

Hand-Held Configuration Devices Mobility DHH801-MFC

DHH801-MFC Configuration Device with HART® Communications



WARNING notices as used in this manual apply to hazards or unsafe practices which could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices which could result in property damage.

NOTES highlight procedures and contain information which assist the operator in understanding the information contained in this manual.

WARNING

POSSIBLE PROCESS UPSETS. Maintenance must be performed only by qualified personnel and only after securing equipment controlled by this product. Adjusting or removing this product while it is in the system may upset the process being controlled. Some process upsets may cause injury or damage.

NOTICE

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Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

- The relevant sections of these instructions must be read carefully before proceeding.
- Warning labels on containers and packages must be observed.
- Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
- Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
- Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
- When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

Read First

WARNING

INSTRUCTION MANUALS

Do not install, maintain or operate this equipment without reading, understanding and following the proper factory-supplied instructions and manuals, otherwise injury or damage may result.

RETURN OF EQUIPMENT

All equipment being returned to the factory for repair must be free of any hazardous materials (acids, alkalis, solvents, etc.). A Material Safety Data Sheet (MSDS) for all process liquids must accompany returned equipment. Contact the factory for authorization prior to returning equipment.

Read these instructions before starting installation;
save these instructions for future reference.

Contacting ABB Instrumentation...

Should assistance be required with any of the company's products, contact the following:

Telephone: **24-Hour Call Center**
1-800-HELP-365

Internet: **www.abb.com**

- Select **Instrumentation & Analytical** from the **Our Offerings** section
- Select **Contact Directory** from the **Products & Services** tab. Then select your country location from the **Your Country** drop-down menu in the center of the page.
- Select **Service** from the **Instrumentation & Analytical** Product Group listing and complete the requested information in the pop-up window.

Product Identification Terms

DHH801-MFC4150 (non-hazardous area use) and DHH801-MFC4150X (hazardous area use) are the model numbers for the handheld products covered by this manual.

DHH801-MFCx2By is the order number for these products where x = 1 (full DOFs) or 2 (ABB only DOFs) and y = 0 (non-hazardous) or 1 (ATEX – cULus).

Throughout this manual, these products are referred to as DHH801-MFC or MFC.

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1 Mobility DHH801-MFC Configurator Overview

The Mobility DHH801-MFC Configurator is a full function HART Communicator supporting Universal, Common Practice and Device Specific commands for commissioning, configuration and maintenance operations. HART field devices can be configured, polled, and trimmed using the Mobility DHH801-MFC with HART communications.

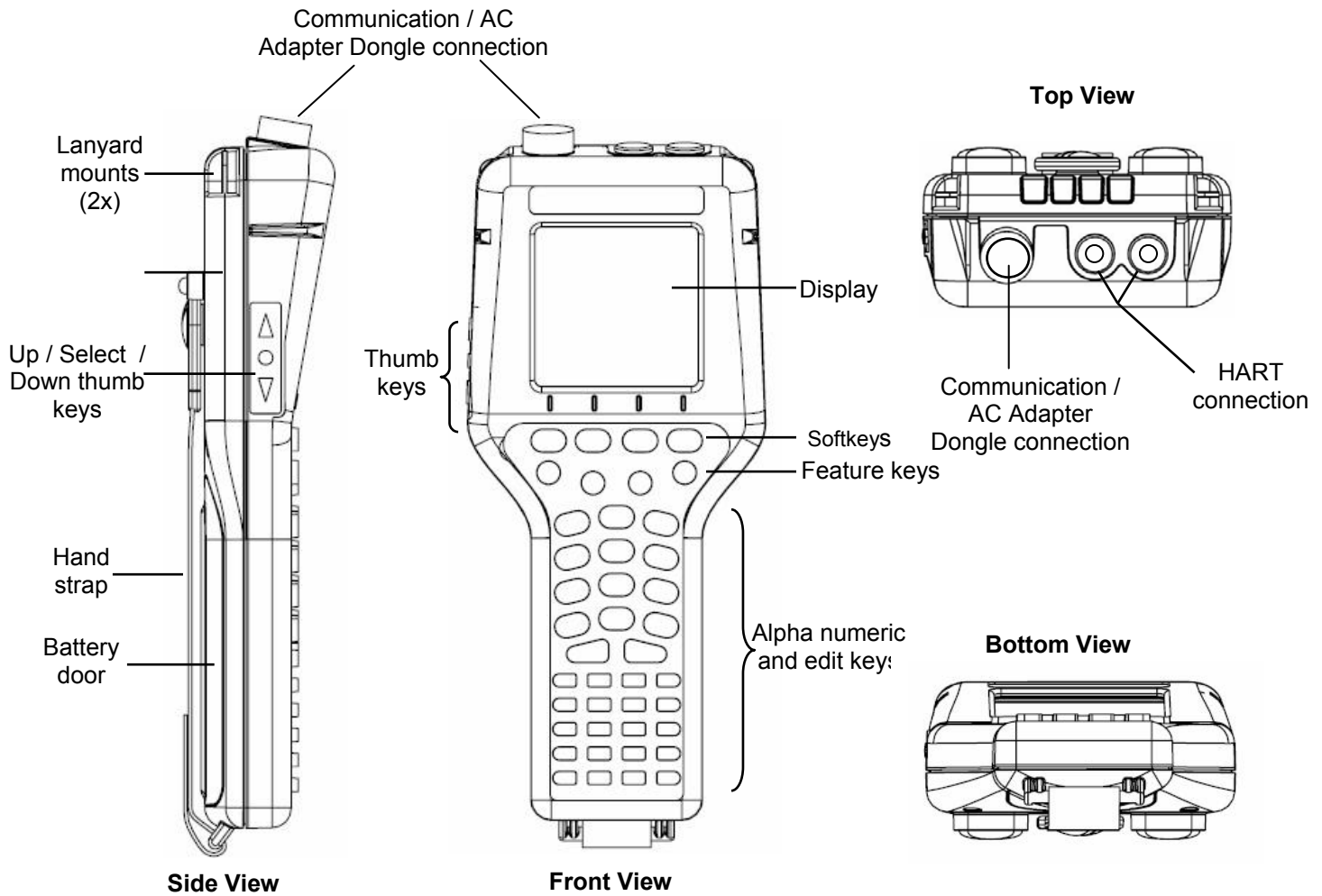


Figure 1-1 Mobility MFC with HART Communications

Note: For Intrinsically Safe Mobility DHH801-MFC models, consult the Hazardous Area Use section of this manual and the Intrinsic Safety Control Drawing in Section 18 of this manual for specific details on use of approved Mobility DHH801-MFCs and applicable restrictions.

2 DISPLAY OVERVIEW

The display of the Mobility DHH801-MFC is a 128 x 128 pixel graphic display with backlight. Viewable area is 2.6" x 2.6" for 13 viewable message lines. The display provides three types of information: 1) header information including display titles, HART communication status indicator, SHIFT indicator, alpha or numeric entry mode indicator and battery gauge, 2) main data display section for display of Mobility DHH801-MFC operating menus, HART menus, and device information, and 3) footer information defining the display's soft key functionality.


2.1 HEADER LINE SYMBOLS


♥ heart symbol indicates active HART


↑ up arrow indicates SHIFT key is on

number sign indicates numeric / symbol entry is the present entry mode for all dual function keys

A letter indicates alpha entry is the present entry mode for all dual function keys

 battery symbol indicates Mobility MFC under battery power; filled portion indicates remaining battery



 electrical plug symbol indicates the AC adapter is connecting and powering the Mobility MFC

 BUSY text box replaces either power symbol when the microprocessor is busy executing a previously requested task. Do not press keys when this status symbol is displayed.

2.2 KEYPAD OVERVIEW

The MFC keypad has three basic key types: single function keys, dual-function keys, and soft keys with changing definitions.

Single keys control a dedicated MFC function.

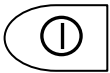
Dual function keys, through the use of the Alpha Lock  or Shift  keys, toggle between two separate functions as needed to facilitate data entry.

Soft key functions change depending on the operating mode. Soft key definitions are displayed at the bottom of the LCD, just above their respective blue soft keys.

The left hand thumb keys can be used to scroll up, scroll down, and to select menu items.



Figure 2-1 Mobility MFC



On/Off

Pressing the ON/OFF key powers up or turns off the Mobility MFC. As the unit powers up, an internal diagnostic check is performed. Any abnormalities are posted on the display. The unit will briefly display the Mobility MFC model number and then check for a HART device with address of zero. If a device with zero address is found, the MFC immediately goes into online status and displays information about the device. If no device is found, the Mobility MFC enters the Mobility MFC Main navigation screen. To turn the Mobility MFC off, press and hold the ON/OFF key for approximately .5 seconds. Unit will power down provided a critical HART operation is not in process.





Quick Menu

The Quick Menu key initiates HART communications and then displays ten (10) HART menu choices for the connected device. These menus are used to short cut the traditional HART menus to enable the user to arrive quickly at desired functions. Typical Quick Menu options include: Main Menu, Config Menu, Rerange, Basic Info, Construction Materials, Display, Sensors, Signal Conditioning, Self Test. Quick Menu is disabled while critical HART operations are in process.



Home

The key sequence  ,  returns the user to the initial or “home” HART menu for the connected device. The Home function is disabled while critical HART operations are in process.



Document

This key provides rapid access to HART communication Save/Send Configs options, List/Edit Configs, and Create Configs functions for all Mobility MFC models. For Documenting operations this key also provides documenting functions used with the ABB Device Management System software. Access to this key is disabled while critical HART communications are in process.



Display Contrast

This key allows the user to adjust the contrast of the LCD display for ambient lighting and user preferences at any time and in any operating mode. Pressing and holding this key cycles through all available contrast settings. After adjusting Display Contrast, wait at least five (5) seconds before turning unit off to insure storage of new contrast setting. Ambient temperature compensation is included in the Mobility MFC.





Backlight

This key toggles the backlight feature between Off / Low intensity / High intensity to illuminate the display for ambient light conditions. Battery life is impacted by use of the backlight feature; High intensity is the most aggressive. An automatic shut-off timer is available by pressing the **Cfg** soft key from the main menu.






Alphanumeric / Symbol Entry

The alphanumeric keys have the heaviest population on the keyboard and are the method of entering data into the MFC. Each Mobility MFC display has a default alpha or numeric / symbol entry mode based on the most likely used mode for the display’s function. Pressing the ALPHA LOCK () key activates the other entry mode for alphanumeric keys. Pressing the SHIFT key () converts the next key stroke to the inactive entry mode and then automatically reverts back to the active mode. The letter “A” in the display header line indicates the alpha input is active while a # sign in the display header indicates the numeric / symbol input is active.

#



Shift

The  key is used to activate the secondary functions of the Mobility MFC’s dual function keys for the next keystroke only. When the Shift key is active, an up arrow  is displayed at the top of the display to the left of the battery power (or AC wall plug) symbol  is also used to activate the Page Up and Page Down soft key functions while viewing lists of information (installed DOFs, stored configs, etc...).



Alpha Lock

This key changes the keypads dual function keys from numeric/symbol entry mode to alpha character entry mode and back. The active entry mode is indicated in the display header line next to the power supply indicator on the upper right of the screen. The letter “A” in the display header line indicates that alpha entry is active while a # sign in the display header indicates that numeric / symbol entry is active.



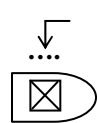
Left / Right Arrow keys

These keys support cursor movement forward and backward for text / numeric editing needs. The default edit mode is “overwrite.” For navigating functions, the left arrow emulates the **Back** soft key and the right arrow emulates the **Select** soft key.



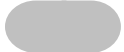
☒ (Delete)

This editing key will delete the character located above the cursor in a text / numeric string. The Insert text edit function is activated by pressing the \uparrow , ... key sequence. Once activated, the next alpha or numeric / symbol keystroke will be inserted into the open text field. The “overwrite” default mode is restored upon completion of the insert operation.



\downarrow ... (Insert)

The Insert text edit function is activated by pressing the \uparrow , \downarrow key sequence. Once activated, the next alpha or numeric / symbol keystroke will be inserted into the open text field. The “overwrite” default mode is restored upon completion of the insert operation.



4 Soft Keys (unlabeled)

The four blue keys located immediately below the display are Soft Keys. The specific functions of these keys change depending on the operating mode of the Mobility MFC. Present definitions are displayed at the bottom of the Mobility MFC display. Whenever possible the two Soft Keys on left are used for navigation functions, the third from the left for action functions, and the right most for back function.

The following are examples of Soft Key definitions and their uses:

Up – moves indicator arrow up one line in a menu list

Down – moves indicator arrow down one line in a menu list

Select – selects the indicated menu item

Cfg – provides access to Mobility MFC configuration settings (Users, Applications, Lockouts, Clock / Timers, Other)

Back – returns to prior display

Inc – increment the value shown above the cursor

Dec – decrement the value shown above the cursor

Next / Prev – these keys move to Next or Previous item within the list function accessed. Next and Prev are for navigation only.

Done – ends data entry session and proceeds with the selected operation

Edit – activate edit function for displayed parameter

Abort – aborts present operation without affecting prior settings or values

Save – saves the present value

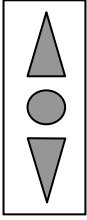
Store – stores the present value

Yes – affirmative response to question presented

No – negative response to question presented

Trim – executes the trim function called for by the HART menu option selected

Chng – change the present menu setting



Thumb operated keys

Up, Select, and Down side keys provide convenient alternate methods of menu navigation. Use these in addition to Soft keys and numbered HART menu lines to make menu navigation fast and easy.


- ▲ = Up = Prev
- = Select, Edit
- ▼ = Down = Next

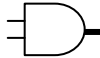
Do not use these keys when the **BUSY** symbol is displayed.

3 GENERAL OPERATION

3.1 Power Options

The Mobility DHH801-MFC12B0 and DHH801-MFC22B0 general purpose units can be powered for portable operation by six (6) each AA alkaline or NiMH batteries. The Mobility DHH801-MFC12B1 and DHH801-MFC22B1 Intrinsically Safe units must be powered by approved AA alkaline batteries (see the “Hazardous Area Use” section of this manual and the I.S. Control Drawing shipped with each Mobility DHH801-MFC12B1 and DHH801-MFC22B1 for more information). AA alkaline batteries are standard with the Mobility MFC shipment. ABB offers NiMH batteries and charger cradles (external charge only) as an option for general purpose (non-I.S.) only. For bench top applications and download operations, the AC adapter (P/N 3KXD311800L0036 included with each Mobility MFC) is recommended. The AC adapter is only for use in safe areas.

 Located in the upper right corner of the display, this icon displays the remaining battery power. Fresh batteries produce a full black cell body. As the power drains, the black segment retreats indicating remaining power.

 When the Mobility MFC is used with the optional AC adapter (P/N 3KXD311800L0036), the battery circuit is bypassed and a wall plug icon replaces the battery icon on the display header. For AC power use, the AC adapter is connected to the Communication / AC Adapter Dongle and then the dongle is connected to the fitting on the top of the Mobility MFC.

NOTE: Power icons may temporarily disappear during certain HART Communication operations

3.2 Communication / AC Adapter Dongle

The Communication / AC Adapter Dongle, included with each Mobility MFC, is used to connect the AC adapter to the Mobility MFC when needed. The dongle is also used to connect the Mobility MFC to a PC for serial communications. See the “Updating Mobility DHH801-MFC Firmware and DOFs” and “Documenting HART Configurations with ABB DMS Software” sections of this manual for more information on communications.

NOTE: For Mobility DHH801-MFC Intrinsically Safe units, the Communication / AC Adapter Dongle can only be used in a safe area. See the “Hazardous Area Use” section of this manual and the Intrinsic Safety Control Drawing in the Appendix of this manual for more information.

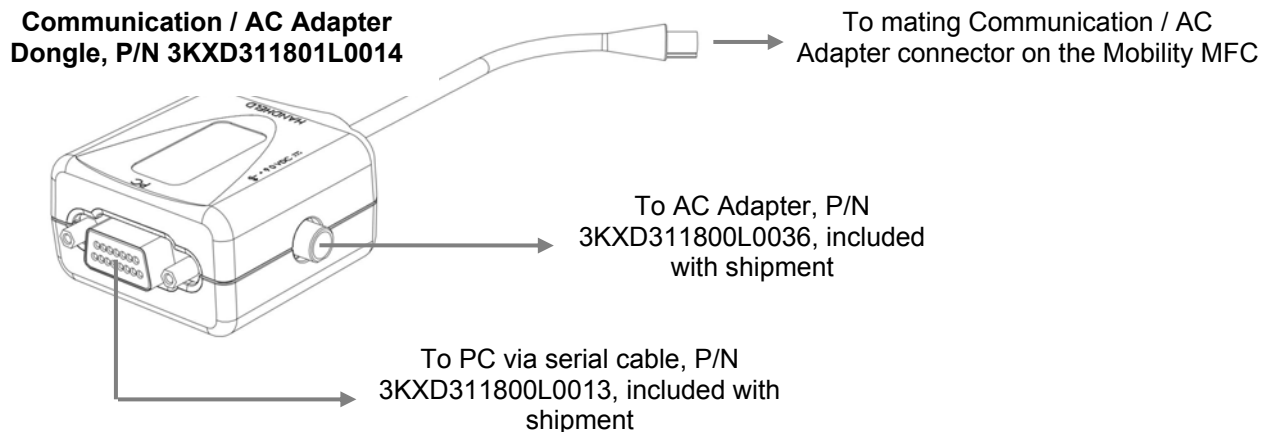


Figure 3-1 Communication / AC Adapter Dongle

3.3 Navigating Menus on the Mobility MFC display

Several methods of navigating through the Mobility MFC menus are available to the user for maximum convenience and utility.

