QUICK START

DevCom uses Device Descriptions (DDs) to access data stored in the memory of the smart field device. These DDs are developed by the manufacturer for their products and, in turn, distributed by the FieldComm Group (FCG) worldwide. The latest DDs are included as part of the DevCom installation. Visit the FCG website (www.fieldcommgroup.org) or the ProComSol website (www.procomsol.com) for update information.

The following steps will allow you to install and quickly begin using DevCom:

Step 1: Setup Your Android Device

1. Allow installation of apps from sources other than the Play Store
Note: Below is for Samsung Galaxy 4, your Android device may have different key sequences.
a) Tap bottom left button on your Android device (Menu Button)
b) Select Settings
c) Select More
d) Select Security
e) Enable Unknown sources
2. Turn on Bluetooth
3. Connect Android device to PC via the USB cable.

Step 2: Install the DevCom App

1. Copy the file "com.procomsol.devcom.apk" to your device. Find it using a File Browser App and click on it to launch the Install App. See Section 4.2.1 for details

Step 3: Activate DevCom License

Launch DevCom by selecting the DevCom icon.

You will be shown the number of days you can run before activation is required. You can use it for up to 10 days before you need to activate it. Activation only needs to occur once. See Section 4.2.2 for details.

Step 4: Install DD Library

After DevCom is licensed or Demo mode is entered, you will be prompted to download the DD Library.

The Install could take up to 15 minutes based on your internet speed. If internet is not available you can use the DD Library Install App, "com.procomsol.devcom.dd.apk". See Section 4.2.3 for details.

Step 5: Connect the communication interface

Connecting to a HART device requires special interface hardware. These interfaces ("HART Modems") are available from ProComSol, Ltd and other sources. The interface should be connected and configured. The preferred interface is a Bluetooth HART Modem - ProComSol, Ltd model HM-BT-BAT-ER or HM-BLE if your Android device supports Bluetooth Low Energy. See Section 4.2.4 for details.

On initial start the App will prompt you for a HART modem to use. Make sure your modem is turned on and tap the "Scan for Bluetooth Devices" button in DevCom. Select your HART Modem and perform the Pairing operation. Enter 1234 for the pairing code. Note that pairing is not required for the HM-BLE modem.

Step 6: Connect to the field device

Find a connection point for the device's 2-wire 4-20mA loop you wish to communicate with. For communications you must have a suitable load resistance or a 250Ω resistor must be placed in series with the device. Using the clips from the HART modem, connect to the HART device. While the HART Communication signal is available anywhere along the 4-20mA wiring, it is often easiest to connect across the field device's terminals (caution should be observed when working in a hazardous area, many Android devices are not rated for intrinsic safety and should only be connected in a safe area).

Step 7: Browse the Device

On initial start, DevCom sends a command to the field device, establishes a connection, and learns its identity. Once DevCom knows the device identity, it locates the device's DD in the library and loads it. From this point forward operation of DevCom is determined by the DD provided by the device manufacturer. If a DD for the device is not present, a generic DD will be used.

Menus and data are presented using a tree scheme. The organization of the data in the display window is dictated by the device DD. The display shows menus and data. To navigate to a different menu simply select it. To return to the previous menu, press the "Back" key on the device.

Step 8: Modify the Device's Configuration

The Menu tree allows access to all of the data exactly as described by the device manufacturer's DD. When you find elements of the field device's configuration you want to change, simply click and edit the data. Once you have changed the configuration to suit your needs, tap the "Commit" button to send the new data to the HART field device.

Step 9: Performing Maintenance and Testing the Field Device

Many devices perform Methods or Standard Operating Procedures (SOPs) that may need to be performed to ensure the device is in peak condition. These Methods may include calibrating the loop current, trimming the transducer values or performing some diagnostic test on the field device. Methods appear on the screen just like menus, but have a blue background. Click on the Method and it will start running in a new window. The Method will guide you through the process ensuring the procedure is completely and consistently performed. When the Method is complete the window will disappear.

Step 10: Exit

When you are through working on the field device simply exit DevCom. Once the App exits, you can then disconnect the HART interface hardware.

Table of Contents

1 INTRODUCTION

The Smart Device Communicator (DevCom) allows access to and management of a HART compatible field device's configuration and calibration. This manual provides the information about the Hardware setup, Communication with Smart devices, and functions of DevCom.

DevCom is unique in that it uses the DD of the connected device to determine what information to display, what variables are available for edit, and what procedures to follow for calibration, setup, and maintenance.

1.1 Acronyms and Definitions

Acronym	Definition
DD	Device Description File. This contains the device information.
DDL	Device Description Language
FCG	FieldComm Group, formerly the HART Communication Foundation (HCF)
DevCom	Smart Device Communicator
☰	Window select button

1.2 Conventions Used in This Manual

Following formatting conventions are used in this guide:

Convention	Description
Words in **bold** type	Field names including buttons in the display, or important phrases.
→ Arrow	Window select button followed by the selection to make are separated by →. For example, select ☰ → **New Device** to connect to a new device.
UPPERCASE	Acronyms
UPPERCASE within angle brackets	Command keys For example, tap <BACK>.
"Parenthesis"	Names of window elements, like "OK".

1.3 Document Organization

DevCom user manual is organized into the following sections:

Section 1	Describes the scope and objective of DevCom user manual along with the organization of the remaining part of the manual.
Section 2	Provides an overview of the DevCom application and its architecture.
Section 3	Provides the information pertaining to hardware and software requirements for the DevCom application.
Section 4	Provides the steps to install, activate, and uninstall the DevCom application.
Section 5	Provides the steps to start the DevCom application and connecting to field devices.
Section 6	This section explains different aspects of the DevCom application and its functionalities.

1.4 Getting Help

If you need help or encounter problems when using DevCom or this guide, please contact ProComSol, Ltd. See Appendix C for contact information. Please provide the following information.

Create a text description of the problem. If possible, provide the text in event sequence, which will enable the duplication of the problem. Provide information about the system. This information must include:

- DevCom version and License ID
- Mobile device information: make, model, and Android version
- What DD (Device Descriptor) is loaded for the HART device
- HART Device information: make, model, and device revision
- Point of contact: name, telephone number, and e-mail address

2 OVERVIEW OF DEVCOM

Field devices such as flow, pressure, level, temperature transmitters, and valve positioners provide the physical connection to the process. These devices allow the control system to monitor and manipulate process conditions. HART devices maintain a real-time database of process, configuration, identification, and diagnostic information. This information can be accessed using the HART Field Communications Protocol.

HART devices are capable of providing functions and features far beyond the basic task of providing a process input or accepting a control output to manipulate process conditions. Many HART compatible device manufactures create a DD (Device Description) describing all of these functions and features specific to that device. The DD also provides information essential to the successful configuration and calibration of the device.

DevCom uses these DD's to access the data stored in a device, providing full configuration and setup support for all registered HART DD's.

DevCom accesses and presents field device data based solely on its DD. No other files, information or custom drivers are required. DevCom is intended to monitor and configure a single device at a time, it is directly connected to the current loop of the particular device and:

- Provides user interface to configure the HART field device,
- Provides a means to configure and view all the parameters related to HART field device, and
- Provides an option to view the detailed status and diagnostic capability of the device.

DevCom allows viewing and modifying of field device parameters based on the DD. Using the device's DD, DevCom performs various tests to verify the proper operation of the HART device. DevCom runs as a standalone software application and must have a HART compatible modem attached to the system to interrogate the HART device.

3 SYSTEM REQUIREMENTS

The following minimum system requirements are recommended for operation of DevCom.

Mobile Device	Memory RAM: 1 GB Memory ROM: 2 GB Screen: 960x540 qHD
SD Card	Optional
HART Modem	ProComSol HM-BT-BAT-ER, HM-BLE, HM-USB-ISO, mobiLink, or equivalent
Bluetooth	Bluetooth 2.0 – HM-BT-BAT-ER Bluetooth 4.0 – HM-BLE
USB Port	HM-USB-ISO
Operating System	Android Jelly Bean (4.3)

4 DEVCOM INSTALLATION

4.1 Prerequisites

You need to be familiar with the basic functions of the following when installing DevCom:

- Android operating system
- HART communication interface
- HART field device

4.2 Installing the DevCom Application

4.2.1 DevCom Application

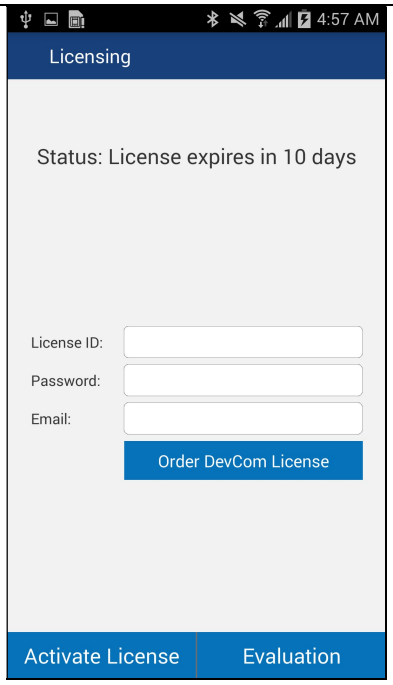
To install the DevCom application, perform the following steps:

Step	Action
1	Copy the file "com.procomsol.devcom.apk" to your device. It is recommended to put it in the "Download" folder.
2	On Android device, launch the "MyFiles" app or equivalent.
3	Navigate to the directory where you saved the file in Step 1.
4	Click on the file "com.procomsol.devcom.apk".
5	At the "Do you want to install this application?" select "Install".

4.2.2 Activating DevCom

DevCom must be activated for use after 10 days. The following procedure will activate the software (this only needs to occur one time):

Step	Action
1	Launch the DevCom App. The following Licensing Window is displayed after accepting the License Agreement:

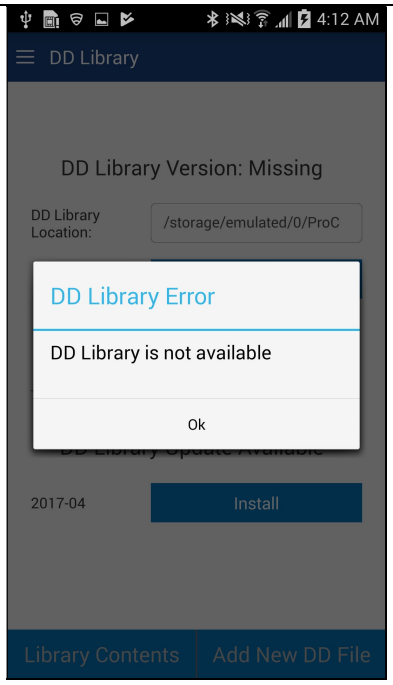
Step	Action
	
2	To activate your license: Enter the provided License ID and Password from your order. Also enter your Email address if you wish to receive update notifications. Then tap "Activate License". Once activated, this window will not appear during start up.
3	To proceed in Evaluation mode, tap "Evaluation". You can use the App for 10 days before activation is required.
4	If you need to purchase a license, tap "Order DevCom License" and you will be sent to the DevCom page on the ProComSol website.

4.2.3 Installing the DD Library

The DD Library is required for App function. Perform the following to download the latest DD Library to your device:

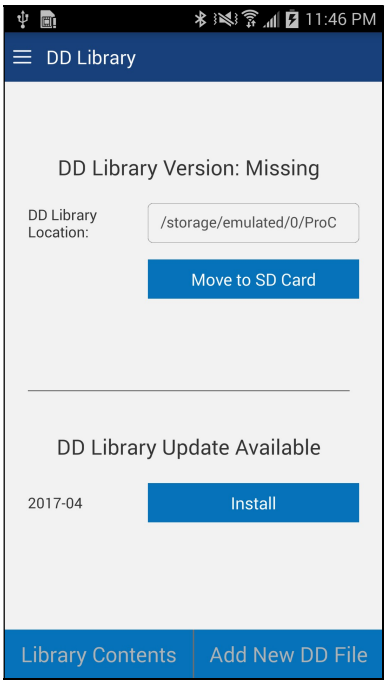
Step	Action
1	The following Window is shown after the Licensing Window:

Step	Action



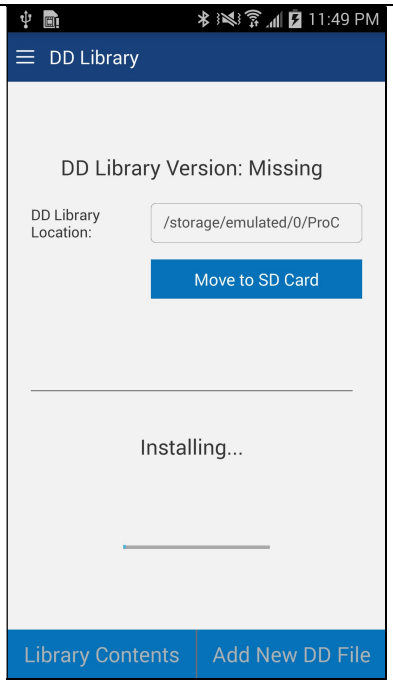
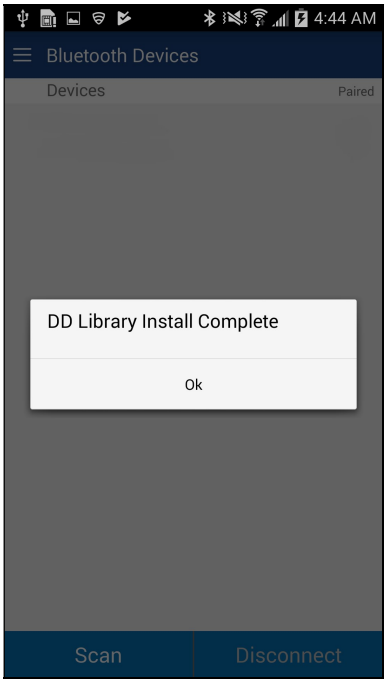
Tap “Ok” to continue.

2



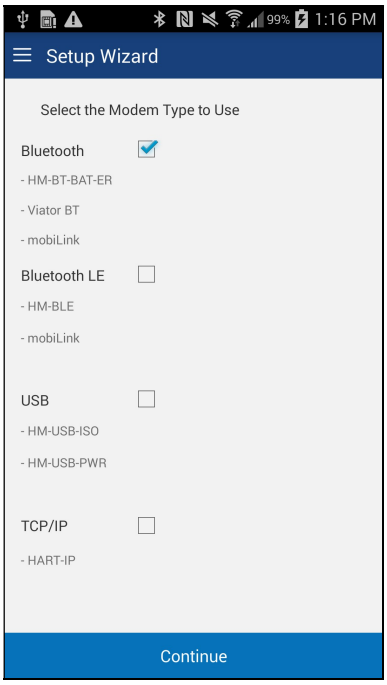
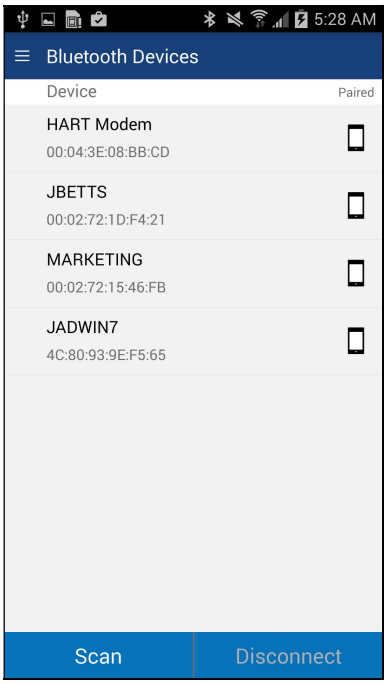
Tap “Install” to continue.

3 The following screen will appear. Note that the full DD Library download takes about 15 minutes. Do not close this screen!

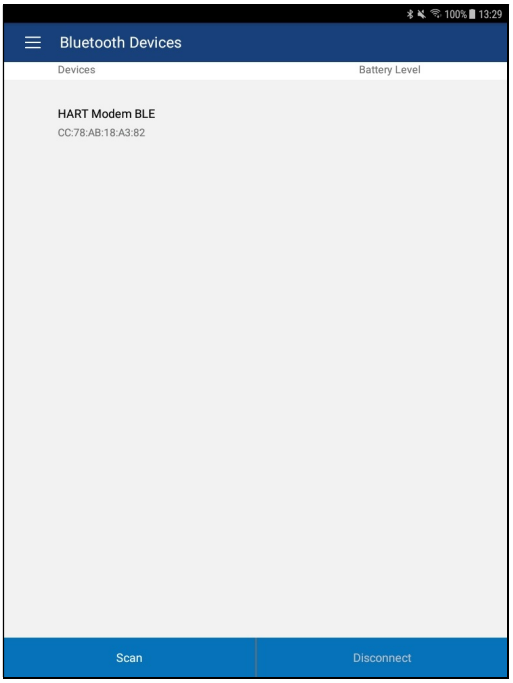
Step	Action
	
4	The following screen will appear when the DD Library install is successfully completed: 

4.2.4 Selecting a HART Modem

A HART Modem is required for communication to your HART device. The following procedure is used to select the modem (this only needs to occur one time):

Step	Action
1	The following Window is shown after the DD Library Window: 
2	Select the Modem Type you will use. Then tap “Continue”.
3	If “Bluetooth” was selected, the next Window will show all available Bluetooth devices after “Scan” was tapped. 
4	If “Bluetooth LE” was selected, the next Window will show all available Bluetooth LE (Bluetooth Low Energy) devices after

Step	Action
	"Scan" was tapped.



5	For all other cases, communications will begin immediately.
6	For the Bluetooth selections, tap your HART Modem in the list. Once a modem is selected, this Window will not appear during start up.

4.3 Connecting to the HART Network

The DevCom application communicates with the HART Field Devices through a HART compatible communication interface (e.g., a "HART Modem"). Using this communication interface you will transmit real-time HART data between DevCom and the connected HART compatible field device.

There are a wide variety of HART compatible interfaces. Please follow the manufacturer's instruction for connecting your interface to the Mobile. This manual uses the HART modem manufactured by ProComSol, Ltd, called the HM-BT-BAT-ER. It uses the Bluetooth interface.

