCO installation

Ui (Vmax) = 17.5 Vdc
Ii (Imax) = 215 mA
Pi (Pmax) = 1.9 W
Ci = 0 uF
Li = 0 mH

Uo (Voc) = 1.9 Vdc
Io (Isc) = 32 uA
Po = 61 uW
Ca = 100 uF
La = 5600 mH

Leakage current:
less than or equal to 50 uA

Classification: T4

Max. Ambient temp:
-10°C less than or equal to Ta
less than or equal to +50°C

FIGURE 3 - CONNECTION DRAWING FOR FF FISCO DEVICE CONNECTION

WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

Notes:

1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Associated Apparatus manufacturer's installation drawing must be followed when installing the equipment.

3. Associated Apparatus and Model 375 Communicator must meet the conditions of the

"FISCO CONCEPT"

see notes on Page 4

FM:

4. The Associated Apparatus must be FM Approved.
5. FF Device must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

CSA:

4. The Associated Apparatus must be CSA certified.
5. FF Device must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1, Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X± ∠±
.XX±
.XXX±
R OR CHAM
UNIT OF MEASURE
DO NOT SCALE THIS DWG
ANSI Y14.5M

REVISIONS				
REV	B	EJH	30SEP04	20417
SUPERSEDES				

Emerson Process Management Distribution Ltd
Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE
DESIGN		
DWN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04

DWG. NO. 00375–1130 REV B
SCALE NONE WGT. A SIZE A
SHEET 3 OF 4

DWG. NO. 00375-1130

FISCO CONCEPT

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (Ui OR Vmax), THE CURRENT (Ii OR Imax) AND THE POWER (Pi OR Pmax) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (Uo, Voc OR Vt), THE CURRENT (Io, Isc OR It) AND THE POWER (Po OR Pmax) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND THE INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF and 10 uH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE Uo (OR Voc OR Vt) OF THE ASSOCIATED APPARATUS IS LIMITED TO A RANGE OF 14 V TO 24 Vdc. ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50uA FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

Loop Resistance R:	15.....150 Ohm/km
Inductance per unit length L:	0.4.....1 mH/km
Capacitance per unit length C:	80.....200 nF

C = C line/line + 0.5C line/screen, if both lines are floating, or
C = C line/line + C line/screen, if the screen is connected to one line

Length of trunk cable:	less than or equal to 1000m
Length of spur cable:	less than or equal to 30m
Length of spur splice:	less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:

R = 90.....100 Ohm C = 0.....2.2 uF

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED DUE TO I.S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITED. THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X± _____ ∠ ±____
.XX± _____
.XXX±_____
R OR CHAM _____
UNIT OF MEASURE _____
DO NOT SCALE THIS DWG
ANSI Y14.5M

REVISIONS				
	B	EJH	30SEP04	20417
SUPERSEDES				

Emerson Process Management Distribution Ltd Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE
DWN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04

DESIGN

DWG. NO. 00375-1130 SHEET 4 OF 4

REV B

SCALE NONE TOL ± A SIZE C

GLOSSARY

Alphanumeric

A character set that contains both letters and digits and, usually, other characters, such as punctuation marks.

AMS Suite: Intelligent Device Manager

Software for remotely managing Smart field devices (offline or online) over existing HART or FOUNDATION fieldbus networks. You can use AMS to monitor devices, configure devices, maintain calibration results, run diagnostic routines, and maintain historical data.

CDC

Communication and Diagnostic Circuitry

Data Link Time

Data Link Time is a network-wide time periodically distributed by the LAS to synchronize all device clocks on the bus.

Device configuration

Parameters that define the physical attributes and operating characteristics of a device. Does not include dynamic data.

Device Description (DD)

A set of instructions written in the HART or FOUNDATION fieldbus Device Description Language that defines the parameters and commands and methods that a host application uses to communicate with a HART or FOUNDATION fieldbus field device.

DDL

Device Description Language. A specialized programming language used to write Device Descriptions for HART or FOUNDATION fieldbus -compatible field devices. *See also* Device Description.

Expansion Module (EM)

An optional removable memory card that snaps into the Expansion Port on the side of the 375 Field Communicator. See ordering information for availability types.