1. **Soft keys:** Use **Up** and **Down** Soft Keys to move cursor arrow to the desired menu option. Then use the **Select** soft key to accept the indicated choice. Soft key navigating tools are found throughout the Mobility MFC Main displays and HART communication displays.
2. **Side keys:** **Up**, **Down** and **Select** keys are also provided on the left hand side of the Mobility MFC. These keys are thumb operated and provide a convenient alternative to the Soft Key navigation buttons. Side key functionality is not always available in the HART communication displays.
3. **Multi-page lists:** Multi-page lists have a Δ and/or ∇ symbol along the right hand side of the display indicating the existence of information on the previous or next page(s). Several pages of information may need to be viewed when reviewing lists of installed DOFs, stored configuration files or finding a specific device in Offline Mode to create a configuration for. While in these list areas, pressing the SHIFT key ($\hat{\uparrow}$) changes soft key definitions **Select** and **Back** to **PgUp** and **PgDn**, respectively. To quickly advance to the next page of a list, press $\hat{\uparrow}$ and then the **PgDn** soft key. To retreat to the prior page, press $\hat{\uparrow}$ and then **PgUp**. **PgUp** and **PgDn** soft keys remain active until the **Up** or **Down** soft key is used or until $\hat{\uparrow}$ is pressed again.
4. **Numbered HART menus:** All HART displays have numbered menu lines when needed. This gives fast access directly to the desired menu line. Mobility MFC displays also have numbered menus with the exception of multi-page list screens.
5. **HART menu HOME key:** To quickly retreat from any location in the HART menu to the initial HART menu screen for a device, press the $\hat{\uparrow}$, $\hat{\uparrow}$ key sequence. This will return the display to the initial HART screen. The Home function will be disallowed if a critical HART task is in process.
6. **Left / Right Arrow keys:** Emulate **Back** and **Select** soft keys, respectively

3.4 Turning on the Mobility MFC

Use the dedicated **ON/OFF** key to power up the Mobility MFC. A brief diagnostic runs while the ABB logo, Mobility MFC model number, and Mobility MFC firmware version is displayed. A message is displayed indicating the Mobility MFC is scanning for a HART device at address zero. The following scenarios are possible.

1. If the Mobility MFC is connected to a HART device with address = 0 (and there is sufficient loop resistance), the Mobility MFC immediately establishes HART communication with the device. A display similar to the example at right appears. The numbered menus and Soft Keys are then used to commission, re-configure, or maintain the connected device.

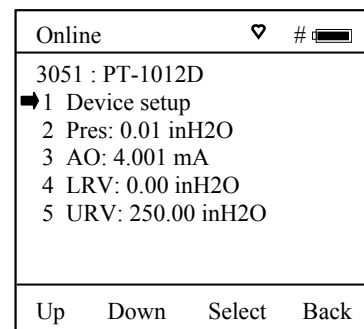


Figure 3-2 Connected to HART Device

2. If no HART device is connected, if a HART device with address $\neq 0$ is connected, or if a connected device is not found due to wiring or loop resistance problem, the Mobility MFC will enter the Main navigation display depicted at right.

- 2.1 Select **Online Setup** once a HART device is connected or once the wiring problem is resolved. A proper connection will be indicated when line three changes to “**Device 0: *Online***”.

- 2.2 Select **Online Setup** if properly connected HART device is setup for Multidrop loop or Burst Mode operation (device address $\neq 0$). The Mobility MFC will respond with a statement and the Soft Key options shown at right. To initiate a Multidrop poll, press the **Multi** soft key. To retry the address 0 poll after rechecking connections, press the **Retry** soft key. Press the **Exit** soft key to enter Offline mode.

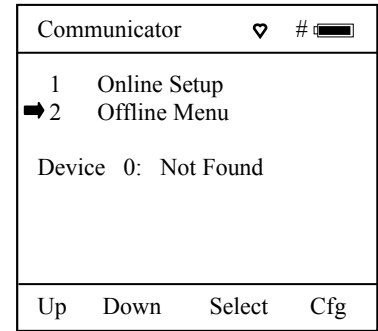


Figure 3-3 Not Connected to HART Device

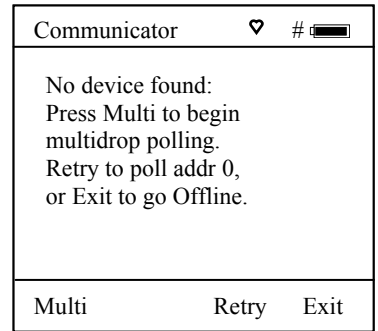


Figure 3-4 Multidrop Search Request

3.5 Mobility MFC Main Display

The Mobility MFC Main display provides access to Online Setup, Offline Menu and to MFC configuration settings via the right hand Soft Key (**Cfg**).

1. **Online Setup** is described above in Turning On the Mobility MFC.
2. **Offline Menu** is selected to provide access to Offline Utilities such as List / Show DOFs, List / Edit Configurations, and Create Configurations. The number of DOFs installed (HART device profiles) and the number of device Configurations stored are also available on Offline Utilities screen. See the Offline section of this manual for more information.
3. **Cfg** Soft Key is selected to configure Mobility MFC settings and view Mobility MFC information such as Model, Serial, and Firmware numbers, DOFs installed and Configurations stored.

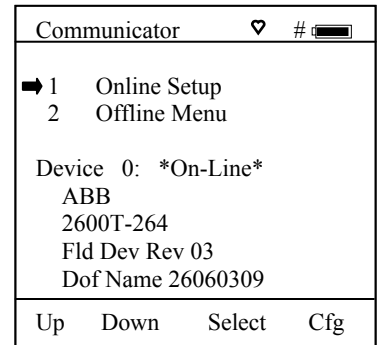


Figure 3-5 Main Display

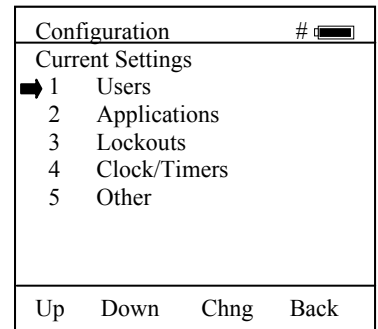


Figure 3-6 Configuration Settings Menu

3.6 MFC Configurations Settings

3.6.1 Users

Not currently used.

3.6.2 Applications

Various applications are available here including Digital Poll (polling device addresses 0 – 15) and other user and factory applications.

3.6.3 Lockouts

The HART Communicator can be programmed to lockout certain standard functions that a supervisor may wish to control. The functions included are used to set up the Mobility MFC for normal use, change online HART device configurations, create offline HART device configurations, update the installed DOFs list (HART device profiles), or to update the Unit's operating firmware. For example, locking out the Configs feature makes the unit a read only HART communicator while locking out DOFs and Firmware prevents unauthorized updates. The lockout can be limited to individual Lockout Details items or all Lockout Details items can be locked out at one time.

To enable the lockout feature, press the “3” key or move the selection cursor ➡ to the **Lockouts** menu option on the Configuration screen (see below left). Choose the **Lockouts** selection by pressing the **Chng** soft key. The Mobility MFC will enter the **Lockout Enable / Disable Screen**. The three choices and current status information are provided (see below left):

Configuration	#	█
Lockouts		
➡ 1 Lockout:	Disable	
2 PV Prompt:	Disable	
3 View Details		
Up	Down	Chng Back

Figure 3-7 Lockout Enable / Disable Screen

Configuration	#	█
Lockout Details		
➡ 1 All :	Disabled	
2 Setting :	Enabled	
3 DOFs :	Disabled	
4 Configs :	Disabled	
5 Firmware :	Disabled	
6 PV Prompt:	Enabled	
Up	Down	Chng Back

Figure 3-8 Lockout View Details Screen



1 Lockout: Indicates Enable / Disable status of Master Lockout feature.

2 PV Prompt: In addition to the primary variable, HART devices can have secondary, tertiary, and sometimes more variables. When PV Prompt on the Lockout screen is “Disabled” and a Save command is issued by the Mobility MFC, the handheld saves only the primary variable. When PV Prompt is “Enabled” and a Save command is issued, the handheld saves the HART parameter information for all variables present. The factory default for PV Prompt on the Lockout screen is “Disabled”.

3 View Details: This option takes the user to the **Lockout Details** screen listing all Mobility MFC parameters that can be protected by lockout (see above right). Individual functions can be locked or, if preferred, the lockout can be set to deny unauthorized access to all parameters. Press the number of the desired menu item to toggle between Enabled and Disabled. Once satisfied with the setting, press the **Back** soft key to return to the **Lockouts** screen.

To enable the lockout options selected, be sure the display reads “1 Lockout: Enabled”. If it does not, press the **Chng** soft key to toggle from “Disabled” to “Enabled”. A prompt will appear to “Enter Code: 0 0 0”.

3.6.4 Lockout Code

This 3-digit lockout code will be required to gain access and change any menu item previously locked out. **The number keys of the unit will not work here.** Use the **Increment**, **Decrement** and **Next** Soft Keys to input a lockout code value. Alternatively you may use the   blue keys for **Increment** and **Decrement** functions. When you are satisfied with the lockout code value, press **Store**.

Note: The Mobility MFC is shipped with a factory lockout code of 3 2 1. The user must enter this code the first time Lockout is used.

IMPORTANT: After the code is entered, the user must cycle the power to activate the lockout! **BE SURE TO SAVE THIS CODE IN A SAFE PLACE IN THE EVENT YOU FORGET THE NUMBER. ACCESS TO LOCKED-OUT FEATURES WILL BE DENIED WITHOUT THE PROPER CODE.**

3.6.5 Disable Lockout

When you wish to use a function or edit a value that is protected by the lockout code, enter the three digit Lockout code when prompted and press **Save**. You will now be able to use the function or edit the setting as normal. Entering an incorrect code will display the message “Incorrect Code” and allow you to try again.

3.6.6 Changing the Lockout Code

To change the lockout code, disable the lockout function for all the parameters selected, shut the unit off, and follow the procedures outlined above.

3.7 Clock / Timers

3.7.1 Clock Edit

The Clock Edit option allows the user to correct the date and time of the Mobility MFC’s internal clock. To edit the clock, press the “4” key or scroll **Down** to **Clock Edit** and press the **Chng** soft key.

Choose a clock or date option to adjust by scrolling **Up** or **Down**. Press **Chng** to choose that option. Enter the correct value using the numeric keypad. You will be asked if you wish to save the new data. Press **Yes** to accept the new value. Pressing **No** will take you back to the previous menu without making any changes to the MFC clock. When all the changes are complete, press **Chng** to save the new value.

NOTE: When replacing the AA batteries, the date and time will remain active. Date & time information is continuously powered by an internal, 10-year life back-up battery. This battery is not serviceable by the user.

3.7.2 Backlight (off timer)

To conserve battery life, the Mobility MFC allows the user to set the backlight to shut off after a certain period of keypad inactivity. To change the backlight off timer on the unit, scroll **Down** to **Backlight** and press **Chng** repeatedly until the desired value is displayed.

The shutoff timer can be disabled or set to shut off after time periods of from 1 minute up to 30 minutes.

NOTE: The Backlight Off Timer is disabled when the optional AC Adapter (P/N 3KXD311800L0036) is powering the Mobility MFC.

3.7.3 Off Timer (master)

To conserve battery life, the Mobility MFC allows the user to set the unit to shut off after a certain period of keypad inactivity. To change the off timer on the unit, scroll **Down** to **Off Timer** and press **Chng** repeatedly until the desired value is displayed.

The shutoff timer can be disabled or set to shut off after time periods of from 1 minute up to 2 hours.

NOTE: The Off Timer is disabled when the optional AC Adapter (P/N 3KXD311800L0036) is powering the Mobility MFC.

3.8 Other

Model information and special settings are available from this menu item. Press number key “5” or arrow to this menu line and press **Chng** to select. This reveals menu options for the following:

- 1 Model Info** – select to view model number, serial number, firmware revision, last update date, number of DOFs loaded with corresponding free memory space and number of HART configurations saved with corresponding free memory space.
- 2 Battery** – shows present battery setting and optimizes the battery life indicator for the battery type entered. Press number key “2” to scroll through Alkaline (factory default) and NiMH battery options or arrow down to this menu item and press **Chng** soft key repeatedly until the desired value is displayed.
- 3 HART** – shows present HART[®] communication setting. The Mobility MFC is a HART[®] secondary master. “Compatible” setting means the handheld will inform the user if another secondary master is on line. Such situations will require the removal of the other secondary master before HART communication can occur. “Fast” setting results in faster communications but will cause interference if a HART[®] primary master is on line (example: a HART[®] Multiplexer or I/O). In normal operation the Mobility MFC automatically selects the best setting.
- 4 Enter PC Comm. Mode** - When the Mobility MFC is connected to a PC for updates via DPC Manager (see DPC Manager Utility section in this manual), a DB-9 serial cable is used. Occasionally a DB-9 Serial cable is encountered that does not have a DTR line. The DTR line is important to the update process because it is used to initiate and confirm communication between the two machines. If a DB-9 cable without a DTR line is used, the MFC must be manually placed in the **Enter PC Comm. Mode**. Go to the Main display and select **Cfg**. Select menu option **5 Other**. Select the **Enter PC Comm. Mode**. Proceed with update and cycle Mobility MFC power when the update is complete. It is recommended to use fresh batteries or an AC adaptor during update procedures. This mode will automatically time-out after approx. 1 minute of inactivity and return to the main display.
- 5 Polling Type** – Two user selectable options are available.
 - Auto** polling directs the Mobility MFC to always poll for HART device address 0 (zero) first. When found, communications begin automatically. If address 0 is not found, the Mobility MFC automatically asks for direction; select **Multi** soft key to start a multi-drop poll from address 1 – 15 or select **Retry** soft key to try to find address 0 again (for more details see the HART Communications section)
 - Digital** polling directs the Mobility MFC to always poll for HART device addresses 0 – 15. This polling method is best for 4 – 20 mA loops where one device with address 0 is present and another device with a non-zero address is on the same loop.

4 Battery Installation & Removal – all Mobility MFC models

The Mobility MFC monitors battery condition and displays a “REPLACE BATTERY” notice when the batteries get low. The Mobility MFC will function for approximately one (1) hour after the notice is posted on the display.

To install batteries, remove the Mobility MFC from the soft case (if used) and remove the large hand strap screw from rear of Mobility MFC using a flat screw driver or coin. Remove protective boot and turn the Mobility MFC face down on a work surface. Use a flat screw driver to loosen the captive battery door screw and remove the door. Six (6) AA batteries are required. Install the positive (+) end of each battery first and then press the negative (-) end into place. Follow the + and – signs that are molded into the battery compartment for proper polarity. See details below. Replace the battery door and tighten the captive door screw. Replace the boot and reinstall the hand strap screw.

Note: For general purpose models, replace all six (6) AA batteries at once with all alkaline or all NiMH cells. Do not mix alkaline or NiMH batteries with each other or with other battery types. Battery replacement is recommended when the “Replace Batteries” notice is posted on the display; however, the Mobility MFC will function for a time after the notice is posted.

Warning: For Intrinsically Safe MFC models, replace batteries only in Non-Hazardous Areas. Use only approved AA alkaline batteries in Intrinsically Safe units. Replace AA alkaline batteries with approved types only - see the Intrinsic Safety Control Drawing in the Section 18 of this manual for a list of approved AA alkaline batteries.



Figure 4-1 Battery Compartment

5 External Connections to MFC

5.1 Connector for Communication / AC Adapter Dongle

Each Mobility MFC has an electrical connector located at the top of the handheld. The connector provides fast and secure connection to the Communication / AC Adapter Dongle supplied with each handheld. Simply line up the key on the Dongle connector with the white arrow on the Mobility MFC's mating connector and insert. To disconnect, pull on the light gray connector (attached to Dongle lead – see photo below).

The Dongle is used to connect the AC adapter to the Mobility MFC when AC power is desired. The Dongle is also used to connect the MFC to a PC for serial communications. See the “Updating Mobility MFC Firmware and DOFs” and “Documenting HART Configurations with ABB DMS Software” sections of this manual for more information on communications.

Note: For Mobility MFC Intrinsically Safe units, the Communication / AC Adapter Dongle must be used only in a safe area. See the “Hazardous Area Use” section of this manual and the Intrinsic Safety Control Drawing in Section 18 of this manual for more information.

WARNING: Serious injury or death may result from explosions. Do not make any connection to the MFC's Dongle connector while in a hazardous area. Use the connector / Dongle only in non-hazardous areas.



Figure 5-1 Communications / AC Adapter Dongle Connection

5.2 HART Jacks / Lead Set

Mobility MFCs are equipped with a standard size banana jack on 0.75" center. The lead set supplied with the Mobility MFC has a standard banana plug on one end and mini-grabbers on the other for convenient connections.

Note: For Intrinsically Safe Mobility MFC models, verify the instruments in the loop are installed in accordance with intrinsically safe field wiring practices before making connection from the field device to the MFC's HART jack. See the Hazardous Area Use Section of this manual and the Intrinsic Safety Control Drawing in Section 18 for more information.