Turn the HM-BT-BAT-ER on. It is assumed you have already performed the Bluetooth pairing procedure. See the HM-BT-BAT-ER documentation for details. Using the clips on the wires from the HART modem, connect to the device across the 4-20ma signal. If a suitable load resistance is not available, a 250Ω resistor must be placed in series with the device power supply.

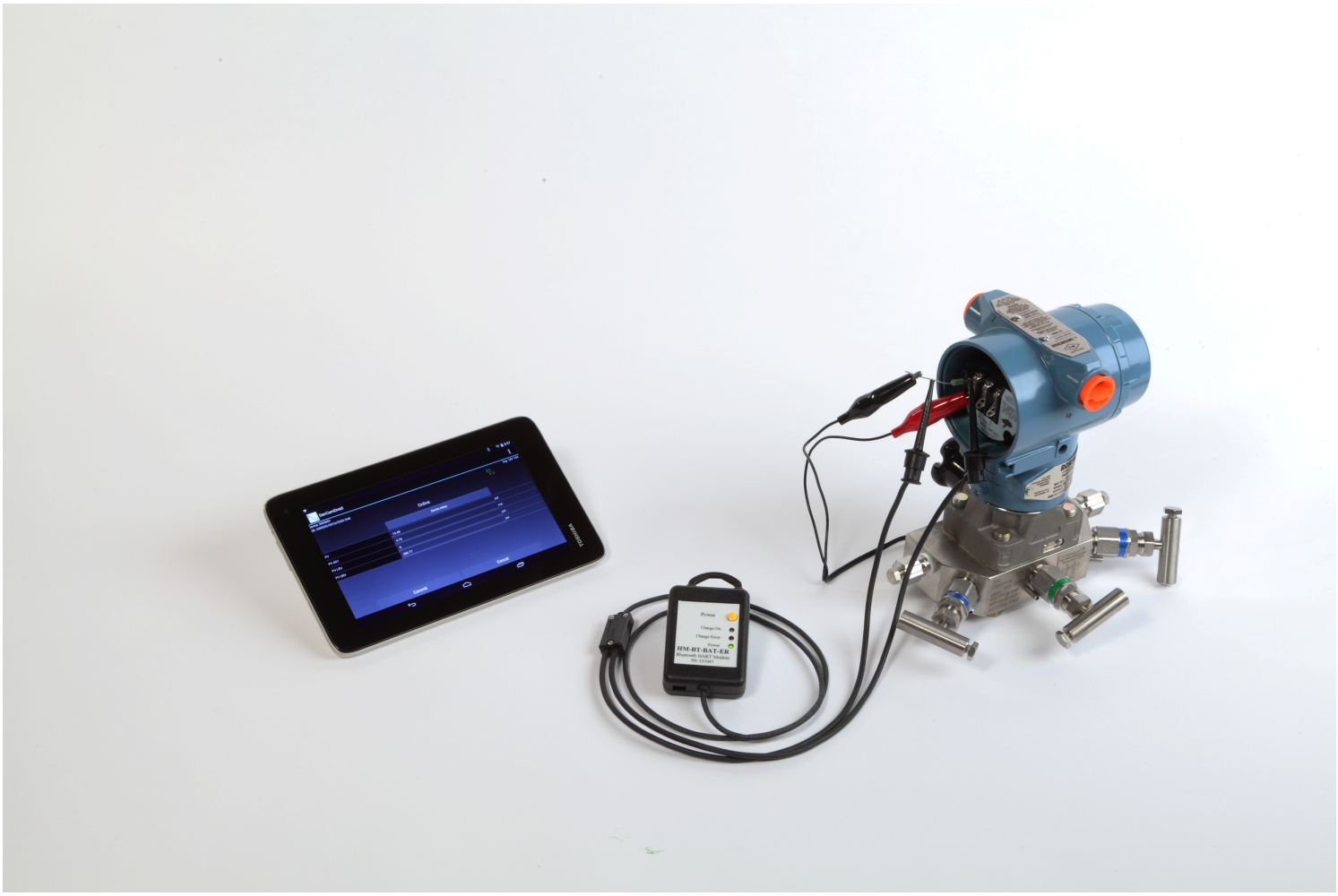


Figure 1 Typical DevCom Hardware Setup

4.4 Uninstalling the DevCom Application

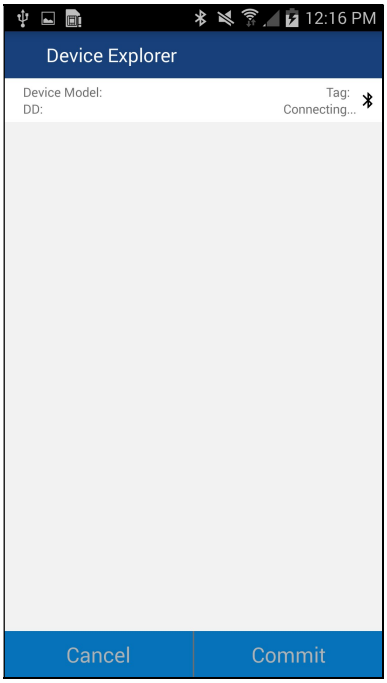
To uninstall the DevCom application, perform the following steps on the Android Device:

Step	Action
1	Go to the Application Manager (or equivalent) screen.
2	Select “DevCom”
3	Select “Uninstall”.
4	Select “OK”

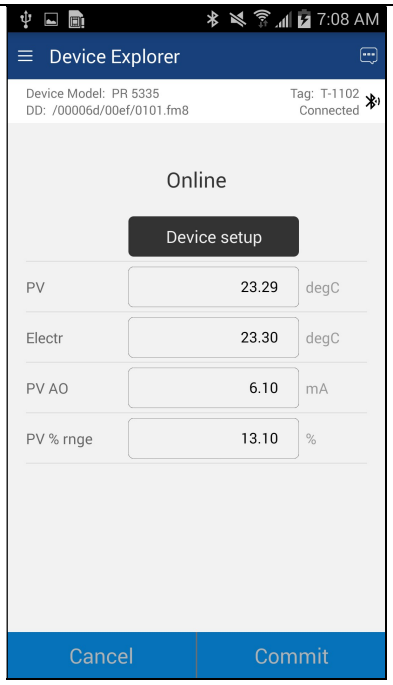
5 USING DEVCOM

5.1 Starting DevCom

Establish the physical connection between the field device and the HART Modem. With the physical connection established, launch DevCom by tapping the DevCom icon on your device screen.

Step	Action
1	Start the DevCom App. The following application window is displayed:  DevCom will then automatically identify the field device and begin communicating with the field device.
2	When the field device is successfully connected to DevCom, the Device Explorer window appears with the root menu of the device DD shown.

Step	Action



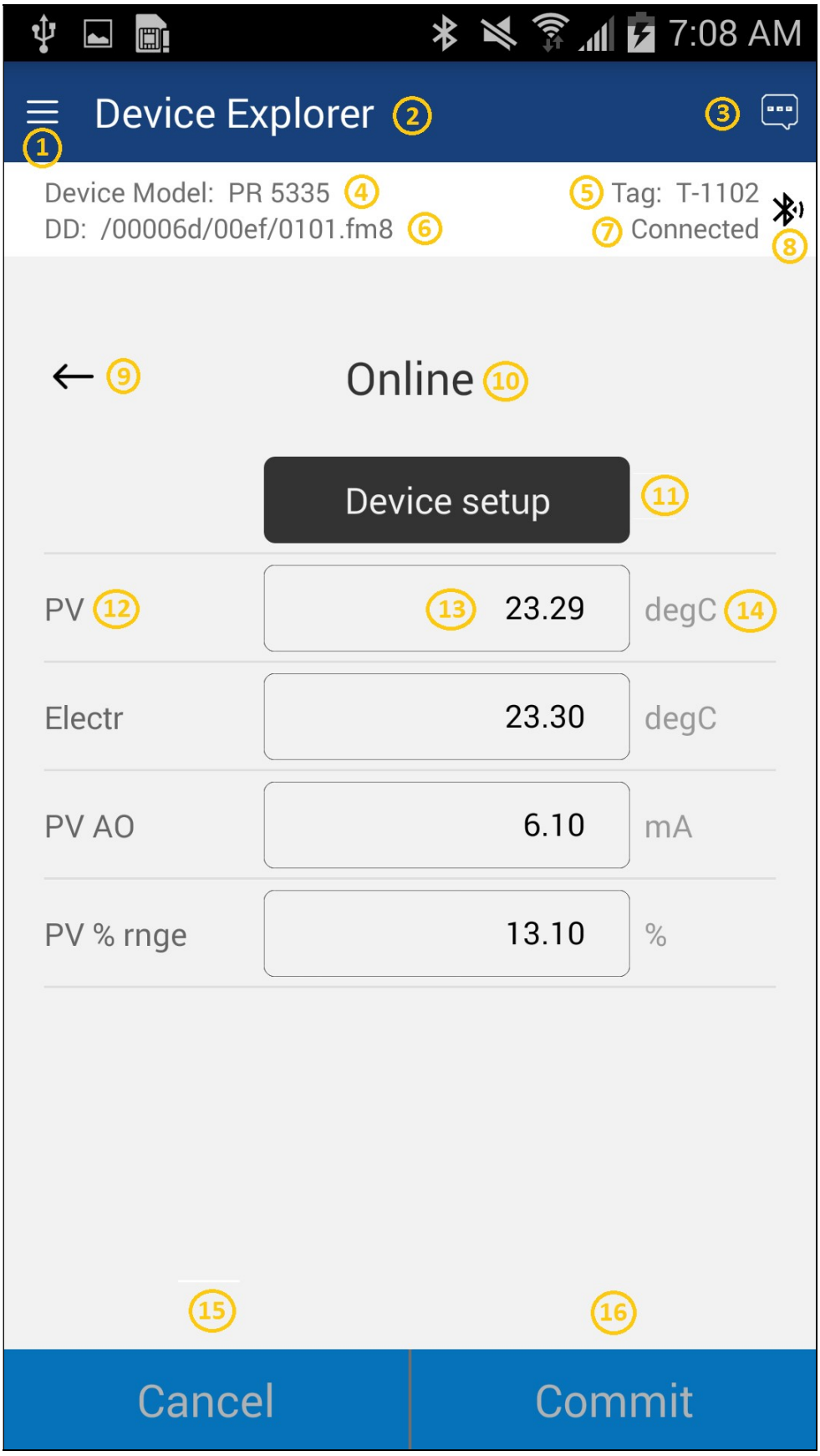
The DevCom windows shown in this document are only an example of what you may see when connected to your field device. What you will see is controlled by the DD and the device. The menus, data, status and configurations displayed are specified by the device's manufacturer in the DD itself.

3	Select the required menu to configure or review the field device's data.

5.2 Getting Familiarized with DevCom

5.2.1 The Device Explorer Window Fields

The DevCom Device Explorer window is designed to provide the operator with valuable information in order to make work quick and easy. Below is a typical Device Explorer window with each field described:


7:08 AM
Device Explorer
1
2
3
Device Model: PR 5335
4
5 Tag: T-1102
DD: /00006d/00ef/0101.fm8
6
7 Connected
8
9
Online
10
Device setup
11
PV
12
13
23.29
degC
14
Electr
23.30
degC
PV AO
6.10
mA
PV % rnge
13.10
%
15
16
Cancel
Commit

1 - Window Navigation icon, aka “Hamburger” icon
2 - Window name
3 - Device Status Icon
4 - Device model of connected HART device
5 - Tag name of connected HART device
6 - DD loaded for connected HART device
7 - Modem status
8 - Communication indication
9 - Back softkey for menu navigation
10 - Menu title for current menu
11 - Sub menu
12 - Label
13 - Data
14 - Units
15 - Commit, save edit changes to connected HART device
16 - Cancel, return edit changes to original value

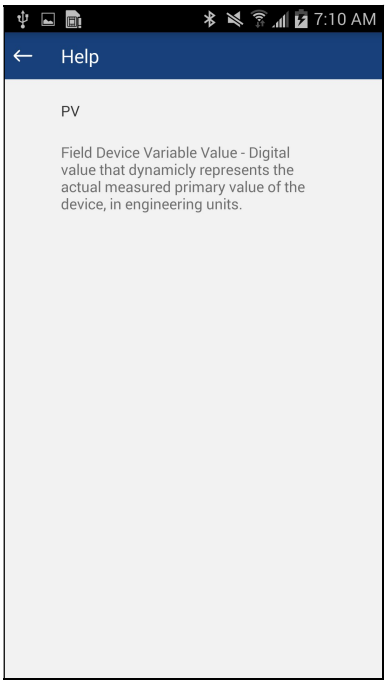
5.2.2 Navigating the Window Menus using the ☰ icon (aka “Hamburger”)

DevCom has several windows with specialized information. Tap the Hamburger icon and the following Window appears, details in Section 6.5: Note that the red icon indicates the active Window when the Hamburger icon was tapped. This helps the user return to the previous window.

Menu	Explanation
DevCom New Device Device Explorer Settings Bluetooth Devices Document Device Download Config Calibration Check DD Library Licensing About Exit	**DevCom –** App name **New Device -** Connect to a new device or reconnect to the same device. **Device Explorer** – Main device window with device data **Settings** – Launches Settings Window **Bluetooth Devices** – Launches Bluetooth Selection Window. If using USB modem, then USB Window launched. **Document Device** – Launches the Document Device Window **Download Config** – Launches the Saved Configurations Window **Calibration Check** - Launches the Calibration Check Window **DD Library** – Launches the DD Library Window. **Licensing** – Launches the License Window. **About** – Shows copyright information, support information, and application Serial Number. **Exit** - Exit DevCom.

5.2.3 Using the Help Menus

When you select a parameter label, a window will appear with information about the parameter. Below is an example:



5.2.4 Menu Color Scheme

DevCom application uses different colors to represent different elements of the application. The following table lists the colors and their meanings:

Color Example	Meaning
<Menu Name>	Indicates a menu in the navigation tree
<Label> <Data>	Indicates an "Enumerated Variable" item (Note the triangle)
<Label> <Data>	Indicates a Read Only "Variable" item (Note the data background is gray)
<Label> <Data>	Indicates an Editable "Variable" item (Note the data background is white)
<Method Name>	Indicates a "Method" (Standard Operating Procedure) item
<Edit Display Name>	Indicates an "Edit Display" item

6 FUNCTIONS AND BASIC OPERATIONS

6.1 Overview

DevCom allows the user to monitor and configure a single device at a time in the field. Each device had a DD that determines what device information is present. A DD may contain any of the following parameters/elements:

Variable

A variable is defined as the data contained in the device (e.g. Device Firmware Version). There are three types of variables:

Numeric – Variable data consists of numbers
Text – Variable data consists of text and/or numbers
Enumerated – Variable data is from a list of valid data points.

The above variables are further definable as follows:

Editable Variable – It allows the operator to modify the value and download it to the device.
Non-Editable Variable – It is a read-only data from the device.

Edit Display

This option is used to view a group of parameters. You can also modify a single parameter from this group, based on which other parameters of the device get altered.

For example, if the Engineering Unit of the device is modified, the corresponding Low Limits and High Limits change as per the Engineering Unit set.

Method / Standard Operating Procedure (SOP)

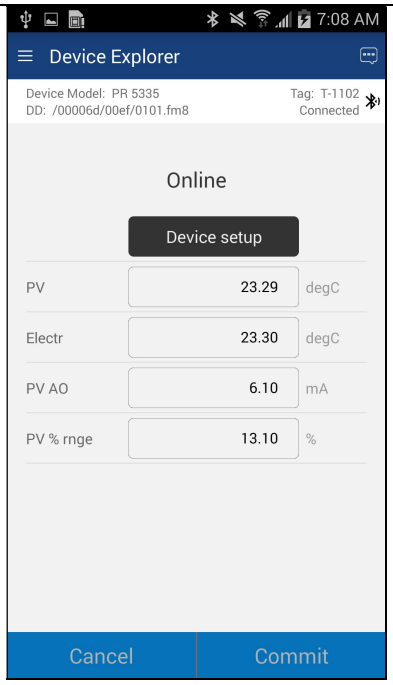
This option helps to perform various tests on the device for instance, Self Test and Loop Test. A Method or SOP is a series of steps that are executed in a sequence results in the completion of some device related tasks. When a method gets invoked, it gives various warning messages and options to the user, by which the user can thoroughly test the device. If a test is aborted by operator command at any stage of the sequence, the method invokes additional steps to bring the device back to its original state before the test.

