

HPCOM

HART Pocket Communicator



Description

The HPCOM is a reliable HART hand held configurator for field devices. Its small size, light weight robust and ergonomic design is easy to carry on your own pocket or tool box, its proven reliability can simplify configuration or data analysis in the field. The HPCOM has communication compatibility with all HART field instruments, currently have available software drive for over 350 existing HART instruments. More device driver can be arranged upon HART DDL/EDDL source files, or custom specification. The HPCOM is mainly used at process control plants for commissioning, diagnosis, data monitoring and configuration changes of HART instruments. The Lithium Ion rechargeable battery will allow a full day of work under reasonable usage, this feature plus size, light weight and software functionality will assure a good return of investment.

Features

- Hand held configuration and monitoring for HART field instruments at the field or control room.
- HART interface plugged with robust industrial connector.
- Software driver for over 350 existing HART instruments.
- New driver can be developed upon customer specification or DDL source file.
- Lithium Ion battery charge for 24 hours operation (at 360 HART messages/hour.)
- Large non volatile memory storage for software and at least 500 device drivers.
- Easy to upgrade or add new device driver.
- Smallest, lightest, and smartest carry on HART communicator available today.

The purpose of this document is assist with the setup, installation, operation and maintenance of the HPCOM as well as providing technical specifications and basic data, for further information about this product can be found at www.springres.com

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1 General Overview

General Principles

The HPCOM HART Field Communicator provides a complete solution for configuring and monitoring HART devices in the palm of your hand. The HPCOM is comprised of three main components plus accessories. These parts consist of the Palm handheld, the HPCOM HART interface hardware, and the HPCOM of Palm applications. This trio of hardware and software comprises a complete HART field communicator that can be powerful, multifaceted and portable all in one.

Using the familiar Palm operating system as a basis for the HPCOM has many distinct advantages. Palm handhelds are widely used across the world, enabling the HPCOM to be used with an already installed base of hundreds of thousands of Palm owners who are familiar with the Palm operating system. Using the large screen and graphical interface of the Palm lends itself to easy configuration of even the most complex transmitters. In addition, the Palm can be detached from the HPCOM interface and used for all the traditional Palm features for personal organization. The new industrial exterior allows for durability in the most rugged of areas.

The HPCOM is ready to go right out of the box. The Palm has been preinstalled with the HPCOM of HART configuration software and is ready to communicate with HART devices. The user needs only to attach the HPCOM HART interface to the Palm, connect the pinch connectors to the HART network and launch the HPCOM application.

For more detailed information on the installation setup and operation of HPCOM, refer to the proceeding sections of this document.

Hardware Overview

The HPCOM HART interface is designed to interface to the Palm multi connector located on the bottom of the Palm handheld, allowing communication between the Palm and the HART network.

The included pinch connectors easily connect to any HART network for instant communication. The HPCOM HART interface requires no batteries, running solely off the handhelds internal power supply. Its compact size and low power consumption makes the HPCOM interface an ideal solution for portability, its rugged exterior makes it the ideal tool for any plant or factory.

Software Overview

The HPCOM of software includes 4 distinct applications: HPCOM, HPCGraph, HPCLogger and HPC301. Each of these applications is preloaded onto the handheld and designed for a particular function. A summary of each application can be seen on the following pages. For detailed information about the features and operation of each application, refer to their respective sections in this manual.

HPCOM

The main application of the HPCOM, allows communication, monitoring and configuration of HART devices. The HPCOM software is based upon manufacturer device description files (DDL) and thus allows access to all menus and parameters as designed by the manufacturer.

HPCGraph

This graphing application allows device variables to be trended over time in an easy to view graphical format. Device parameters can be simultaneously graphed in various colors for easy identification.

HPCLogger

This software application allows for the logging of device variable values over time. A wide range of variables can be logged automatically at a user selectable sample time, or manually one by one. These logs can be saved and transferred to a PC for further analysis.

