



***User Guide
Optiwave
(FMCW)
Device***



**Asset Management
Solutions (AMS)**

HART Communicator 375

**Version 1.1
January 2008**

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1 HART® Transmitter Revisions and Instrument Firmware

1.1 Device Revision

The Optiwave HART® transmitter has only one revision: Device revision 1.

1.2 DD Revision

Optiwave 7300C has the *DD revision 2*.
DD is tested with AMS 9.0.

2 Installation of DLL in AMS

Refer to the AMS help to install the device (Optiwave 7300C) into an AMS System.

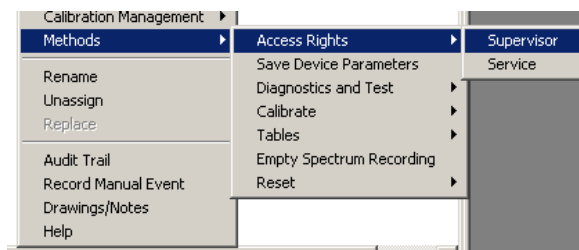
3 Menu

3.1 Access Rights

3.1.1 Password protection implementation

There will be two user login, Supervisor & Service which is implemented in <Access Rights> menu. By default, Supervisor can see & edit all parameters except service parameter. After service person is logged in he can see & edit all the parameters including the service parameters and tables.

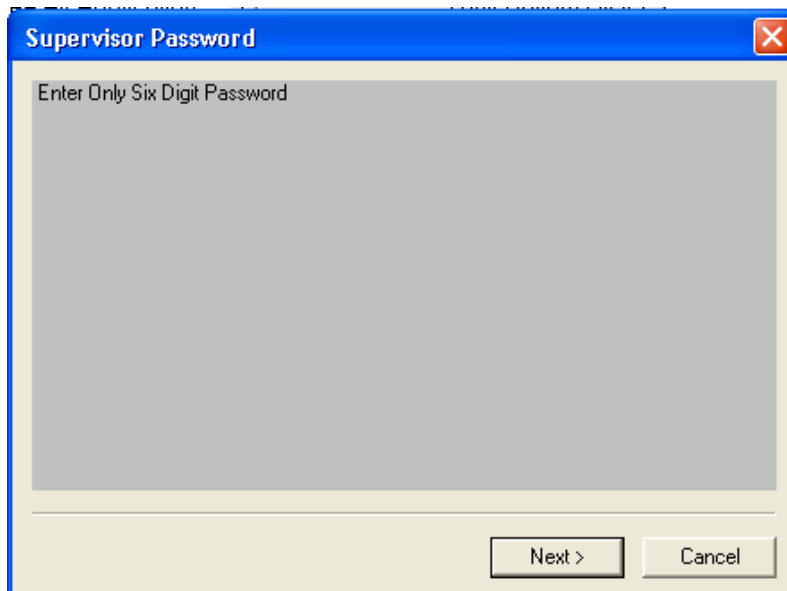
Password can be numeric digits from 0-9. There may be maximum six digits password. As we can't store the password directly in AMS, we are validating the password in AMS by reading the password from device. Password setting facility is not given from AMS to avoid conflicts to know the password to login from HMI. After validation it will give following messages "Supervisor Password OK" or "Service Password OK" as per the login. On clicking the Access Rights on the main menu, two submenus appear as Supervisor and Service.