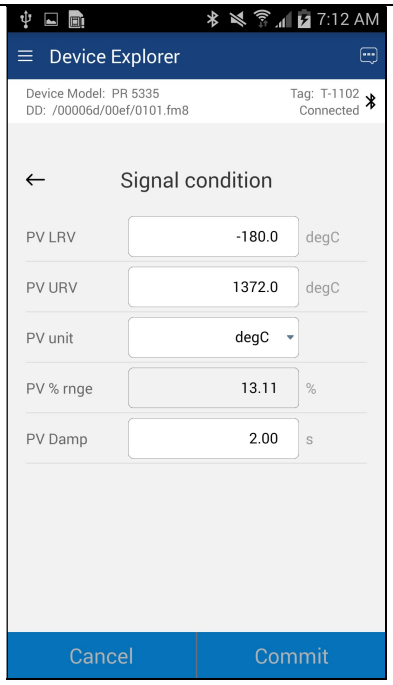
6.2 Configuring Device Information

6.2.1 Overview

DevCom allows you to view and configure the field device parameters based on the device description (DD). The related variables are grouped under various menus of different levels as defined in the DD file. The following table describes the details about the device configuration:

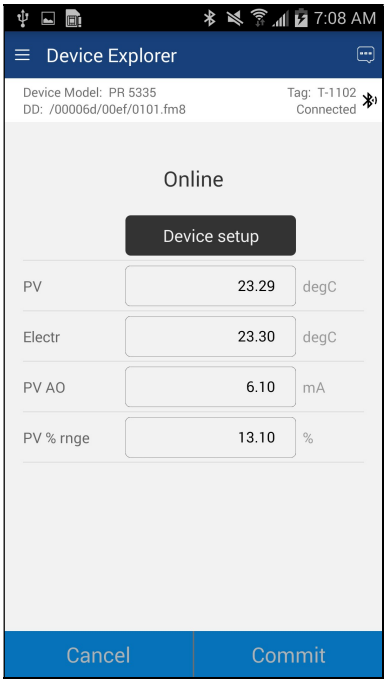
Step	Action
1	Ensure that the application is running and communications have been established:

Step	Action
	
2	There are three types of variables: Numeric, Text, and Enumerated. In turn these variables can be read/write and read only. Dynamic variables are also read only. Following points describe how the device parameters represents their status when connected to DevCom: White Data Background: Modifiable Values Gray Data Background: Read only Values Data field with gray triangle: Enumerated data

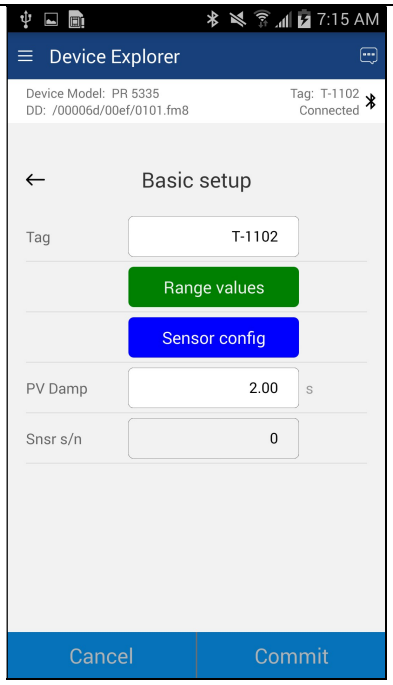
Step	Action
	
3	Select the parameter and configure the values, as required.
4	The subsequent topics explain how to configure device parameters.

6.2.2 Variable Edit

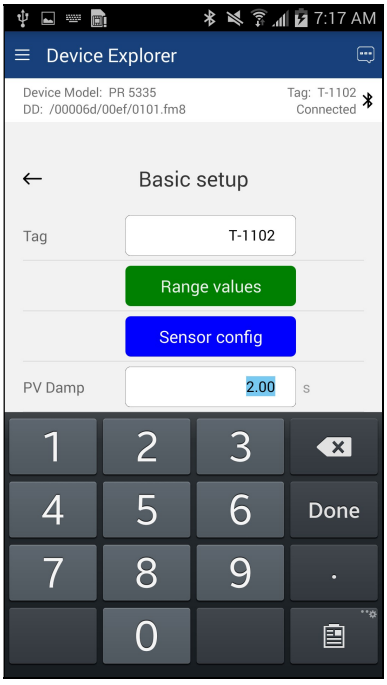
To edit a parameter of the connected device, perform the following steps:

Step	Action
1	Ensure that the application is running and communications have been established: 
2	Select the menu where the editable parameter is present as shown below. For this example we are editing PV Damp:

Step	Action

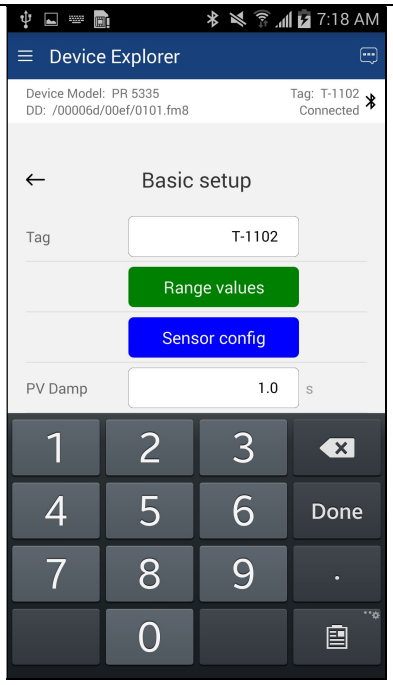


3 Select the variable data to edit it. The existing data will be highlighted and an appropriate soft keyboard will appear:

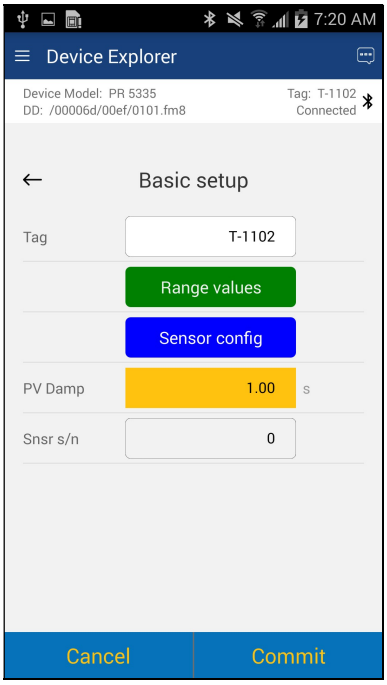


4 Make the changes to the parameter value, as required.

Step	Action

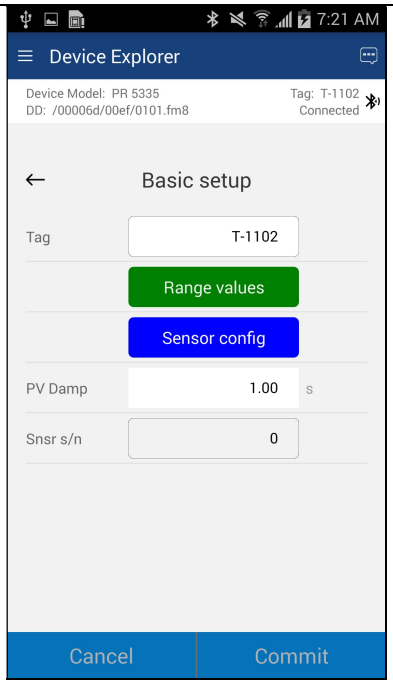


5 Use the Back key or "Done" button to remove the keyboard. Note that the changed variable data background is now Yellow and the "Commit" and "Cancel" buttons are also Yellow:

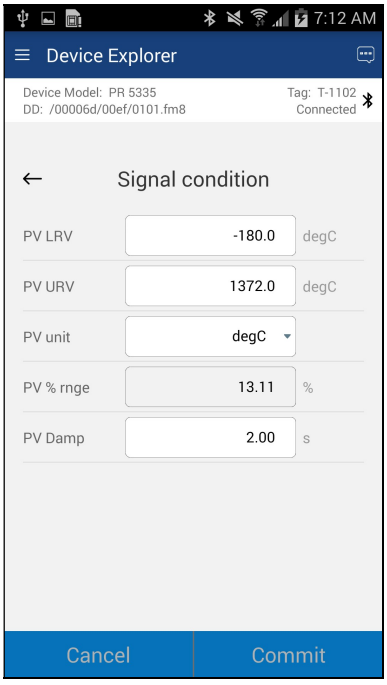


6 Click on the "Commit" button to send the new value to the device. The buttons and data return to white when complete:

Step	Action

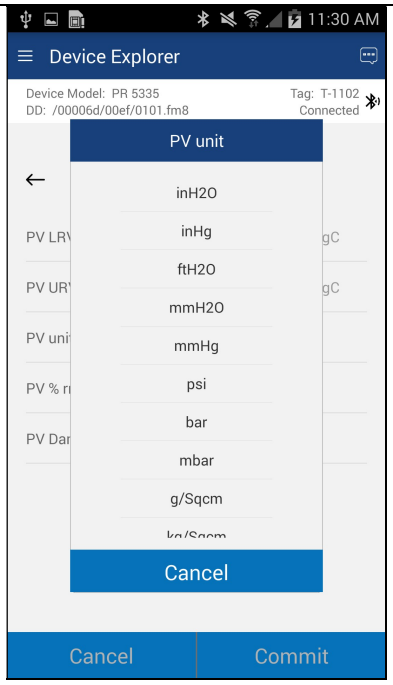


7 For Enumerated variables, the process is very similar. Start by selecting the menu where the desired parameter is located:

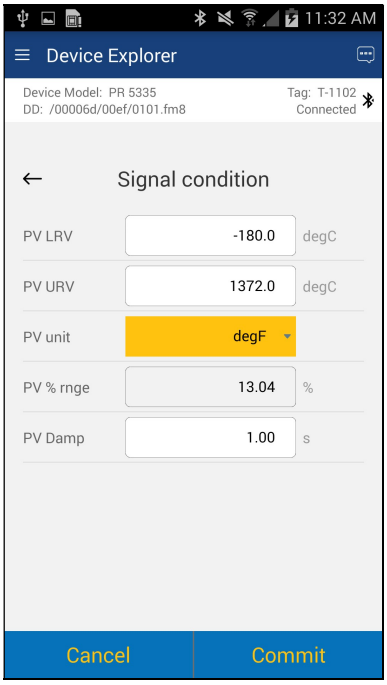


8 Select the variable data to edit it. A list will appear with the valid values to use:

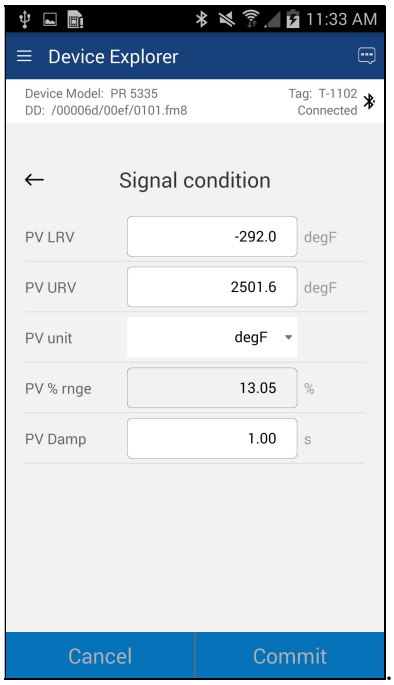
Step	Action



9	Select the value you wish to use.
10	Once selected, the list will disappear and the new value will be inserted into the data field. Note that the changed variable background is now Yellow and the “Commit” and “Cancel” buttons are also Yellow:



11	Click on the “Commit” button to send the new value to the

Step	Action
	device: 

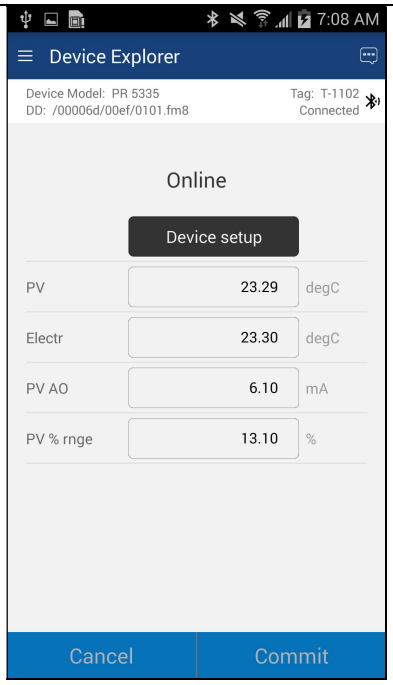
6.2.3 Edit Display

The Edit Display is a variation on the Variable edit. An additional window helps the user view a group of parameters based on the DD. You can also modify a single parameter from this group. Parameters linked to the edited field will be updated automatically

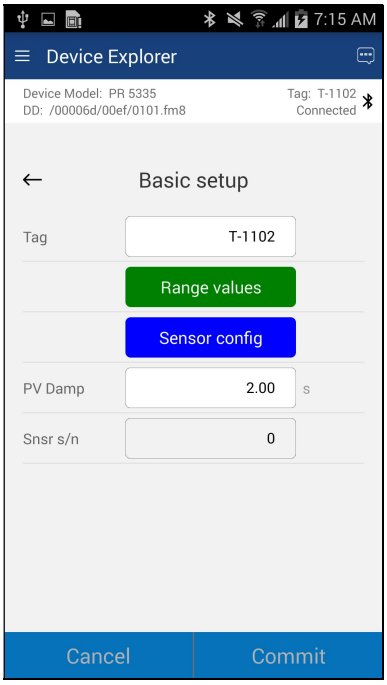
To view and configure these variables, perform the following steps:

Step	Action
1	Ensure that the application is running and communications have been established:

Step	Action

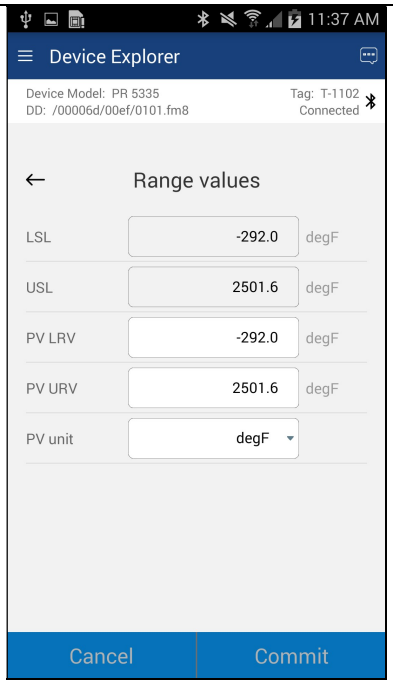


2 Select the menu where the editable parameter is present as shown below. For this example we want to edit URV from the Range Values Edit Display:

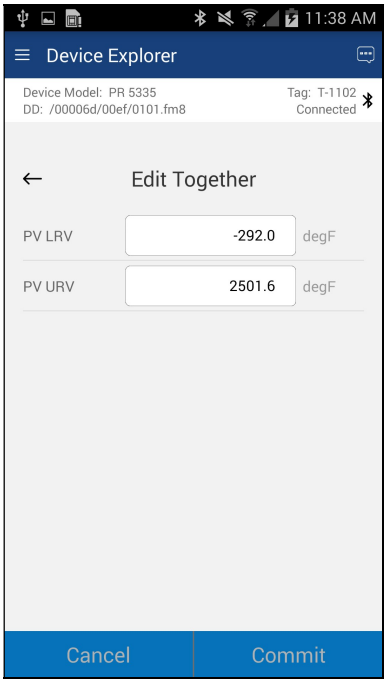


3 Once selected, the Edit Display looks like a regular menu as seen here:

Step	Action



4	Select the parameter you wish to edit from within the Edit Display box. The following dialog box appears on the screen:



5	Make the change to the value, as required.
6	Click on the “Commit” button to send the new value to the device.

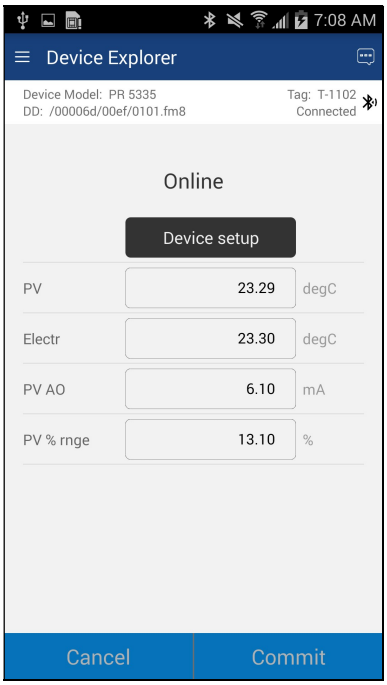
6.2.4 Executing Methods or Standard Operating Procedures

Methods are defined in the DD file for the device that DevCom is connected to. You can select the Method and execute it for calibrating the device, trouble shooting, etc. Method execution leads you through a number of steps, like in a wizard.

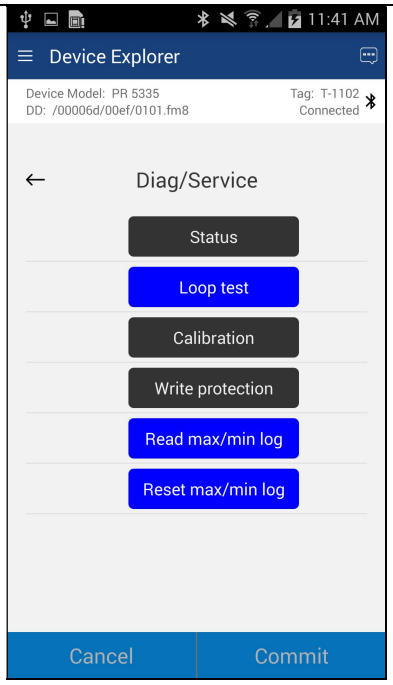
A Few examples of methods include,

Set high and low range calibration points
Calibrate the device
Run the advanced diagnostic test procedure
Execute tests to gather information on device operation.

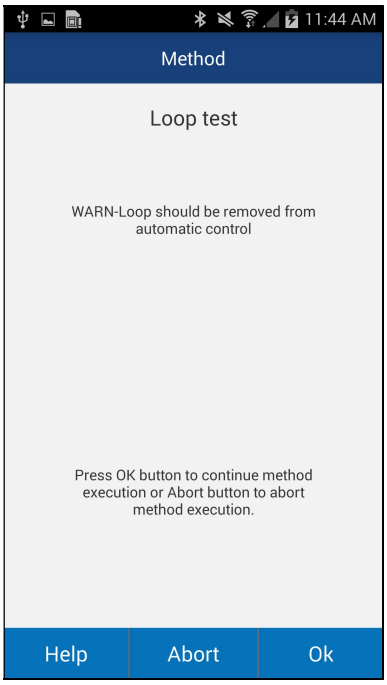
To execute a Method, perform the following steps:

Step	Action
1	Ensure that the application is running and communications have been established: 
2	Select the menu where the method is present and select the desired Method:

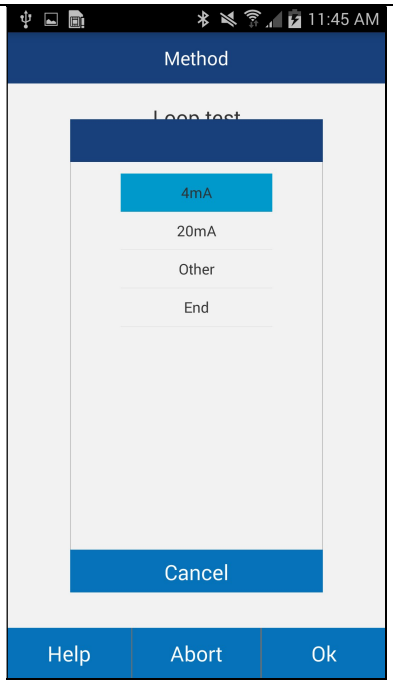
Step	Action



3 Below is an example of a Method window:



4 Click “OK” to move to the next dialog in the Method sequence. Some methods require more user input such as selecting an enumerated value as below:

Step	Action
	
5	Click "Abort" to cancel the Method execution.
6	Click "Help" to get specific help for that step of the Method. This Help information is provided by the device DD.