HPC301

The HPC301 software is the predecessor of the HPCOM software. It allows for the configuration and monitoring of HART devices but is not DDL derived. This application has been included as an alternative to using the DDL based menu and parameter structures of HPCOM for those whom have grown accustomed to the HPC301 layout for devices such as the Smar line of transmitters.

2 Setup & Installation

Hardware Overview

Before setting up your HPCOM, please verify that all box contents are included. The HPCOM box contents can be seen below in Figure 1.

1. Palm PDA - The included Palm is pre loaded with the HPCOM of software. The battery of the Palm may require charging. Please read the Palm documentation before using.
2. HPCOM Interface - The HPCOM hardware interface attaches to the bottom of the Palm and connects to the HART network. See the following section on how to correctly use this interface.
3. Product Documentation & Software - Contains the documentation and software. Note: The HPCOM of software is already preloaded onto the Palm PDA
4. Power Supply - Connects to the Palm or the HPCOM HART interface to recharge the Palm.
5. Palm USB Hotsync Cable - Connects the Palm to your PC to Hotsync via USB.



Fig.1 - HPCOM Box Contents

Hardware Setup & Usage

Before using the HPCOM to communicate you may wish to fully charge the Palm. This can be done by connecting the Palm power supply to the Palm. In order to charge your Palm, simply plug it into the provided power supply.

Connecting/Disconnecting the HPCOM Interface:

Insert the HPCOM Interface into the multiconnector of the Palm handheld as shown in Figure 2 below, pushing the HPCOM Interface connector into the multiconnector slot until locked in.

Connect the pinch connectors to the HART line. Communication requires a minimum load of 250 Ohms on the HART line. The Palm is now ready to communicate. Tap the HPCOM icon on the Palm screen to load the software and begin communicating.

To disconnect the HPCOM Interface, pull the interface away from the Palm handheld firmly, avoiding any twisting or sideways force.

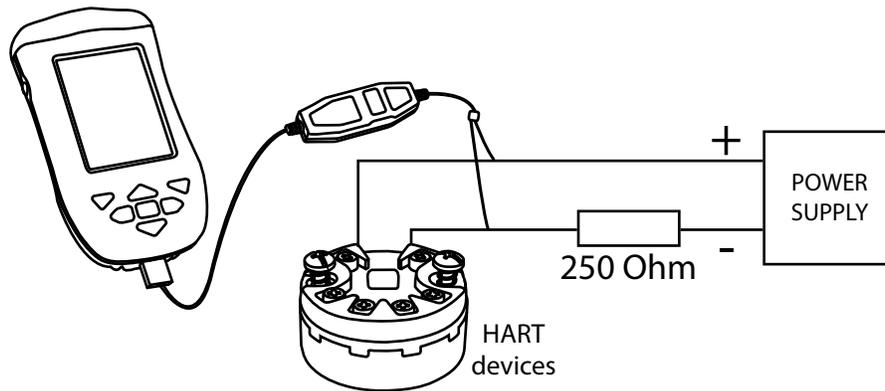


Fig.2 - Connection to the HART network

Charging the Palm handheld via the HPCOM Interface:

The Palm handheld can be charged with the HPCOM Interface still connected. This is possible due to the inclusion of a passthrough power supply connector on the bottom of the HPCOM Interface. To charge the Palm with the HPCOM Interface connected, simply insert the connector of the included power supply into the HPCOM power supply connector. The Palm handheld will indicate it is being charged. The HPCOM hardware and software can be used as normal while the Palm is charging.

Note: The HPCOM Interface is powered from the Palm battery and requires no additional power supply to function.

Software Setup & Installation

The entire HPCOM is preloaded onto the included Palm handheld and is ready to be used. It is recommended to install the Palm software onto your PC in order to enable Hotsyncing and to backup the files contained on your Palm. This will ensure that the HPCOM along with your Palm settings will be recoverable if your Palm should lose its memory. In this case a simple Hotsync will restore these files and settings automatically.

Note: Installation of the Meazura and Palm software can be completed by inserting the Springfield Research Product CD into the CD-ROM drive of your PC and selecting the "MEZ1000 Setup".