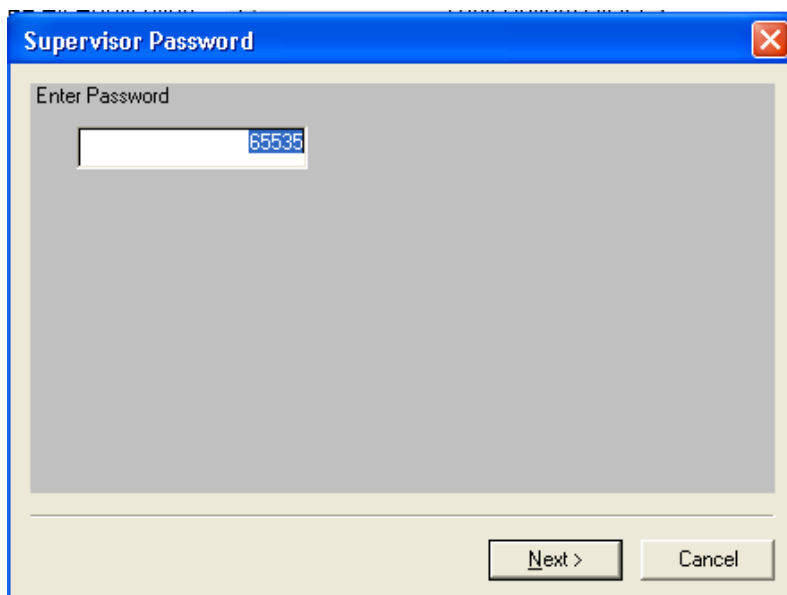
3.1.2 Supervisor Password

On clicking Supervisor it shows the following screen.

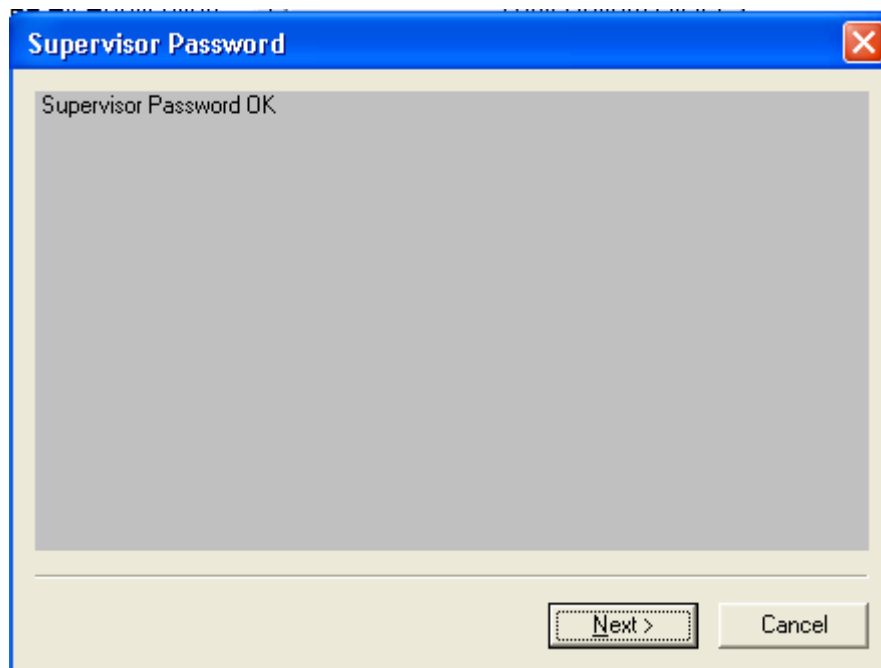
Note: Before accessing this menu user needs to select the “configuration variables” for synchronization of all device parameters and for proper validation of the device parameters.



On clicking next, it shows the following window, which asks user to enter the Supervisor Password with the default value as 65535.



After entering the valid password and clicking next, it shows the following screen:



For success: **“Supervisor Password OK”**

For invalid password: **“Supervisor Password Invalid”**

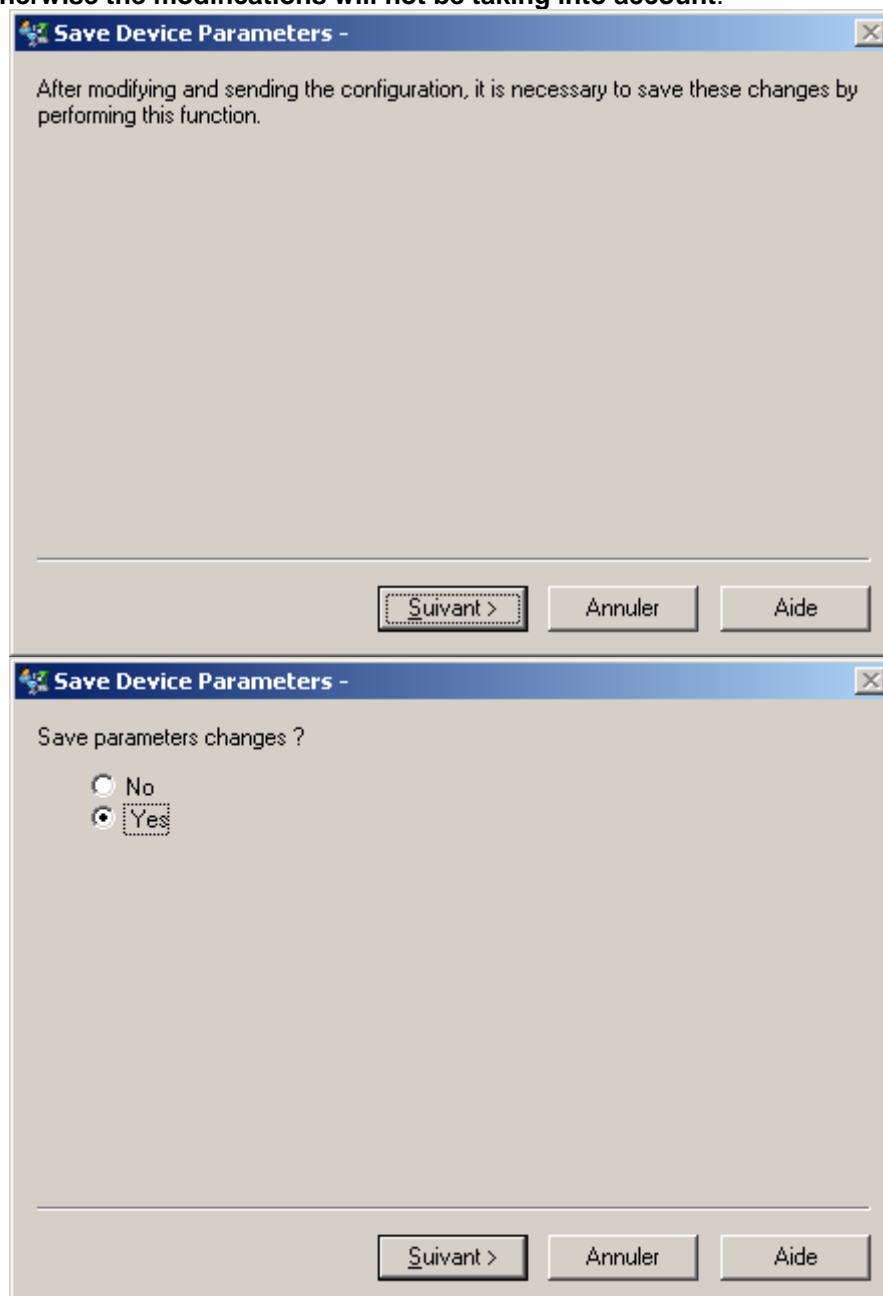
3.1.3 Service Password

See “Supervisor Password” method

3.2 Save Device Parameters