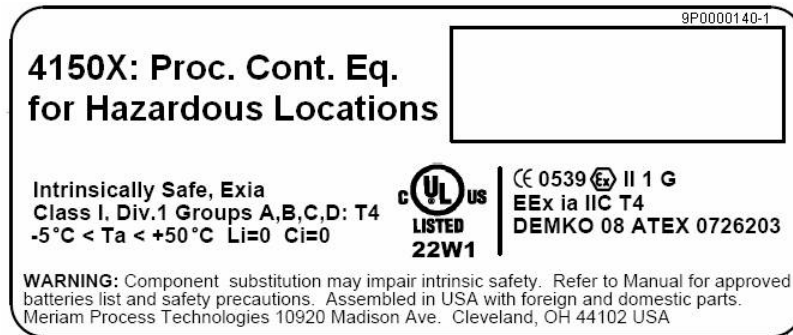
6 HAZARDOUS AREA USE

6.1 Intrinsically Safe Operation

The Mobility DHH801-MFC12B1 and DHH801-MFC22B1 HART Communicators include ATEX certification for Intrinsically Safe operation. Refer to the Intrinsic Safety Control Drawing in Section 18 of this manual for more information. The following table identifies Mobility MFC model numbers and areas of acceptable use.

Model Number	Use Description	Non-hazardous Area	Hazardous Area
DHH801-MFC12B0 DHH801-MFC22B0	General Purpose	√	NO
DHH801-MFC12B1 DHH801-MFC22B1	Intrinsically Safe	√	√

Mobility MFCs with Intrinsically Safe certification can be identified by model number or by a special name plate on rear of the unit. A sample of the Intrinsically Safe name plate is shown below for reference.



Note the following WARNINGS and REQUIREMENTS for Intrinsically Safe Mobility MFC models:

- Substitution of components may impair Intrinsic Safety
- To prevent ignition of flammable or explosive atmospheres;
 - Disconnect power before servicing
 - **DO NOT** open the unit, including battery compartment, or attempt to service the unit when located in flammable or potentially explosive atmosphere. Remove to safe area.
 - **DO NOT** mix old batteries with new or mix batteries from different manufacturers
 - **DO NOT** replace batteries while in explosive or hazardous atmospheres
 - **DO NOT** use any battery type other than those listed on the “Intrinsic Safe Control Document” found in Section 18 of this manual.

WARNING: Serious injury or death may result from explosions. Do not connect the Communication / AC Adapter Dongle to a Mobility MFC while in a hazardous area. This warning applies to the Dongle and to both of the external connections to the Dongle – the AC Adapter and Serial Cable.

WARNING: Serious injury or death may result from explosions. Before making electrical connections to an Intrinsically Safe Mobility MFC at the HART jacks, verify the HART instrument of interest is installed in accordance with intrinsically safe field wiring practices.

NOTE: Restrictions apply to the use of Intrinsically Safe Mobility MFC units in hazardous areas. Refer to the Intrinsic Safety Control Drawing in Section 18 of this manual for more information. ABB reserves the right to revise the Intrinsic Safety Control Drawing without notice. Contact ABB (www.abb.com) for the current Intrinsic Safety Control Drawing.

For Intrinsically Safe Mobility MFC models, consult the Intrinsic Safety Control Drawing in Section 18 of this manual for restrictions, for special instructions in use, and for electrical connections allowed.

7 HART® Communications with the Mobility DHH801-MFC

7.1 Overview

The Mobility MFC HART communicator provides device specific HART communication functions that allow the user to poll, configure and maintain supported HART field devices. The MFC uses Universal, Common Practice and Device Specific commands to facilitate communication with a HART field device. Use the Mobility MFC to commission devices, for operational re-configuration needs, or maintain devices through analog and sensor trim adjustments and many other features.

The Mobility MFC will communicate with any HART device through Universal and Common Practice Commands using the standard Generic DOF (Device Object File) but must have the DOF for a specific HART device installed before it can execute Device Specific Commands. Consult the large and growing list of available DOFs at www.abb.com for an up to date list of HART devices with device specific support. The list is found under Instrumentation, Device Management, Hand Held Devices. When HART device support for new devices becomes available, the Mobility MFC can be easily field updated via Internet downloads.

Warning: To avoid damage to a PC serial port, do not connect the Mobility MFC's HART leads to an AC powered HART device while the MFC is on AC power and a serial cable is connected to a PC. ABB recommends disconnecting the HART leads from the MFC prior to any communication activity.

7.2 HART Commands

Three HART command types are used by the Mobility MFC to communicate with HART field devices. First, *Universal Commands* are primarily used to identify a field device by its model number and tag number and to read process data from the device. This communication is referred to as "polling". The Mobility MFC can poll any Hart Device. Second, *Common Practice Commands* are used for calibration and maintenance functions that are common to many devices. An example of this would be trims or adjustments for the devices' analog outputs. Third, *Device Specific Commands* are used to handle functions that are unique to a particular device or manufacturer. Examples of these commands include sensor zero, sensor trim, calibration curve characterization, density inputs required for calculations made by the HART device or other configuration functions unique to the specific device.

7.3 HART Connections

HART connections are made using two standard banana jacks (3/4" center) located at the top end of the Mobility MFC. Refer to the following diagram. Polarity is not a concern for HART connections, therefore, both jack collars are black. ABB supplies a HART lead kit (P/N 3KXD311800L0011) complete with mini-grabber connections and a 250 Ω load resistor with each model MFC.

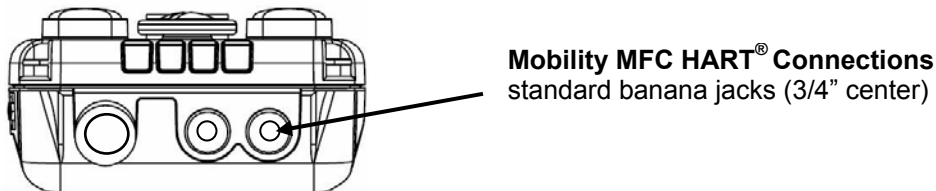


Figure 7-1 Mobility HART Test Lead Connections

For low load loops (less than 250 Ω), a 250 Ω resistor may be needed in the loop to insure reliable HART communications. ABB supplies a 250 Ω load resistor in the form of a standard adaptor (P/N 3KXD311800L0012). Refer to the following diagram for connection details.

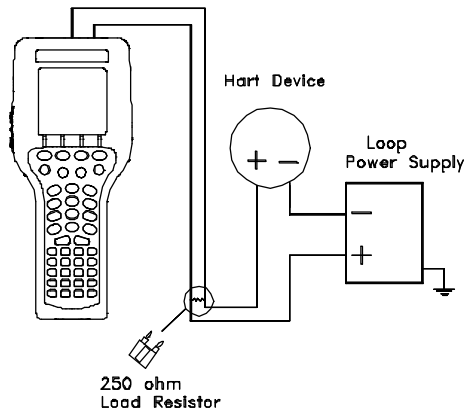


Figure 7-2 Low-Load Loops

When connecting the Mobility MFC to a loop with a resistive load greater than 250 Ωs, the HART jacks may be connected across the loop + and – or to the HART device communication terminals. Refer to the following diagram for connecting across the loop + and –.

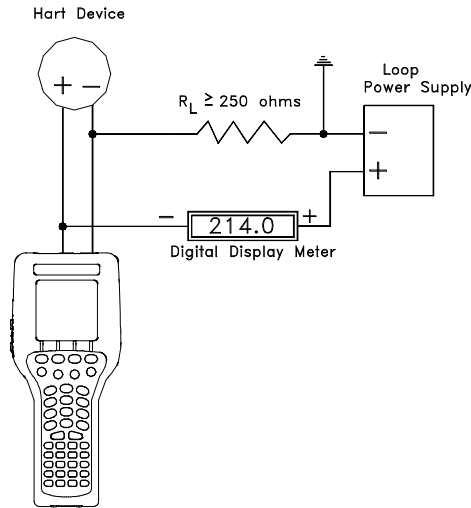


Figure 7-3 Connecting to the Mobility MFC communication terminals, R Loop > 250 ohms

7.4 HART® Communications Initial Screens / Online Mode

After power up the Mobility MFC automatically detects if a field device is connected and attempts to establish HART communications; this is the factory default “Auto” poll function. When a device with address zero is found, the Mobility MFC provides feedback to the user and starts the initial HART display for the connected device. See an example of Online Mode below.

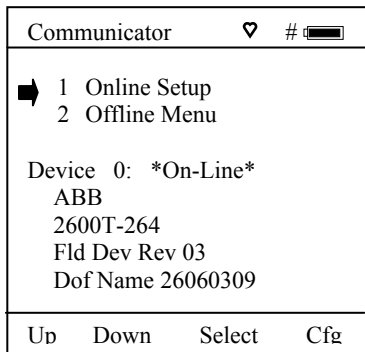


Figure 7-4 HART Device Found Screen

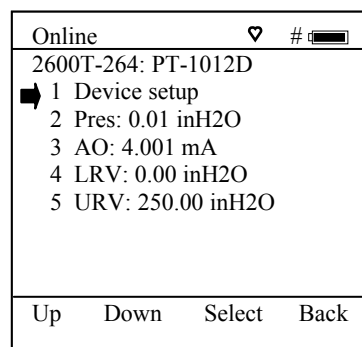


Figure 7-5 Online HART Screen

When no device connection is detected the Mobility MFC enters the **Main** navigation screen and the message **Device 0: Not Found** is displayed. Upon selecting the “1 Online Setup” option, the Mobility MFC checks again for Device address 0 and if not found displays the **Multidrop / Retry 0** screen. This screen allows selection of either of three options: launch Multidrop poll by selecting the **Multi** soft key, retry Device 0 communication after re-checking physical connections to the device by the selecting **Retry** soft key, or exit to Offline mode by selecting the **Exit** soft key.

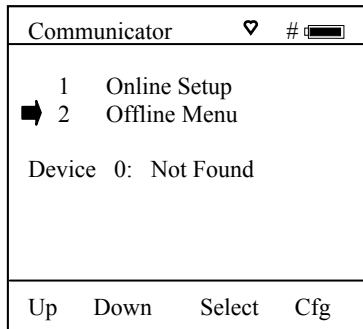


Figure 7-6 Main Navigation Screen - No device or Non-zero address found

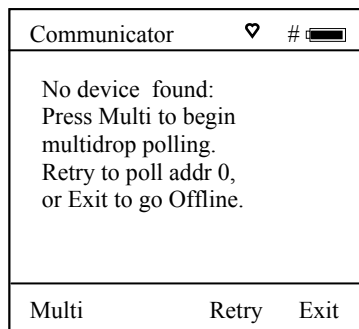


Figure 7-7 Multidrop / Retry 0 Screen - No device or Non-zero address found

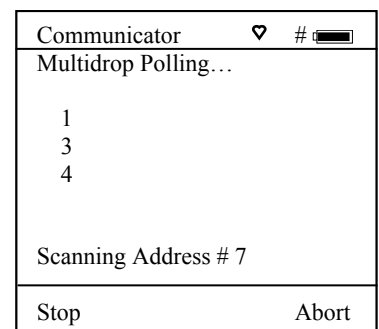


Figure 7-8 Multidrop Polling Screen - Multidrop & Burst Mode Support

7.5 Multidrop Poll (addresses 1 – 15)

To initiate a Multidrop Poll, select the **Online Setup** option from the **Main** screen when the **Device 0: Not Found** message is displayed. Then select **Multi** soft key from the **Multidrop / Retry 0** screen. This function polls for all non-zero addresses (1 – 15). Located addresses are listed on the display as the remaining addresses are checked. When polling is complete, or upon pressing **Stop** after the address of interest is found, use the soft key controls to select the address of interest. The initial HART menu for the selected device will be displayed.

7.6 Digital Poll (addresses 0 – 15) for One Power Cycle Only

Digital Polling is a special feature accessible through the Main navigation screen and the **Cfg** soft key. Press the **Cfg** soft key and then select the “2 Applications” menu option. Select the “1 Digital Poll” menu option to launch a polling operation that starts with address 0 and ends with address 15. All addresses on the loop will be displayed on the Mobility MFC screen. The address of interest can be selected from the list to launch HART communication with that device. This Digital Poll is for one power cycle only and can only be launched from this location in the handheld’s menu structure. Turning the Mobility MFC power off will return the unit to the Mobility MFC’s default HART poll setting.

7.7 Auto and Digital Poll (addresses 0 – 15) Default Setting Options

Auto Poll is the factory default setting. To set Digital Polling or re-set Auto Polling as the Mobility MFC’s default poll setting, press the **Cfg** soft key and then select the “5 Other” menu option. Select “5 Polling Type.” Two user selectable options are available.

Auto polling directs the Mobility MFC to always poll for HART device address 0 (zero) first. When found, communications begin automatically. If address 0 is not found, the Mobility MFC automatically asks for direction; select “**Multi**” from soft key to start a multi-drop poll from address 1 – 15 or select the “**Retry**” soft key to try to find address 0 again.

Digital polling directs the Mobility MFC to always poll for HART devices addresses 0 – 15. This polling method is best for 4 – 20 mA loops where a device with address 0 is present and another device with a non-zero address is on the same loop. Selecting Digital Polling here sets it as the Mobility MFC’s default poll setting.

7.8 Manual Launch of Device 0 Poll

When the message **Device 0: *On-line*** is displayed on the Main navigation screen, selecting **Online Setup** will launch HART communication with the device. The message indicates that a HART device with address 0 has been detected at the HART connection and the Mobility MFC is standing by to initiate communications. The **Device 0: *On-line*** message is shown 1) if a physical connection is made to a HART device after the Mobility MFC power is turned on or 2) if the user exits from a HART communication session without disconnecting the lead wire by using the soft key controls provided.

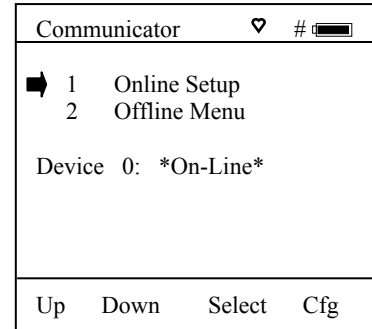


Figure 7-9 Main Navigation Screen - Manually launch polling on device 0

7.9 Offline Menu Mode

The **Offline Menu** gives the user access to lists and functions that can be viewed or performed in Offline Mode at the user's convenience for the purposes of reviewing the Mobility MFC's DOF list, reviewing stored device configurations or creating HART configurations. Stored configurations can also be edited and then applied later to a connected HART device. When the **Offline Menu** is selected from the **Main** navigation screen, the display at right is shown.

7.9.1 List / Show DOFs:

Provides a list of installed DOFs (Device Object Files) used by the Mobility MFC to communicate with HART devices. Lists can be viewed by Manufacturer, by Device Name or by stepping through all Devices one at a time. Use the soft key controls to move through the list. Pressing the \uparrow key changes soft key definitions **Down** and **Up** to **PgUp** and **PgDn**. To quickly advance to the next page of a list, press the **PgDn** soft key. To retreat to the prior page, press the **PgUp** soft key. Once engaged the **PgUp** and **PgDn** soft keys remain active until the **Up** or **Down** soft keys or \uparrow is pressed again.

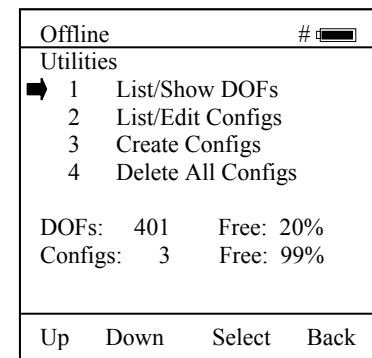


Figure 7-10 HART Offline Menu Screen

7.9.2 List / Edit Configs:

This screen lists all stored HART configurations by Tag Number. The configurations stored enable fast commissioning of replacement devices, cloning of existing systems, or re-configuring for changes in process conditions or batch runs. Any configuration in the list can be sent to another HART device of the same manufacture and model. The display can show 20 character tag numbers. Truncated tags are listed if more than 20 characters are used. Moving the cursor down to the tag of interest and pressing the **Select** soft key will provide a detailed information screen, including full tag number up to 28 characters, for the tag of interest (see example below, right).

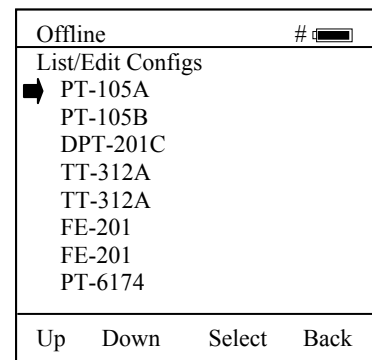


Figure 7-11 Offline List / Edit Configs Screen

The editing function allows review of all HART parameters in a configuration and modification of editable parameters. The edit function can be locked out if desired (see the **Lockout** section of this manual for more information). To view detailed information of a stored configuration, move the cursor to the desired tag number and press the Select soft key. The Config Detail screen (see example at right) provides information to help the user confirm the identity, origin, and save date/time of the configuration. Pressing Select again opens the configuration for review or offline editing.

New configurations saved are added to the bottom of the List / Edit Config list. If multiple entries for one device are shown, the most recently saved configuration is always shown at the bottom.