Reinstalling the HPCOM software with Hotsync backup from PC:

If you have installed the Palm software onto your PC and completed at least one Hotsync, your PC will contain a backup of the HPCOM software and any other Palm data since your last Hotsync. In this case all you must do is connect the Palm to your PC and Hotsync.

Reinstalling the HPCOM software without Hotsync backup from PC:

If you have not installed the Palm software onto your PC and completed at least one hotsync, you will need to install both the Palm software and the HPCOM onto your PC. Installation of the Meazura and Palm software can be completed by inserting the Springfield Research Product CD into the CD-ROM drive of your PC and selecting the "MEZ1000 Setup".

A copy of the HPCOM software is contained on the included Springfield Research Product CD. When a complete reinstallation is necessary, this CD can be used to reinstall all the HPCOM applications onto the Palm handheld. Simply insert the CD into the CD-ROM drive of your PC and follow the on screen instructions to install the desired applications. Please note: the Palm software must already be installed on your PC in order to successfully reinstall any HPCOM software.

3 Using the HPCOM Software

Opening the HPCOM

The HPCOM of applications, HPCOM, HPCGraph, HPCLogger and HPC301 can be found under the HART category. Select "HART" from the dropdown list located at the upper right corner of the Palm screen. This will display the various HPCOM applications as shown in Figure 3. Opening any of the HPCOM applications is as simple as selecting it on the screen.

The following sections will discuss the general usage of each of these programs.

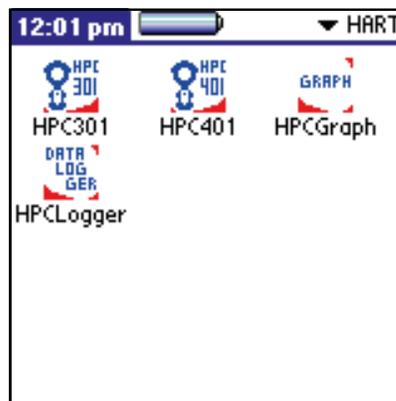


Fig.3 - HPCOM

HPCOM

HPCOM is the primary application of the HPCOM. HPCOM allows the user to poll for devices on the HART network, communicate with them and configure their various parameters. Because HPCOM is based upon Device Description files (DDL), all the menus, variables and methods are supported as defined by the manufacturer DDL.

The HPCOM is already loaded with support for devices from a range of manufacturers. In addition, new device drivers can soon be downloaded from the Springfield Research website and added into HPCOM. For more information on adding or requesting new device drivers, see the device drivers section.

After selecting HPCOM from the HART category of the applications screen, an "About HPCOM" screen will appear. This screen identifies the Version number of the software you are running along with important copyright information. To continue the main application, select "OK," or select "Cancel" to return to the application selection screen.

Registering the HPCOM

The HPCOM comes already registered from the factory, but in some cases the registration is lost and needs to be reentered, if this is the case an HPCOM Registration screen will appear every time the HPCOM is launched until the software is properly registered. Unregistered software will prompt you to fill out the registration form and input your registration code. Please fill out the included HPCOM registration form and agree to the terms and conditions of the agreement. This form should be faxed or emailed to Springfield Research Corp. You will receive your registration code shortly via email or fax.

Enter the registration code you have received at the registration code prompt. A successful code will notify the user, at which point the registration screen will no longer appear at the startup of HPCOM. A unsuccessful code will inform the user of such, and allow the user to reinput the code.

Polling for Devices

HPCOM can locate HART devices via the polling screen. The polling screen is automatically opened at the start of HPCOM. As seen in Figure 4, the polling screen allows the user a choice of polling by device address, address range (0-15) or by tag. The details of each method are explained on the following pages. After HPCOM polls the network, all found devices will be listed in the live list. To open a particular device, simply select it from the list.