ATTENTION: **This is a very important method.**

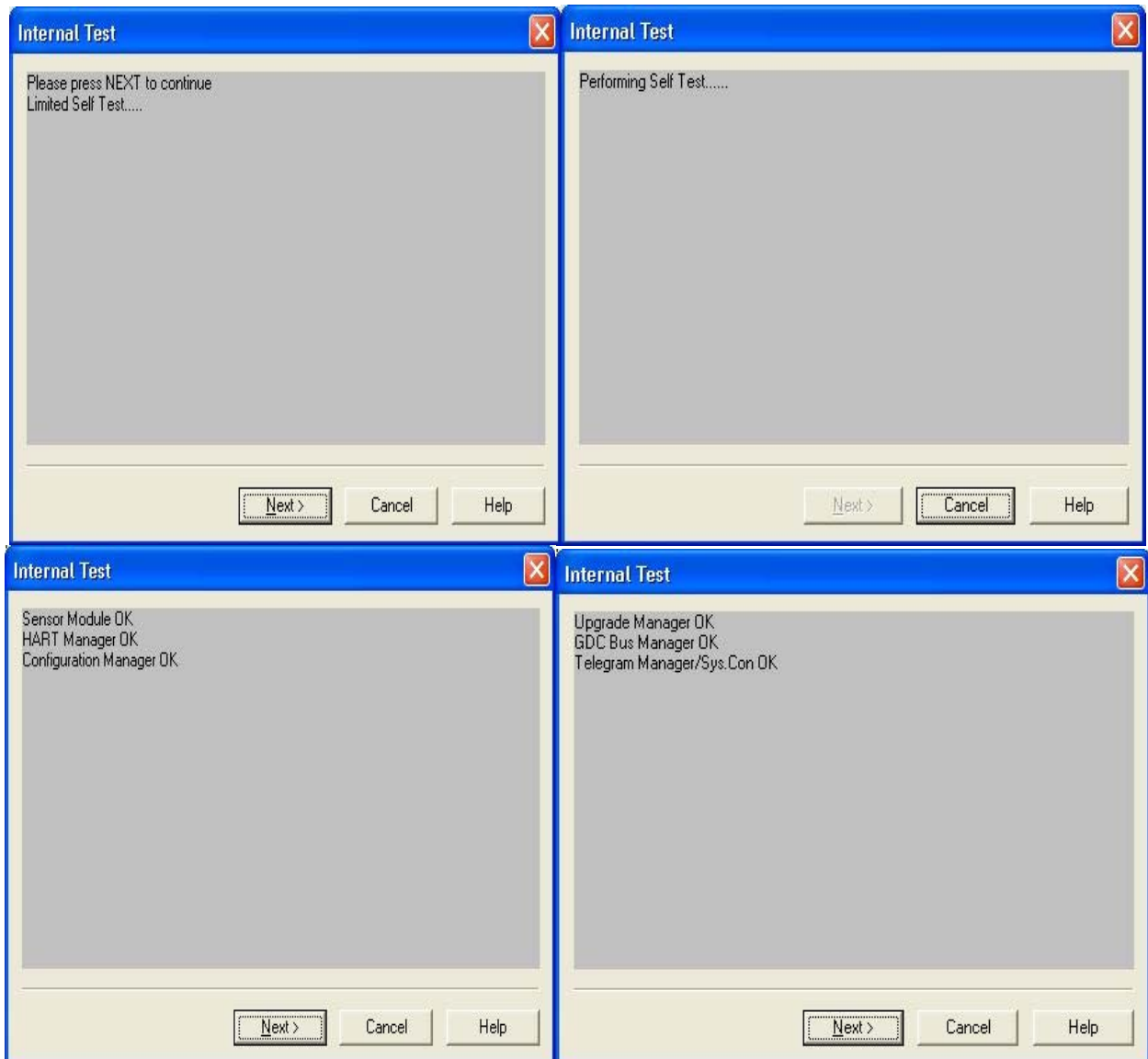
Each time the device configuration is modified (after applying changes) it is necessary to execute this method. **Otherwise the modifications will not be taking into account.**