Field device

Field devices may generate or receive an analog signal in addition to the HART digital communication signal.

Fieldbus Foundation

The organization that develops and supports FOUNDATION fieldbus, an international, interoperable standard for communication of process automation and control information. Members include suppliers and end users of process control and manufacturing automation products. Support for the standard includes education, interoperability and conformance testing, testing tools, and development software.

FOUNDATION fieldbus

A specific fieldbus technology developed and supported by Emerson Process Management and the other members of the independent Fieldbus Foundation. Foundation Fieldbus technology uses Device Descriptions and function blocks to enable intelligent field devices to execute control functions traditionally performed by a distributed control system.

HART device

A device that communicates information using the HART protocol.

HART loop

A communication network in which the master and slave device are HART-smart or HART-compatible.

HART protocol

Highway Addressable Remote Transducer communication protocol. An industry-standard protocol for digitally enhanced 4–20 mA communication with Smart field devices.

HART tag

An 8-character field used to identify a device. A 32-character long tag is also possible with HART Universal revision 6 device. This field is stored in the HART device and can be modified.

Instantiation

Some FOUNDATION fieldbus devices support instantiation of function blocks in the device. This means the device allows a command to be sent to it that will create or instantiate additional function blocks in the device. Once instantiated, these function blocks operate like any other block in the device. The 375 Field Communicator does not currently support the command to instantiate function blocks in a fieldbus device. The 375 Field Communicator is, however, able to access function blocks that have been instantiated by other external means.

Internal Flash

Non-volatile memory that stores the OS, application software, internal device configurations, event captures, fieldbus statistics, and user generated text files.

Intrinsic Safety

Circuits that are designed to limit the amount of energy consumed or provided to field devices to levels below those that are required to ignite specific types of hazardous materials under fault and no fault conditions.

Also a method of providing safe operation of electronic process-control instrumentation in hazardous areas, such as flammable environments. IS systems keep the available electrical energy in the system low enough that ignition of the hazardous atmosphere cannot occur.

Intrinsic Safety barrier

A physical entity that limits the current and voltage into a hazardous area in order to satisfy Intrinsic Safety requirements.

IrDA

Infrared Data Association, a non-profit trade association that establishes standards for infrared communications between devices such as personal computers, printers, and handheld devices.

Link Active Scheduler (LAS)

The bus arbiter for the segment. The LAS, recognizes and adds new devices to the link, removes non-responsive devices from the link, and distributes Data Link (DL) and Link Scheduling (LS) time on the link.

Link master

A Link Master device controls when devices access the fieldbus and executes the link schedule which synchronizes communications with function block execution on the fieldbus. The H1 card or any field device that supports Link Master functionality can function as a Link Master device. Only one Link Master device can be active at a time on the fieldbus segment. This device is called the LAS.

Link Scheduling time

Link Scheduling time is a link-specific time represented as an offset from Data Link Time. It is used to indicate when the LAS on each link begins and repeats its schedule. System management uses it to synchronize function block execution with the data transfers scheduled by the LAS.

Personal Computer (PC)

Synonymous with microcomputer, a computer that serves one user in the office or the home. PCs are the largest installed base of personal computers.

Polling

A method of sequentially interrogating a network to determine which devices are present.

Process variable (PV)

A process parameter that is being measured or controlled (e.g., level, flow, temperature, mass, or density).

Segment (Fieldbus only)

The section of a fieldbus that is terminated in its characteristic impedance. Segments are linked by repeaters to form a complete Fieldbus.

System Card

An internal Secure Digital Card with non-volatile Flash memory. A copy of installable 375 Field Communicator application software exists on every SC. The SC memory also stores all HART and FOUNDATION fieldbus Device Descriptions.

User data file

A text (.TXT) file created by a user either on a PC or with the ScratchPad application on the 375. User data files can be transferred between the 375 Programming Utility and a 375.

INDEX

EMERSON
Process Management

Emerson Process Management
Asset Optimization Division
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Eden Prairie, MN 55344 USA
www.fieldcommunicator.com

Emerson Process Management
00375-0047-0001, rev D

Rosemount
00809-0100-4276

HART® FIELD COMMUNICATIONS PROTOCOL

Fieldbus Foundation