Polling for a Single Device

To poll for a single online device by address:

1. Select the checkbox next to the "Device Address" option.
2. Choose the address of the device by selecting it from the drop down menu located next to "Device Address".
3. Select the "Poll" button.

Polling for Multiple Devices

To poll for multiple online devices within an address range:

1. Select the checkbox next to the "From/To" option.
2. Choose the start and end search addresses from the corresponding drop down menus located next to the "From" and "To" options respectively.
3. Select the "Poll" button.

Polling by Tag

To poll for an online device by tag:

1. Select the checkbox next to the "Tag" option.
2. Enter the tag of the device you are looking for in the field located next to "Tag".
3. Select the "Poll" button.

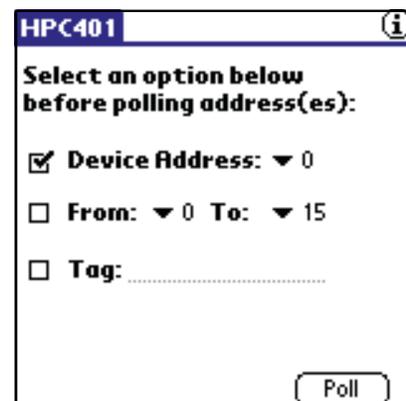


Fig.4 - Polling Screen



Fig.5 - Live List Screen

Navigating Device Parameters

Devices listed in the Live List can be opened by selecting them from the list. Once a device is selected, the main menu of the device will be opened. The contents of the main menu and subsequent screens will vary dependant on the device manufacturer and model. However, the general layout and navigation of these screens is common to all devices. Below is an example of a typical device.

The main menu of most devices will consist of a number of buttons which lead to various submenus, parameters and methods. Menus and Methods are represented by buttons. Selecting a menu button will open the corresponding submenu. Selecting a method button will execute the corresponding action.

User editable fields are available for changing various parameters of the device. Editable variables will include either a text field denoted by a dotted underline or a drop down list denoted by an arrow. Examples of this can be seen in the figure below. These variables can be edited by the user and sent to the device by selecting the "Send" button at the bottom of the screen.

At the bottom of every submenu there is three buttons: "Send", "Back", and "Done". The Send button will send any changes you have made to the editable fields of the current menu to the device. Once the send is complete, the values have been successfully sent to the device. The Back button will return you to the previous menu. The Done button will return you to the main menu of the device.

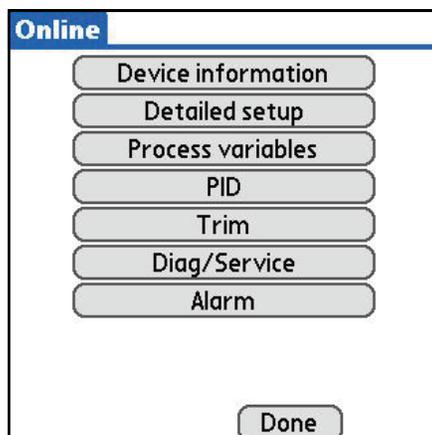


Fig.6 - Typical Device Main Menu

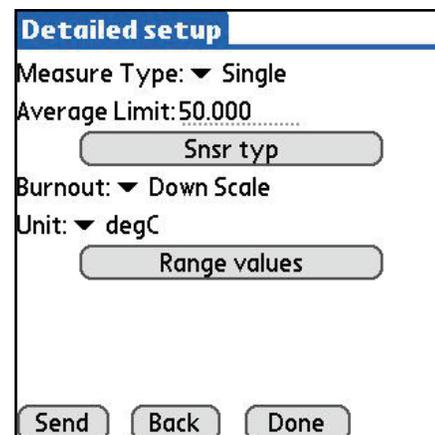


Fig.7 - Various Editable Fields

Device Drivers

The HPCOM software is based on the Device Description Language (DDL). This language was created to offer a standardized method of detailing all the variables, commands and parameters of a specific device as well as to describe the basic menu structure and layout that the end user should see when communicating with a manufacturers device. Device description files are created by the device manufacturer and allow the device parameters and menus to be displayed and structured as the manufacturer intended. The HPCOM software builds on these DDL's to offer compatibility with a range of HART devices directly from your Palm PDA.