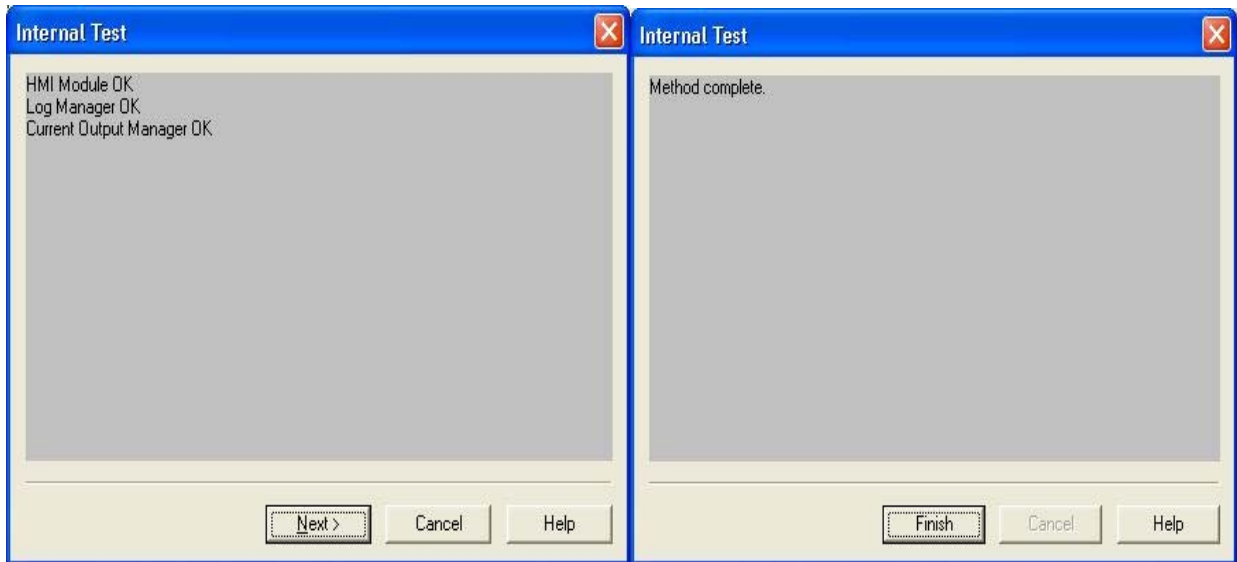


3.3 Diagnostic and Test

3.3.1 Internal Test

On selecting “Internal Test” from the main menu, device performs self test and displays results as following:

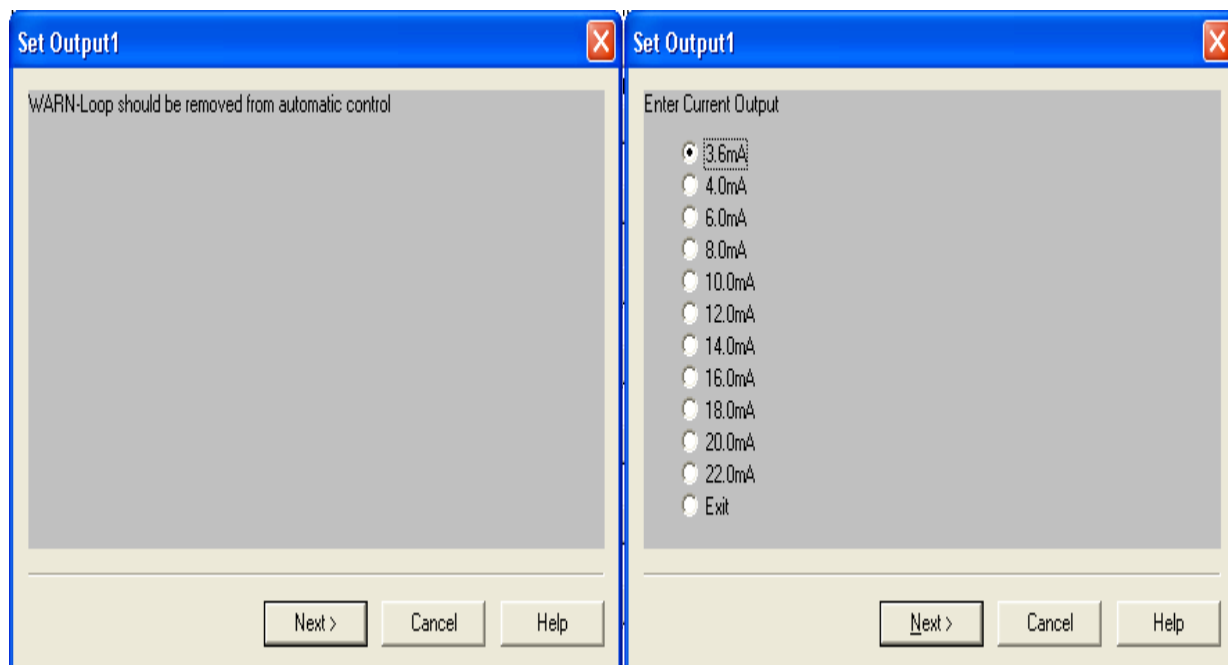




3.3.2 Set Output1

It allows fixing different values to the current output1 . It is a test mode. User can check the loop currents in output1 and output2. The list of currents are displayed in the list box.

Once the appropriate current is selected the loop current is fixed to that current value. Check the loop current by ammeter and validates the current as selected from the device. The loop current exits from the current mode after clicking on 'Exit' or 'Cancel' from the method.