6.3 Calibrating HART Field Devices

Calibration of field devices and loop test are achieved by executing the Methods or Standard Operating Procedures that are specific to device. Methods are defined based on the test parameters specific to the device, providing information for the calibration of that device.

See the previous section for Method execution.

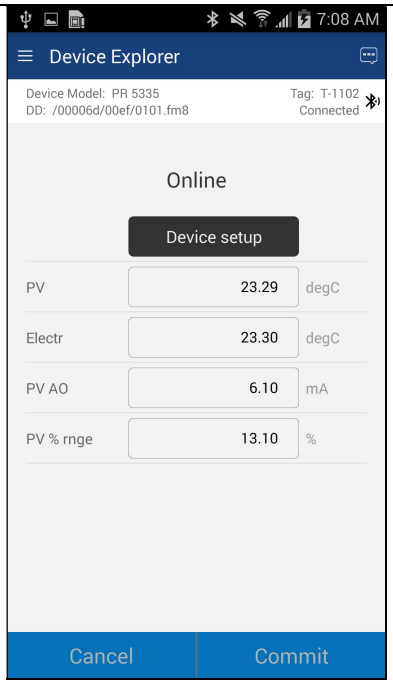
6.4 Viewing the Device Status

DevCom provides the user with the ability to monitor the device specific status of the device.

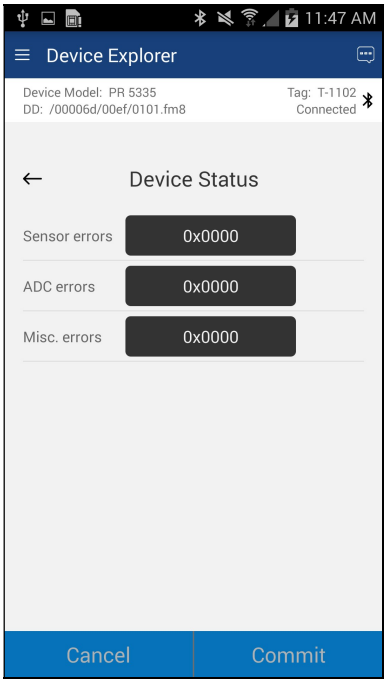
To view the device and status, perform the following steps:

Step	Action
1	Ensure that the application is running and communications have been established:

Step	Action

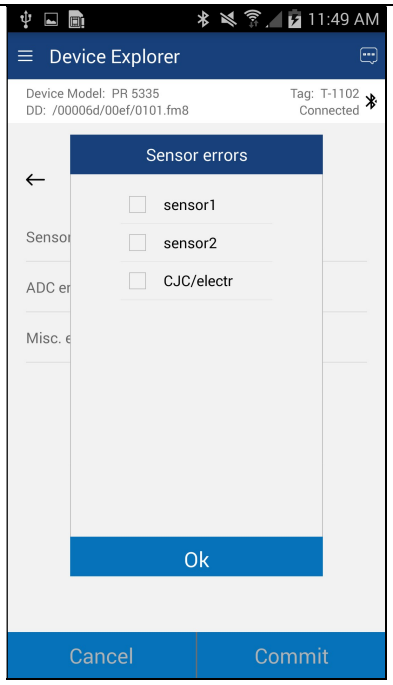


2 Select the Device Status icon. The following window is displayed:



The status byte is shown for each status point.

3 To see more details on which status point is active, select the status data. Here is a sample:

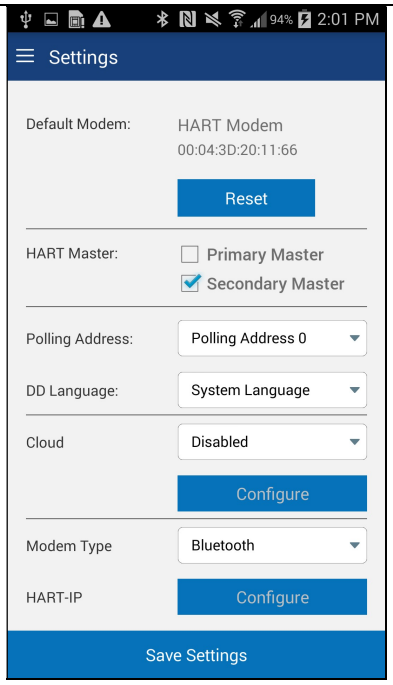
Step	Action
	
4	Click the Back hardware button to close the Device Status window. Or you can tap the ← soft key.

6.5 Window Detailed Description

6.5.1 Settings

There are several Settings that may need to be changed by the user to perform a desired activity. Below is a description of what Settings are available:

Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **Settings** from the main window. The Settings window is displayed:

Step	Action
	 Each Setting is explained below.

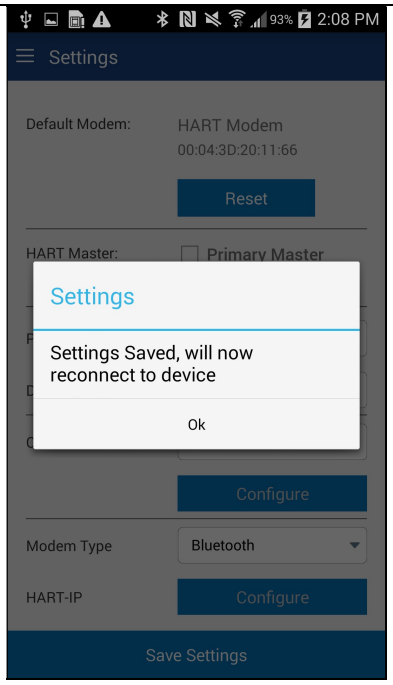
6.5.1.1 Default Modem

This option allows the user to disconnect the modem. Tap "Reset" to clear the modem from App memory.

6.5.1.2 HART Master

This option allows the user to select Primary Master or Secondary Master for Multi-master systems.

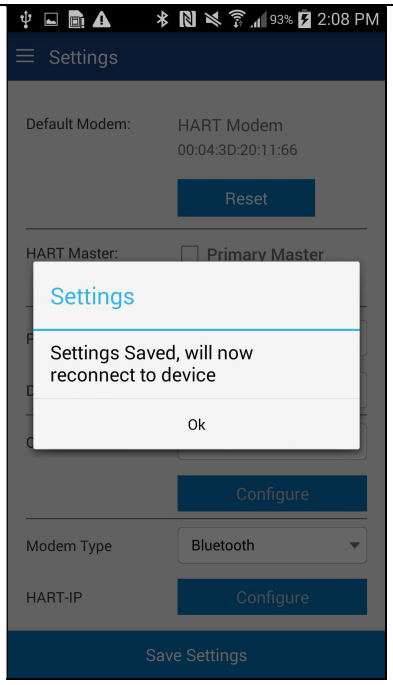
Step	Action
1	Select desired HART Master.
2	Tap "Save Settings" If a new HART Master was selected the following message will be shown:

Step	Action
	
3	Tap “OK” to return to the Device Explorer window.

6.5.1.3 Polling Address

This option allows the user to set the address to look for devices on Multi-drop networks. The default is address 0.

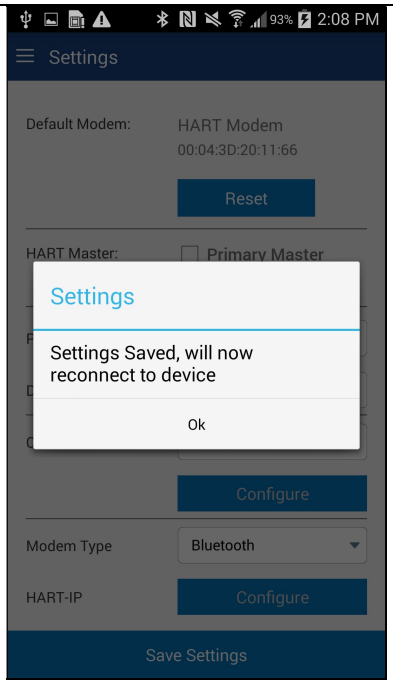
Step	Action
1	Tap the triangle next to the current Polling Address selection. A drop down list will appear with all the valid Polling Addresses. You may need to scroll to view the address you want.
2	Tap the desired Polling Address.
3	Tap “Save Settings”. If a new Polling Address was selected the following message will be shown:

Step	Action
	
4	Tap “Ok” to return to the Device Explorer window.

6.5.1.4 DD Language

This option allows the user to select which language the DD data will be presented. Note that all DD’s do not have each of these languages. In this case, English will be used. Also note that only the DD data is affected (currently), DevCom specific items will always be English.

Step	Action
1	Tap the triangle next to the current DD Language. A drop down list will appear with all the valid DD Languages. You may need to scroll to view the language you want.
2	Tap the desired DD Language.
3	Tap “Save Settings”. If a new DD Language was selected the following message will be shown:

Step	Action
	
4	Tap "Ok" to return to the Device Explorer window.

6.5.1.5 Cloud

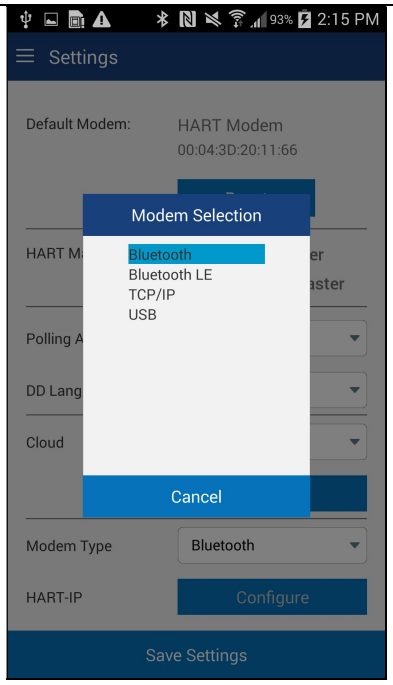
This option allows the user to enable or disable the cloud features for this device. See Section 6.9 for Cloud details.

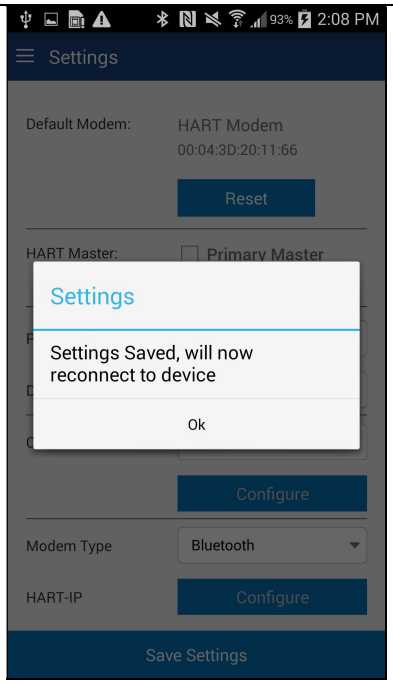
Step	Action
1	Tap the triangle next to the current Cloud setting. A drop down list will appear with the valid options.
2	Tap the desired selection. If "Enabled", then the Cloud Configure button becomes active. Tap this button to configure the Cloud User. See Section 6.9.1.
3	Note that it is not necessary to tap "Save Settings" for the Cloud setting.

6.5.1.6 Modem Type

This option allows the user to select which modem to use to connect to the HART Network. See Section 6.5.2.1 for Bluetooth, Section 6.5.2.2 for Bluetooth LE, Section 6.5.2.3 for USB, or Section 5.8 for HART-IP and the TCP/IP modem type.

Step	Action
1	Tap the triangle next to the current Modem. A drop down list will appear with all the valid Modem types.

Step	Action
	
2	Tap the desired Modem Type. Note that some Android devices may not support Bluetooth LE. An error message will appear if this modem type is not supported. Also note that if TCP/IP selected, the HART-IP Configure button becomes active. Tap this button to configure HART-IP parameters. See Section 6.8.1.
3	Tap “Save Settings”. If a new Modem Type was selected the following message will be shown:

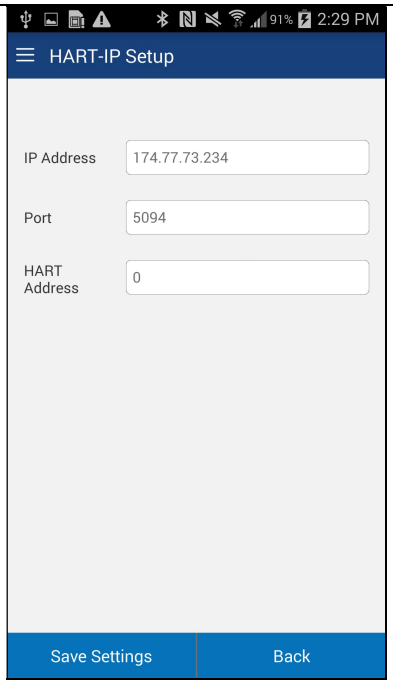
Step	Action
	
4	Tap “Ok” to return to the Device Explorer window.

6.5.1.7 HART-IP Setup

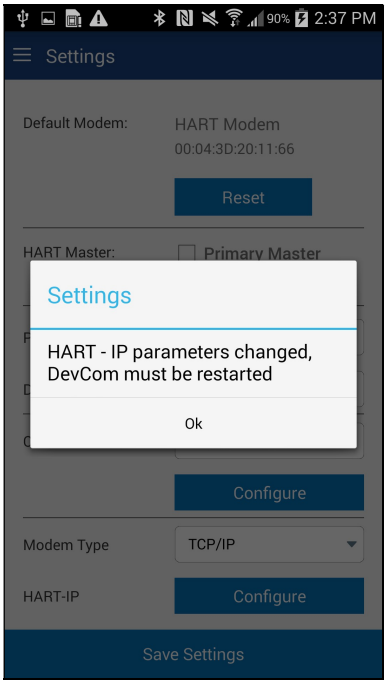
This option allows the user to select parameters for connecting to HART-IP supported device networks. See section 5.8 for HART-IP and the TCP/IP modem type.

Step	Action
1	Tap HART-IP “Configure” button to bring up the HART-IP Setup window.

Step	Action



2	Enter the required information to connect to your WirelessHART Gateway or HART-IP Multiplexer.
3	Tap “Back” to return to the Settings Window. You must Tap “Save Settings” on this window to save the data. If the HART-IP parameters where changed, you will receive this message:



4	Tap “Ok” and the DevCom App will restart with the new

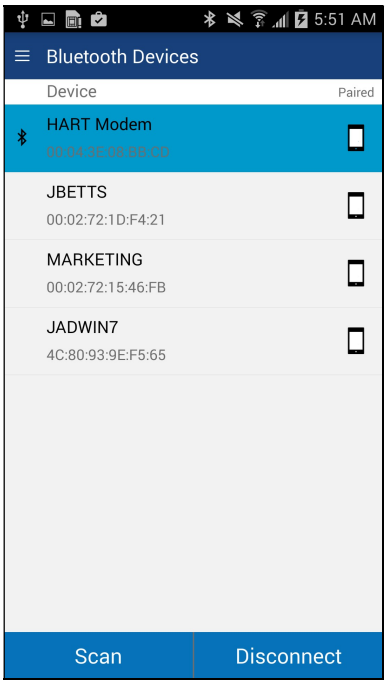
Step	Action
	HART-IP settings.

6.5.2 Bluetooth/Bluetooth LE/USB Devices

This window allows the user to view the current modem or to change what modem to use for communications. Each Window type will be discussed

6.5.2.1 Bluetooth

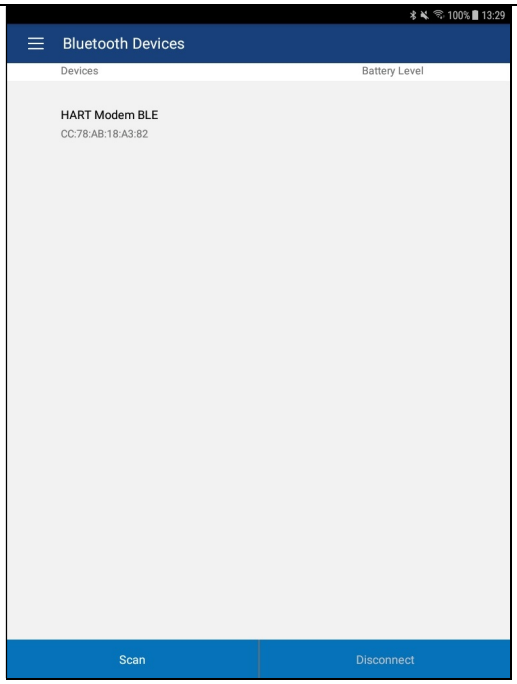
Step	Action
1	The Window will show all available Bluetooth devices with the current selected modem highlighted and/or marked with the Bluetooth icon.



2	Tapping the current HART Modem will restart the connection.
3	Tapping “Scan” will look for nearby Bluetooth devices.
4	Tapping “Disconnect” will remove the connection to the current HART Modem.

