Honeywell

Herculine Smart Actuators

Installation and Operation Manual

Herculine Actuators with HART Communications

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References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title	Doc ID
Herculine 10260 S Smart Actuator Specification and Model Selection Guide	62-86-03-12
Herculine 2000 Series Specification and Model Selection Guide	61-86-03-14
Modbus RTU Serial Communications User Manual	51-52-25-66
Modbus RTU Serial Communications User Manual, Communication Interface for 10260S Actuator	51-52-25-103
10260S HercuLine® Smart Actuator. Installation, Operation and Maintenance Manual.	62-86-25-08
Herculine 2000 Series Installation, Operation, and Maintenance Manual	62-86-25-10

Definitions

DD	Device Description
HCF	HART Communication Foundation
HART®	Highway Addressable Remote Transducer; **HART®** is a registered trademark of HART Communication Foundation.
SDC-625	Smart Device Configurator 625
H-FDCM	Honeywell Field Device Configuration Manager
Honeywell MC Toolkit	Honeywell MC Toolkit SDC625 Pocket PC version
Modbus®	Modbus® is a registered trademark of Modicon, Inc.
PWA	Printed Wiring Assembly
HC-275	HART Communicator 275; A product of Emerson Process Systems.
HC-375	HART Communicator 375; A product of Emerson Process Systems.
AMS	Asset Management Solution; Is a trade mark of Emerson Electric Co.
CE	Conformité Europénne
NEMA	National Electrical Manufacturers Association
CSA	Canadian Standards Association

UL	Underwriters Laboratories
LED	Light Emission Diode
EEPROM	Electrically Erasable Programmable Read-Only Memory

Contents

Table of Figures

1. Introduction

1.1 Overview

About Smart Actuator

Honeywell's HercuLine series actuators are industrially rated rotary control actuators and are precision engineered for exceptional reliability, accurate positioning, and low maintenance. Designed for very precise positioning of dampers and quarter turn valves in the power and processing industries, these actuators perform especially well in extremely demanding environments requiring continuous-duty, high reliability and low maintenance.

Precise positioning of the actuator is achieved through the state-of-the-art motor control and positioning electronics. The motor starts and stops instantaneously, preventing overshoot and hunting. Positioning repeatability of 0.2 % span or better is achievable for extremely tight process control to take full advantage of modern controllers.

A no-burnout synchronous induction motor is combined with a heavy-duty precision-machined output worm gear mesh providing a responsive, low maintenance, and non-backdriving actuator. Accidental stalls up to 100 hours can be withstood without damage to the gear train. End-of-travel limit switches are provided as standard to prevent damage to the valve or damper and are backed up by mechanical stops. Honeywell electric actuators provide instantaneous response to a demand signal, eliminating system nonlinearity due to dead time. Additionally, since the actuator is electric, the costs associated with providing and maintaining a clean, dry air supply is eliminated. A heavy duty cast crank arm and precision rod-end bearing is provided with each actuator. Crank arms can be positioned at any angle on the output shaft and an adjustable radius is provided to allow flexibility in linkage set-up.

All actuators are equipped with a manual hand wheel for operation during loss of power or installation. A local auto/manual hand switch can be provided for local operation and has an “out of auto” contact to annunciate that condition.

Enabling HART Communications

The HART Communications option enables the HercuLine series actuators to be able to connect to a HART network and will provide communication interface for both primary and secondary HART masters. The primary master would be an IO card/interface (or H-FDCM or AMS) and the secondary master would be an HC-275/375 handheld (or Honeywell MC Toolkit) connected at the same time.

The HART Solution enables the actuators to provide digital communications over the 4-20mA signal wire. The same HART Communication option supports all Herculine series actuators 10260S series, 11280S series and the 2001/2002.

HART Protocol

In a typical process control environment, field devices such as pressure, level, and temperature transmitters and valve positioners provide the physical connection to the process. These devices allow the control system to monitor and manipulate process conditions.

Smart field devices, such as HART devices, maintain a database of process configuration, identification, and diagnostic information in memory. These devices use the HART digital protocol (governed and maintained by the HART Communication Foundation) to communicate information to the control and asset management system.

HART is an open smart field device protocol available for use by all member companies. The word HART is an acronym that stands for **H**ighway **A**ddressable **R**emote **T**ransducer. For more about HART and HCF, visit their web site at: http://www.hartcomm.org/.

1.2 Connectivity with Different Hosts

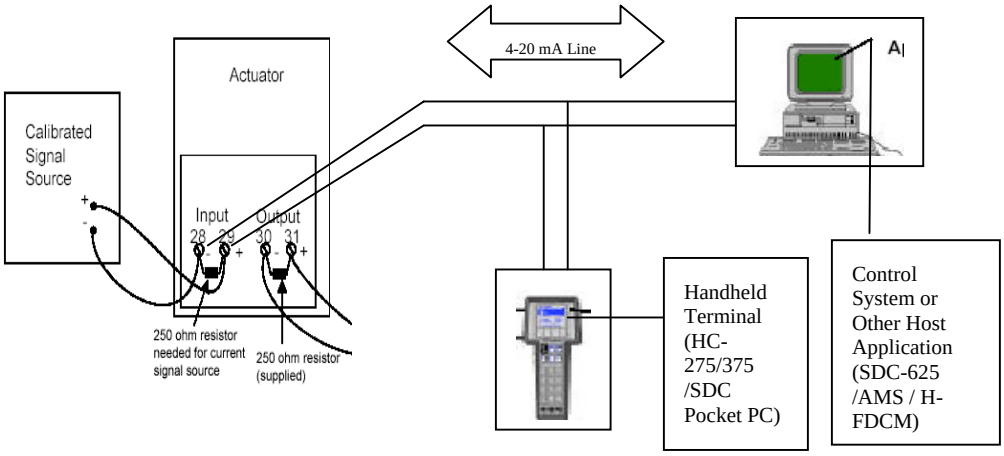

Figure 1-1: Connecting 10260S Actuator with HART Primary and Secondary Masters

The HART communicator (HC-275/375) communicates to the Actuator on the 4-20mA input current lines. The HART communicator acts as a secondary HART master. On the same input current lines a primary master (AMS/H-FDCM) can also be connected as shown in the Figure 1-1. A request-response is the basis for communication.

A HART Master allows the user to configure the Actuator, Monitor the output values, Diagnose potential problems from a remote location, such as control room. The purpose of the communication is to:

- **Configure:** Define and enter the actuator's operational parameters
- **Monitor:** Read the input and output parameter values, engineering units, Alarms and the status.
- **Display:** Receives and displays all the parameter values, status, Alarms etc.
- **Check Position value:** Check the output position value with respect to input current.
- **Troubleshoot:** Check the status of the actuator (hardware, software, Alarms) and display corresponding error message to user.

1.3 Multi Drop Configuration

HART Actuator can be used either in point-to-point mode operations or multi-drop mode.

A point-to-point mode operation is one where a single actuator is connected to a 4-20mA input signal directly

In multi-drop mode, more than 1 actuator is using the single analog 4-20mA input signal.

The poll address of the actuator is set to 0 when the device comes out of factory. Each actuator connected in the multi drop network should have a unique poll address. Before connecting the devices in multi-drop mode the user needs to configure a unique poll address for each device using any of the HART Host in point-to-point mode before connecting them in the mult-drop network.

The multi-drop mode operation is used in the control applications like Proportional flow using Multiple Actuators, Split Valve configuration as given in section 6 of reference document ID 62-86-25-08.