HPCOM is preloaded with all supported devices at the time of purchase. Accessing supported devices is as simple as selecting them from the Live List (for more information on polling for devices, see section 3.2.2). The various device parameters, menus and methods can then be accessed as designed by the manufacturer.

Uninstalled or Unsupported Devices

Occasionally a device may be found on the HART network that is either not installed on your Palm or is currently unsupported. When an uninstalled or unsupported device is found by HPCOM, the software will display a message explaining such. The message includes a device driver number. Devices may be requested to be added by sending this device driver number along with your full contact information to sales@srctec.com. Devices for which the device driver is not installed may still be accessed in generic mode via the HPC301 software. Please note, before requesting the addition of a device, check the HPCOM Device Driver Library located at www.srctec.com for the most up to date device drivers.

Adding a Device Driver to HPCOM

Device drivers may be added to the HPCOM in order to quickly and easily support new devices. To add a device driver to your HPCOM, follow the steps below:

To add a device driver to HPCOM:

1. Download the device driver file "mmddrr.prc" from the www.springres.us HPCOM device driver library (or email) and save it to a location on your computer.
2. Double click the *.prc file to have it added to your Palm Hotsync list.
Note: The Palm desktop software must be installed on the computer.
3. Connect your Palm to your computer to Hotsync.
4. The new device driver is now downloaded to your Palm and available for use in HPCOM.

The HPCOM Device Driver files follow a naming convention of "mmddrr.prc" where:
mm = HART Manufacturer Code
dd = Device Code rr = Hardware Revision Code

HPCLogger

The HPCLogger application adds the additional functionality of data logging to the HPCOM. HPCLogger enables the user to log variables over time automatically or manually and store these variables for later trending or processing. The stored logs can be transferred easily to your PC for further processing.

Starting HPCLogger

To start HPCLogger, follow the steps below:

1. Select the HPCLogger icon from the Palm application menu. This will open the application and bring you to the polling screen.
2. The polling screen is common to all HPCOM applications. Simply select the address, address range or tag of the device(s) you wish to poll for and select "Poll" (see section 3.2.2 for additional details regarding polling).
3. After execution of the Poll, the list of devices found on the bus will be displayed.

Selecting Logged Variables

By default, the device variables that will be logged are the PV (primary device variable), PV%, Out (mA), and SV (secondary device variable). If the device supports command 33 of the HART specification, you alternatively have the option to log different variables.

After you have started HPCLogger and polled for devices (see section 3.3.1) follow these steps to select nondefault variables:

1. Select a device from the Live List.
2. Select the desired 4 variables to log from the 4 drop down menus on the Specific Monitor screen (Figure 8).
3. Select "Done".

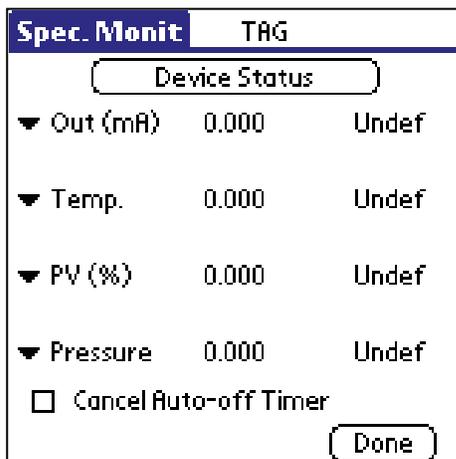


Fig.8 - Specific Monitor Screen

NOTE:
Only devices which support command 33 of the HART specification will support custom selection of logging variables. Devices which do not support this command will only log the default variables as described above and will not have access to the Specific Monitor screen.