Entries in the List / Edit Config list may have been saved or created from various sources. Possible sources include the save command from a connected HART device, created in the Mobility MFC using the **Create Configs** function, copied from another configuration and renamed, or created by editing an existing file. The Mobility MFC will also list configurations downloaded from the separately available Device Management System software. Tag numbers, date / time of save, type of configuration stored, and other information are displayed under **List/Edit Configs**. Configuration types are:

- Complete Config saved from connected device in Online mode, or a complete config that was downloaded from DMS
- Default Config created by Mobility MFC in Offline mode, or created in DMS and downloaded to MFC
- Edit Vars Only created by editing an existing configuration and includes only the edited parameters
- MVar Primary Cfg for multivariable devices – Primary Variable configuration
- MVar Sub Config for multivariable devices – Sub-configuration (secondary, tertiary, fourth, etc variables)

7.9.3 Create Configs:

The **Create Configs** function allows the user to configure a HART device file in Offline Mode for sending to the intended device later when connected in the Online Mode. Use the soft key controls to move through the list and select the device model number required. The menus prompt the user to make the necessary configuration selections, tag the file for later retrieval and use, and edit configuration lines as required. This function can be locked out. See the Lockout Section of this manual for more information.

7.9.4 Delete All Configs:

The **Delete All Configs** function clears all configurations from memory (including active and hidden configs). When this menu option is selected, the Mobility MFC will ask “Delete ALL Configs... ARE YOU SURE???” Select **Yes** to clear all stored configurations from memory.

7.9.5 Delete Individual Configs / Clearing Configuration Memory:

Individual stored Configurations may be deleted with Mobility MFC **Del** soft key function (see example at right). When this menu option is selected, the Mobility MFC will ask “Delete CURRENT Config... ARE YOU SURE???” Select **Yes** to clear only the selected configuration from memory.

The **Del** key only hides the record from the Mobility MFC screen; it does not clear memory space. This function can be locked out. See the Lockout Section of this manual for more information.

Offline	#		
List/Edit Configs			
Tag: FI-105A			
Device ID 1365			
PV: Flow			
ABB			
TrioWirl			
Complete Config			
Uses DOF 11070702			
51 Variables			
12/18/03 4:58 PM			
Copy	Del	Select	Back

Figure 7-12 Offline List / Edit Configs Detail Screen

7.10 Online Setup Mode

Online Setup is the normal HART communication mode for the Mobility MFC. This mode enables communication with HART field devices at the Universal, Common Practice and Device Specific Command levels for full device setup and functionality.

Menus displayed for the connected device follow the HART device manufacturer's menu structure for the connected device. Consult the device manual for menu structure details.

The Mobility MFC features two unique online features for added convenience to the user.

1. Live HART connection monitor: The Mobility MFC display lets you know from the Main navigation screen when a device is * **On-line** * and ready for communication.
2. **Review/Edit**: This menu option allows the user to review configurations line-by-line. The Mobility MFC supports editing of the configuration once the parameter of interest is located.

7.11 HART Communications Trouble Shooting

If an operating HART device is connected to the Mobility MFC but the "Device 0: Not Found" notification is received, a Multidrop Poll may be executed to determine if the connected device has a non-zero address. Select **Online Setup** from the Mobility MFC Main navigation screen and then select the **Multi** soft key to initiate the Multidrop poll. If the "No Devices Found" message is received, then the loop connections to the Mobility MFC should be carefully checked.

If an operating HART device with address zero (0) is connected to the Mobility MFC but the "Device 0: Not Found" notification is received, the loop connections to the Mobility MFC should be carefully checked.

Make sure all connections are correct and secure. Check for shorts, open circuits and multiple grounds.

Determine if the loop resistance is greater than 250Ω and less than 1100Ωs. If less than 250 Ω then use the supplied 250 Ω load resistor in series with the loop (see diagram HART Connections section).

If communication is still not established, check the **List / Show DOFs** menu under **Offline Menu**. Check the list for the presence of the "Generic" DOF under the manufacturer name Meriam. If "Generic" is found, then HART communication is possible when the device is properly wired and connected to the Mobility MFC (see connection troubleshooting details above).

When the message "Generic" is displayed after connecting to a HART device there are two possible causes:

- 1) No device specific DOF for that device is currently installed in Mobility MFC memory. Check for availability of the required DOF on the ABB web site. For download instructions, see the DOF / Firmware Download Site section of this manual.
- 2) The connected HART device supports only HART Universal and Common Practice commands (i.e. generic commands). There are several such devices on the market, particularly level type devices.

7.12 More Status Message

HART device events (diagnostic flags) cause the Mobility MFC to display a "More Status Message" at the display bottom. This message notifies the user of one or more diagnostic warnings in the Review Status menu option of the connected device. Upon receipt of this message, enter the **HART** mode and select Detailed Setup / Diagnostics – Service / Test – Status / View Status to retrieve the diagnostic information.

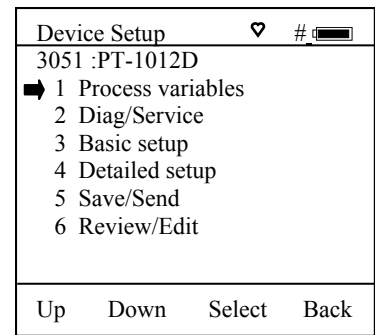



Figure 7-13 Online Device Setup Screen

7.13 Save / Send Configuration Functions

HART device configurations may be saved to MFC memory or sent from MFC memory to a HART device. These functions are useful for cloning a device configuration for use in another transmitter of the same configuration, for recording as-found and as-left configurations for later review, for returning HART devices to previously used configurations, etc...

The Save / Send function may be accessed in one of two ways:

1. Press the Document  key on the Mobility MFC for the screen shown at right. Then select the "Save/Send Configs" menu option to launch a HART communication poll and use the Save / Send options.
2. Use the Save / Send menu option within the HART device's standard menu. The Mobility MFC would be in Online mode in this case. Save / Send is normally found under the "Device Setup" menu option on the initial HART display for the device

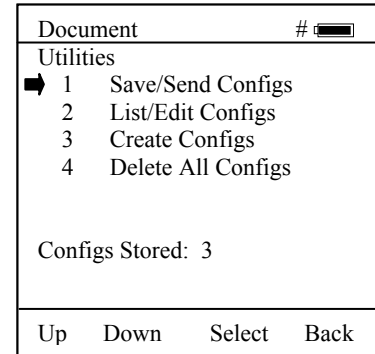


Figure 7-14 Document Key Menu Screen

8 DOF Memory Maintenance

DOF flash memory will become fragmented after many DOF download sessions to add new or update existing DOFs. Fragmentation reduces the total number of DOFs that can be saved in memory. 560 DOFs is the nominal capacity of the flash memory. When fragmentation becomes extreme, the Mobility MFC will not accept additional DOF downloads. Periodic DOF memory maintenance will be needed to optimize DOF memory.

The Offline screen indicates the number of DOF files stored in memory and the percentage of free memory available for additional files. 401 DOFs ideally use about 72% of the available memory, so 28% of DOF memory should be free... The example at right indicates that only 20% of DOF memory is free. This indicates fragmentation.

To optimize DOF flash memory, it is necessary to delete all DOFs and then reload them all in one session. Connect the Mobility MFC to a host PC that has DPC Manager installed (see the DPC Manager Utility section of this manual for more information). There are 2 methods for doing the re-installation.

Offline		#	█
Utilities			
➔ 1	List/Show DOFs		
2	List/Edit Configs		
3	Create Configs		
4	Delete All Configs		
DOFs:	401	Free:	20%
Config:	3	Free:	99%
Up	Down	Select	Back

Figure 8-1 HART Offline Menu Screen

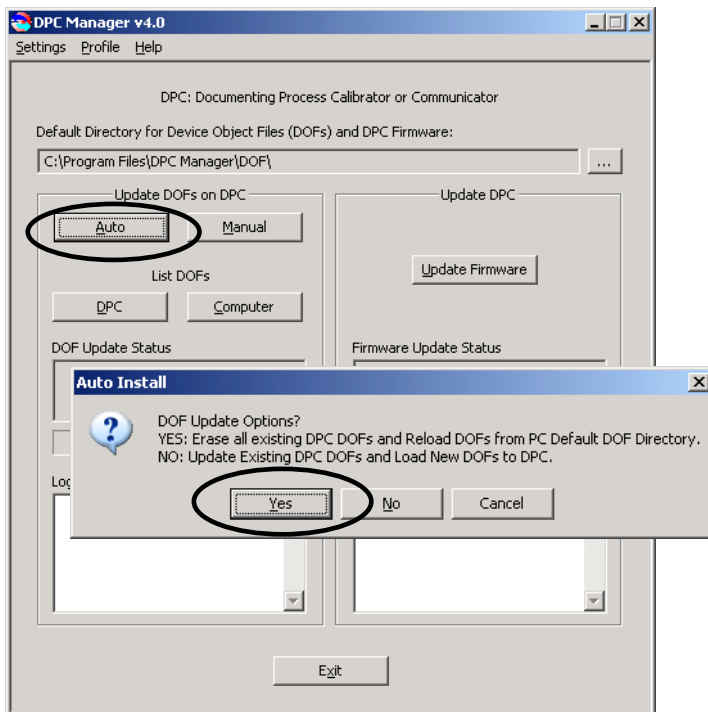


Figure 8-2 DPC Manager Reload DOFs

Method 1 - This procedure works well for users that only download a select number of DOFs from the Internet onto the PC that are needed with instruments in their installation.

Launch DPC Manager and select the “Manage DPC Device Driver and Firmware Updates” option. Go to the Tool Bar and click on “Settings”, then click on the “Advanced” option. The screen to the left will appear.

Under “Update DOFs on DPC” section on left side, click on the “Auto” button. An Auto Install dialog box will appear.

Select the “Yes” response to the “DOF Update Options? question to erase all existing DOFs and re-load DOFs from the default DOF directory.


Method 2 - This procedure is needed when all available DOFs are downloaded from the Internet onto the PC. The MFC will run out of memory if an attempt is made to download all stored DOFs (as is done in Method 1). To overcome this, a profile must be created and used for determining which DOFs to download onto the MFC. Refer to section 13.2.6 “Update Handhelds” for instructions to “Re-Install DOFs” to erase handheld memory and to install selected DOFs.

9 Documenting HART Configurations with DMS Software

The documentation functions of the DHH801-MFC provide additional functionality for use with the ABB Device Management System (DMS) software. DMS is a database product for complete device management services including calibration documentation with the ABB DHH810-MFT Series of multifunction calibrators and HART configuration documentation with the DHH801-MFC. Complete device histories are maintained in the database. For HART devices these histories can include as-found and as-left HART configuration data to complete this important part of a device's history.



Figure 9-1 Mobility MFC and MFT with DMS

The Document key  on the Mobility MFC models will save configurations in as-found or as-left categories as selected by the user. These configuration files can be uploaded later to DMS. When the **Save/Send Configs** menu option is selected the Mobility MFC automatically polls for an online device for subsequent user selections.

DMS can also be used as a configuration repository ready to download stored device configurations for batch runs or changes in operating requirements. New configurations can be downloaded to Mobility MFC memory for later recall and use in the field.

10 Available DOF Website

After ensuring your PC has Internet access, establish a connection to the Available DOF website by going to www.abb.com/instrumentation and making the following selections:

- ”Device Management and Fieldbus” from the main page
- ”Hand Held Configuration Tools” from the main page
- ”DHH80x-MFC” from the main page
- ”Mobility Hand Held Supported Devices” under Links in the right hand column.

A list of currently available DOF’s for HART device communication is presented as shown below:

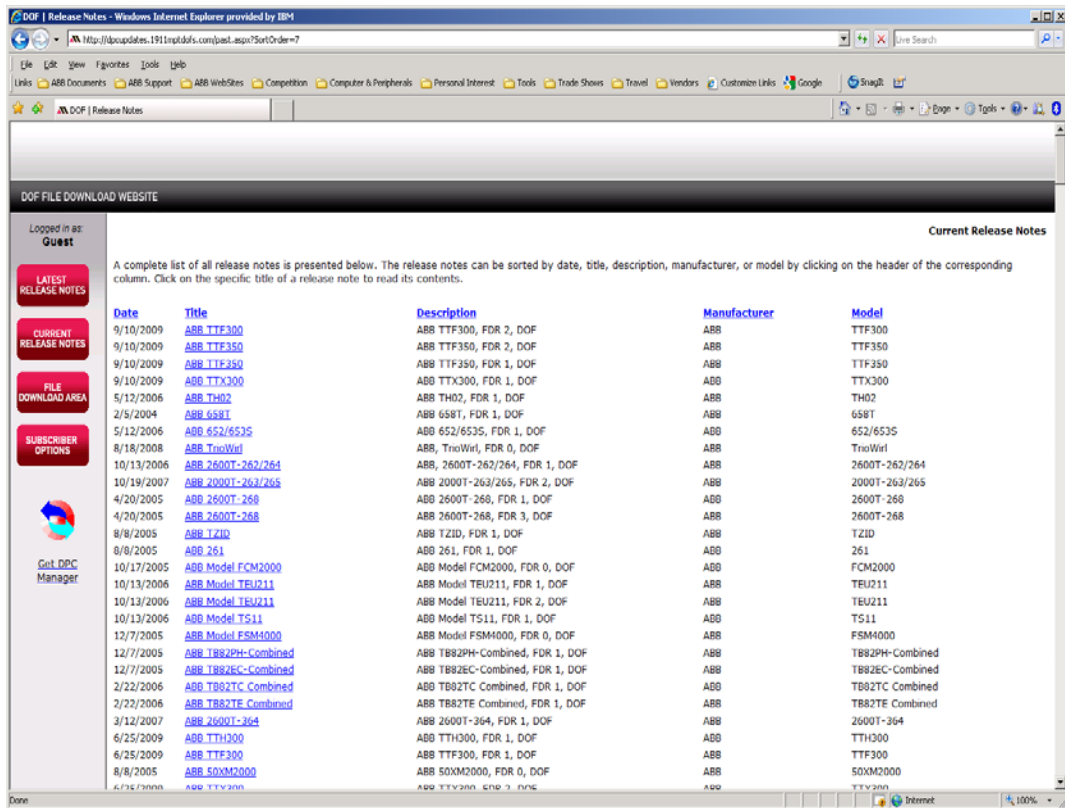


Figure 10-1 Mobility Handheld Supported Devices View

In addition to listing the Available DOFs, the website also provides access to the **Current Release Notes** screen that lists and describes the most recent firmware releases posted and the posting date. The screen describes the most recent firmware releases available and dates posted. Five (5) columns are shown on this page: Date, Title, Description, Manufacturer, and Model. These categories will assist the user in finding the release descriptions of the DOF, Mobility MFC Installer or Mobility MFC Firmware releases of interest. Each column can be sorted to assist searches of the release database.

11 Handheld Registration

Every Mobility MFC is shipped with a card that identifies a user name and password. Only registered handhelds with valid download subscription coverage are able to receive new DOF downloads. To register your handheld, establish a connection to the Internet and follow the instructions in the Available DOF Website section of this manual to get to the Mobility Hand Held Supported Devices web link. A list of currently available DOF's for HART device communication is presented as shown in Figure 10-1.

From this link, select the "Subscriber Options" button (red box) where a login page comes up where you are prompted to enter a user name and password. Enter the text from the card and press Go. Then fill out the requested information. This will also enable you to receive e-mail notices of new firmware and DOF availability.

12 Mobility DHH801-MFC Device Specific & Generic HART® Communications

ABB supports a large and growing number of Device Specific DOFs (Device Object Files). Refer to the **Available DOF Website** section of this document for accessing a current listing of HART® devices with full Device Specific communication support. Information found there can be sorted by manufacturer name or model number.

To facilitate communication with HART devices that are not yet supported with Device Specific DOF files or that do not require DOF files, the Mobility MFC includes Generic HART Communication capability. This allows the user to communicate with any HART device using Universal and Common Practice commands to poll, configure, and maintain HART devices. Specific functions supported include most polling, tagging, device configuration and trim operations for analog outputs. Generic communications do not support Device Specific commands for higher order HART functions (see the **HART® Commands** section of this manual or the User's Manual for the HART device of interest for more information on the three command levels).

12.1 Using Generic HART Communication

The DHH801-MFC's Generic HART Communication mode starts automatically when HART communication is initiated with a device for which no Device Specific DOF (device object file) is stored in the handhelds flash memory. When this occurs, line two of the display will indicate "Generic" and the device tag number.

In general, the Generic HART mode operates similarly to its device specific DOF counterpart (see HART Communication section of this manual for more details). However, the Mobility MFC does not display Device Specific related communication menus or options when in the Generic communication mode. For example, the Zero and Sensor trim menu options (normally executed by Device Specific commands) are not displayed for pressure transmitters without DOF support. Please see the **Updating the Mobility DHH801-MFC Firmware and DOFs** section of this manual for information on downloading the latest Device Specific DOF files to your Mobility MFC.

13 Updating the Mobility DHH801-MFC Firmware and DOFs

13.1 Overview

Firmware upgrades and new DOFs can be downloaded via the Internet in either of two ways. The first way is to use the DPC Manager utility (shipped with each Mobility MFC or downloaded from the DOF Download Site) on a PC with Internet access to download files from the DOF Download Site automatically and then update the MFC. The second way is to use the DOF Download Site to download the needed files to the host PC and then use the DPC Manager utility to coordinate the update of the Mobility MFC. The Download Site enables users to stay current as new DOF's or revisions of existing ones are posted. Automatic email notices of new DOF postings are sent to all users who have logged on to the Download Site and registered their email address under "Subscriber Options." Firmware updates are free of charge. DOFs are available by subscription.

Mobility MFC users also using the ABB Device Management System (DMS) software should always use the DOF update utility found within DMS to synchronize Mobility MFC DOFs with those in DMS. This is critical for downloading configuration files to a Mobility MFC for use in the field and for uploading saved device configurations from Mobility MFC memory to the DMS. For more information, see the DMS Instruction Manual.

Refer to the Available DOF Website section of this manual to access a list of currently available DOF's for HART device communication. Sort the list by clicking on any column header.