1.4 DD Parameter Listing

Menu Structure in the DD

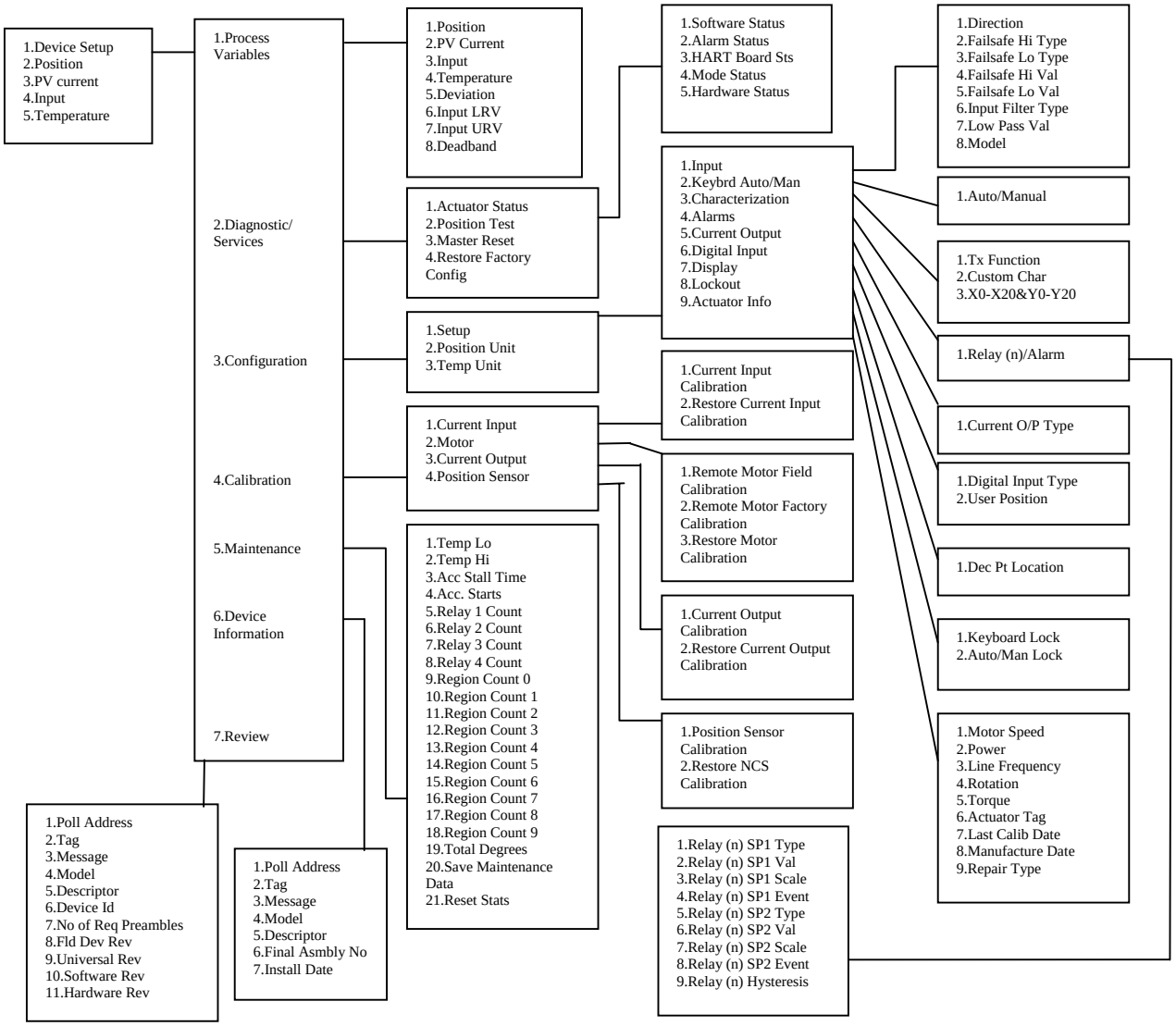

Figure 1-2: DD Menu Structure

Menu Trees with SDC-625

When the device is loaded with SDC-625, the main menu will look like Figure 1-3. The left pane shows the complete menu structure. The right list view shows the variables present under the **Online** menu.

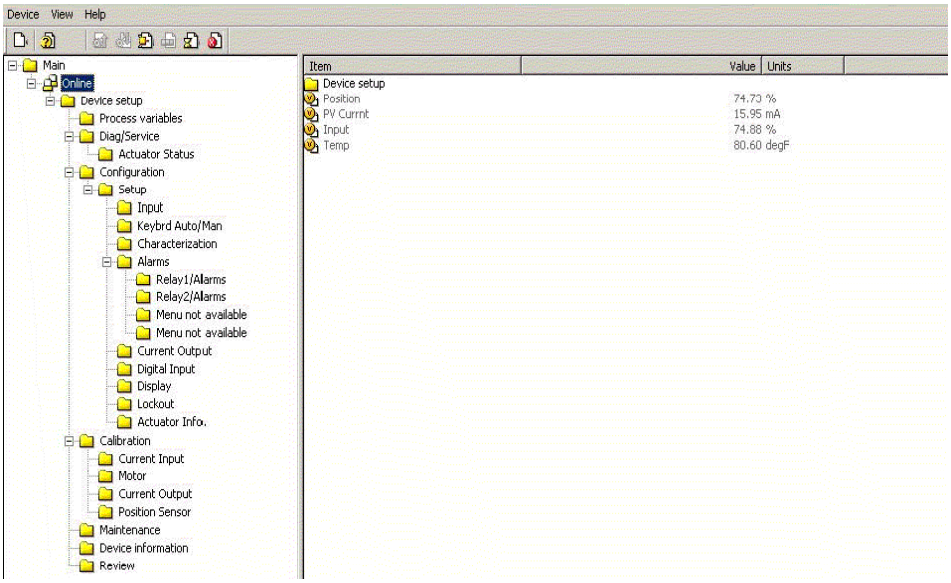

Figure 1-3: Online Menu with SDC-625

Process Variables Menu

The process variables menu will look like as shown in the Figure 1-4.

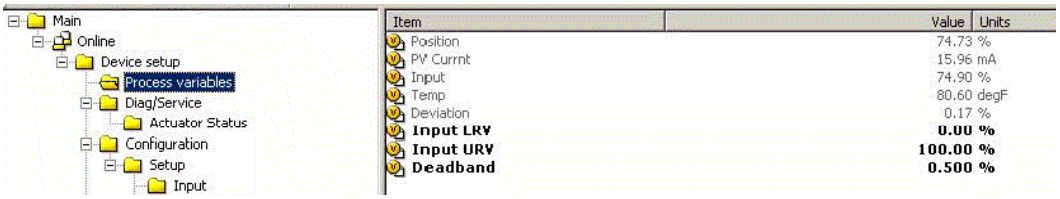

Figure 1-4: Process Variables Menu with SDC-625

Diagnostic/Service Menu

All the device status variables are present under the "**Online/Device setup/Diag Service/Actuator status**" menu. The detailed status bits of each variable can be displayed by right clicking on the variable in the right pane and selecting the Display value option in the context menu. The status selections are Software Status, Alarm Status; HART board Status, Mode Status and Hardware Status. An example the "**Software status**" variable is shown in the Figure 1-5. The Software status variable gives the status of the Main PWA's software status including input signal Failsafe condition. A checked box will indicate that the particular condition has occurred in the actuator. In Figure 1-5, the Failsafe checkbox is checked, indicating that the Failsafe condition has occurred.

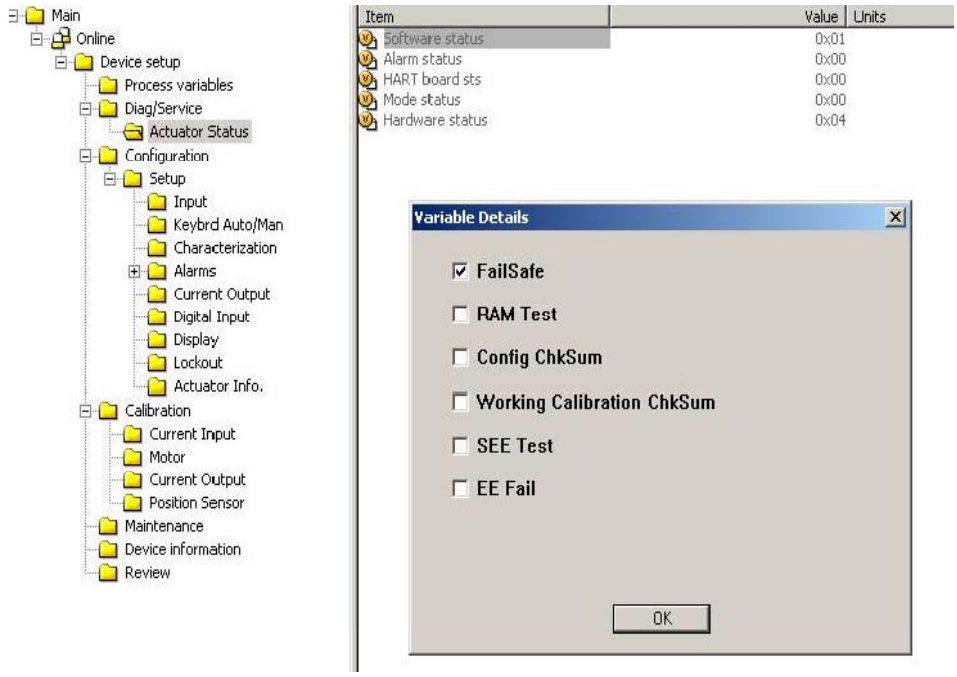

Figure 1-5: Status Menu with SDC-625

The Alarm status byte tells the status of the programmable Alarms either ON or OFF. The bits in the Alarm status byte are

1. Alarm / Relay1 Set
2. Alarm / Relay2 Set
3. Alarm / Relay3 Set
4. Alarm / Relay4 Set
5. Stall Alarm Set
6. Position Sensor Fail

The HART Board status byte tells the software status of the HART PWA. The bits in the HART Board status byte are

1. EEPROM Fail
2. RAM Fail
3. FLASH Fail
4. MODBUS Communication Fail

All the 3 bytes mentioned above are critical for the functionality of the actuator. The rest of the bytes mode status and hardware status are for information purpose only. Mode status informs the user of the present mode of the Actuator (Auto or Manual). The mode status selections are

1. Auto/Manual Mode - The current mode of the Actuator (Auto or Manual). If this bit is checked then the actuator is in Manual Mode.
2. Manual Front Panel - The status of the Actuator front panel switch. If this bit is checked the actuator front panel switch is put in Manual mode.

3. Manual External Switch - The status of the External Auto/Manual switch. If this is checked the actuator External Switch is put in Manual mode.

Setting of any of the last two bits in Manual mode will set the mode of the actuator to Manual.