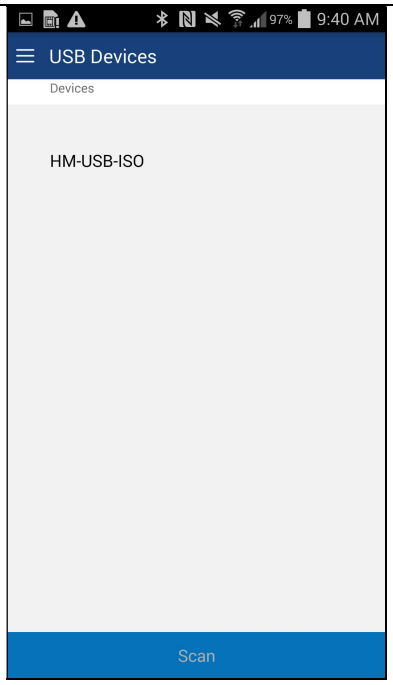
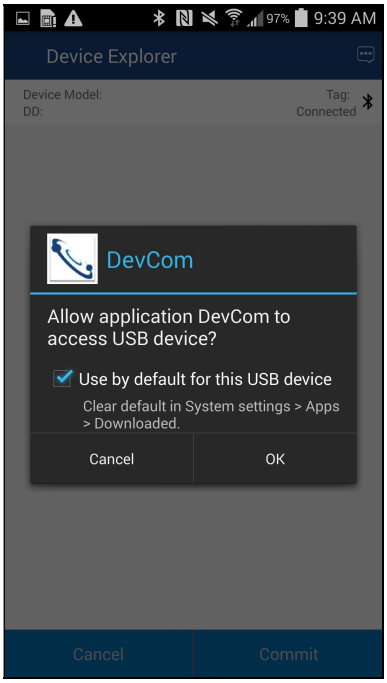
6.5.2.2 Bluetooth LE (Bluetooth Low Energy)

Step	Action
1	The Window will show all available Bluetooth LE devices with the current selected modem highlighted and/or marked with the Bluetooth icon.

Step	Action
	
2	Tapping the current HART Modem will restart the connection.
3	Tapping “Scan” will look for nearby Bluetooth devices.
4	Tapping “Disconnect” will remove the connection to the current HART Modem.

6.5.2.3 USB

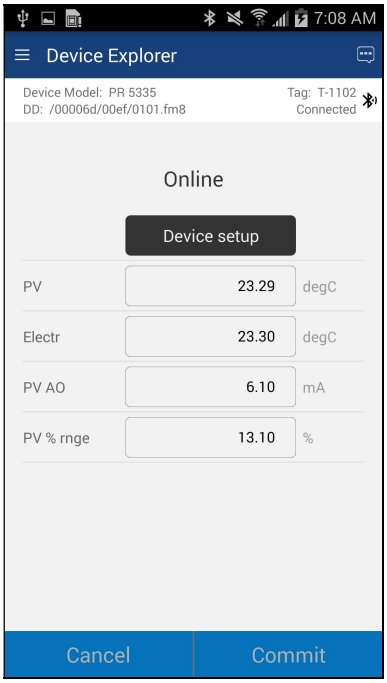
Step	Action
1	The Window will show the USB device with the current selected modem highlighted and/or marked with the USB icon.

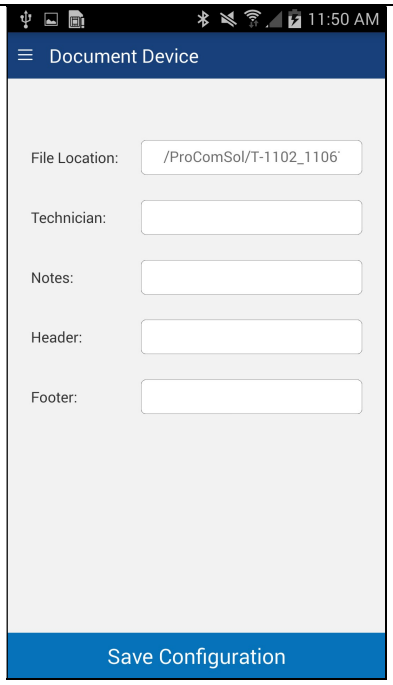
Step	Action
	
2	Tapping the current USB Modem will restart the connection.
3	When the USB modem is first accessed by DevCom, you will be prompted to allow the USB connection. Tap “Ok”. 

6.5.3 Document Device

HART Device configurations can be saved to memory as a comma delimited text file and formatted PDF file to document the device.

To save device configurations to disk, perform the following steps:

Step	Action
1	Ensure that the application is running and communications have been established: 
2	Select ☰ → **Document Device** from the main window. The Document Device window is displayed:

Step	Action
	
3	The default directory is \ProComSol. The default file name is Tag_Date_Time. The filename can be changed by the user. Edit the directory and filename as needed.
4	Enter Notes in the Notes field if desired. Enter Technician name in the Technician field if desired.
5	Enter Header and Footer information for the PDF file if desired.
6	Tap the "Save Configuration" button to save device configuration to text file and pdf file.
7	When complete, the pdf file will be displayed. You may need to select which App you want to use to display the file.

6.5.4 Download Config

The saved HART Device configurations can be viewed and even downloaded to other devices. If using Cloud functionality, also see Section 6.9.5.

To view saved device configurations, perform the following steps:

Step	Action
1	Select ☰ → **Download Config** from the main window. The Saved Configurations window is displayed:

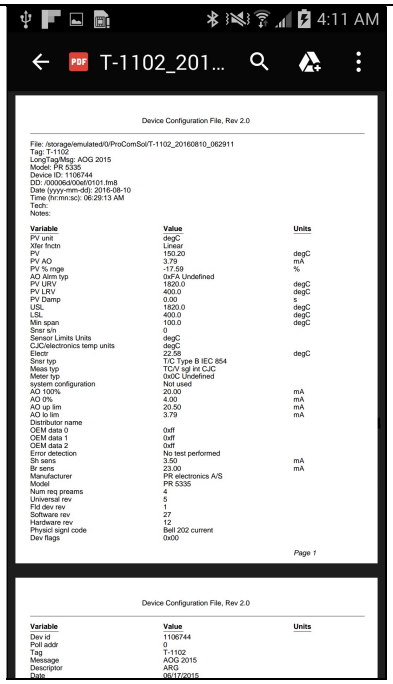
Step	Action
	 The icon means the configuration file is stored locally on the device.
2	The saved configurations are shown in the order they were created. You can scroll up and down the list if necessary.
3	Tap a configuration to view details of the configuration. When a configuration is tapped, the Configuration Detail window is displayed:

Step	Action

This window shows the details of the saved configuration.

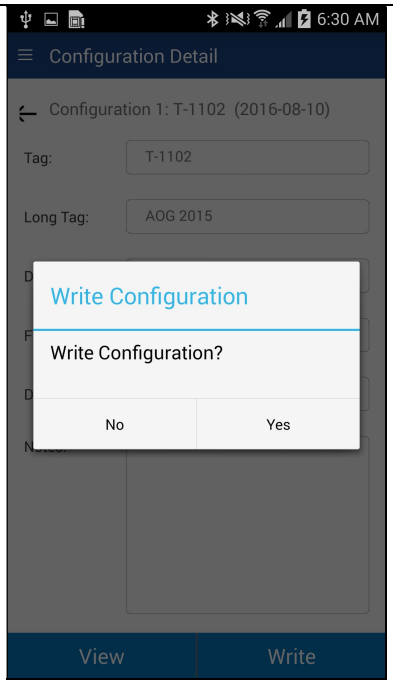
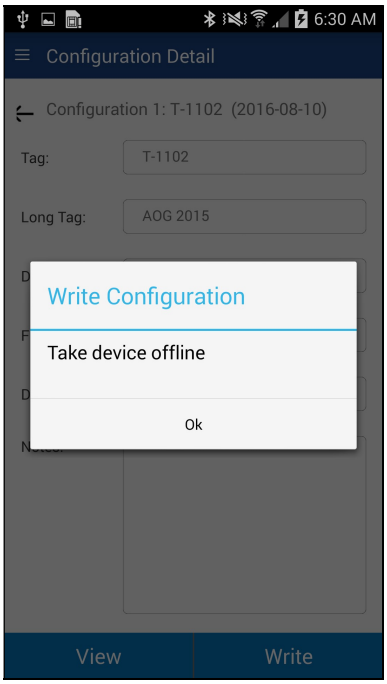
6.5.4.1 View Saved Configuration

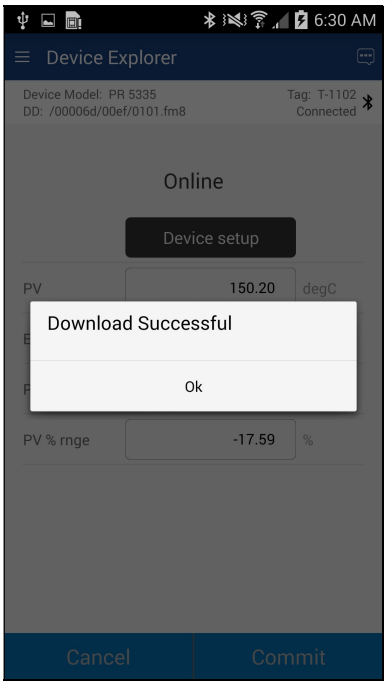
Step	Action
1	From the Configuration Detail window, tap “View”.
2	The PDF file for the saved configuration is shown using the Android device PDF viewer:

Step	Action
	
3	Tap the “Back” key to dismiss

6.5.4.2 Configuration Write

Step	Action
1	Ensure that the application is running and communications have been established.
2	From the Configuration Detail window, tap “Write”. The following Prompt is displayed:

Step	Action
	
3	Tap “Yes” to continue or No to go back to the Configuration Detail window.
4	If “Yes”, tapped, the following prompt appears:  This alerts the user that a configuration change can upset the process and the device should not be connected to the process.
5	Tap “Ok” when device is not connected to the process.

Step	Action
6	When the configuration write is complete, the following prompt will be displayed:  Also note that the connection to the device has been reinitialized in order to refresh the data in the App memory.

6.5.4.3 Configuration Browse

This function allows the user to bring configurations saved from another source into their device. The other source can be other DevComDroid users or even DevCom2000 users.

Step	Action
1	Copy the zzz.pdf, zzz.dc, and zzz.txt (where zzz is the configuration root file name) files to the Android device. The recommended directory is the /Download directory
2	Select ☰ → **Download Config** from the main window. The Saved Configurations window is displayed:

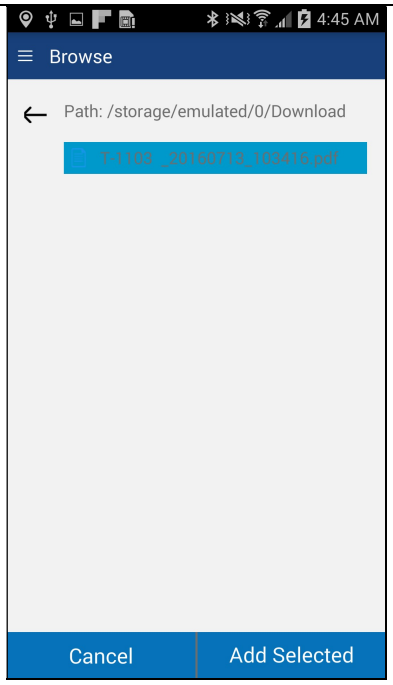
Step	Action

3 Tap “Browse”. The Browse window is displayed:

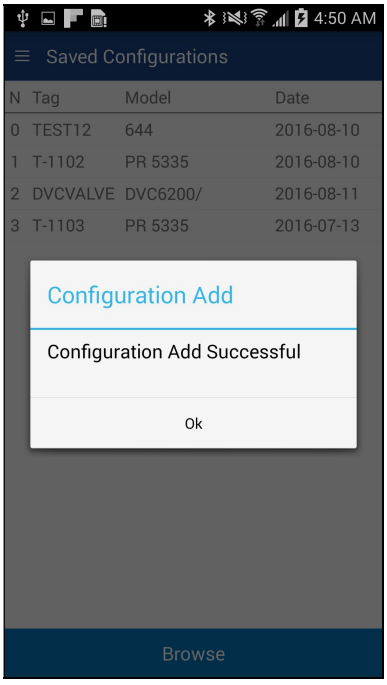
This window will just show the .pdf files. You can navigate to other directories using the Back key.

4 Select the desired configuration to add to the device. Once selected the Add Selected button becomes active:

Step	Action



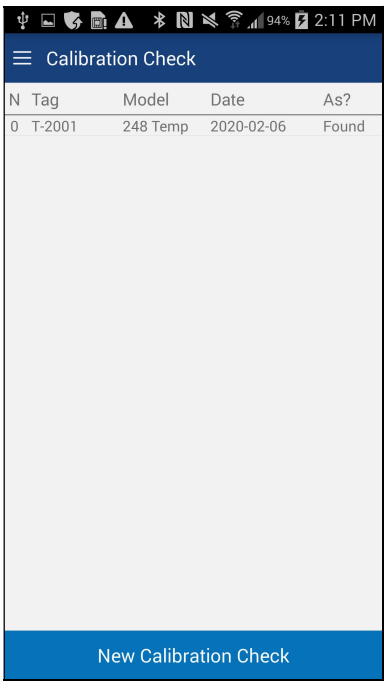
5 Tap “Add Selected”, and the following prompt appears when the Configuration Add is complete:

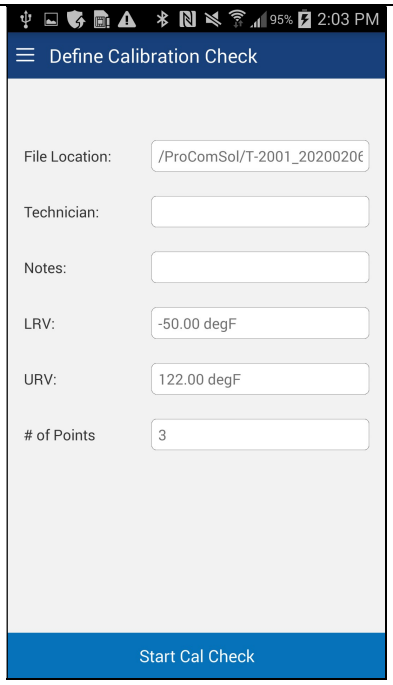


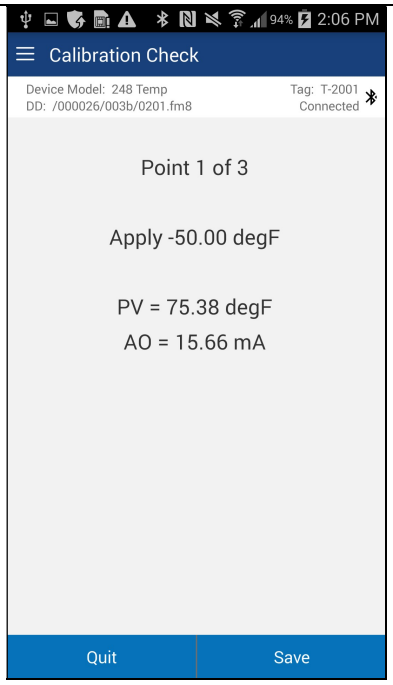
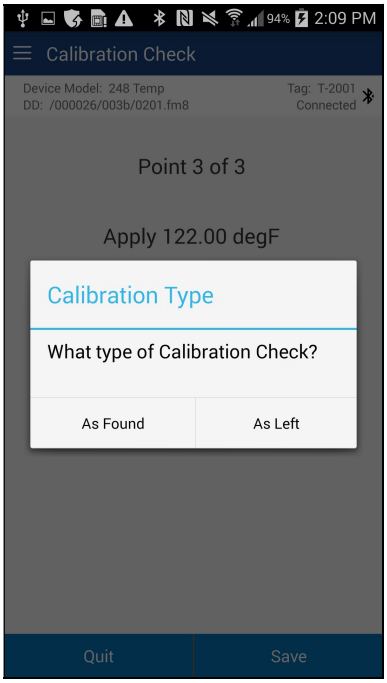
6.5.5 Calibration Check (Cal Check)

Calibration Check is feature that with an external calibrator, turns the DevCom App into a documenting Calibrator. It is a simple check to see if the HART device measurement results match the input value. The user picks the

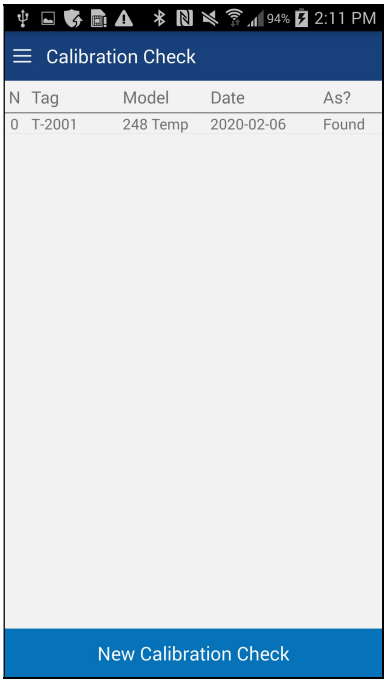
number of points to check between the LRV (Lower Range Value) and the URV (Upper Range Value). The results are stored for later analysis.

Step	Action
1	Select ☰ → **Calibration Check** from the main window. The list of performed Cal Checks is displayed: 
2	From here you can view previous Calibration Checks or create a new one. Tap "New Calibration Check" to start a new one.

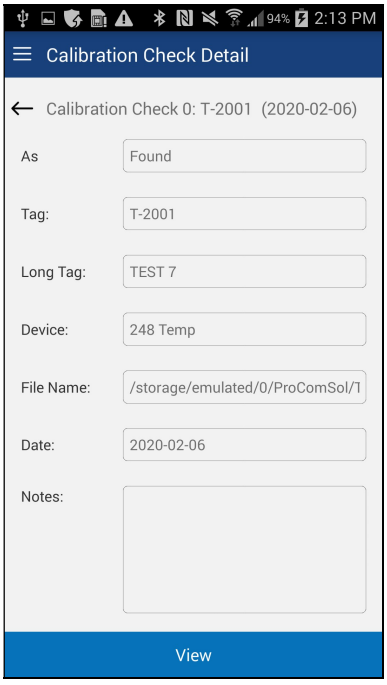
Step	Action
	
3	The default directory is /ProComSol. The default file name is Tag_Date_Time. The filename can be changed by the user. Edit the directory and filename as needed.
4	Enter Notes in the Notes field if desired. Enter Technician name in the Technician field if desired.
5	URV and LRV are read from the connected device. These are Read only.
6	Number of Points is the number of calibration check points you wish to examine between (and including) the LRV and URV values.
7	Tap “Start Cal Check” to begin.
8	The Cal Check now steps through each point telling the user what value to apply to the HART device using an external calibrator.