13.1.1 Who has access to the Download Site?

All Mobility MFC purchasers have unlimited access to the Download Site for three years from date of shipment. These customers may download all published files from the site to their Mobility MFC upon proper registration of the MFC as described in the Handheld Registration section of this manual. After the initial three-year period, the Download Site is available with a paid three-year subscription fee. Contact an ABB representative for more information and to purchase a three-year subscription.

13.1.2 PC Requirements for Download Operations

ABB recommends IBM compatible Pentium I PCs or higher for download operations. The PC should have an available RS-232 port, minimum modem speed of 28K and access to Internet service. USB ports can be used with USB to serial adapters as well. The RS-232 port must not be shared with other software applications during update operations

13.1.3 Preparing the MFC

All Mobility MFC models come ready to connect to an IBM compatible PC. Connect the supplied Communication / AC Adapter Dongle (P/N 3KXD311801L0014) to the MFC. Connect the Dongle to the PC using the supplied six-foot male DB-9 to female DB-9 cable (P/N 3KXD311800L0013). Similar cables are acceptable. For PCs that only have USB connections, a USB to DB-9 serial port adapter can be obtained (P/N 3KXD311800L0115). Provide power to the Dongle using the supplied AC Adapter (P/N 3KXD311800L0036). The Mobility MFC is ready for download operations.

Warning: To avoid damage to a PC serial port, do not connect the Mobility MFC's HART leads to an AC powered HART device while the Mobility MFC is on AC power and a serial cable is connected to a PC. ABB recommends disconnecting the HART leads from the Mobility MFC prior to any communication activity.

13.2 DPC Manager Utility

The DPC Manager Utility should be installed on the host PC from the Mobility Interface Software CD (included with Mobility MFC shipment). The DPC Manager coordinates the download operations from the DOF Download Site to the host PC and from the host PC to the Mobility MFC. Periodic improvements may be incorporated into this utility. Therefore, ABB recommends periodic comparison of the DPC Manager

version installed on the host PC to the latest available version on the Available DOF Website to insure use of the up-to-date utility tool. All instructions herein are based on use of version 4.0 which is the latest version available at the time this manual was written. Later versions of the DPC Manager can be downloaded by making the following selections from www.abb.com/Instrumentation

- “Device Management and Fieldbus” from the main page
- “Hand Held Configuration Tools” from the main page
- “DHH801-MFC” from the main page
- “DHH801/810 Software Download DPC Manager, Version x.y” link from the right side column

Note that the DPC Manager software is >20 MB and phone modem downloads can be lengthy. After downloading the file, double click on the DPCsetup.exe self extracting zip file, type in a storage location, select all files, and press the Extract Items button. Go to the location where the extracted files were stored and run the setup file to install DPC Manager. Directions for using DPC Manager are found under the Help Tool Bar selection.

13.2.1 Prerequisites:

- A. DPC Manager is installed on a computer that has Internet Access. This software is shipped with each MFC on a CD and is available for internet download.
- B. The latest version of DPC Manager is installed and the correct COM Port has been configured. (see “Settings” topic in Tool Bar, then “Communications” and then “Port” to select COM port).
- C. A standard RS-232 Cable is connected to the dongle attachment that’s connected to the MFC and the unit is turned on. Note: The DPC cannot communicate HART while simultaneously communicating through the RS-232 connection.
- D. The AC power adapter is connected to the Dongle (required for all RS-232 communications).

13.2.2 Launching DPC Manager

Open the DPC Manager Utility by double clicking on the desktop icon for it and select the “Manage DPC Device Driver and Firmware Updates” button.

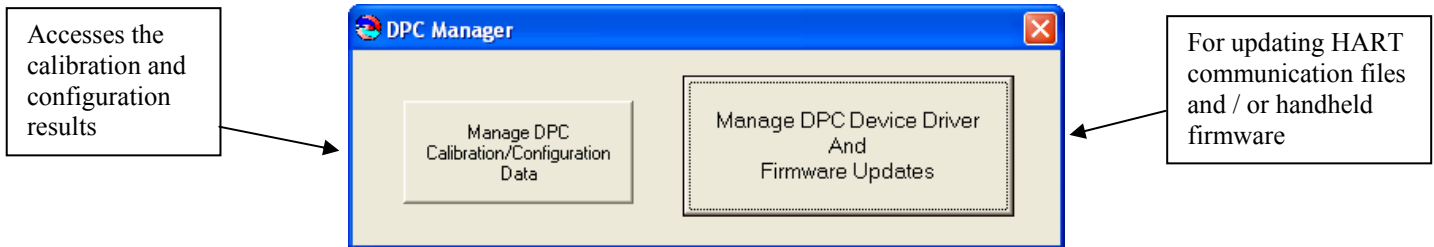


Figure 13-1 DPC Manager Option Selection

13.2.3 Using DPC Manager to Keep Your MFC Up to Date

Click on “Settings” in the toolbar and make sure the “Advance Settings” option is unchecked.

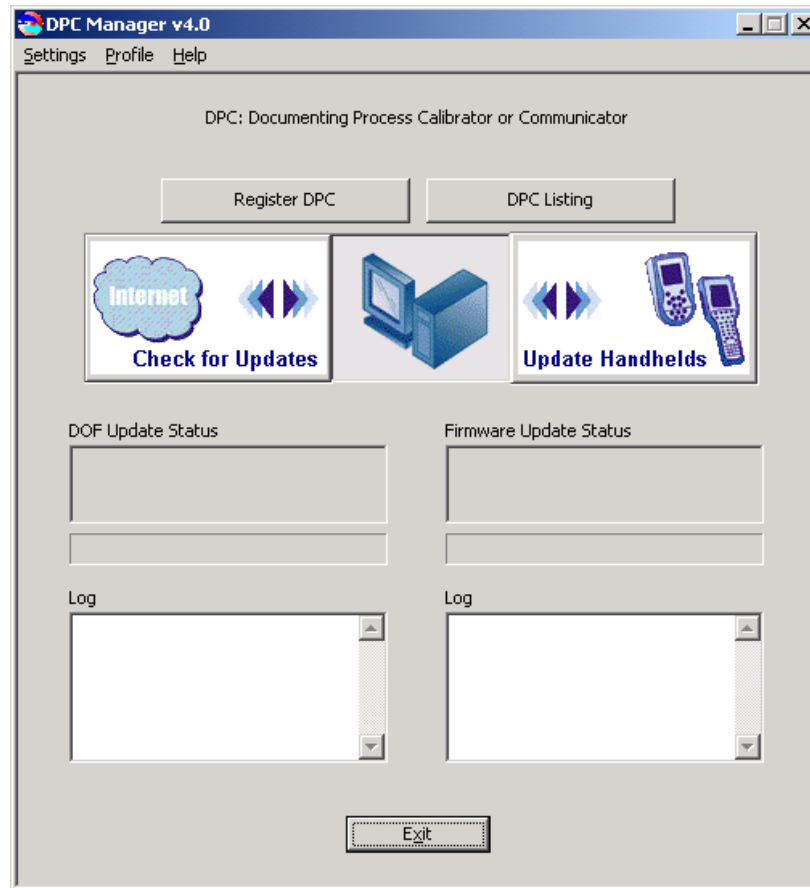


Figure 13-2 DPC Manager Basic Update Method

13.2.4 Register MFC

Click the “Register DPC” button and the Model Number, Serial Number, Expiration Date and Firmware version of your MFC will be retrieved and registered. A screen will appear displaying the Model Number, Serial Number, Expiration Date and Firmware version of your MFC. If the expiration date and firmware version of your MFC is blank, then press Check Subscription. You will not be able to download DOFs to the handheld until the MFC is registered as indicated by a filled in expiration date and firmware version. If the registration date has expired, then a 3-year extension can be purchased .

13.2.5 Check For Updates

Click on “Internet Check for Updates” button and DPC Manager will automatically download all firmware and DOF files to your computer. NOTE: Problems here may be due to firewall settings. See the “Manually Keeping Your MFC Up to Date” section below for alternative approach.

13.2.6 Update Handhelds

Click on the Update Handhelds icon/button to initiate an update session. The “DOF Update Status” box and “Log” box will update to show progress. This process takes a minute or so depending on the number of DOFs loaded on the connected handheld. Once all handheld DOFs are logged, a Tree View of those DOFs will appear.

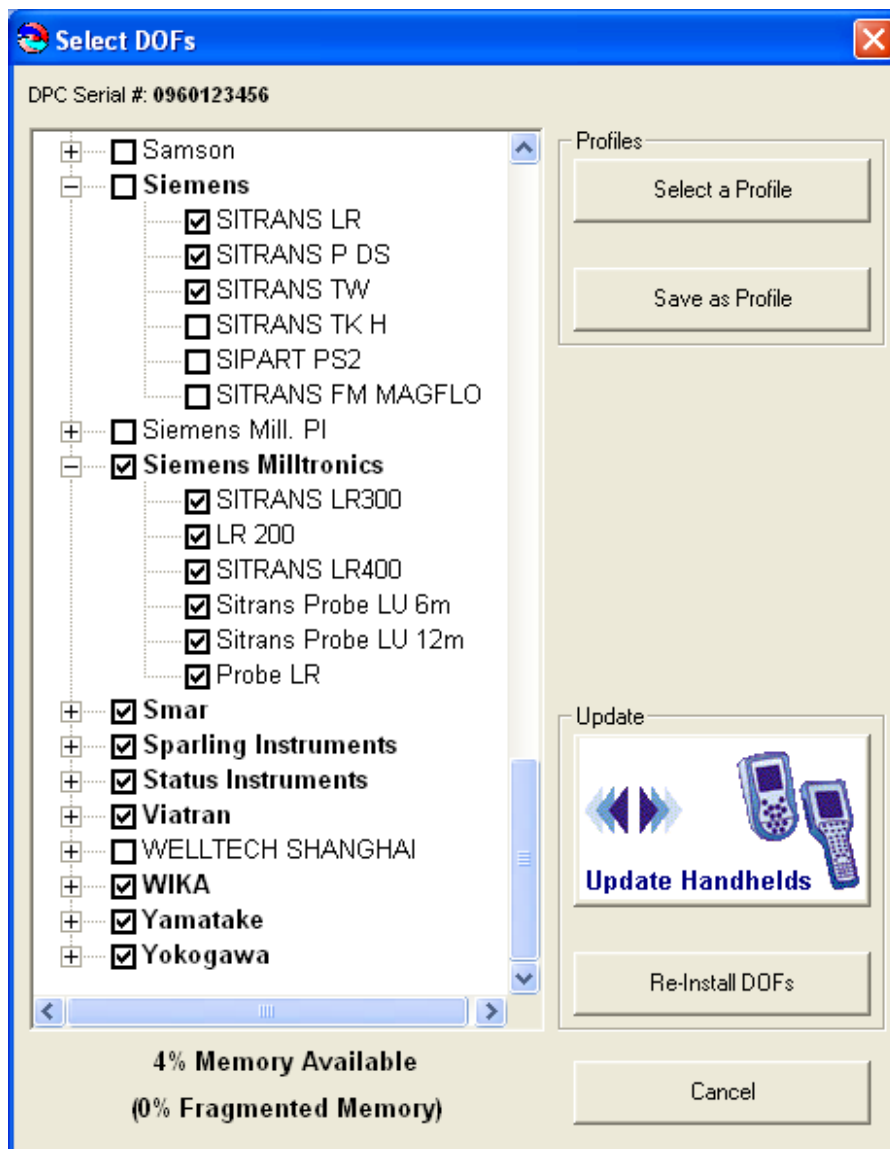


Figure 21.3 DPC Manager DOF Selection

The Tree View shows all DOFs installed on the connected handheld. Handheld serial number is shown at top. Checked boxes indicate DOFs that are on the handheld. A check in the manufacturer's box with bold lettering means all their devices are loaded. An unchecked manufacturer's box with bold lettering means some of their DOFs are loaded. An unchecked manufacturer's box with standard lettering means none of their DOFs are loaded. % Memory Available and % Fragmented Memory are shown for the connected handheld at bottom of Tree View. A low or negative "% Memory Available" number and/or high "% Fragmented Memory" number indicates that the "Re-Install DOFs" button should be used to update the connected handheld. To make more memory available, uncheck all manufacturers that are not used in your plant. Uncheck unused devices within a manufacturer's list to save further memory. Then select "Re-Install DOFs" button to erase handheld memory and re-install DOFs.

% Memory Available will update to reflect deletions or additions from the Tree View. If "% Memory Available" is high, then use the "Update Handhelds" button to add new or revised DOFs. Click "Update Handhelds" button to add newly checked device DOFs and new revisions of previously loaded DOFs as determined by the checks in the Tree View.

NOTE: "Update Handhelds" will not remove newly unchecked DOFs from the connected handheld. To remove unwanted DOFs, click the Re-Install DOFs button. This will erase all DOFs current in handheld

memory and re-install only those DOFs checked on the Tree View. This takes longer the first time but makes more memory available for future use of the “Update Handheld” button.

Using Profiles

Any Tree View can be saved as a Profile for later re-use by clicking on the “Save as Profile” button. Or, a Tree View can be created by clicking on the “Select a Profile” button and then selecting the “BlankProfile” from the default location. Save Profiles with descriptive names for easy identification at a later date.

Profiles can be re-used for updating additional handhelds, automatically update with new or revised DOFs from checked manufacturers, and automatically queues DOF revisions of all checked devices for future handheld updates. Just click on “Internet Check for Updates” and then select a saved Profile to Re-Install DOFs or Update Handhelds.

Updating Firmware

After updating the HART® device DOFs, DPC Manager automatically checks the handheld’s firmware version against the latest downloaded firmware and initiates a firmware update if needed.

13.2.7 MFC Listing

The “DPC Listing” button provides a list of all MFC’s and MFT’s that have been registered with the DPC Manager on the host computer.

13.3 DPC Manager Option

In addition to supporting Internet downloads of new DOFs, DPC Manager also provides a licensable option for storing, displaying, and printing configuration results uploaded from the DHH810-MFC handhelds. Contact your ABB Manufacturer’s Representative to obtain pricing and purchase the licensable option. This option adds a powerful documenting function to the DPC Manager utility. Users can retrieve saved calibration results and / or HART configurations from the handhelds. The information is then saved in .csv format to spreadsheet applications such as MS Excel®.

The DHH801-MFC HART Communicator saves HART device configurations to memory to document as found and as left parameter values. The configurations can be uploaded to a host PC for viewing parameter lists or the lists can be printed for record purposes.

The DPC Manager Data Management feature is a one-way tool; results can be uploaded from the MFT or MFC handheld memory to a host PC. Data changed in the spreadsheet application cannot be returned to the handheld for use in the field. For two-way data management features (upload and download capabilities), consult ABB for information on our Mobility DHH820-DMS Device Management System software product.

13.3.1 Managing Configuration Data

1. After double clicking on the desktop DPC Manager icon, the following will appear:

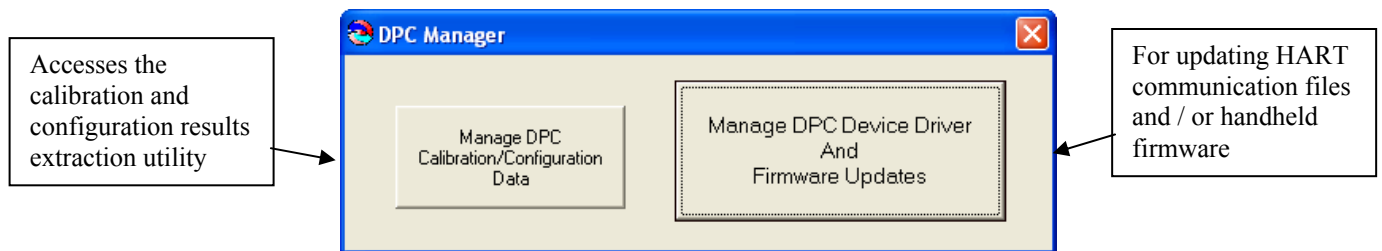


Figure 13-3 DPC Manager Option Selection

- Click on the left hand button “Manage DPC Calibration/Configuration Data” and the following will appear:

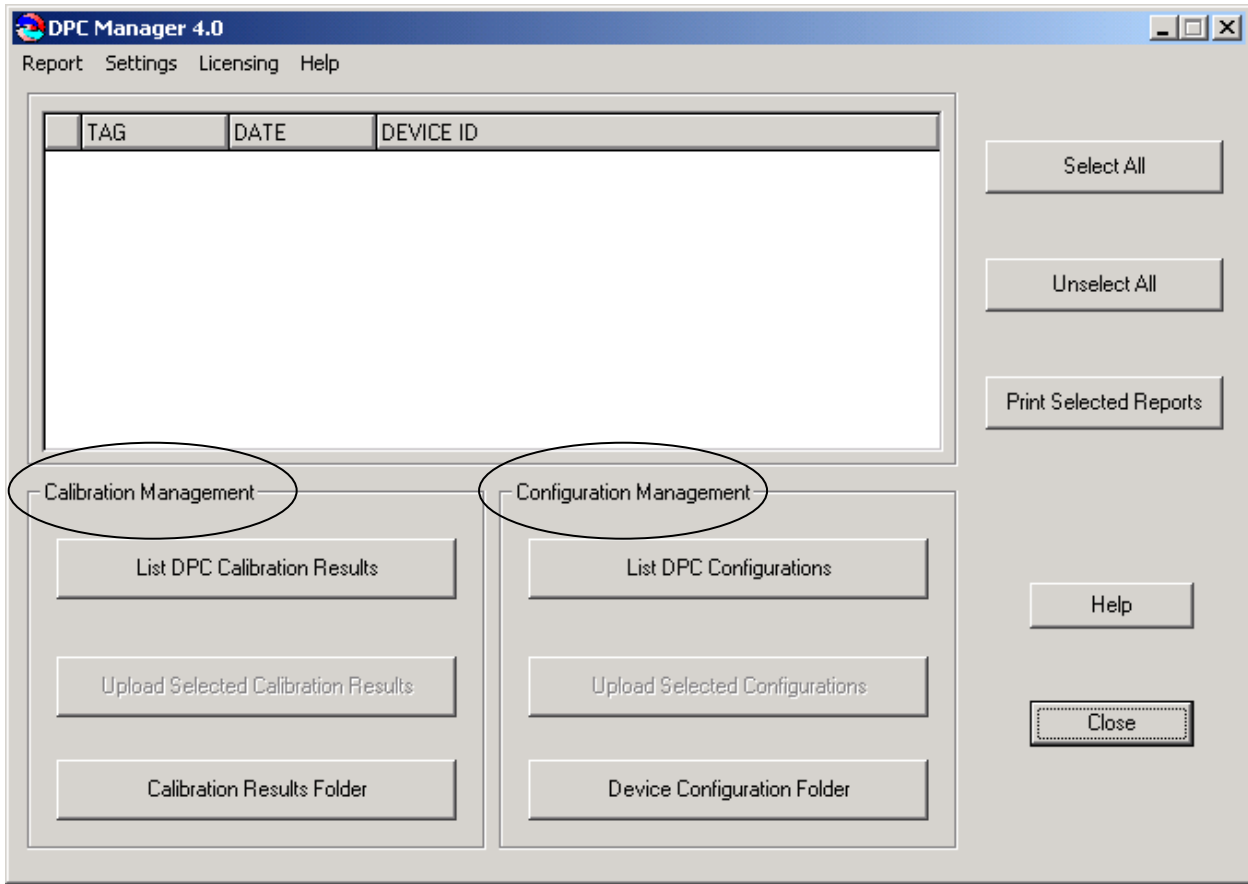


Figure 13-4 DPC Manager Configuration / Calibration Management

The utility is divided into a “Calibration Management” section and a “Configuration Management” section

- Click on the “Device Configuration Folder” button and the following will be displayed. This is the default storage location on the computer’s hard drive. Double click on the “SampleConfig” file to see how HART configuration data is displayed in MS Excel

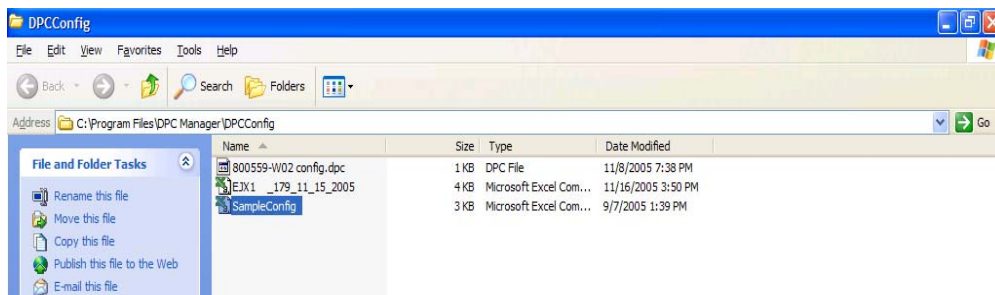


Figure 13-5 DPC Manager Sample Device Configuration Selection

4. To see a sample of the Report that can be generated from a HART configuration, click on “Report” in DPC Manager’s toolbar. Then select “Configuration” from the resulting drop down box.

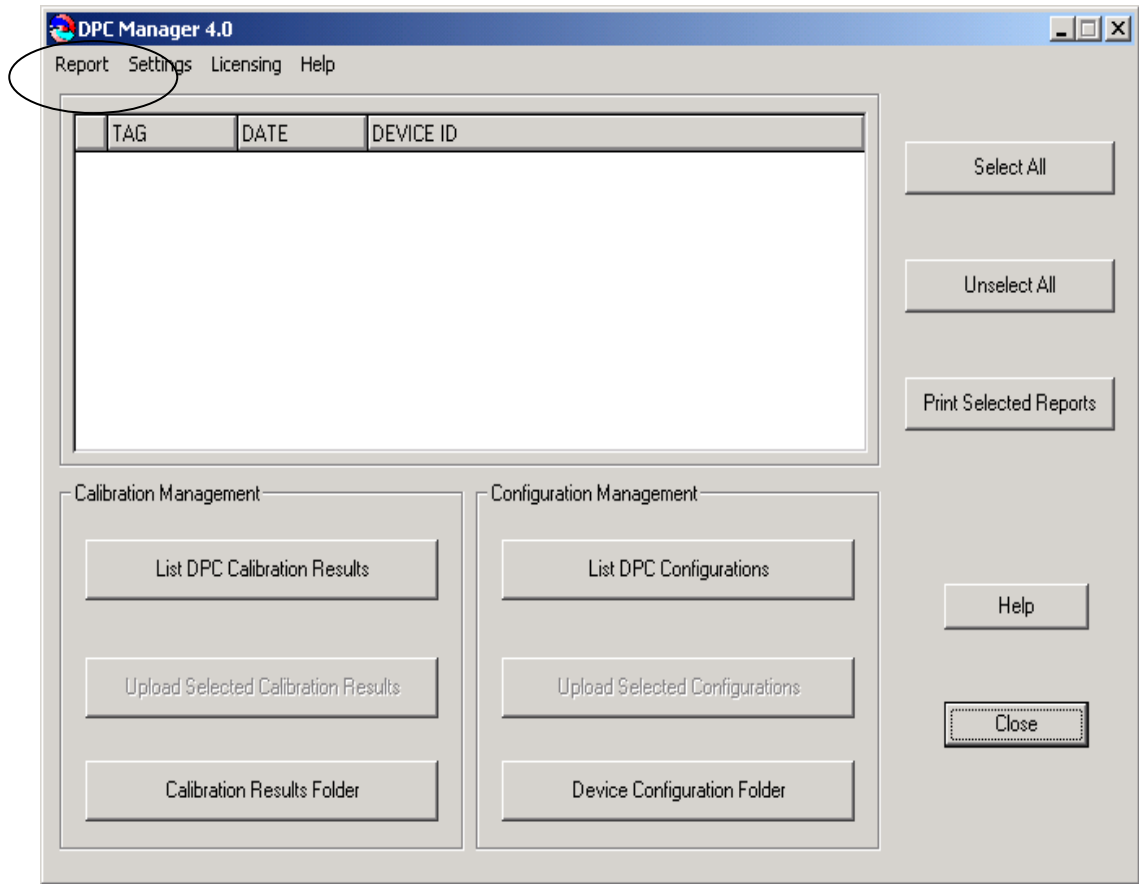


Figure 13-6 DPC Manager Configuration / Calibration Management Report Selection

- Select "SampleConfig" from the next frame by double clicking on it or click once and then click "Open" button.

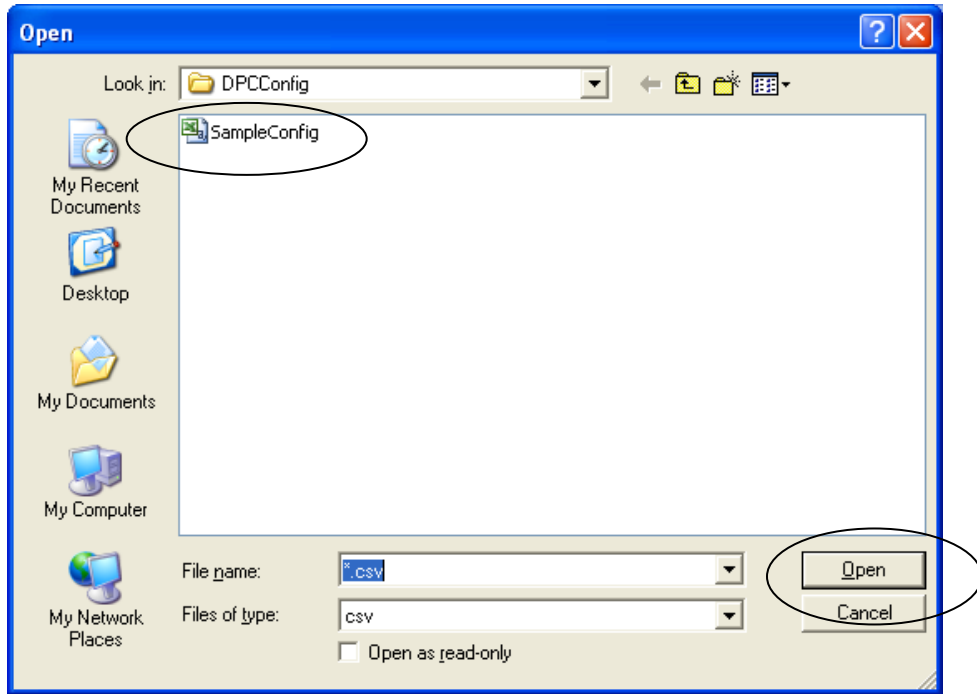


Figure 13-7 DPC Manager Sample Device Configuration Report Selection

- DPC Manager will show the Configuration Report that can be printed.

Device Configuration 3/24/2006

Tag: 1FSR5101	YTA70E
Device ID: 11553	Complete Config
Single Var	Uses DOF 370A0101
Yokogawa	40 Variables
	8/30/05 9:18 PM

PARAMETER	VALUE	PARAMETER	VALUE
Manufacturer:	Yokogawa	PV unit:	degC
Dev id:	11553	PV Damp:	2.000 S
Model:	YTA70-E	PV LRV:	-180.000 degC
Tag:	1FSR5101	PV URV:	1372.000 degC
Descriptor:	@@@@@@@@@@@@@@@@@@	Sensor Limits Units:	degC
Message:	@@@@@@@@@@@@@@@@@@	Snsr typ:	T/C Type K IEC 854
Date:	03-30-2005	Meas typ:	TC/V sgl int CJC
Write protect:	Not write protected	Meter typ:	Bad12
Snsr s/n:	0	system config:	Not Used
LSL:	-180.000 degC	Number of wires:	2 wire
USL:	1372.000 degC	CJC type:	Internal
Min span:	50.000 degC	AO 100%:	0.000 mA
Xfer fnctn:	Linear	AO 0%:	0.000 mA
Final asmbly num:	0	AO up lim:	0.000 mA
Distributor:	Yokogawa	AO lo lim:	0.000 mA
Hardware rev:	7	Error detection:	No test performed
Software rev:	25	Sh sens:	20.500 mA
Universal rev:	5	Br sens:	3.800 mA
Fld dev rev:	1		

Figure 13-8 DPC Manager Sample Report

13.4 Manually Keeping Your MFC Up to Date

DPC Manager is a utility provided to simplify the users download experience but it does not preclude the user from performing manual downloads. In situations where a users LAN, firewall, or proxy server prevents DPC Manager from registering and downloading DOF and firmware files, the following manual download procedure can be used.

1. If not already done, perform the steps in Section 11 for Handheld Registration.
2. Follow the steps in Section 10 to access the Available DOF Website.

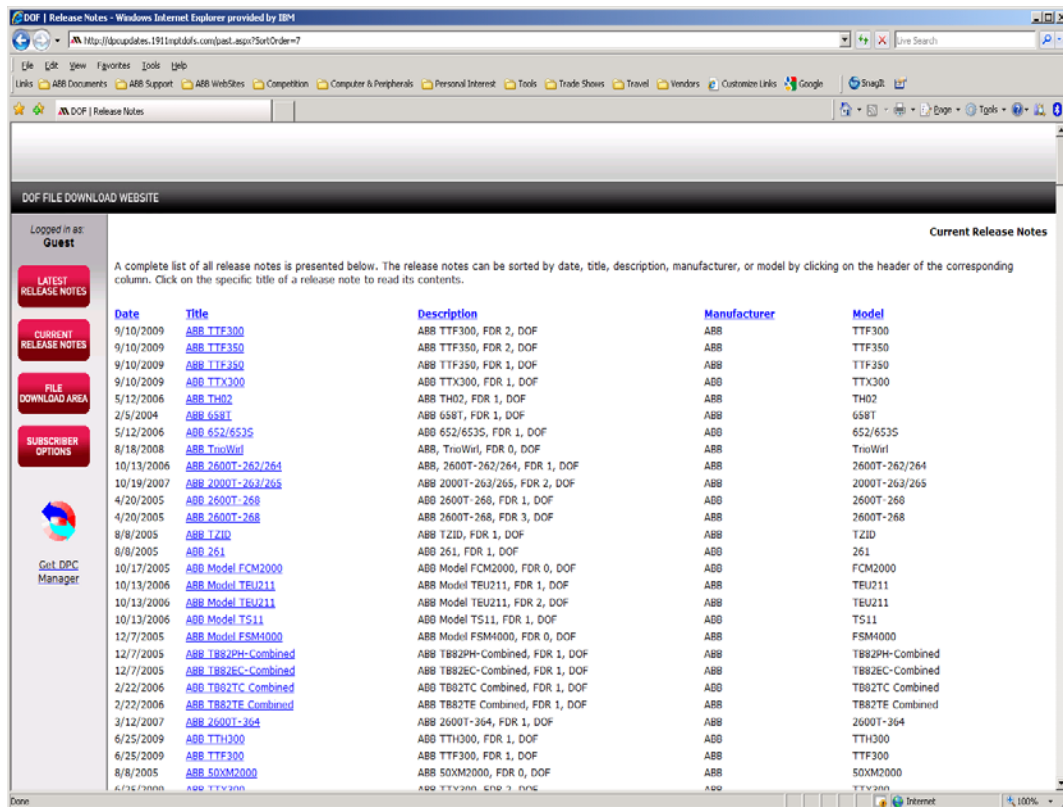
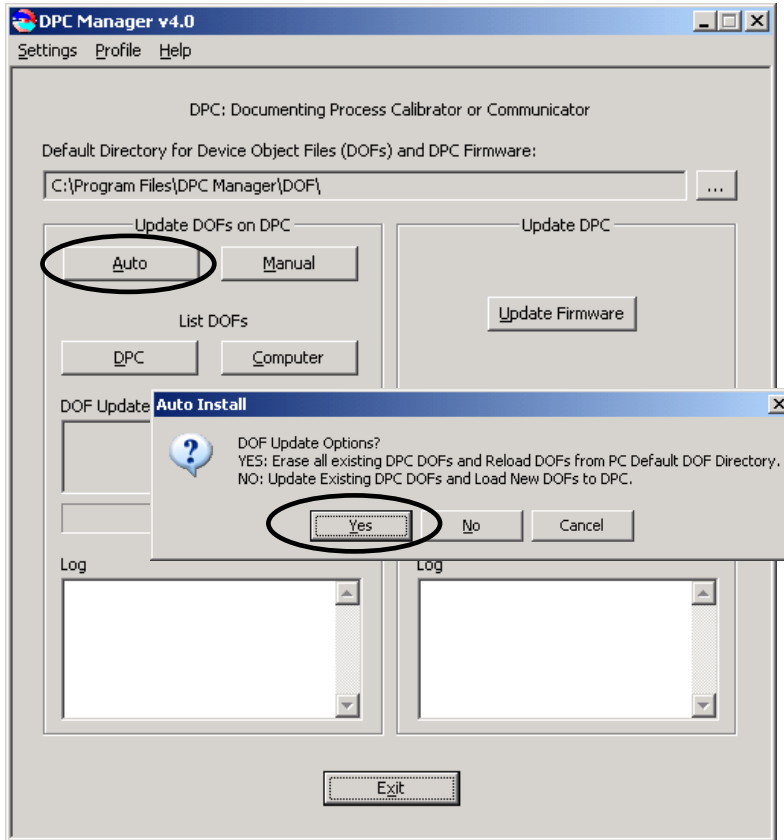


Figure 13-9 Mobility Handheld Supported Devices View

3. After establishing a connection to the DOF Download Site, select **File Download Area** (red button)
4. Select individual files for downloading from the list of downloadable files (including DPC Manager Utility, MFC Firmware, and DOF's) by locating the file name(s) of interest with the PC mouse and clicking on the corresponding selection box(es). Alternatively, all files can be marked for download by clicking on the "Check All Files" button at the top of the page.
5. Start the download process by scrolling to the bottom of the page and clicking on the "Download Checked Files" button.
6. Follow the dialog boxes to save the downloaded file to a directory on the host PC. Remember the directory location.
7. Once the download is completed, open the file and use the unzip application to extract the individual files.
8. Open DPC Manager and select the "Manage DPC Device Driver and Firmware Updates" button.
9. Click on "Settings" in the toolbar and select "Advance Settings."
10. Use the browser button to navigate to the location of the DOF files on the host PC.

11. Connect Handheld to the PC (if not already done)
12. Start a Firmware update by clicking on the "Update Firmware" button under the "Update DPC" header.



13. Start a DOF update by clicking on the "Auto" button under the "Update DOFs on DPC" header.
 - a. Answer YES to erase all DOFs on the MFC and re-install all DOFs.
 - b. Answer NO to add any new or revised DOFs to the existing MFC memory.
14. DPC Manager will provide updates as firmware or DOFs are being loaded.

14 Upgrading DHH801-MFC22 to Support All HART Devices

The MFC Model DHH801-MFC22 only communicates with ABB HART Devices with HART Device Specific commands and all other devices with Universal and Common Practice commands. This unit can be upgraded to support All HART devices with Device Specific Commands on a trial basis or permanently.