The hardware status gives availability of the actuator hardware resources. The bits present are:

1. Relay board 1 (Relay 1 & Relay 2)
2. Relay board 2 (Relay 3 & Relay 4)
3. Display/Keyboard
4. HART Communication Card

If any of the bits are checked, it means that they are available in the Actuator.

Configuration Menu

All the configuration parameters are arranged under the "**Online/Device setup/Configuration**" menu. The input signal configuration parameters are present in the setup/input menu as shown in the Figure 1-6.

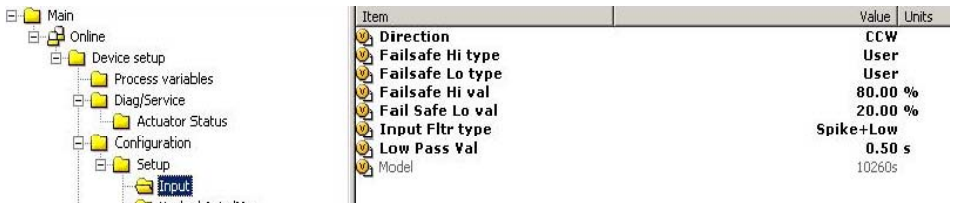

Figure 1-6: Input Setup Group Menu with SDC-625

The actuator information such as motor speed, torque etc. is available under the menu "**Online/Device setup/Configuration/setup/Actuator info**". The actuator information screen is shown in the Figure 1-7.

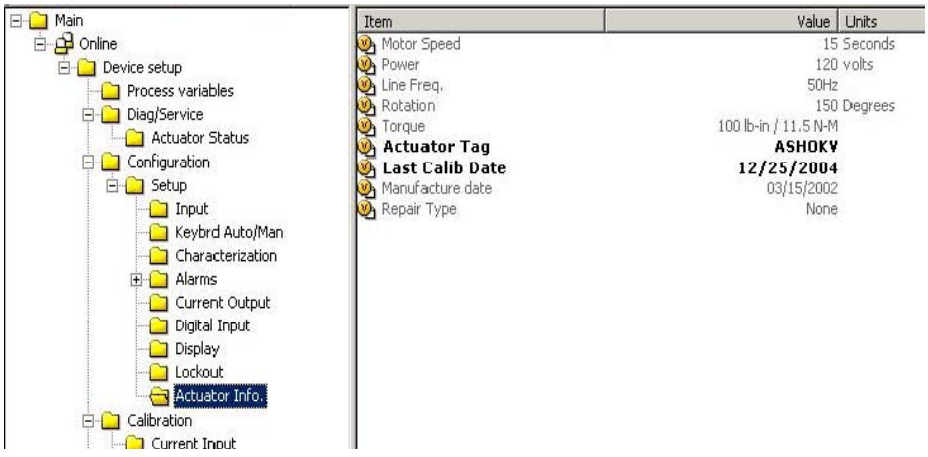

Figure 1-7: Actuator Information Menu with SDC-625

Calibration Menu

All the calibration methods are placed under the separate menu "**Online\Device setup\Calibration**" as shown in the following Figure 1-8. There are four types of calibrations; current input, motor, current output and position sensor calibration. Separate methods are provided for restoring factory calibration.

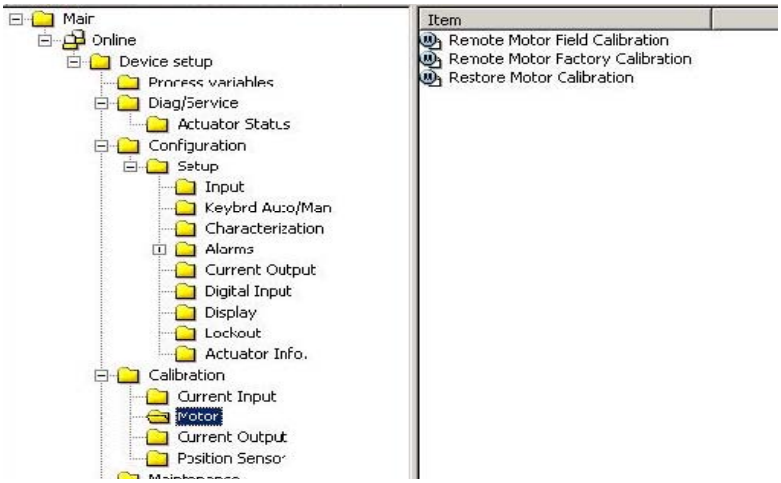

Figure 1-8: Calibration Menu with SDC-625

Maintenance Menu

The Maintenance data can be viewed from the menu **"Online/Device Setup/Maintenance"**

There are two methods available in this menu, Save Maintenance Data and Reset stats. Save Maintenance Data is used to save the maintenance data (shown in the Figure 1-9) to EEPROM and will be retained even when the power is removed. Reset stats method is used to reset any of the maintenance statistics shown in the Figure 1-9.

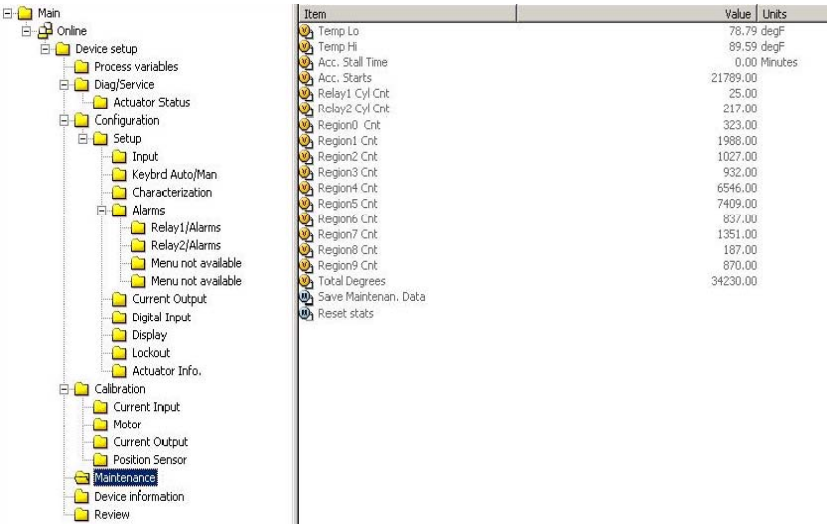

Figure 1-9: Maintenance Menu with SDC-625

Menu Trees with HC-275

When the actuator is detected by HC-275, the first screen appears is the **Online** screen and will look like as shown in the following Figure 1-10.

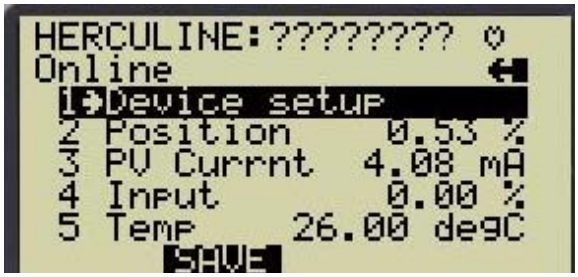

Figure 1-10: Online Menu with HC-275

The device setup screen and the other screens will look similar to the menu structures given for SDC-625.

The process variable menu screen is shown in the Figure 1-11. There are few more variables in this menu, which are not visible. Use the Arrow keys present on the HC-275 keyboard to scroll through all the available variables under the menu.

Figure 1-11: Process Variables Menu with HC-275

The Device information menu contains all the HART variables such as Tag, Message, Descriptor, and Polling Address and is shown in the Figure 1-12.

Figure 1-12: Device Information Menu with HC-275

The device status menu contains all the status variables and is shown in the following Figure 1-13.

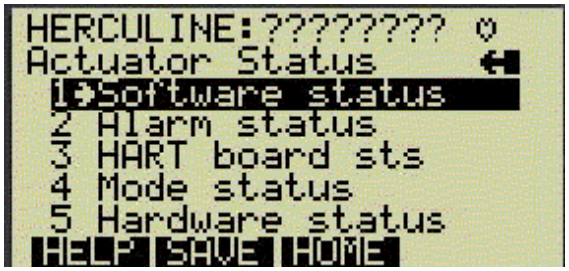

Figure 1-13: Status Menu with HC-275

Menu Screens for AMS

Some of the menu screens with AMS are presented here. When a device is detected with AMS and the user right clicks on it, the device menu will appear as shown in the Figure 1-14.