Step	Action
	
9	Tap "Save" to move to the next calibration point. Apply the new input value and keep repeating until all points are saved.
10	After the last point is saved, the user is asked if this is an "As Found" or an "As Left" calibration check.
	
	Tap the appropriate response and the Cal Check is Done.
11	To view the results, tap the desired Cal Check record in the

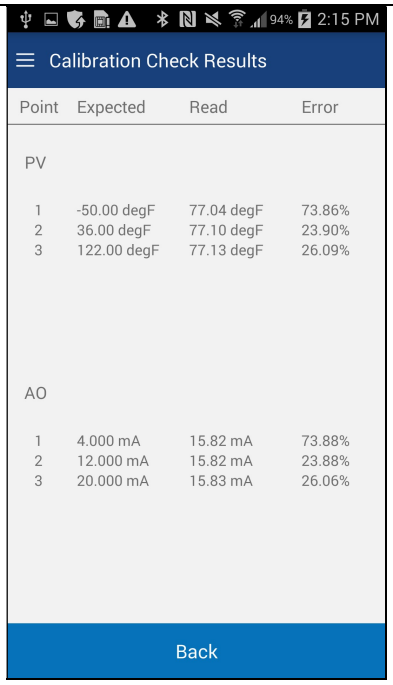
Step	Action
	Calibration Check window.



12	A Calibration Check Detail window is shown.



13	Tap “View” to see the Cal Check Results.

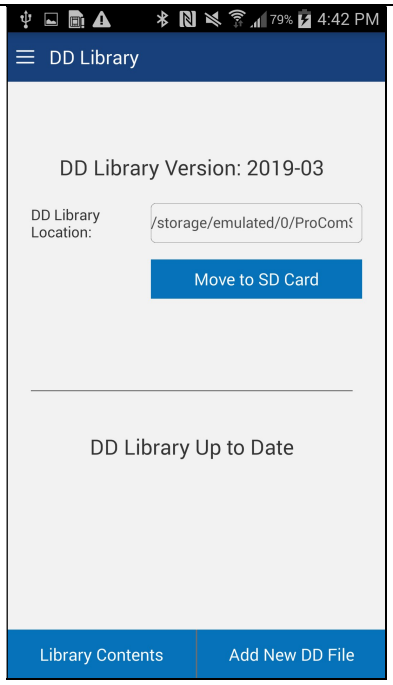
Step	Action
	 Note that Error is % of scale.

6.5.6 DD Library

This window allows the user to move the DD Library to the SD Card (if available), view the library contents, and even add new DD files to the library.

6.5.5.1 Move DD Library

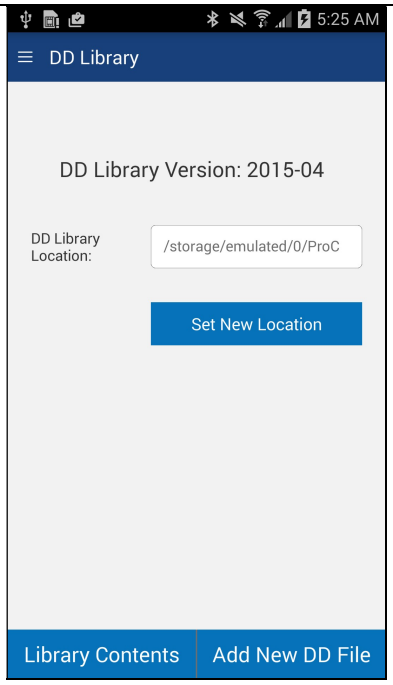
Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **DD Library**. The DD Library Window is displayed:

Step	Action
	
3	Tap “Move to SD Card” to move the library from the main memory to the SD Card. This button will be shown if an SD Card is available.

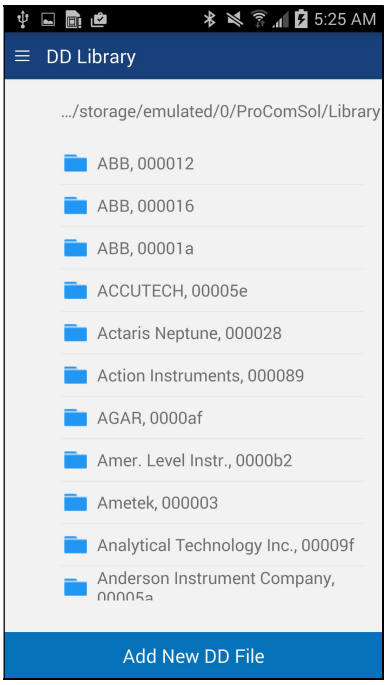
6.5.5.2 View DD Library

Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **DD Library**. The DD Library Window is displayed:

Step	Action

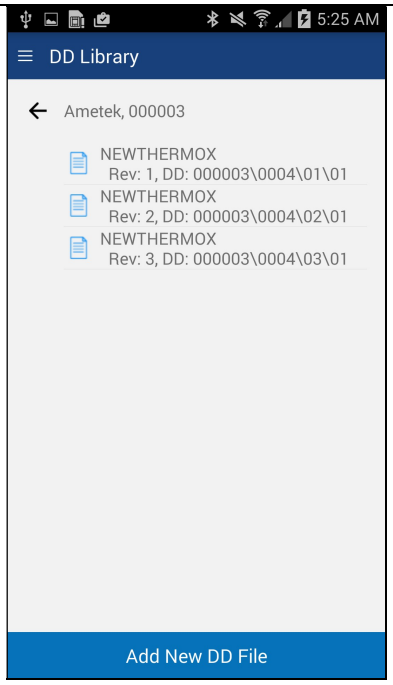


3 Tap “Library Contents” The following Window is displayed:



The list of manufacturers is shown in alphabetic order.

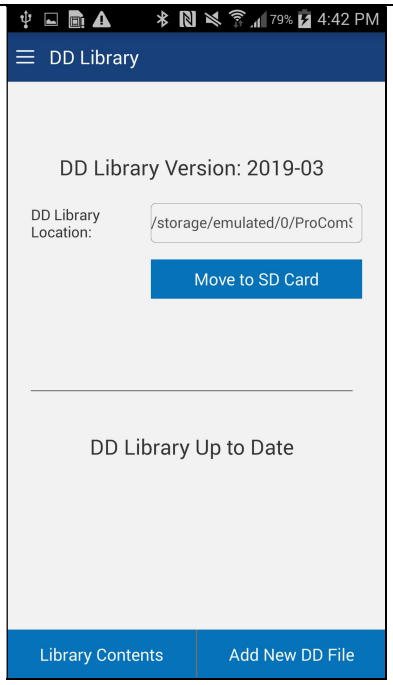
4 Select a manufacture and the list of devices for that manufacturer are displayed:

Step	Action
	

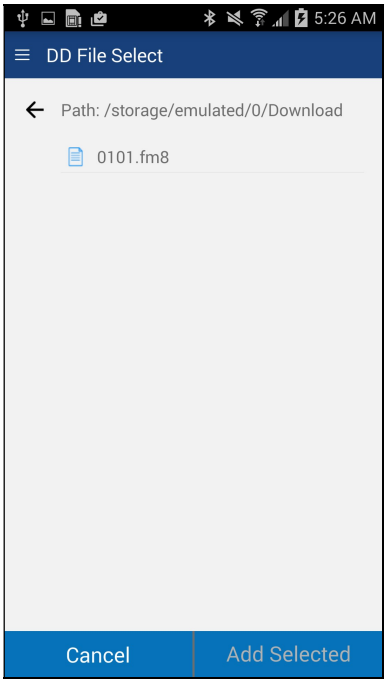
6.5.5.3 Add File to DD Library

Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **DD Library**. The DD Library Window is displayed:

Step	Action

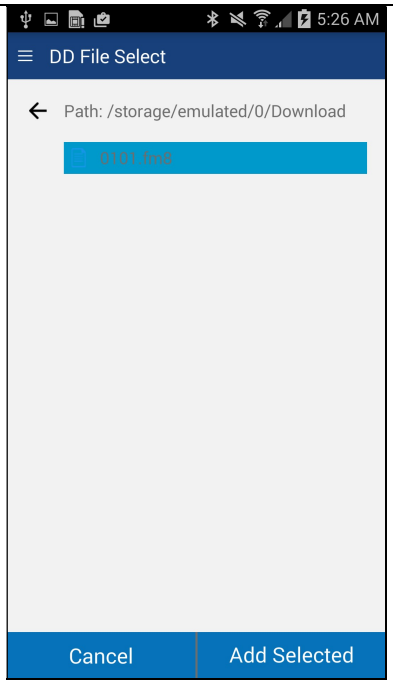


3 Tap “Add New DD File” The following file selection Window is displayed:



Use the <- key to navigate the device file structure until you find the file you would like to add.

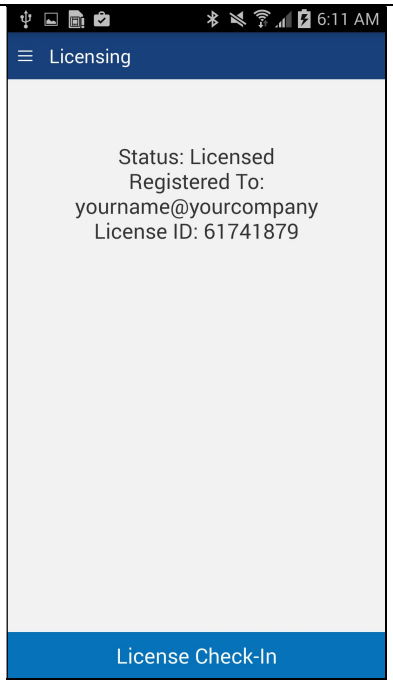
4 Once the desired file is found, select it to activate the “Add Selected” Button.

Step	Action
	 Tap "Add Selected" to add the file to the DD Library.

6.5.7 Licensing

The user may need to review license status to get the number of days left in the evaluation for example. This window shows License details.

Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **Licensing**. The Licensing Window is displayed:

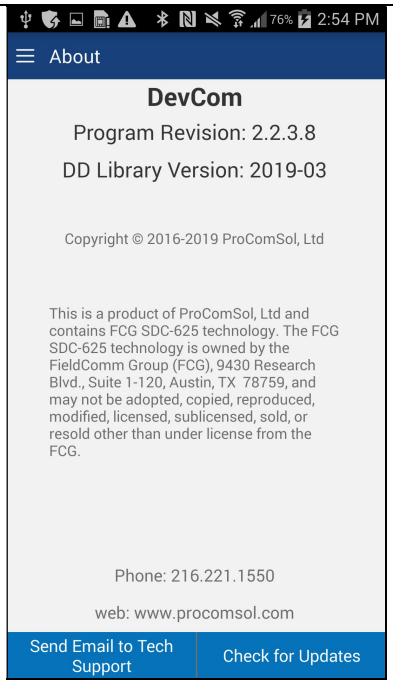
Step	Action
	 This image shows an Activated license.
3	Tap the "License Check-In" to send the license back to our server. It can then be used on another Android device. This makes sharing licenses easy and convenient.

6.5.8 About

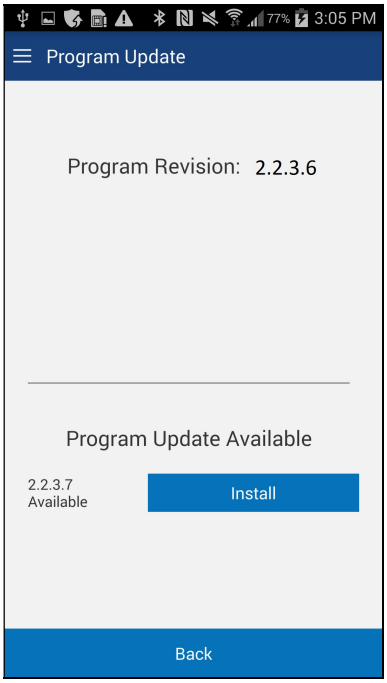
This window summarizes revision status and provides support contact information for the DevCom App:

Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **About** from the main window. The About window is displayed:

Step	Action



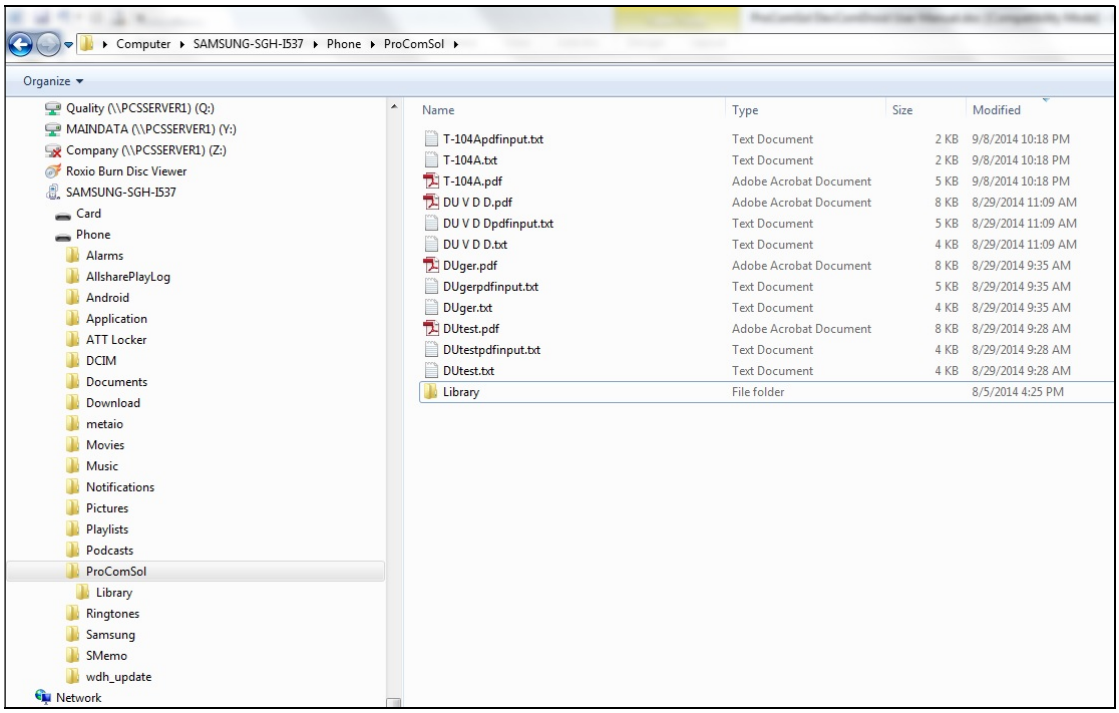
3	Tap “Send email to Tech Support” to bring up your Email App which you can then send to ProComSol to get help for your issue.
4	Tap “Check for Updates” to see if an App update is available.



5	Tap “Install” to copy the .apk file to your device.

6.6 PC Interface to Mobile Device

The Windows Explorer program is a convenient way to copy configuration files back to the PC for archiving and storage. The Android device looks like a disk to the Windows file system. Below is an example screen shot:



The default location for the saved configuration files is the directory "\ProComSol". Simply highlight the desired files and copy to your PC. Once on the PC, they can be viewed or imported to many different software packages.

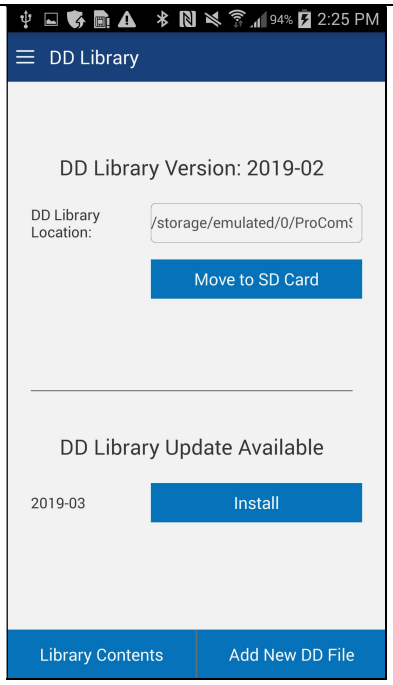
6.7 DD Library Updates

The DD Library is update approximately four times per year. There are new devices added and current DDs updated. Note that a DD Library update will NOT affect DDs that you added yourself. Users who provide their Email address to ProComSol will be notified when DD Library Updates are available. The Email will provide detailed instructions on how to obtain the update.

The DevCom App also notifies the user of an update with a "Push Notification" from our server. Also, simply go to the DD Library window to see if an update is available as shown below:

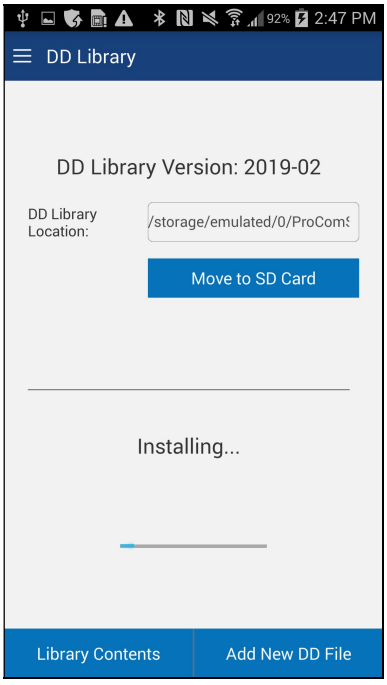
Step	Action
1	Ensure that the application is running. Communications do NOT need to have been established.
2	Select ☰ → **DD Library**. The DD Library Window is displayed:

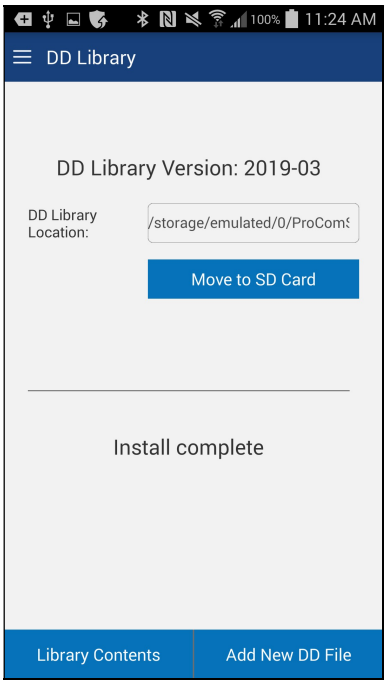
Step	Action



The App contacts the ProComSol server to see if a newer version is available and shows an Install button if yes. Tap the "Install" button to begin download and installation of the DD Library Update.