14.1 7 Day Trial

To turn on a temporary license that enables communications with all HART devices, go to the following menu options:

Select Soft Key "Cfg" and go to **Applications\Upgrade Base Unit**

A prompt with "Enter Code:" is shown.

For the trial version, enter 22000 and then push the Soft Key "Done".

The Trial Version will last for 7 Days. If the user attempts to change the Date on the base unit, the trial date will be TERMINATED. Each unit has three (3) Trials for the life of the unit.

14.2 Permanent Upgrade

To turn on a license that enables support for All HART Devices permanently, proceed as follows:

Contact your ABB Manufacturer's Representative or direct salesperson to obtain pricing and purchase the upgrade license with P/N 3KXD311801L0042. You will need to provide the serial number of your handheld to get the upgrade license.

The S/N of your handheld can be found by going to the following menu options: Select Soft Key "Cfg" and go to **Other\Model Info\Serial #:**

After purchasing your upgrade license, you will be given a key code that is based on your handheld's serial number. Follow the same instructions for entering the 7 Day Trial code to enter this permanent code. Once licensed, your unit will permanently support all HART Devices with Device Specific commands.

15 Returning the Mobility MFC for Repair

In the event that a Mobility MFC requires service and must be returned to the factory for repair, please contact your local ABB Representative (see page I, contacting ABB Instrumentation, for information on contacting ABB).

Please do not send any unit in for repair without first contacting an ABB Representative or ABB Factory for a Return Material Authorization (RMA) number. This number will be provided by the ABB Repair Department when you call, fax or e-mail your information. An RMA number must accompany all incoming packages to insure proper tracking, processing and repair work.

To assist us in processing your repair request, please have the Model & Serial Number of the unit available when you call. This information is located on the Mobility MFC label. This information can also be obtained directly from the Mobility MFC display by pressing the **Mobility MFC** Soft Key from the **Mobility MFC Main** display. See the **Mobility MFC Main display** section in this manual for more details.

16 PRODUCT SPECIFICATIONS

BASE UNIT: 10.375" (264 mm) L, 4.25" (108 mm) W – top , 4.375" (111 mm) W – middle, 1.875" (48 mm) D.
Handle: 2.50" (64 mm) W, 1.25" (32 mm) D

ABS plastic case with shock absorbing boot, 1.7 lbs (0.77 kg) including batteries and boot

DISPLAY: 128 x 128 pixel graphic display, 2.6" (66 mm) x 2.6" (66 mm) viewable area, backlight

POWER: six (6) AA alkaline batteries, six (6) AA NiMH batteries or 100 – 240 Vac universal power adapter (P/N 3KXD311800L0036) connected to the MFC via the Communication / AC Adapter Dongle.

Note: Use only approved AA alkaline batteries in Intrinsically Safe units. DO NOT USE unapproved AA alkaline batteries, AA NiMH batteries or other types of AA batteries in Intrinsically Safe units. Do not use the Dongle or AC Adapter with Intrinsically Safe units in a potentially hazardous environment. See the "Hazardous Area Use" section of this manual, the specifications below and the Intrinsic Safety Control Drawing in the Appendix for more information.

BATTERY LIFE (Approximate): 60 hours using AA alkaline batteries without backlight
27 hours using AA alkaline batteries with backlight
65 hours using NiMH alkaline batteries without backlight
28 hours using NiMH alkaline batteries with backlight


TEMPERATURE SPECIFICATIONS:

Storage: -40° F to 140° F (-40° C to 60° C)

Operating: 23° F to 122° F (-5° C to 50° C)


CONNECTIONS: Standard banana jacks (3/4" center) for HART communications
Communication / AC adapter connector for Dongle connection: AC power adapter and serial cable (to PC port) connects to Dongle; Dongle connects to MFC.

APPROVALS: DHH801-MFC12B1 & DHH801-MFC22B1 (ATEX/I.S.)

ATEX Intrinsically Safe  II 1 G; EEx ia IIC T4


cUL_{us} Listed Intrinsically Safe, Exia
Class I, Div. 1 Groups A, B, C, D: T4
-5° C < Ta < +50° C

Entity parameters: Li = 0, Ci = 0

 CE compliance

Approved Batteries for ATEX/I.S.: (6) AA alkaline Duracell PC1500
(6) AA alkaline Duracell MN1500
(6) AA alkaline Varta 4906

APPROVALS: DHH801-MFC12B0 & DHH801-MFC22B0 (general purpose)

 CE compliance

MEMORY – separate, dedicated, non-volatile flash memory for MFC firmware, DOFs, and Configurations

DOF Memory: 560 HART devices (based on average DOF size)

Configuration Memory: 200 HART devices (based on average configuration size)

AUTO SHUT-OFF - occurs after user-selected period of keypad inactivity or can be disabled (both MFC and backlight auto shut off are user selectable).

DIAGNOSTICS – MFC self-tests upon power up. Advisories are posted on the display.

17 MOBILITY MFC MODEL ORDERING INFORMATION

ABB Model Number	Description
DHH801-MFC12B0	HART® Communicator Includes CE Mark, HART Lead Kit, Batteries, Communication / AC Adapter Dongle, RS-232 Serial Cable, Universal Power Adapter, Protective Boot, Soft Carrying Case, Adjustable Shoulder Strap, User's Manual, CD (includes User's Manual and DPC Manager Utility), 3 Year Download Subscription, Full DOF Access
DHH801-MFC22B0	HART® Communicator Includes CE Mark, HART Lead Kit, Batteries, Communication / AC Adapter Dongle, RS-232 Serial Cable, Universal Power Adapter, Protective Boot, Soft Carrying Case, Adjustable Shoulder Strap, User's Manual, CD (includes User's Manual and DPC Manager Utility), 3 Year Download Subscription, ABB only DOF Access
DHH801-MFC12B1	HART® Communicator Includes CE Mark, HART Lead Kit, Batteries, Communication / AC Adapter Dongle, RS-232 Serial Cable, Universal Power Adapter, Protective Boot, Soft Carrying Case, Adjustable Shoulder Strap, User's Manual, CD (includes User's Manual and DPC Manager Utility), 3 Year Download Subscription, Full DOF Access ATEX certified Intrinsic Safety to II 1 G; Ex ia IIC T4; cULus Listed Class I, Div. 1 Groups A, B, C, D, T4 Intrinsically Safe, Exia Class I, Zone 0, AEX ia IIC T4 -5° C < Ta < +50° C
DHH801-MFC22B1	HART® Communicator Includes CE Mark, HART Lead Kit, Batteries, Communication / AC Adapter Dongle, RS-232 Serial Cable, Universal Power Adapter, Protective Boot, Soft Carrying Case, Adjustable Shoulder Strap, User's Manual, CD (includes User's Manual and DPC Manager Utility), 3 Year Download Subscription, ABB only DOF Access ATEX certified Intrinsic Safety to II 1 G; Ex ia IIC T4; cUL _{us} Listed Class I, Div. 1 Groups A, B, C, D, T4 Intrinsically Safe, Exia Class I, Zone 0, AEX ia IIC T4 -5° C < Ta < +50° C
3KXD311801L0042	Upgrade from DHH801-MFC22 (ABB HART devices only) to DHH801-MFC12 (all available HART devices)

17.1 Mobility MFC ACCESSORIES LIST

MFC ACCESSORIES	
Part Number	Carrying Accessories
3KXD311801L0001	Protective boot provides degree of protection against drop related damage; slip on, gray
3KXD311801L0002	MFC carrying case - custom soft case with adjustable shoulder strap and HART lead / spare battery compartment
3KXD311800L0003	Adjustable, detachable hanging strap - clips directly to MFC attach points
Part Number	Communication Accessories
3KXD311800L0011	HART Lead Kit (inc'd w/ MFC) - std banana plugs, mini-grabbers, 250 ohm resistor
3KXD311800L0012	Std size 250 ohm shunt resistor (inc'd w/ MFC) - req'd for HART low resistance loops
3KXD311800L0013	DB-9 cable, Male x Female, 6 ft length
3KXD311801L0014	Communication / AC Adapter Dongle,
3KXD311800L0115	Keyspan USB to Serial Converter, includes 35" USB cable
Part Number	Power Accessories
3KXD311801L0121	AA Alkaline Batteries, 6-pack (inc'd w/ MFC)
3KXD311801L0122	AA NiMH Batteries, 6-pack (Not Approved for ATEX Intrinsically Safe units)
3KXD311810L0222	Energy 8 NiMH battery Charger (100-240 AC/50 or 60 Hz), Univ. Plug Kit
3KXD311800L0036	Power adapter, 100 V AC to 240 V AC, 50 - 60 Hz and Universal Plug Adapters
Part Number	DPC Manager Software Options (Each (1) License covers unlimited DPC's one Computer
3KXD311820L0001	DPC Manager for Configuration Management (DPCMAN-CFG)
3KXD311820L0003	DPC Manager for Configuration and Calibration Management (DPCMAN-ALL)
3KXD311820L0004	Upgrade DPC Manager to Configuration and Calibration Management (DPCMAN-ALL-UPGRD)
Part Number	DLS - DOF Download Subscription
3KXD311800L0051	3 year download subscription per MFC for 1 MFC
3KXD311800L0052	3 year download subscription per MFC for 2 to 4 MFCs
3KXD311800L0053	3 year download subscription per MFC for 5 to 9 MFCs
3KXD311800L0054	3 year download subscription per MFC for 10 to 19 MFCs
3KXD311800L0055	3 year download subscription per MFC for 20 or more MFCs
Part Number	Media Accessories
3KXD311801R4301	Mobility MFC Operations Manual, printed hard copy - one copy supplied with order at no charge and pdf instructions included on CD (694A198U02)
3KXD311801L0041	Mobility Interface Software CD set, latest version - one copy supplied with order at no charge (698B277U02)

18 Intrinsic Safety Control Drawing

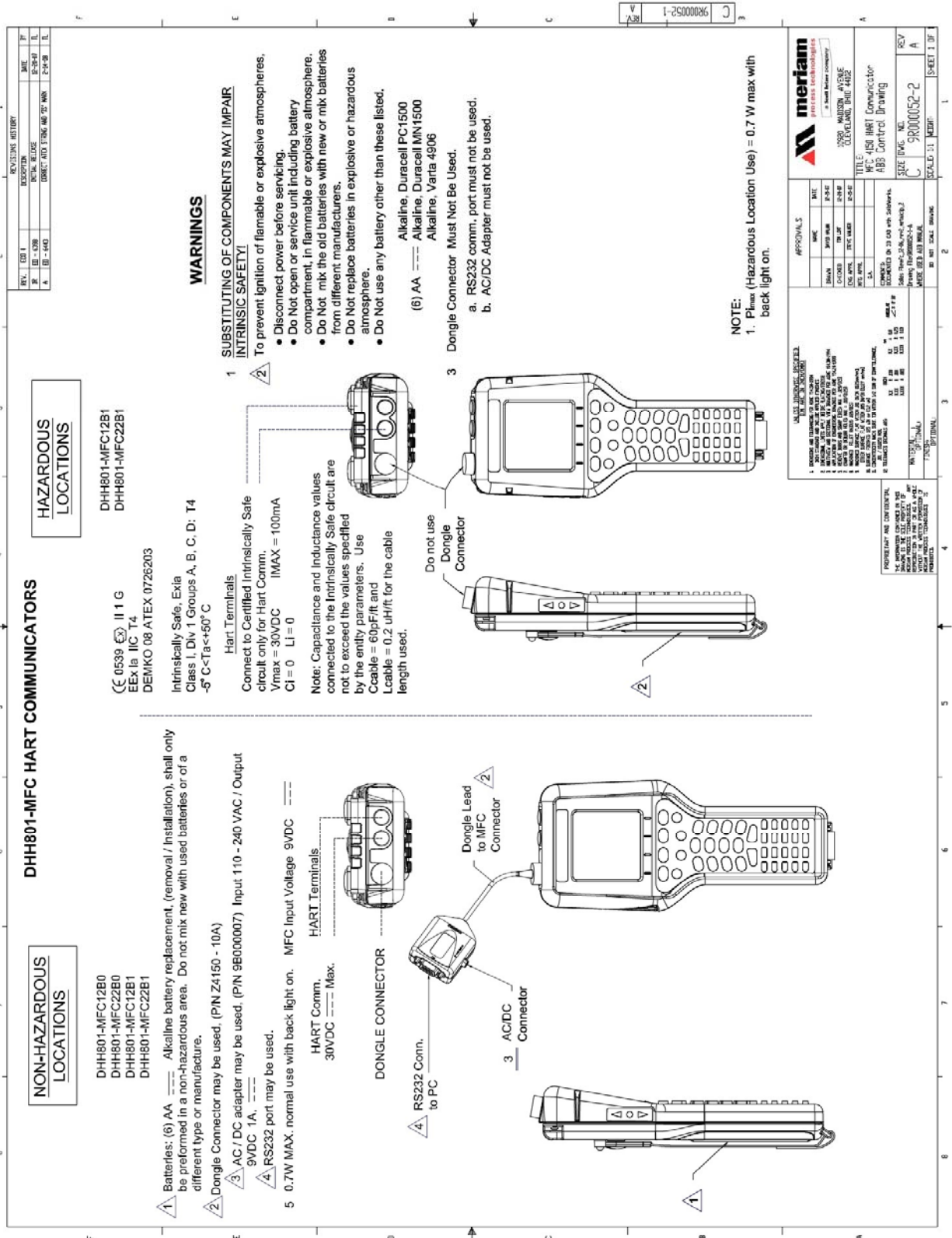


Figure 18-1 MFC Series Intrinsic Safety Control Drawing

19 EC Declaration of Conformity



This is to declare, in accordance with Directive 94/9/EC, that the following product(s) are designed and manufactured in accordance with Annex II of Directive 94/9/EC.


The manufacturer attests on their own responsibility that the apparatus has been constructed in accordance with the principles of good engineering in safety matters, and that any routine verification and test required by Clause 27 of EN 60079-0:2006 has been successfully completed.

Manufacturer:

Manufactured for ABB
by Meriam Process Technologies, 10920 Madison Avenue, Cleveland, Ohio 44102, USA

Product Description:

Multifunction Calibrator with HART Communication Terminals, model series 4150X,
also known as DHH801-MFC 4150X series.

CE 0539  II 1 G
EEx ia IIC T4
DEMKO 08 ATEX 0726203
Intrinsically Safe, Exia
Class I, Div. 1 Groups A, B, C, D: T4
-5° C < Ta < +50° C Li = 0, Ci = 0

Certifying Agency:

UL International DEMKO A/S Testing & Certification (0539)
P.O. Box 514, Lyskaer 8, DK-2730 Herlev, Denmark

This Declaration is based on Compliance with the following Standards:

Regarding Hazardous Environments:

- EN 50020:2002 Electrical apparatus for explosive gas atmospheres - Intrinsic safety 'I'
- EN 50014:1997 A1 + A2 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
- EN 60079-0:2006 Electrical apparatus for explosive gas atmospheres - General requirements
- EN 60079-26:2007 Special requirements for construction, test and marking of electrical apparatus of equipment group II, Category 1 G.