3.3.3 Set Output2

See “Set Output1”

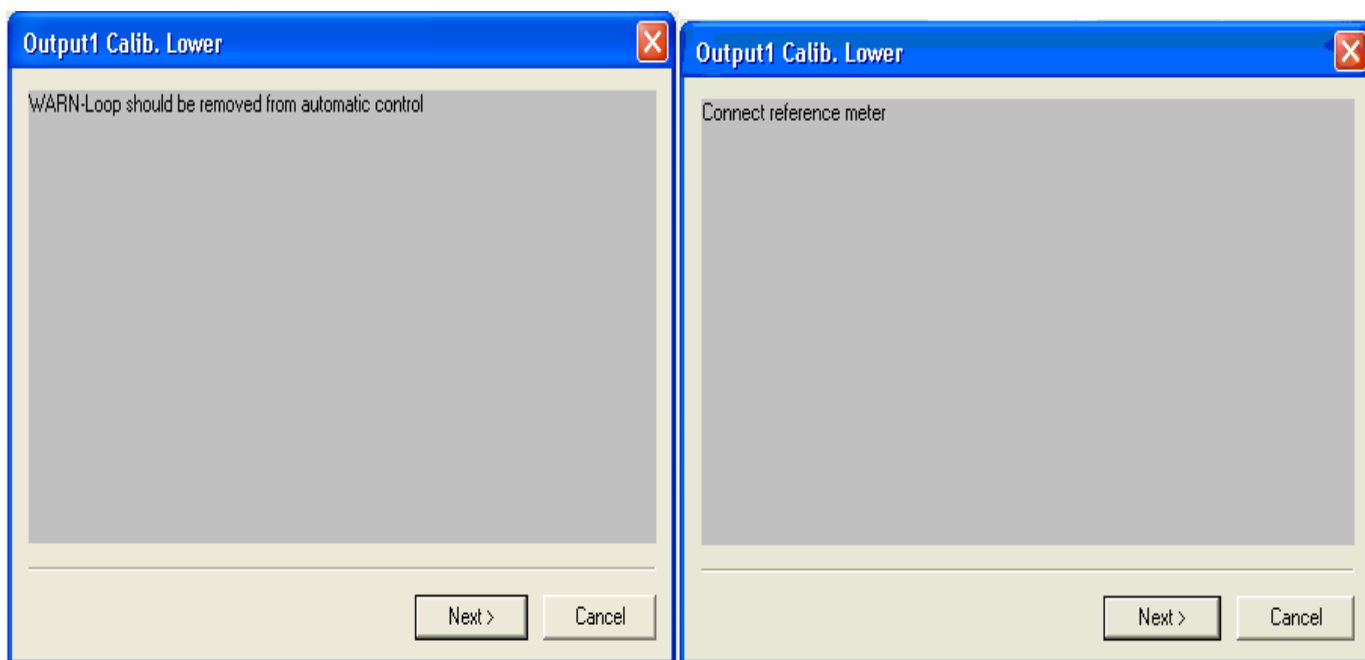
3.4 Calibration

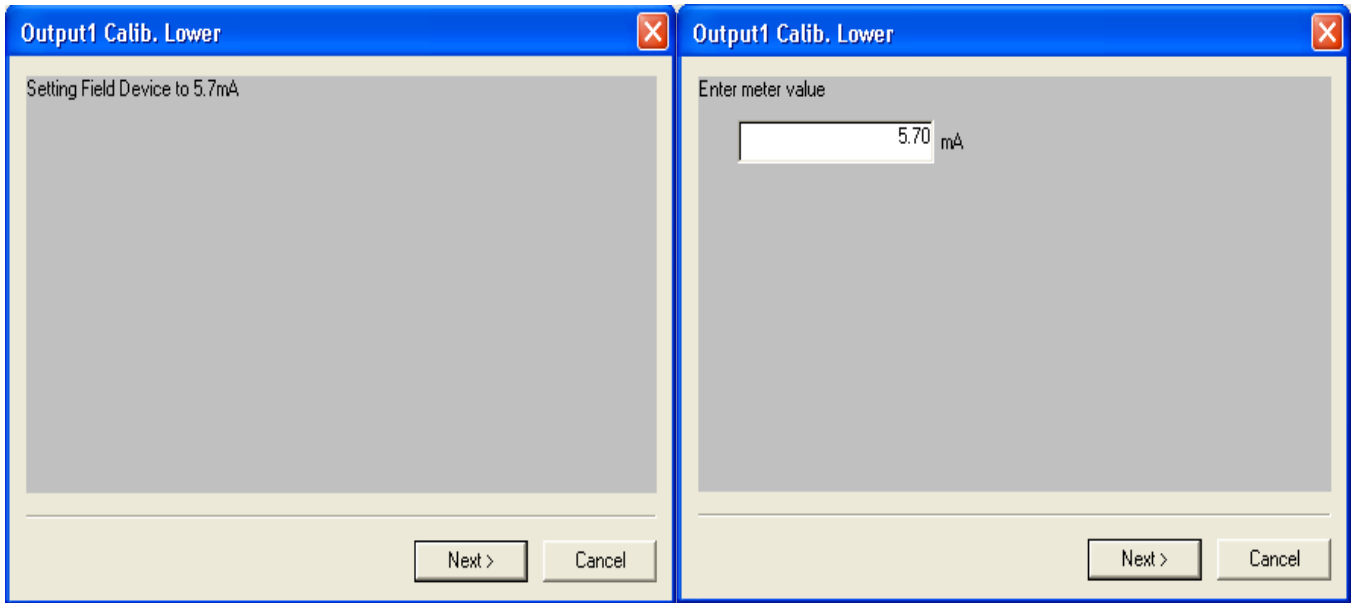
The Calibration can be done for the output1 and output2. Here the following sections will be describes the detailed about the calibration screen options for the output1 lower and upper.