3 A progress bar shows the status of the update. Speed depends on the quality of your internet connection. Do not close this screen during an update!



Step	Action
4	The user is notified when the download and install is complete. 

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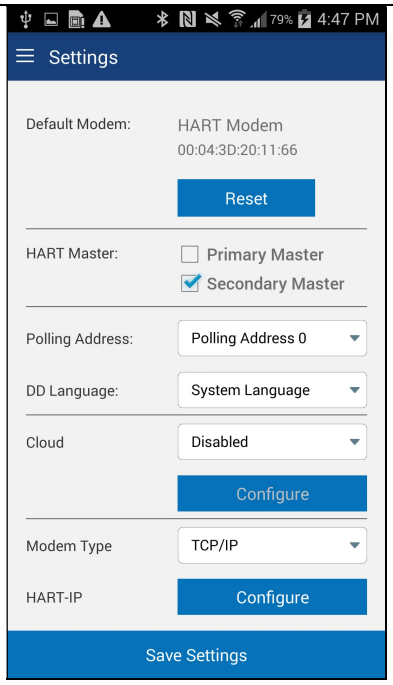
6.8 HART-IP Interface

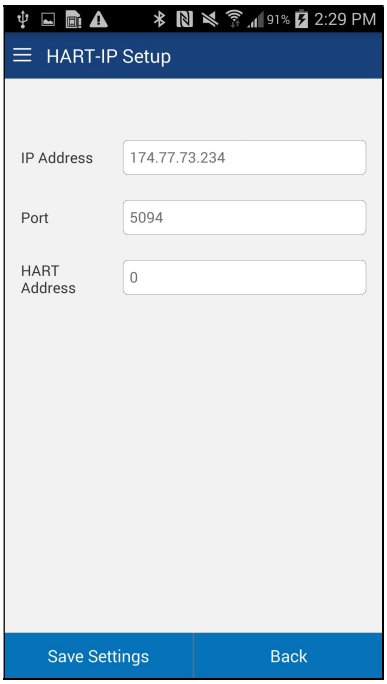
6.8.1 Setup

DevCom allows you to connect to your WirelessHART network using HART-IP over an Ethernet connection to the networks WirelessHART Gateway. Once connected to a device, DevCom behaves just like connected via a modem. You can view data, edit parameters, etc. Below is the procedure for setting DevCom to use HART-IP and for connecting to a HART device:

Step	Action
1	Go to the Settings Window and change the “Modem Type” to “TCP/IP”:

Step	Action

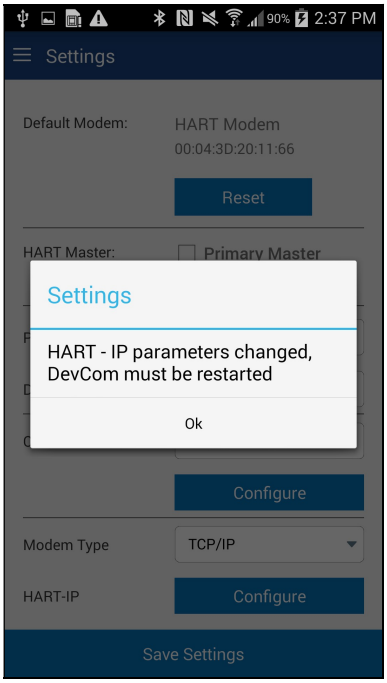


2	The HART-IP Configuration button is now active. Tap it to bring up the HART-IP setup window.
3	

The default network IP address is the ProComSol demo WirelessHART network. It is used to demonstrate the HART-IP features of the DevCom App.

4	Make the necessary edits for your WirelessHART Gateway and

Step	Action
	tap “Save Settings”.
5	Note that if changes were made to the HART-IP settings, you will need to restart DevCom.



6.8.2 Connecting to a Device

Once the connection to the WirelessHART Gateway is configured, restart DevCom. The App will then connect to the WirelessHART Gateway and retrieve network hierarchy information. This section describes how to then connect to the desired device.

Step	Action
1	Once the network hierarchy information is retrieved, it is displayed in the Gateway Network window. Note that the example below if for the ProComSol Demo network and that your network will look different:

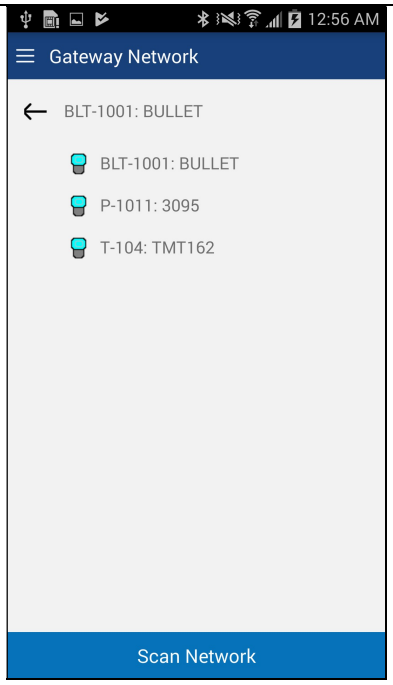
Step	Action

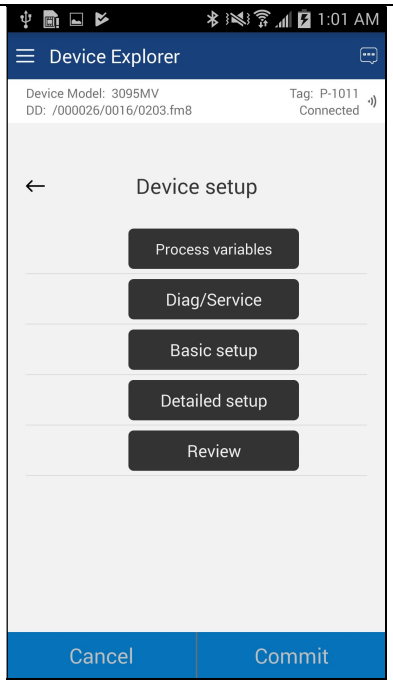
Item description:

Wihartgw – is the Tag for the WirelessHART Gateway

BLT-1001:BULLET and others are devices on the WirelessHART network that have sub devices.

2	Tap “Scan Network” if you want to refresh the Gateway Network window.
3	Tap a device to show the sub-devices connected to it. Note that native WirelessHART devices will have itself as a sub-device. Below is the screen that shows after BLT-1001:BULLET is tapped. Again this is on the ProComSol Demo network:

Step	Action
	 Item description: BLT-1001:BULLET – is the root device P-1011: 3095 and others are the sub-devices connected to the root device.
4	Tap any of the sub-devices to connect to that device. The display then looks just like a modem connected device. The only difference is that the Bluetooth Activity icon is now the Wireless Activity icon as seen here:

Step	Action
	
5	You are now connected to the device and can perform any DevCom function you like as if you were connected locally through a modem.

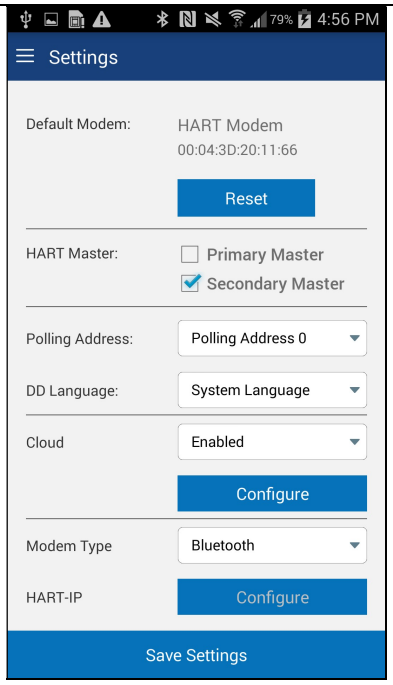
6.9 Cloud

6.9.1 User Setup

DevCom allows you to create a Cloud account on the ProComSol server. You can then store your device configuration data in a safe, secure, off-site server. This protects your data and allows you to share your configuration with your team members. Team members must join a Group in order to share data with other Group members. To get started you need to purchase a Cloud Subscription. Then you create your User Account and Create or Join existing Groups as needed. To get started, go to the Settings window.

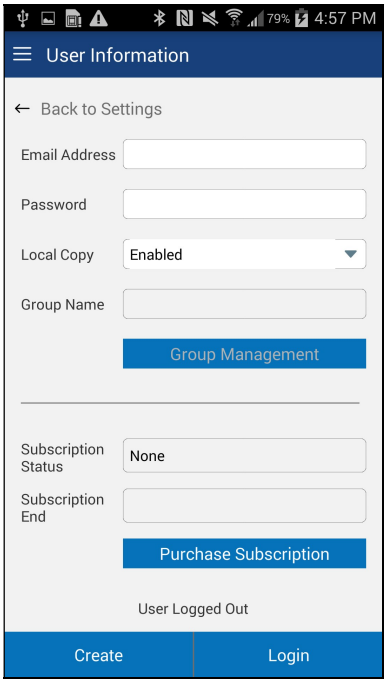
Step	Action
1	Go to the Settings Window and change Cloud from Disabled to Enabled:

Step	Action

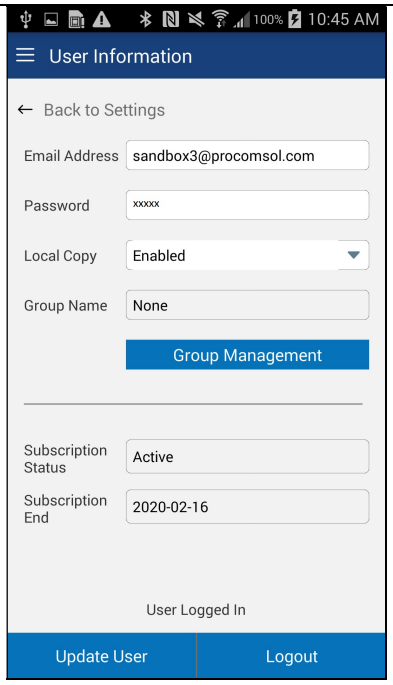


This will enable the "Configure" button.

2 Tap "Configure" to bring up the User Information Window.



3 Enter your email address and a password. Decide whether you want a local copy of your configuration data stored on this device or that you just want the data to go to the Cloud only. Set "Local Copy" appropriately. Then tap "Create" to create your account. Below shows a successful account creation:

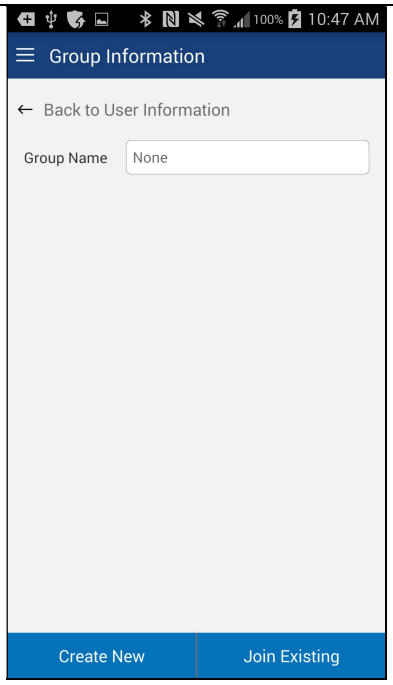
Step	Action
	

6.9.2 Group Create

Once you create your user account you can create a new Group for sharing your configurations or you can join an existing Group. If you Create a Group, you are the Admin for that Group. This allows you to invite team member, approve team members that request to join, and to manage Group membership going forward. To setup or manage Groups, tap the "Group" button. The Group Information window then appears.

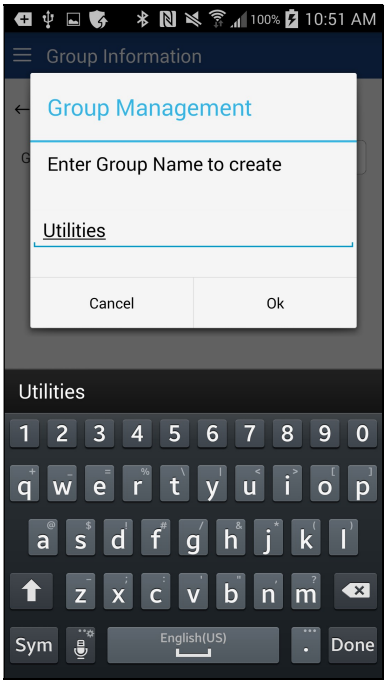
Step	Action
1	Tap "Group Management" to bring up the Group Information window.

Step	Action



From here you can Create a new Group as an Administrator, or Join an existing Group.

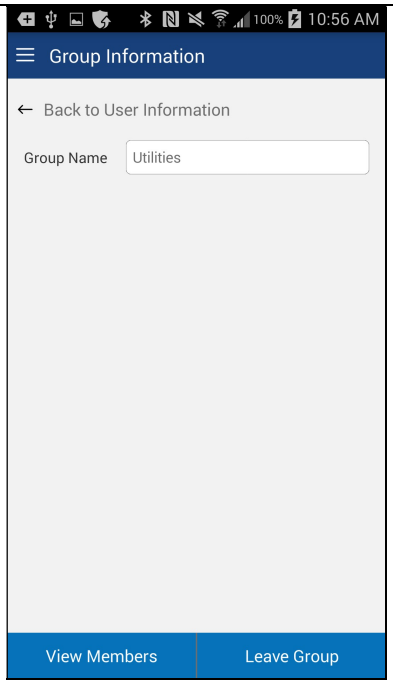
2 Tap “Create New” to create a new Group.



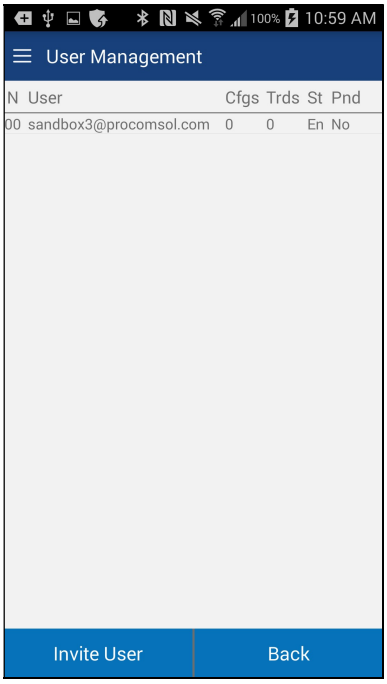
Type a new Group Name in the box and tap “Ok” to create.

3 After the Group Creation Success message, the window now looks like below. From here you can View the other group members or Leave the Group.

Step	Action



4 Tap “View Members” to see the members in this Group.



Columns Explained for this Admin User:

N - Simple index of members

User - The email address of the user

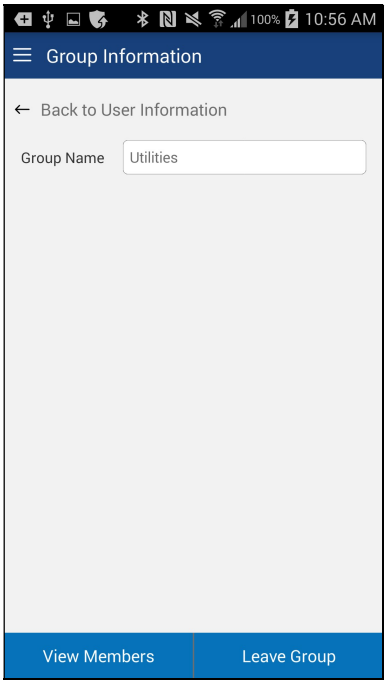
Cfgs (Configurations) - Number of Configurations this user has on the cloud.

Trds (Trends)- Number of Trends this user has on the cloud.

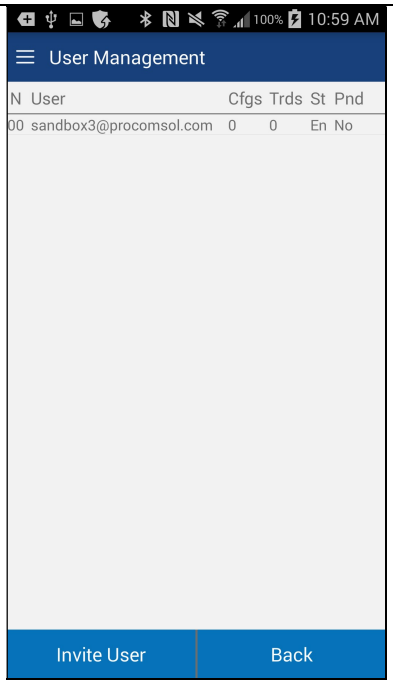
Step	Action
	Trends is an upcoming feature. St (State)- The State of this user. En is Enabled, and Ds is Disabled. Pnd (Pending)- The Group Join state of this user, known as Pending. If Yes, the user has requested to join this group and the Amin needs to Accept or no. Note that the above screen is for the Admin of this Group. If not the admin, the logged-in user can only see N, User, Cfgs, and Trds data.

6.9.3 Group Join, Admin Invite

The Admin for a group can invite other users to join. Once invited, the user will have to log-in and accept the invitation in order to have Group access. This section describes this process. Note that this logged-in user is an Admin for his Group.