Regarding Electromagnetic Compatibility (EMC) for Handheld Class A device

Series 4150 hand held unit compliant with EMC Directive 2004/108/EC

- EN 61326-1:2006 Electrical equipment for measurement, control and laboratory use-EMC requirements
- EN 60529:1991 + A1:2001: Degrees of Protection Provided by Enclosures (IP Code:IP40)

For and on behalf of
Meriam Process Technologies,

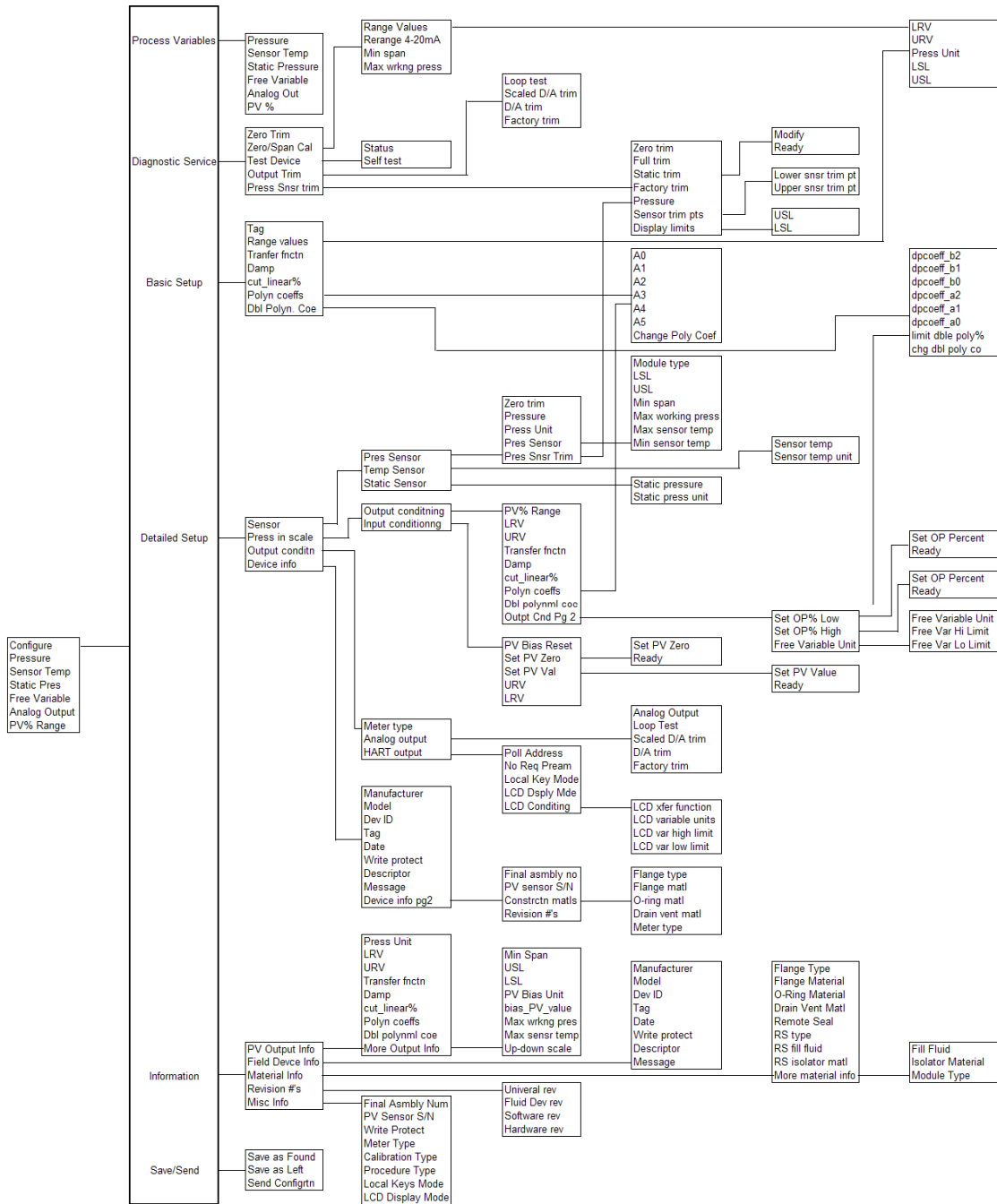
Timothy E. Lint Date: Oct. 30, 2009
Standards Engineer
Meriam Process Technologies

Authorized Representative in EU:

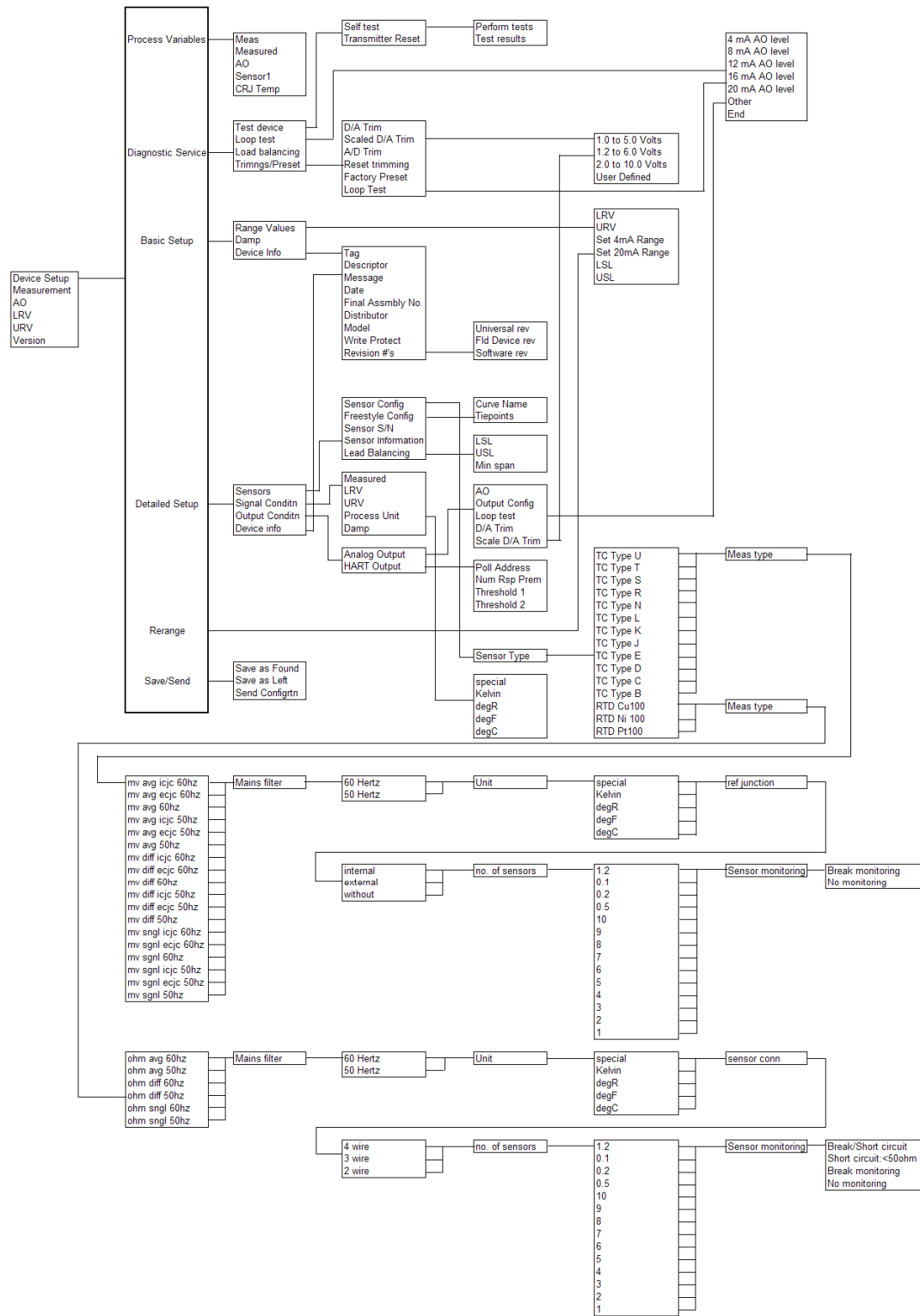
Mr. Karl Ilg, Manager
TetraTec Instrument GmbH
Gewerbestrabe 8
71144 Steinenbronn
Germany
Telephone: (49) 7157-5387-0
Fax: (49) 7157-5387-10

20 HART® Command Structure Menu Tree

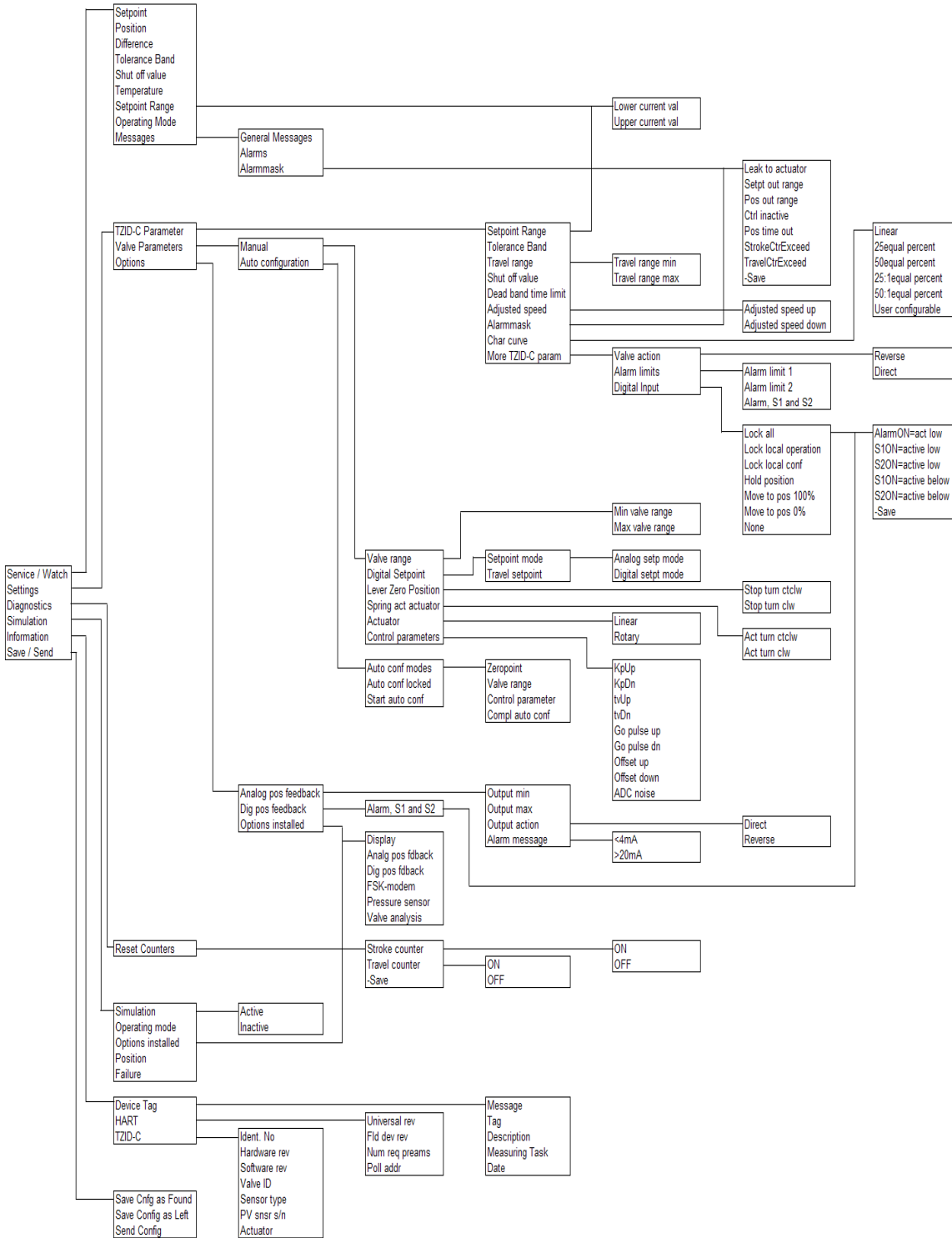
20.1 2600T-262/264 Rev. 1 Menu Tree



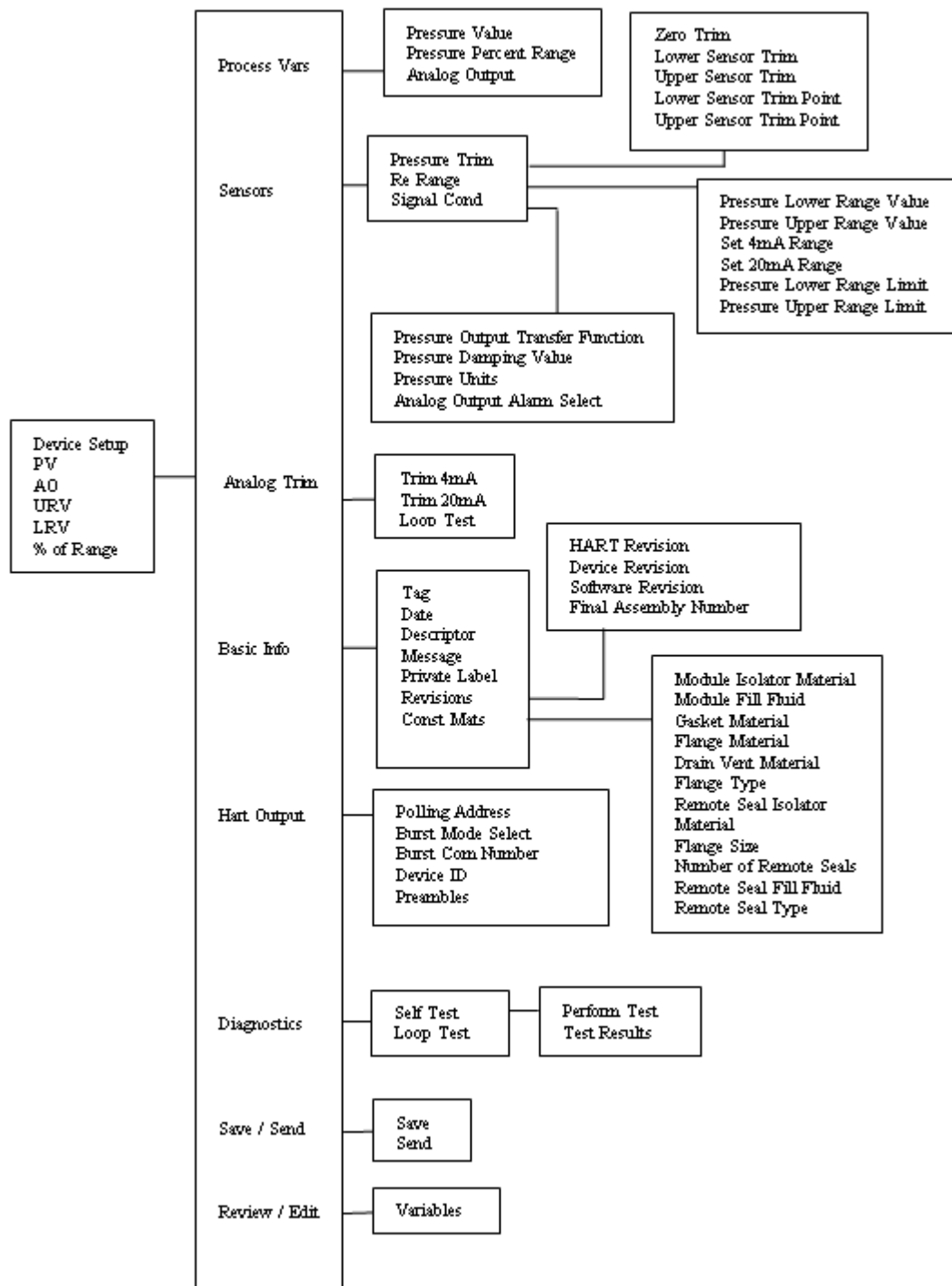
20.2 THx02 Rev. 1 Menu Tree



20.3 TZID-C Rev 2 Menu Tree



20.4 1151 Rev. 5 Menu Tree



20.5 3051 Rev.2 Menu Tree

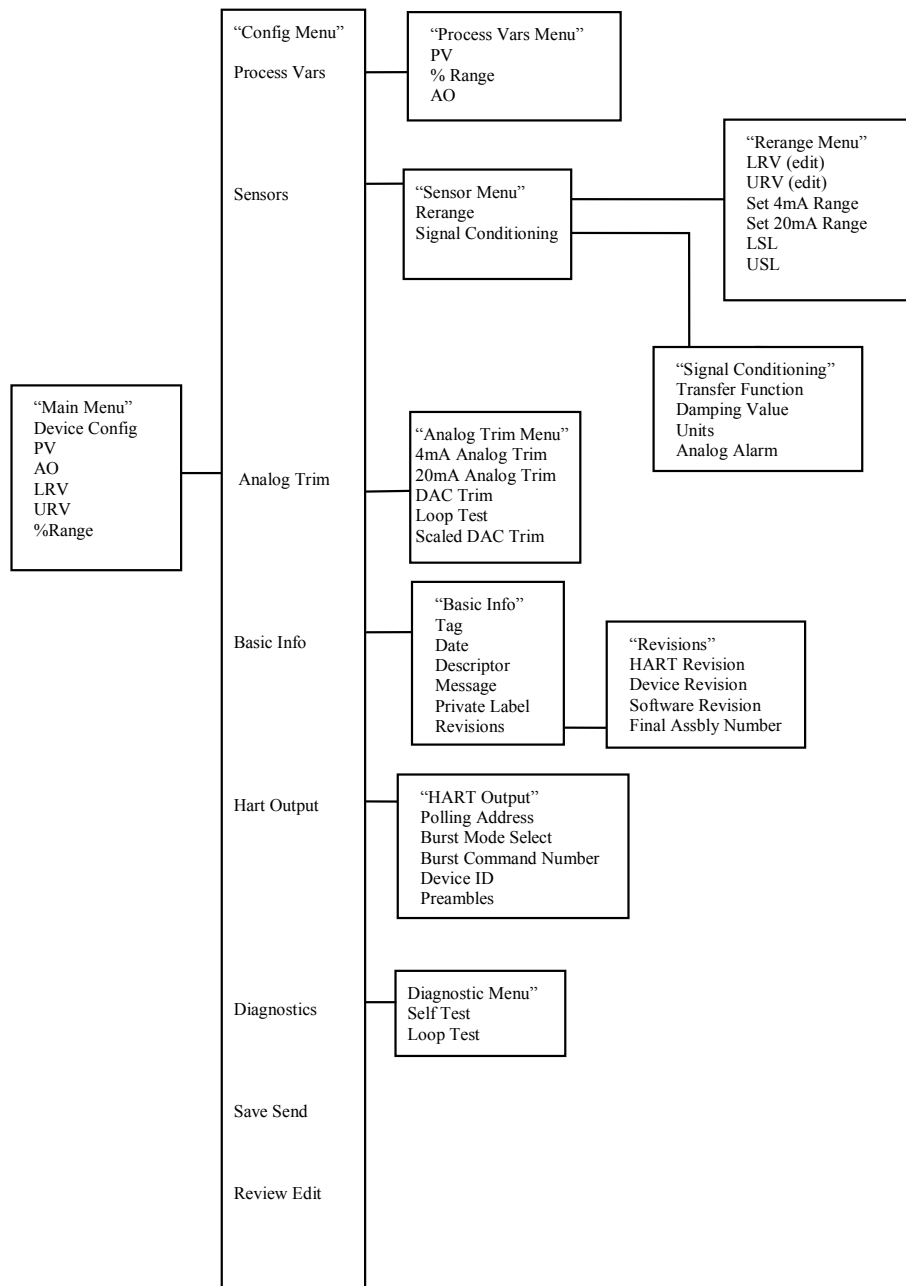


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