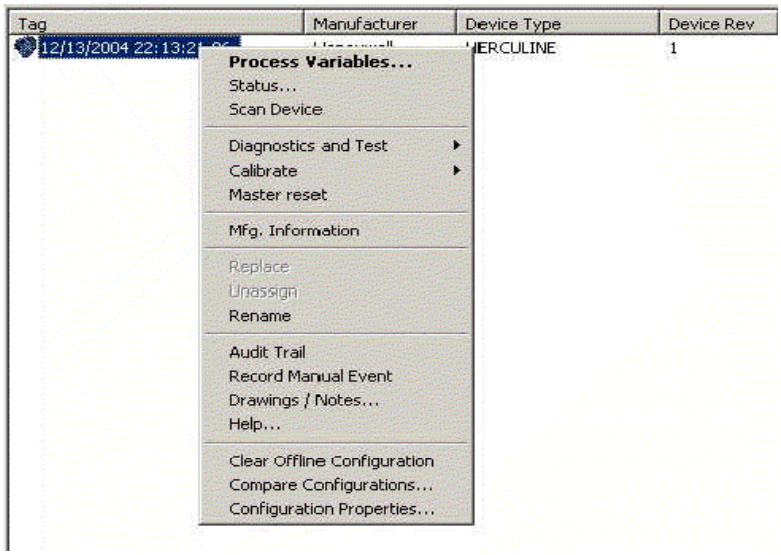

Figure 1-14: Device Menu with AMS

Calibration methods are presented in the **Calibrate** menu. All the diagnostic methods such as Master reset, position test are presented under **Diagnostic and Test** menu. When you select the **Process Variables** menu, the following dialog box is displayed (Figure 1-15).

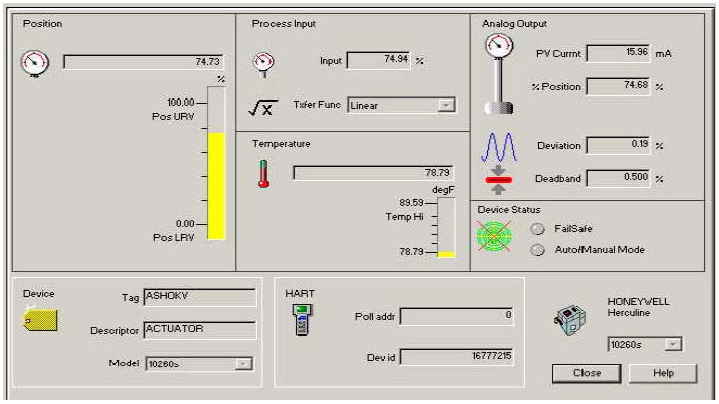

Figure 1-15: Process Variables Menu with AMS

All the process variables that change dynamically with the applied process are presented here and are read only. The parameters to be configured are presented in the configuration properties dialog box (***Configuration Properties*** menu) with separate tabs as shown in the Figure 1-16.

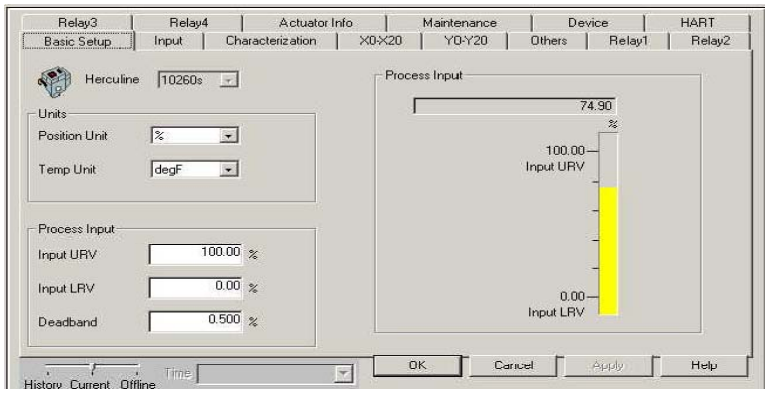

Figure 1-16: Configuration Properties Menu with AMS

The Maintenance Data menu in AMS looks as shown in the Figure 1-17.

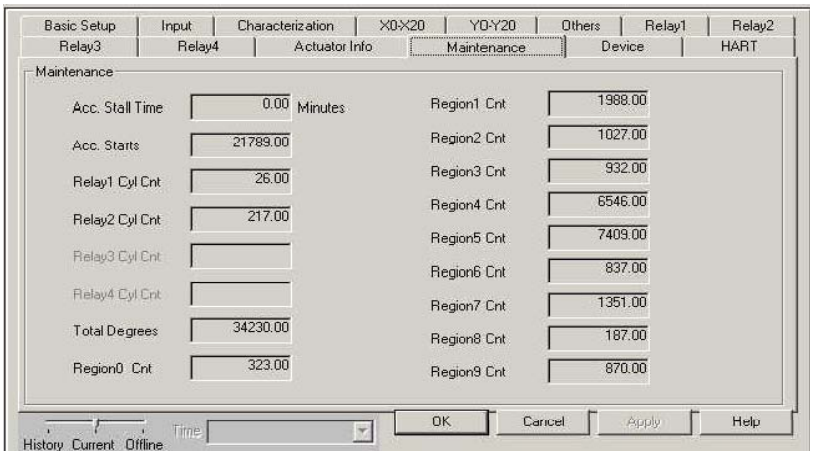

Figure 1-17: Maintenance Menu with AMS

The example Relay menu in AMS is shown in the Figure 1-18:

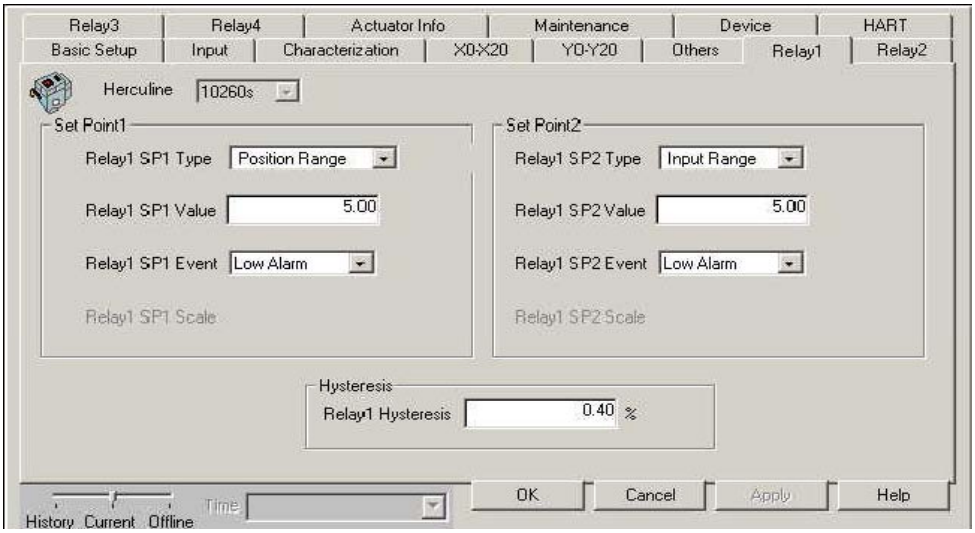

Figure 1-18: Relay1 Menu with AMS

1.5 Methods Available in the DD

1. Master Reset
2. Position Test
3. Restore factory configuration
4. Save Maintenance Data
5. Reset Stats
6. Current input calibration
7. Restore current input calibration
8. Current output calibration
9. Restore current output calibration
10. Remote Motor field calibration
11. Remote Motor factory calibration
12. Restore Motor calibration
13. Position Sensor calibration
14. Restore NCS calibration

The methods 1-3 are present under the menu "**Online/Device setup/Diag Service"**.

Master Reset: This method resets the actuator; this operation is same as the actuator Powered OFF and ON.

Position Test: This method instructs the Herculine Actuator to move the motor from current position to a different location (this depends on current position of the motor) and to return back to the original position, the method reports any problem found during the execution.

Restore factory config: Restores the user configuration to the factory configuration.

Methods 4-5 are present under the menu "**Online/Device setup/Maintenance**" menu.

Save Maintenance Data: Saves all the maintenance data to the EEPROM. Since the data is stored in a Non-Volatile memory the values will be retained even the actuator power is removed.

Reset Stats: Resets the any or all of the maintenance data variables to zero value.

All the calibration methods 6-14 are arranged under the menu "**Online/Device setup/Calibration**"

Current Input calibration: This procedure calibrates the Actuator's remote current input field. Before Running the Method, ensure that the calibrated 4-20mA current source is connected at input terminals of the actuator.

Restore Current Input calibration: Restores the user current input calibration to the factory values.

Current Output calibration: This procedure calibrates the Actuator's remote current output field. Before running the method, make sure that the Actuator's current output type has already been configured and a voltmeter is connected across a 250-ohm resistor, which is connected across the current output terminals of the actuator.

Restore Current Output calibration: Restores the user current output calibration to the factory values.

Remote Motor Field Calibration: This procedure calibrates the Actuator's Actuation span

Remote Motor Factory Calibration: This procedure calibrates a position Sensor that has been replaced in the field. ***WARNING:*** performing this procedure will destroy the original factory motor calibration. Before calibrating, ensure that the Motor direction (CCW) and the engineering units are already configured. This calibration must be a complete 100% SPAN calibration and in the CCW direction.

Restore Motor calibration: Restores the user motor calibration to the factory values.

Position Sensor calibration: This method is to calibrate the position sensor when the sensor output is incorrect (or) the position sensor in the actuator has been replaced (or) the position sensor adjustment has been disturbed.

Restore Position calibration: Overwrites the original calibration with the user remote factory calibration.

An example calibration method is given in section 1.6.

1.6 Calibration with SDC- 625

Remote Motor Field Calibration:

An example is given here for calibrating remote motor field with the detailed steps including windows dialogs. This calibration is performed with SDC-625.