Selecting Logged Variables

To start logging:

1. From the Live List screen, enter the desired sample time in minutes (Figure 12) .
The default value is 1.
2. Select the "Start Logging" button to go to the logging screen (Figure 13).
3. From the logging screen you may select to automatically log or manually log the selected variables. Automatic logging will log the variables at the interval entered on the Live List screen, while manual logging requires the user to select each time the variables should be logged.

To automatically log:

4. Select the "Auto Log" button.
5. Select the "Done" button when finished.

To manually log:

4. Select the "Manual Log" button.
5. Select the "Log Now" button repeatedly as desired (Figure 14).
6. Select "Done" when finished.

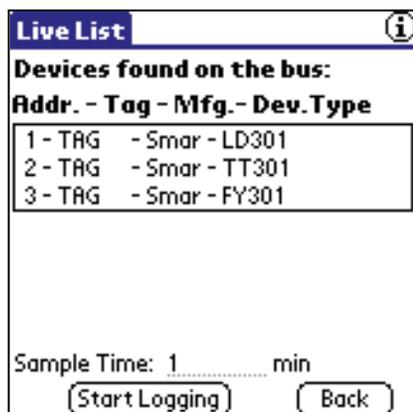


Fig.9 - Live List Screen



Fig.10 - Logging Screen



Fig.11 - Manual Logging

Transferring Logs to a PC

Once device variable data has been logged, this data can be transferred to your PC for further analysis. To transfer logs to a PC and view them, follow these steps:

1. Install the Springfield Conduit software onto your PC with the Palm Desktop software. The Conduit software is included on the Product CD and can also be downloaded from www.springres.us.
2. Execute a Hotsync between your Palm and your PC.
3. The newly created data files will be located in the <palm folder>\<user name>\Datalogger directory of the PC. The naming convention for these log files are **dMMDDXXXXXX.txt** where:
 - MM** is the devices manufacturer code in hexadecimal format (for example, 3e for Smar)
 - DD** is the devices type code in hexadecimal format (for example, 01 for the LD301)
 - XXXXXX** is the devices serial number in hexadecimal format.
4. Open the text file in your preferred text editor.

HPCGraph

The HPCGraph application allows for the graphical trending of up to 4 variables simultaneously from any HART device. Graphs can be customized and saved for offline viewing. For instructions on how to use the various functions of HPCGraph, see the following sections.

Starting HPCGraph

To start HPCGraph, follow the steps below:

1. Select the HPCGraph icon from the Palm application menu. This will open the application and bring you to the polling screen.
2. The polling screen is common to all HPCOM applications. Simply select the address, address range or tag of the device(s) you wish to poll for and select "Poll" (see section 3.2.2 for additional details regarding polling).
3. After execution of the Poll, the list of devices found on the bus will be displayed.

Selecting Variables to Graph

By default, the device variables that will be graphed are the Current, PV (primary variable), SV (secondary variable), and TV (tertiary variable). If the device supports command 33 of the HART specification, the option to alternatively log different variables is available. After you have started HPCLogger and polled for devices (see section 3.3.1) follow these steps to select which variables will be graphed:

1. Select a device from the Live List.
2. Select the check boxes next to the variables you wish to graph. The color underneath each check box corresponds to the line color of the graph (Figure 12). If the device supports command 33 of the HART specification, variables other than the default may be graphed by selecting the "Spec Monit" button. From the specific monitor screen, 4 variables may be selected from the 4 drop down lists. Check the boxes for the variables you wish to graph (Figure 13).
3. Select the "Graph" button when you are finished selecting the variables.

NOTE:
Only devices which support command 33 of the HART specification will support custom selection of graphing variables. Devices which do not support this command will only log the default variables as described above and will not have access to the Specific Monitor screen.

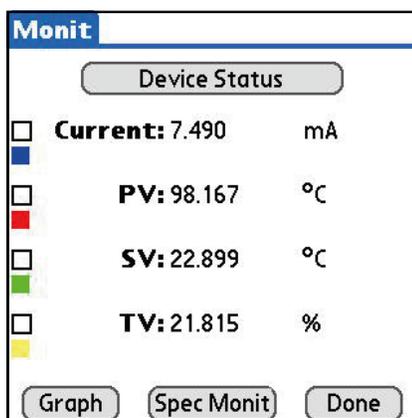


Fig.12 - Variable Selection

NOTE:
At any time during the variable selection, the "Device Status" button may be selected to view the current device status information.