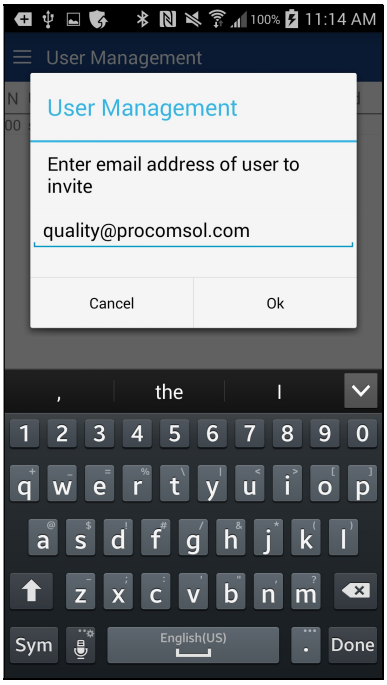
Step	Action
1	The Admin user logs in and Taps the "Group Management" button to get to the Group Information window.  From here you can Create a new Group as an Administrator, or Join and existing Group.
2	Tap "View Members" to see the members in this Group. The User Management window appears.

Step	Action



Tap “Invite User” to invite a user to join the group.

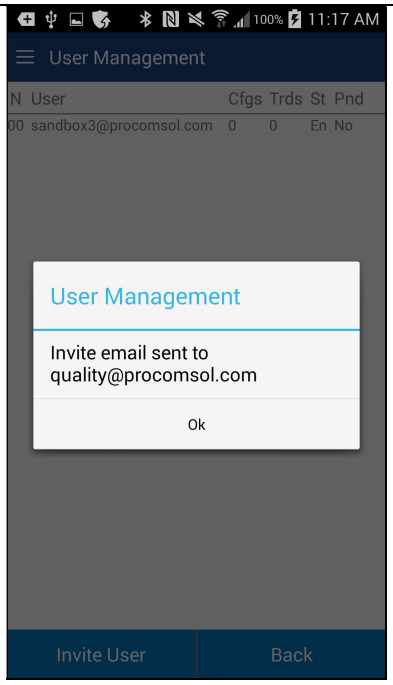
3 Enter the email address of the user you wish to invite. Note that the user does not yet need to be created. .



Tap “Ok” when done.

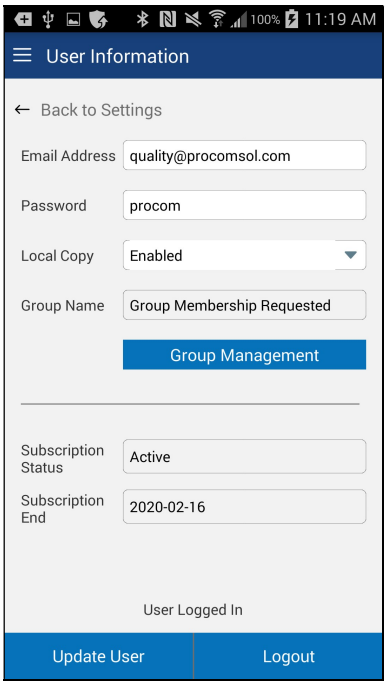
4 An email is sent to the user to prompt him to create an account and join this Group.

Step	Action

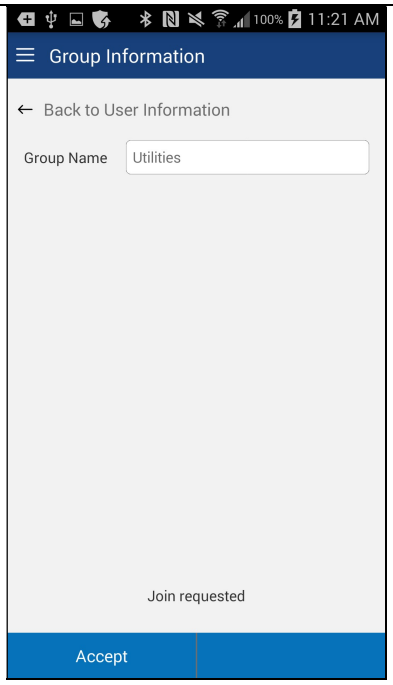
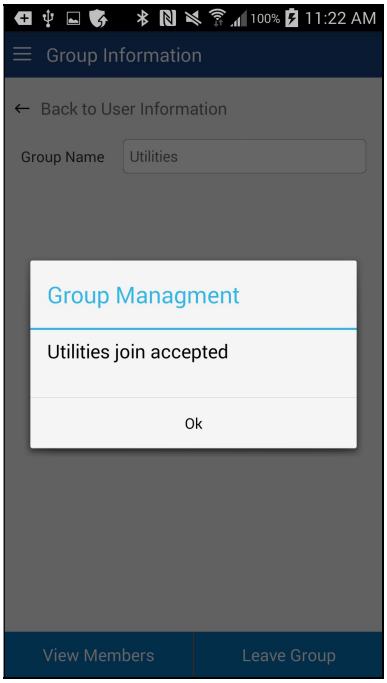


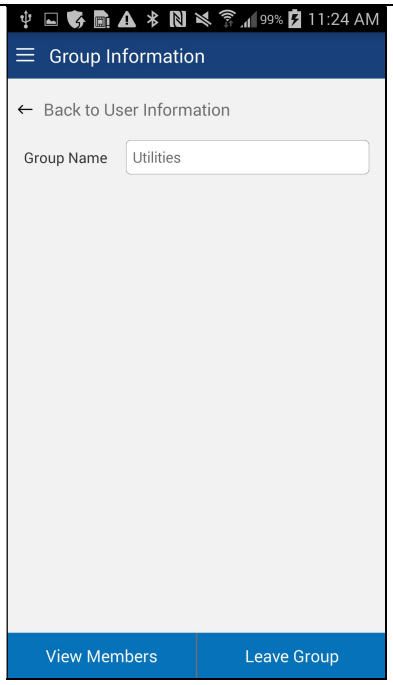
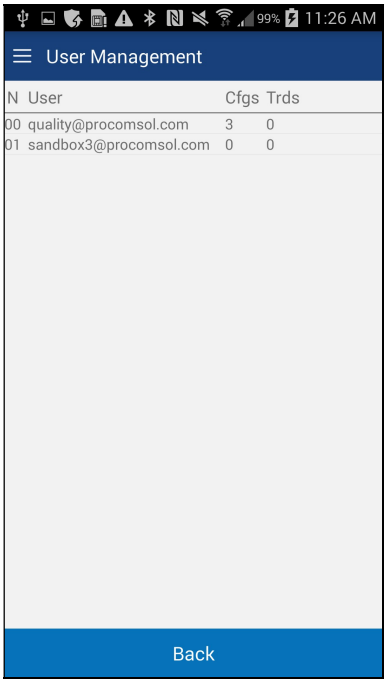
Now the Admin waits until the invited user acknowledges the invite.

5	The invited user logs in to their Cloud account and will now see a membership request message.



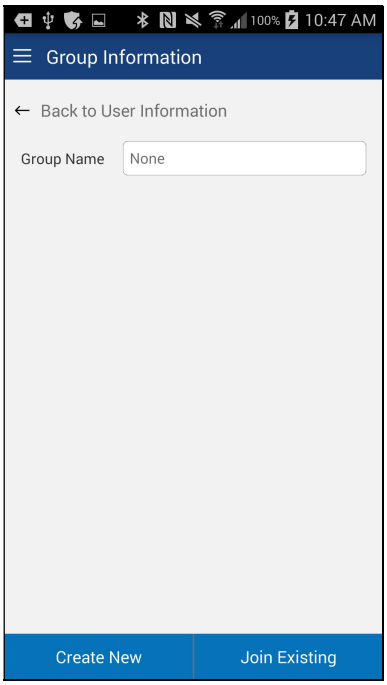
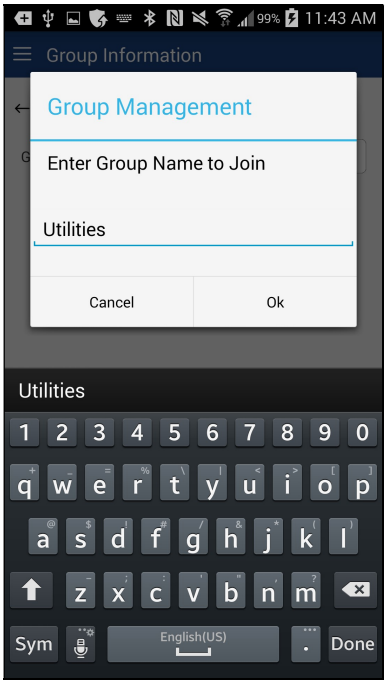
6	The user taps “Group Management” to get details on this invite.

Step	Action
	
7	Tap “Accept” to join the group. If successful, the window below is shown: 
8	Now the user can View the other members in this group.

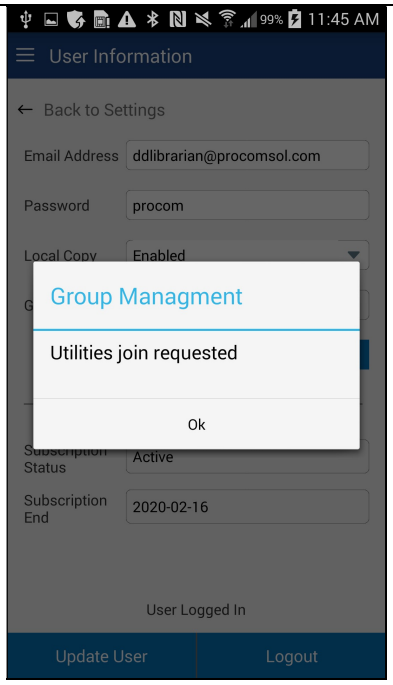
Step	Action
	
9	Tap “View Members” now shows a slightly different window since this user is NOT an admin. 

6.9.4 Group Join, User Request

The other way a user can join a Group is by requesting membership. Once requested the Admin must approve the join request. This section describes this process. Note that this logged-in user is NOT an Admin for his Group.

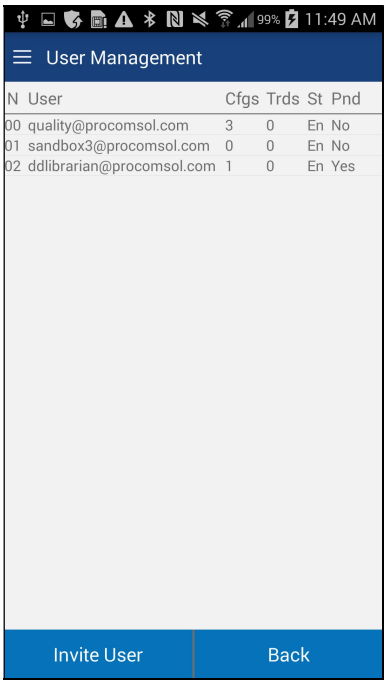
Step	Action
1	The non-Admin user logs in and taps the “Group Management” button to get to the Group Information window.  Tap “Join Existing” to join an existing Group.
2	Enter the Group Name in the prompt.  Tap “Ok” when done.
3	If the Group exists, you will see a success message.

Step	Action

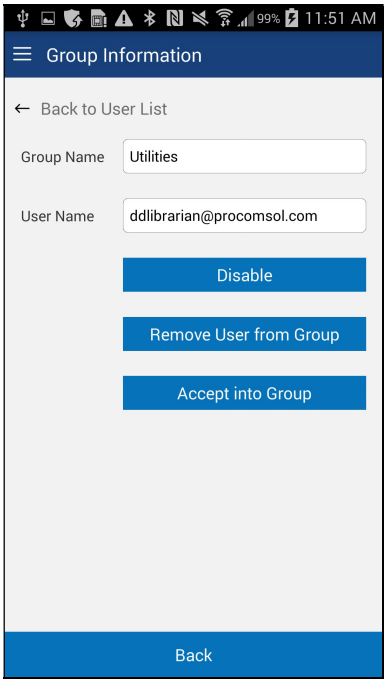


Now this user must wait until the Admin acknowledges the Join request.

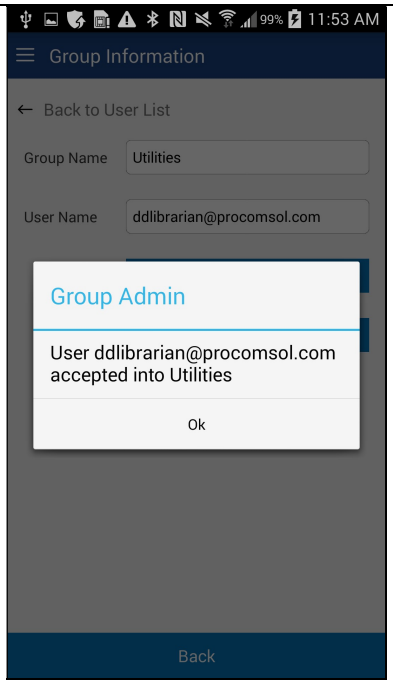
4 The Admin user logs in and goes to the User Management window by tapping Group Management->View Members. The requesting user is now shown in the list with Pnd (Pending) set to Yes.



The Admin taps the new user to bring up the Group Information

Step	Action
	window.
5	 Disable - The user cannot log-in. Remove User from Group - The user is removed from the Group but can still log-in to see their own data. Accept into Group - User has asked to join this group. The Admin decides if this user should join. In our use case here, Accept the join request from this user. Tap "Accept into Group".
6	If successful, the prompt below is shown.

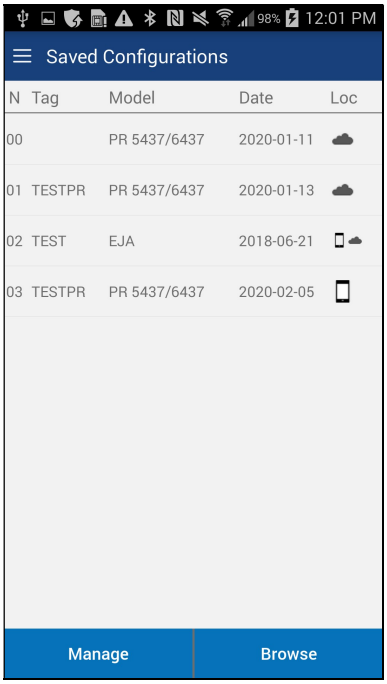
Step	Action



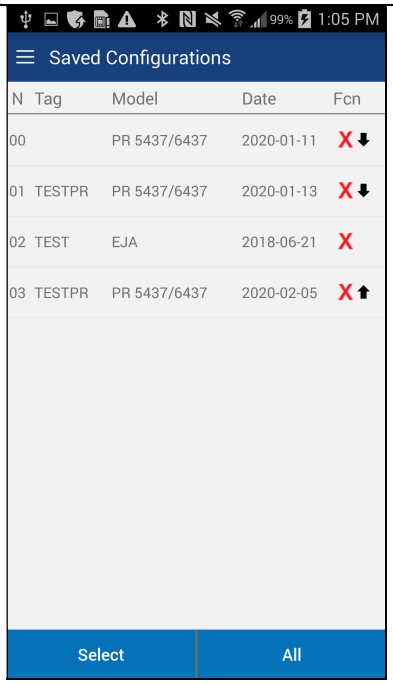
7 The Pnd (Pending) status is now no:

6.9.5 Cloud and Saved Configurations

Once the user is created and joins a Group, he now has access to all the configurations saved by the Group members. These will now show in the Download Config window along with the user's own saved configurations. The Saved Configurations window now has more information and functions. This section describes the new information and functions.

Step	Action
1	Tap the “Download Configs” window item on the Hamburger menu to bring up the Saved Configurations window. Below is a sample.  The icons in the Loc (Location) column have special meanings: Configuration is stored in the Cloud only Configuration is stored locally on this device only Configuration is stored both locally and on the Cloud
2	Tap the “Manage” button to change the display to Configuration Manager as seen below:

Step	Action



The icons in the Fcn (Function) column have special meanings and are active buttons

X Delete the configuration

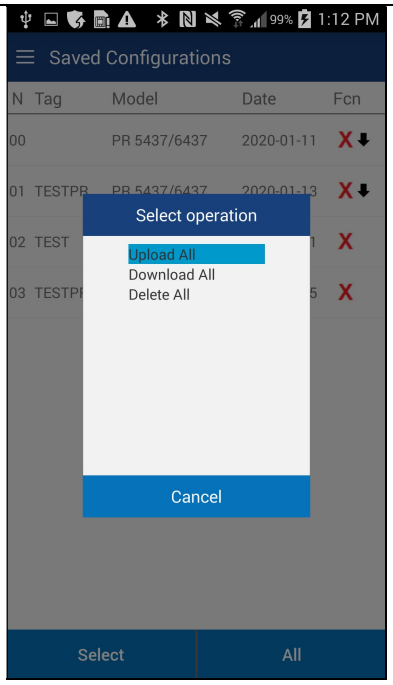
⬇ Download the configuration from the Cloud to the local device

⬆ Upload the configuration from the local device to the Cloud

If the configuration does not have the Upload or Download icon it means the configuration is already in both locations.

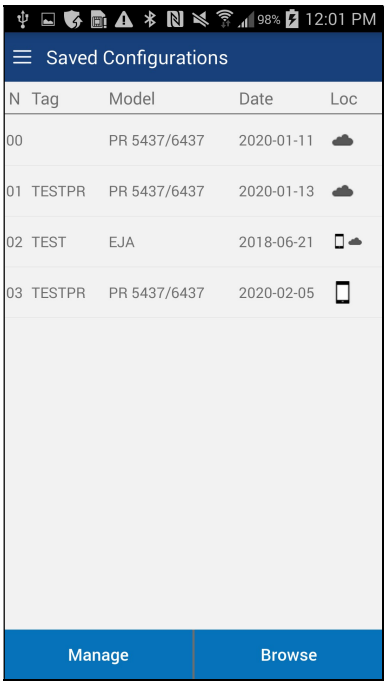
3	Tap “All” to perform an operation on all configurations that qualify. You will be asked what operation to perform:

Step	Action



Select the operation you wish to perform and all configurations that qualify for that operation will have it performed on them.

4 To return to the normal Saved Configuration window display, tap “Select”.



Appendix A

Troubleshooting Guide

Problem:
Will not communicate

Hardware Check:

Verify the following:
1. Paired to correct HART Modem
2. Loop power supply is on.
3. Loop resistance between 250 ohms and 1Kohms.
4. Loop current within HART limits.
5. If multi drop configuration, all transmitters in loop have unique addresses.
6. HART interface hardware connected across loop resistor or across transmitter terminals.

Appendix B

Contact Information

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