When the remote motor field calibration method is executed, the first dialog appears is as shown below:

Step1

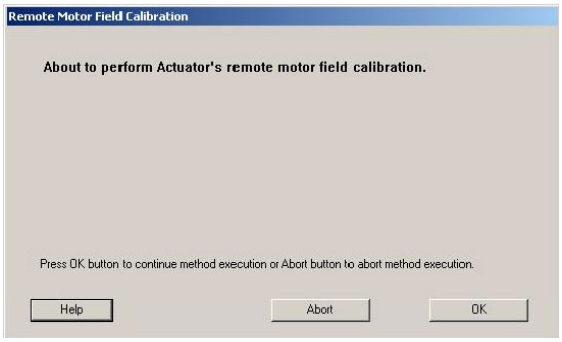

Figure 1-19: Remote Motor Calibration (Step 1)

Press ‘OK’ to proceed with the calibration or press ‘Abort’ to abort the method.

You can press Abort at any stage of the method execution to abort the field calibration. If you abort in the middle of the method execution the calibration values will not be saved.

You need to perform all the steps (till the end of the method) to complete the calibration. If you click OK, the method will proceed to the step 2.

Please click OK in step 2 to proceed to step 3, step 4, step 5 and Step 6. The OK or Abort buttons will not be enabled in Step 3, 4 and 5.

Step 2

If the engineering unit is not configured to %, this step will automatically set the unit to % before proceeding to step 3.

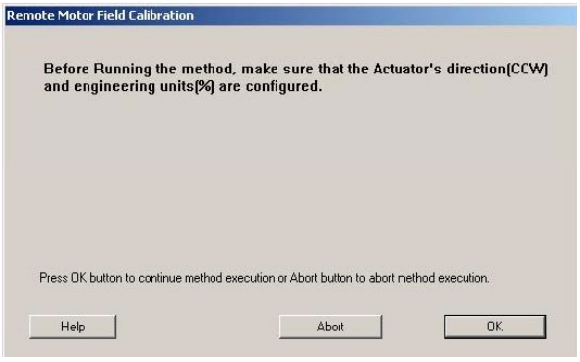

Figure 1-20: Remote Motor Calibration (Step 2)

Step 3

This step selects the Motor Calibration group in the actuator.

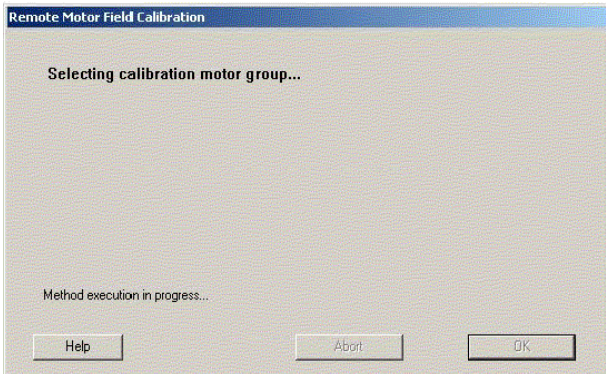

Figure 1-21: Remote Motor Calibration (Step 3)

Step 4

Step 4 and 5 invokes and enables the Motor calibration respectively.

Figure 1-22: Remote Motor Calibration (Step 4)

Step 5

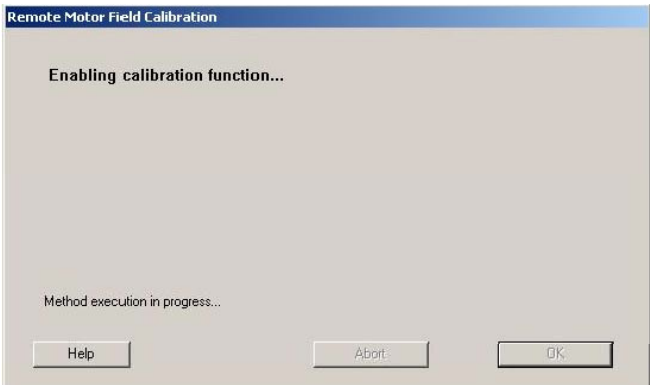

Figure 1-23: Remote Motor Calibration (Step 5)

Step 6

Step 6 requests user to select Low calibration (Lo Cal) or high calibration (Hi Cal) to perform. User has to select Lo cal first, perform the low calibration and then go to High calibration. If user selects the Low calibration, the calibration proceeds to step 7.

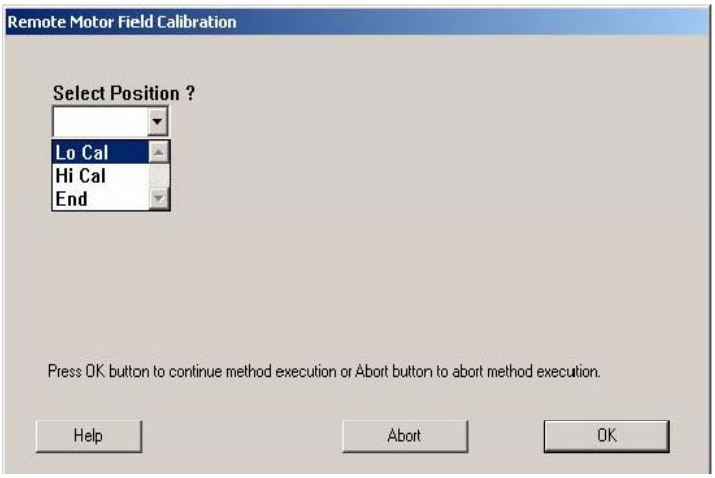

Figure 1-24: Remote Motor Calibration (Step 6)

Step 7

User needs to enter Low motor calibration value in % in the Box provided and then Click OK to proceed further.

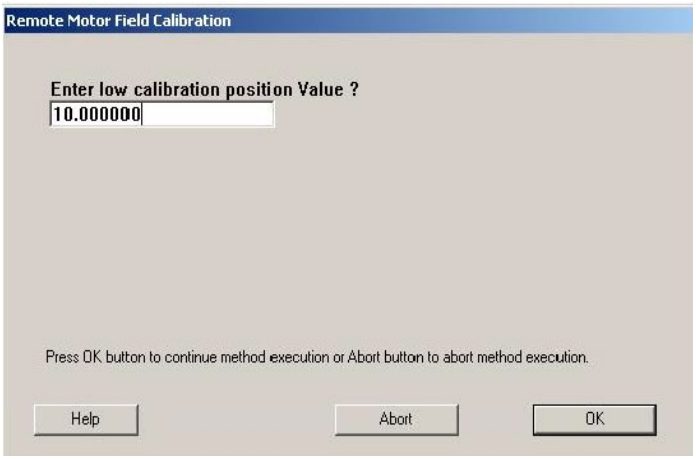

Figure 1-25: Remote Motor Calibration (Step 7)

Step 8

This step just displays the user-selected value and user has to click OK to continue with the method.

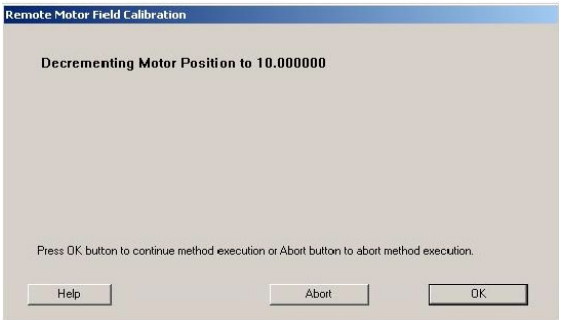

Figure 1-26: Remote Motor Calibration (Step 8)

Step 9

This step will wait till the motor is placed in the user requested position before proceeding to the next step. Both the OK and Abort buttons are disabled here. The displayed message in the dialog box depends on the current position of the actuator. This can be either Decreasing Motor position or Increasing Motor position message. Once the motor is placed in the user requested position the calibration proceeds to the next step

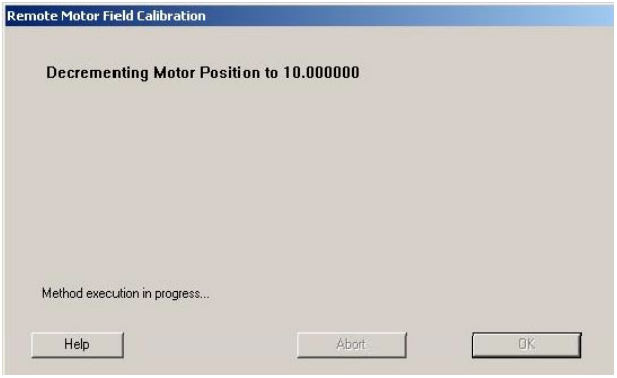

Figure 1-27: Remote Motor Calibration (Step 9)

Step 10

The final position may not be exactly the same value requested by the user. There may be a small difference between the user requested value and the set position value. Check the position value displayed in the actuator front panel display. Adjust the motor position using Handwheel or Auto/Manual switch to the requested value and then proceed with the next step.

Figure 1-28: Remote Motor Calibration (Step 10)

Step 11

Select the High calibration (Hi Cal) in this step and click OK to continue.