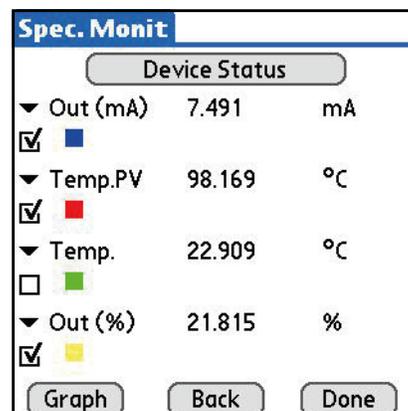


Fig.13 - Specific Monitor

Using Graphs

Once the graphing variables have been chosen and the "Graph" button has been selected, the graphing will proceed. An example of the graphing screen can be seen in Figure 14 along with descriptions of its various fields.

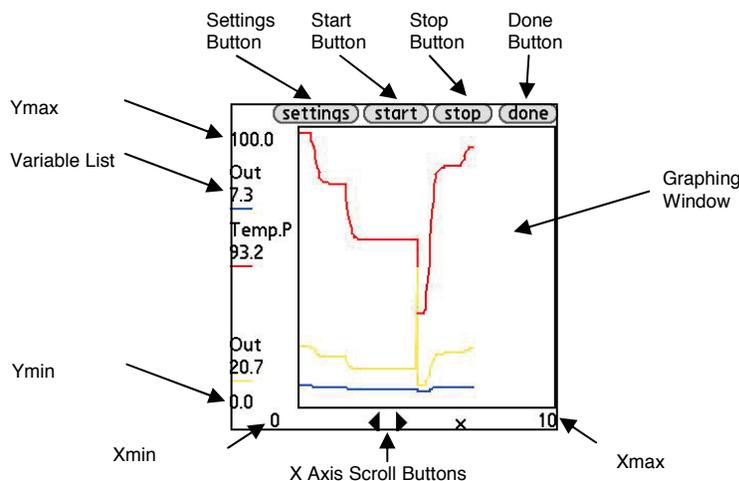


Fig.14 - Graphing Screen

Variable List - Located on the left side column, the variable list provides information for each of the 4 graphed variables. The variable name, current value and line color is shown for each variable.

Graph Window - This is the area where the 4 variables will be graphed. Each color corresponds to the appropriate variable in the Variable List.

Ymax,Ymin,Xmax,Xmin - The X & Y scale for the Graph Window is based upon the minimum and maximum values as shown by Ymax, Ymin, Xmax and Xmin respectively. To change the scale of the graph, select the "Settings" button.

Settings Button - This button opens the setting screen where the scale of the graph can be changed (Figure 15v). The values for the vertical scale (Ymax, Ymin) and the horizontal scale (Xmax, Xmin) can be edited here simply by entering a new value into the corresponding fields. Once you have entered the desired values, select "Done" to return to the graph screen. The graph will now reflect the scale that was entered.

Start Button - This button will start the graphing of the selected variables.

Stop Button - This button will stop the graphing of the selected variables.

Done Button - To stop the graphing and exit the graphing screen, select this button. The graphed data will automatically be saved to the palm.

X Axis Scroll Buttons - These two arrow shaped buttons will scroll the X axis in the corresponding direction. This is useful for graphs which have a large amount of trending data.

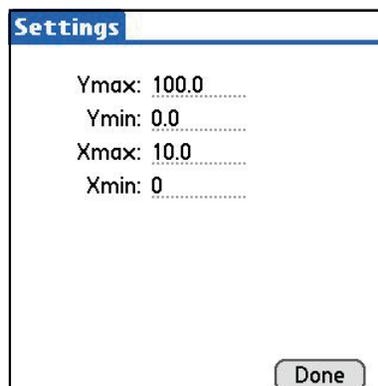


Fig.15 -Settings Screen

Offline Graphing

Graphing data which has been previously graphed is automatically stored to the Palm for later review.