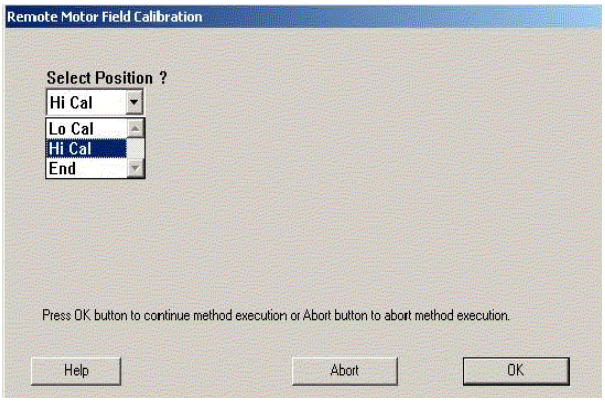

Figure 1-29: Remote Motor Calibration (Step 11)

Step 12

Enter the High calibration position value in this step. The high calibration value should be 10% more than the low calibration value entered in step 7. Click OK to continue the method.

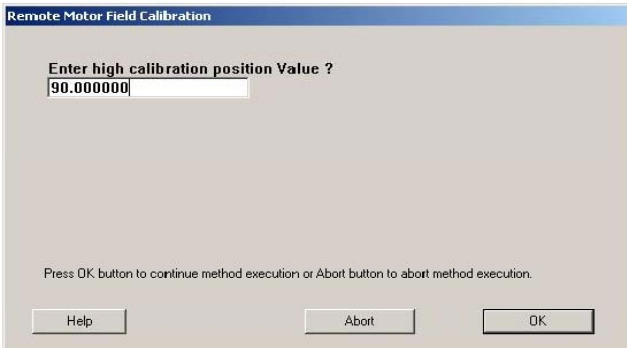

Figure 1-30: Remote Motor Calibration (Step 12)

Step 13

This step just displays the user-selected value and user has to click OK to continue with the method.

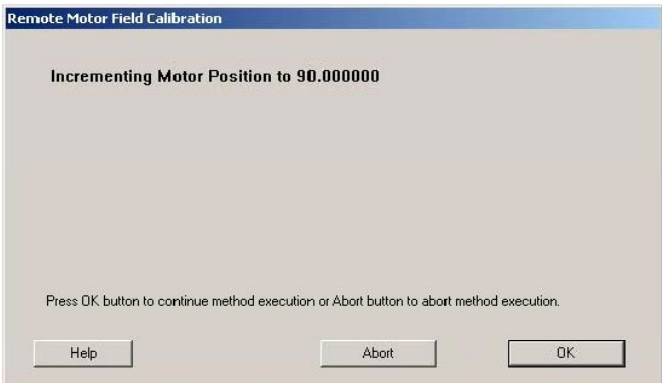

Figure 1-31: Remote Motor Calibration (Step 13)

Step 14

This step will wait till the motor is placed in the user requested position before proceeding to the next step. Both the OK and Abort buttons are disabled here. Once the motor is placed in the user requested position the calibration proceeds to the next step

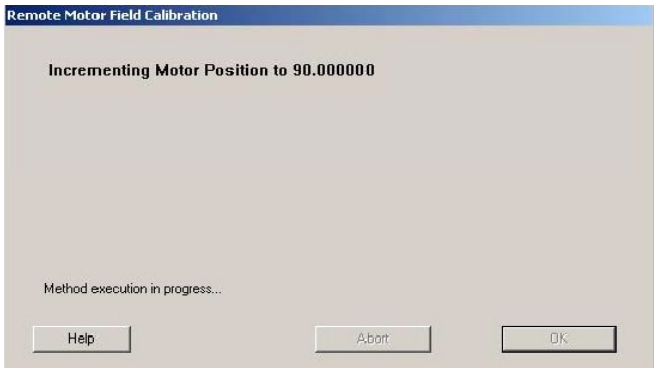

Figure 1-32: Remote Motor Calibration (Step 14)

Step 15

The final position may not be exactly the same value requested by the user. There may be a small difference between the user requested value and the set position value. Check the position value displayed in the actuator front panel display. Adjust the motor position using Hand wheel or Auto/Manual switch to the requested value and then proceed with the next step.

Figure 1-33: Remote Motor Calibration (Step 15)

Step 16

Once the Low and High calibrations are completed select End and press OK to complete the calibration method.

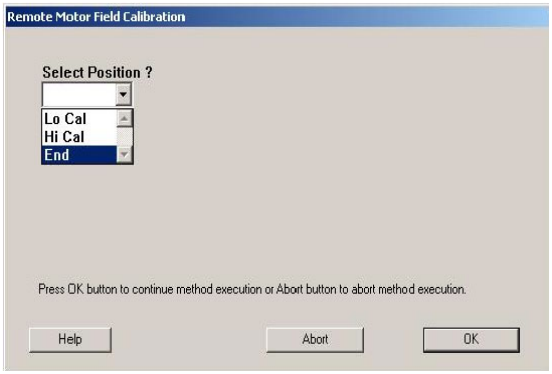

Figure 1-34: Remote Motor Calibration (Step 16)

Step 17

Click OK here to terminate the Motor field calibration.

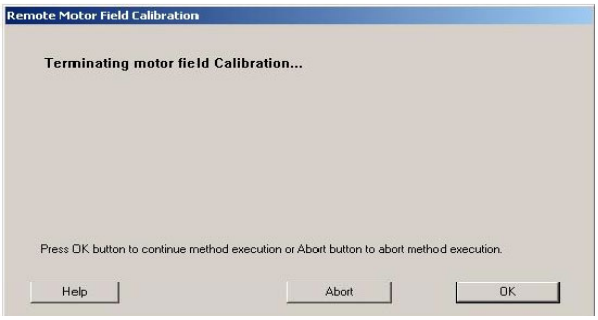

Figure 1-35: Remote Motor Calibration (Step 17)

Step 18

The dialog box displays the Motor field calibration completed message.

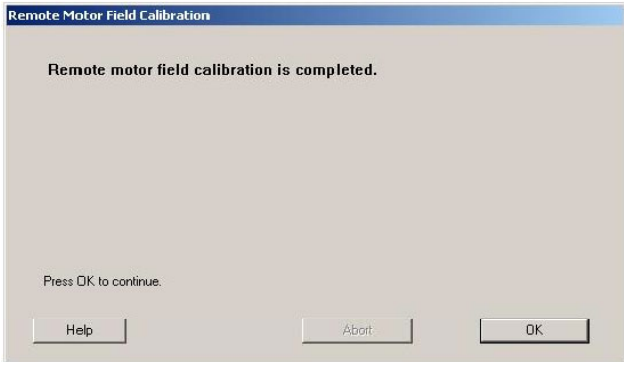

Figure 1-36: Remote Motor Calibration (Step 18)

Current Input Calibration

An example is given here for calibrating Current Input with the detailed steps including windows dialogs. This calibration is performed with SDC-625. When the Current Input calibration method is executed, the first dialog box appears is as shown below:

Step 1

Click **OK** to proceed with the calibration or click **Abort** to abort the method. You can press Abort at any stage of the method execution to abort the Input calibration. If you abort in the middle of the method execution the calibration values will not be saved. You need to perform all the steps (till the end of the method) to complete the calibration. If you click **OK**, the method will proceed to the step 2. Click **OK** in step 2 to proceed to step 3, step 4, step 5 and Step 6. The **OK** or **Abort** options will not be enabled in Step 3, 4 and 5.

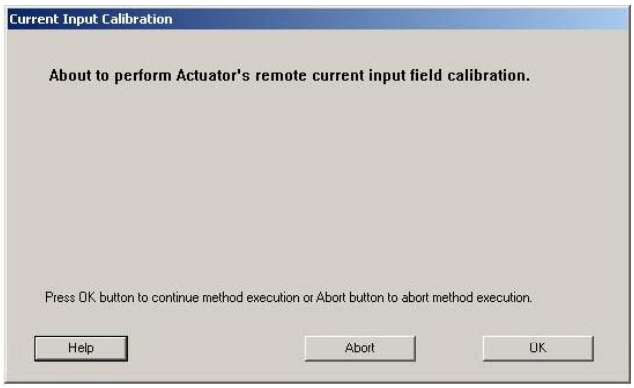

Figure 1-37: Current Input Calibration (Step 1)

Step 2

Make sure that the calibrated 4-20mA input current source is connected at the input terminals of the actuator before proceeding with clicking OK button.

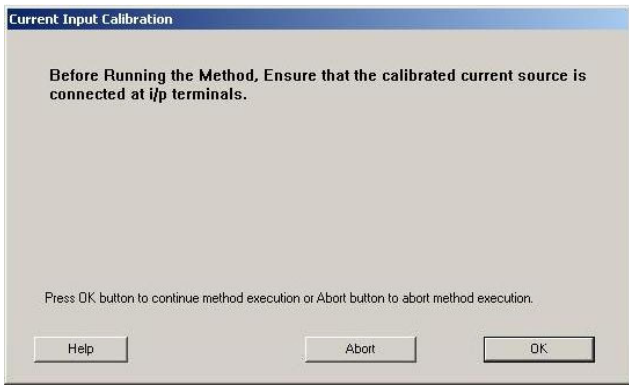

Figure 1-38: Current Input Calibration (Step 2)

Step 3

This step selects the Input type Calibration group in the actuator.