These "offline" graphs can be accessed from the polling screen. Follow these steps to open and view an offline graph:

1. From the main polling screen of HPCGraph, select the "Offline Graphics" button.
2. A list of all currently available offline graphs will be displayed (Figure 19). Select a file and it will be loaded (Figure 20). The offline graph files follow the following naming convention:

dMMDDXXXXXgf where:

MM is the devices manufacturer code in hexadecimal format (for example, 3e for Smar)

DD is the devices type code in hexadecimal format (for example, 01 for the LD301)

XXXXXX is the devices serial number in hexadecimal format.

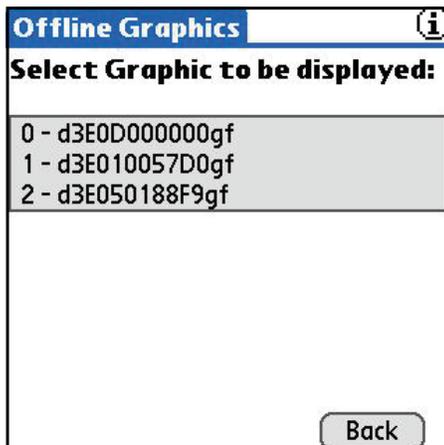


Fig.16 - Offline Graphics File Selection

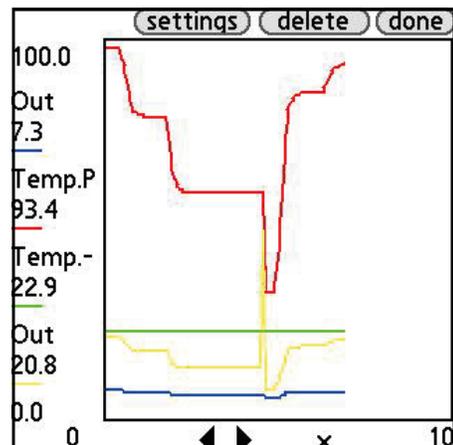


Fig.17 - Offline Graphics

HPC301

The HPC301 software is a legacy piece of software which has been included in the HPCOM for users whom have grown accustomed to the layout and structure of the HPC301 software. In addition, the HPC301 software can be used to access devices in generic mode which do not currently have a loaded Device Driver in HPCOM. The usage of HPC301 is similar to HPCOM. Simply poll for devices from the polling screen and navigate the device parameters. HPC301 can access any HART device in generic mode as well as fully support a collection of specific HART devices including the full line of Smar HART devices. For more information on the operation of the HPC301, contact Springfield Research Corp.

4 Troubleshooting

Problem	Possible Cause	Possible Solution
No Communication or Intermittent Communication	Excessive noise or ripple. Low level signal.	Place the HPCOM Interface leads across the resistor and check if communication is working. Verify fieldwiring shield is grounded at one end only. Normally, the shield is grounded at the power supply side only.
	Insufficient loop resistance.	Add an additional 250-ohm resistor in series to the current loop.
	Interface is not connected.	Refer to the Hardware Setup & Usage section of this manual.
	Field device is not powered or polarity is reversed or insufficient loop current and voltage at the field device terminal.	Verify power supply and field device.
	The Palm battery has been discharged past the normal range.	Recharge the Palm battery.
	More than one device using the same address.	Poll for device by TAG name rather than address. Disconnect one device, change the connected device address and reconnect the first device.
	Field device configured in multidrop mode. It is using an address other than zero.	Execute polling address operation scanning from address 1 to 15.
Palm no longer contains HPCOM software	Palm lost internal memory and reset. Battery fully drained.	If you have Hotsynced with your PC, Hotsync to restore the HPCOM software. If you have never Hotsynced your Palm, use the included Product CD to reinstall by selecting the "MEZ100 Setup".

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