Figure 1-39: Current Input Calibration (Step 3)

Step 4

Step 4 and 5 invokes and enables the Input calibration respectively

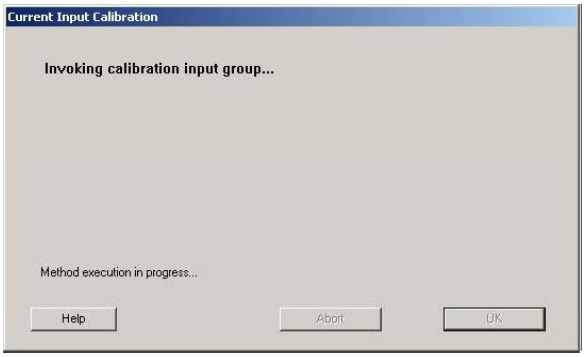

Figure 1-40: Current Input Calibration (Step 4)

Step 5

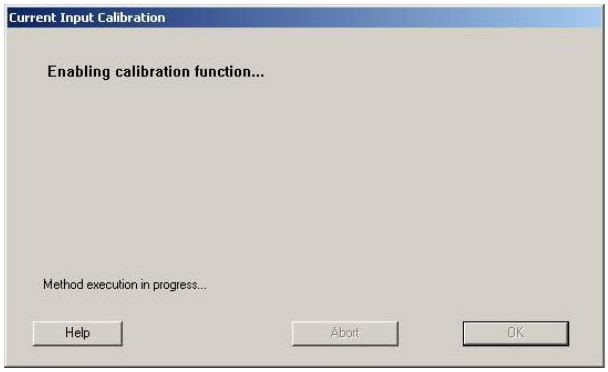

Figure 1-41: Current Input Calibration (Step 5)

Step 6

Step 6 will activate the Zero Calibration Function

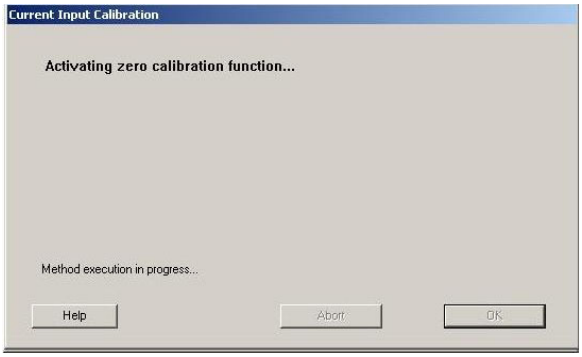

Figure 1-42: Current Input Calibration (Step 6)

Step 7

Step 7 ensures that Zero calibration is activated. User has to set the Low Calibration Point in the external input source (4mA) before pressing OK and proceeding to next step.

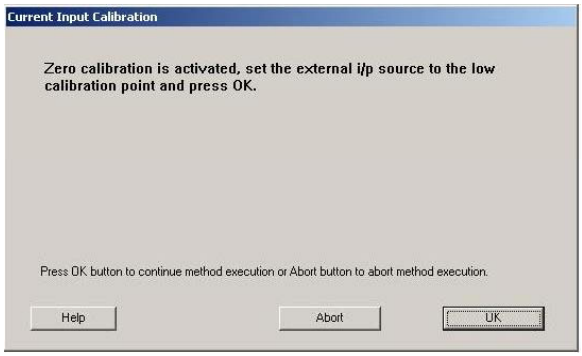

Figure 1-43: Current Input Calibration (Step 7)

Step 8

This step displays that the zero calibration is completed.

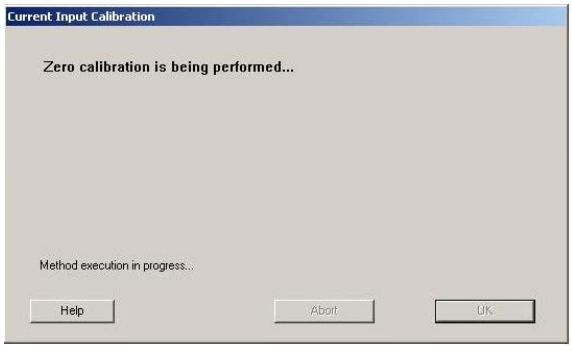

Figure 1-44: Current Input Calibration (Step 8)

Step 9

Once the zero calibration is completed the method performs the span calibration

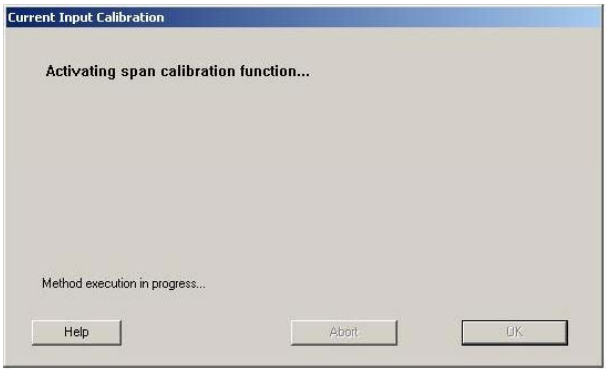

Figure 1-45: Current Input Calibration (Step 9)

.***Step 10***

Span calibration will be performed from step 9. User has to set the High Calibration point (20mA) in the external source before proceeding to next step.

Figure 1-46: Current Input Calibration (Step 10)

Step 11

Steps 11 and 12 will perform the span calibration and terminate the calibration method.

Figure 1-47: Current Input Calibration (Step 11)

Step 12

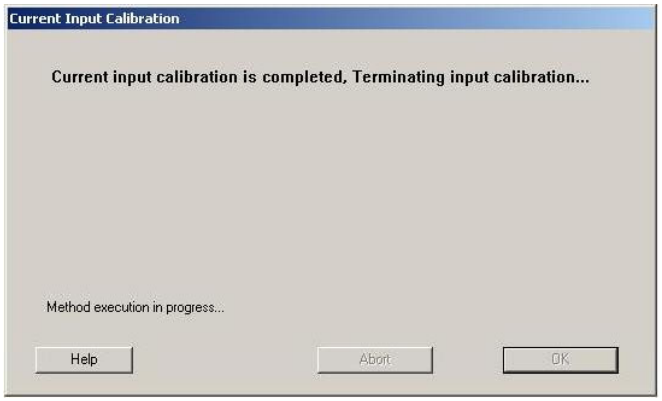

Figure 1-48: Current Input Calibration (Step 12)

Step 13

This dialog box shows that Input calibration is completed.

All the other calibration methods (current output and Non-contact sensor) are similar to the above examples. Each step in the method will direct the user if an action is required from user end.

Figure 1-49: Current Input Calibration (Step 13)

2. DD Upgrading

2.1 Overview

If your HART Host does not have the Herculine actuator DD installed, please upgrade your Host with the latest actuator DD by downloading from http://www.honeywell.com/imc

The link contains the DD installation files for the following Hosts:

1. Herculine actuators DD file for HC-375
2. Herculine actuators DD file for HC-275.
3. Herculine actuator DD installation kit for AMS.

Installing in HC-375

Use the 375 Easy Upgrade utility received with the HC-375 to install the DD file (*.hdd, *hhd) onto HC-375.

Installing in HC-275

To load the DD onto HC-275 you need to have 275 DD upgrade hardware & software. Please contact Emerson Service center if you don't have the HC-275 DD upgrade facility.

Installing in AMS

The downloaded AMS device installation kit can be installed only on PC's where AMS is installed. This kit is tested for only AMS 6.0, 6.1 and 6.2 versions and is not tested with any other AMS versions.

1. Unzip the file and extract the contents to a folder on the PC where AMS is installed.
2. Select **Start** > **Programs/AMS/Add Device Manually**. In the dialog box, click **Next** to proceed.
3. A new dialog box will appear asking to select the source directory where the device installation kit present as shown in the Figure 3.1. Select the directory where the **Ddinstal.ini** file is located. This file will present in the directory where the DD installation kit is extracted (**Extracted Directory/Herculine/Ddinstal.ini**). Click **Next** to proceed.

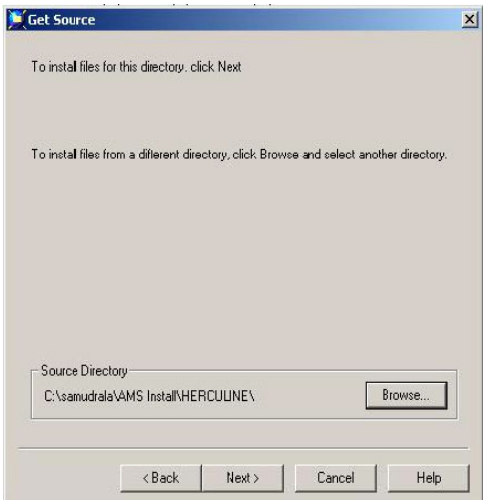

Figure 2-1: Installing DD installation kit in AMS (Step 1)

4. A new dialog will appear showing the Device DD present in the installation kit as shown in the below Figure 3.2:

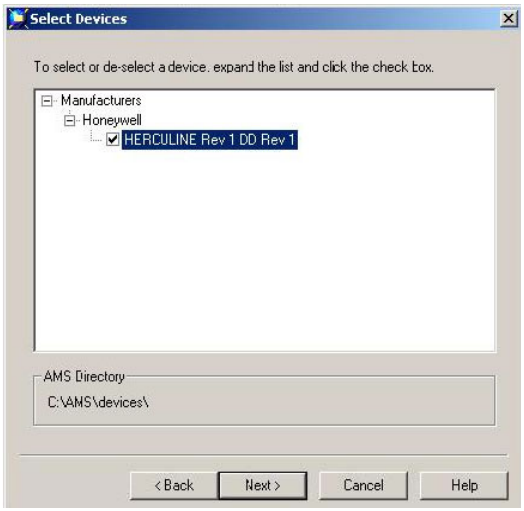

Figure 2-2: Installing DD installation kit in AMS (Step 2)

5. Click Next to proceed further. Once all the steps are finished a message will appear saying "**Device installation successful**".

Installing for SDC-625

1. Copy the DD file (.fms file) to where the device database for SDC is present.
2. If the DD IDE is already installed, the device database path should be C:\HCF\DDL\Library.
3. Copy the .fms file into the patch "C:\HCF\DDL\Library\000017\0005". If the path is not present create one.

Installing in H-FDCM

1. Copy the DD file (.fms file) to any location in the PC,
2. Open the H-FDCM client, and select **Tools**/**Add DD File** from the menu. A dialog box will appear asking to select the .fms file.
3. Select the copied **.fms** file and select **Open** to proceed further.
4. The **DD file Uploaded successfully** message is displayed.

3. Limitations /Not Supported

- Burst Mode is not supported

4. Trouble Shooting

4.1 Command 48 Bytes / Device Status Byte / Alarms

All the device status and command 48 screens presented here are taken with AMS.

Device Status Byte

The string will be shown with the red color background if that particular condition is set in the actuator. Refer HART Protocol documentation for specific meaning of the device status byte strings.

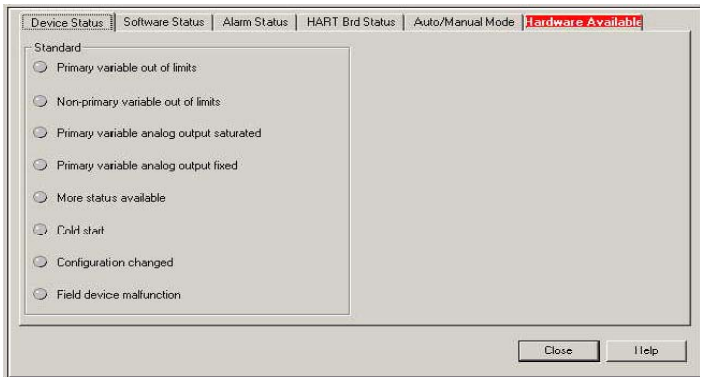

Figure 4-1: Device Status Byte in AMS

Software Status

This byte gives the software and hardware status of the Actuator Main PWA. The Failsafe condition will set if the input signal is out of limits (not within 4-20mA).

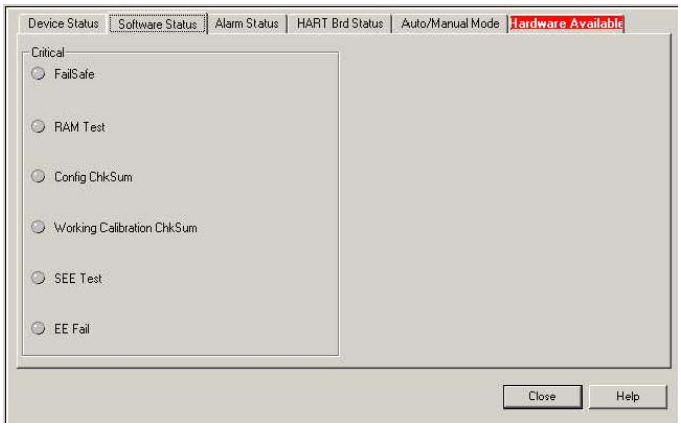

Figure 4-2: Software Status Byte in AMS

Alarm Status

This byte gives the Alarms status of the actuator including stall condition and Rivitz failure. All the alarms are user configurable.

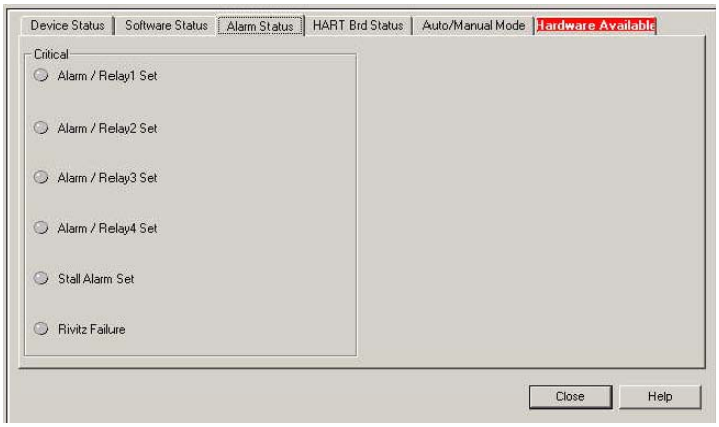

Figure 4-3: Alarm Status Byte in AMS

HART Board Status

The HART Board status byte gives the software and hardware status of HART PWA.

- If Modbus communication Fail bit is set, there could be a problem with the Modbus communication in the actuator. This problem will be cleared automatically once the Modbus communication restores. If the problem persists for long time, run the Master Reset method to resolve the problem or Power OFF and Power ON the actuator.
- Replace the HART PWA board with new one if RAM or EEPROM or FLASH failure happens.

All the above three bytes are command 48 bytes and are critical to the operation of the actuator.

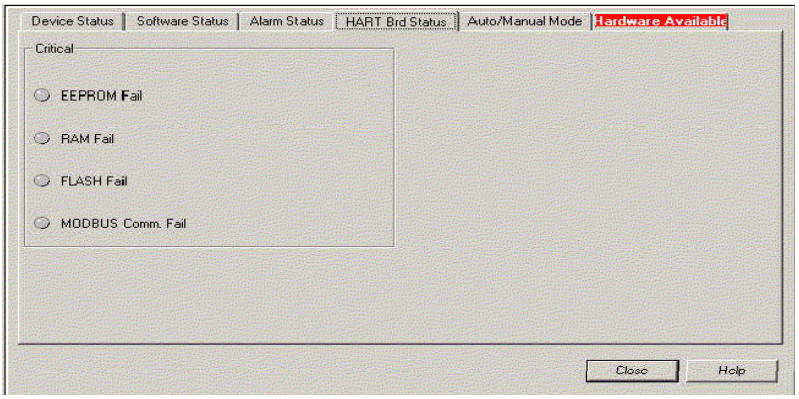

Figure 4-4: HART Board Status Byte in AMS

Auto/Manual Mode

This byte gives Auto/Manual mode status of the actuators External and Front panel switch. If any of the bits is set then the actuator is in Manual mode.

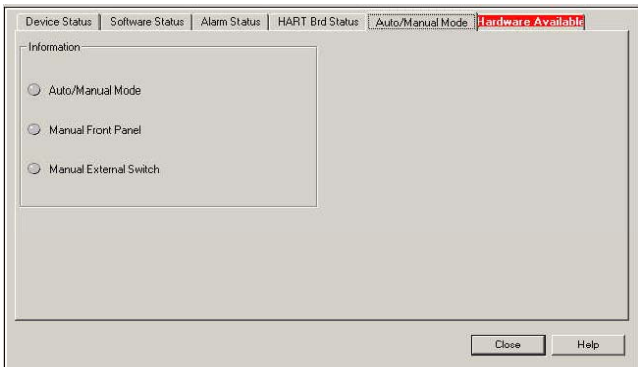

Figure 4-5: Auto/Manual Mode Status in AMS

Hardware Available

This byte gives the hardware available with actuator. Each relay board has two Relays/Alarms. The two bytes are for information purpose only.

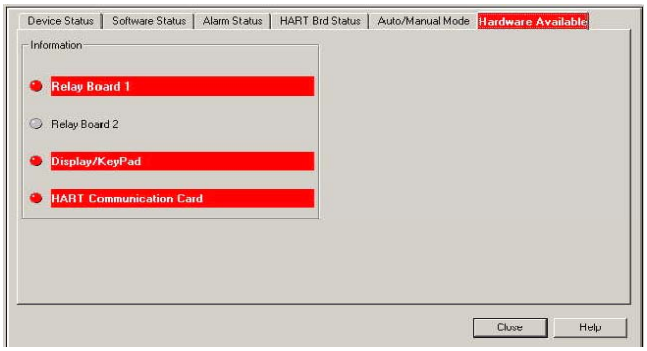

Figure 4-6: Hardware Available Status in AMS

5. Approvals

The Herculine actuator with HART Communications is approved for the following standards

1. CE
2. UL
3. CSA
4. NEMA

Honeywell

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