3.4.1 Output1 Lower

In Output1 Lower, it allows user to trim current output1.

The user starts to fix the current to 4mA, after entering the current value he reads on a voltmeter, this value is sent to the device. This method allows adjusting to have exactly the good current value of output1 loop.

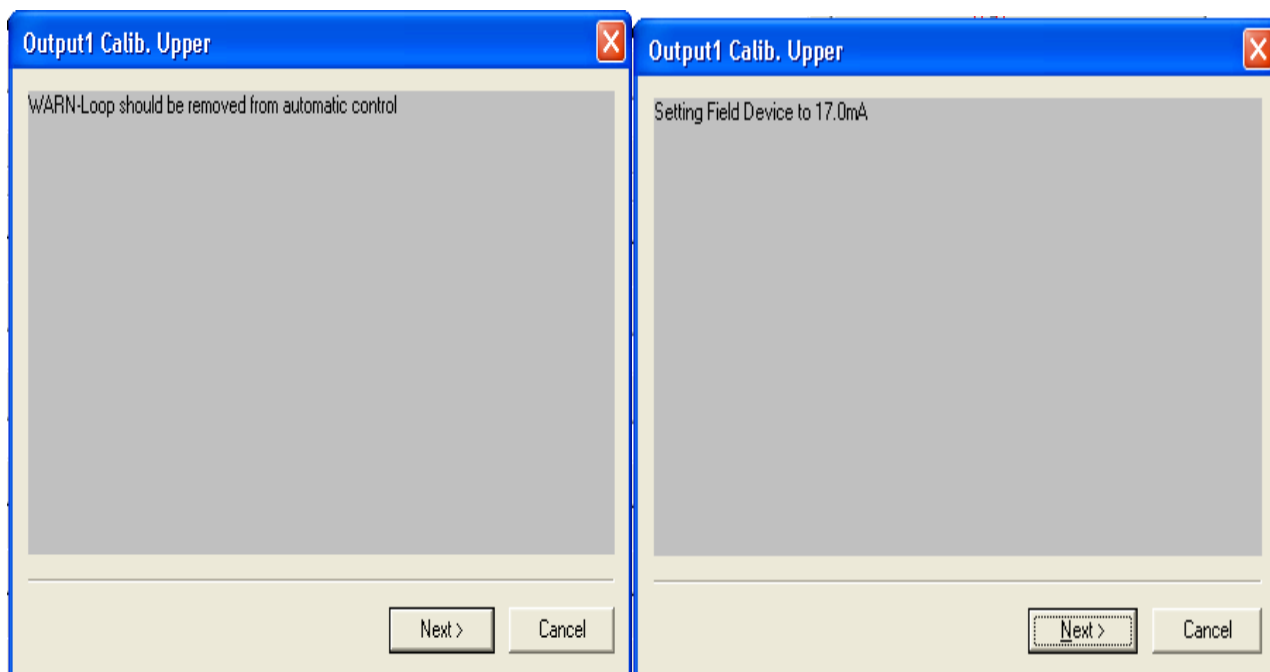


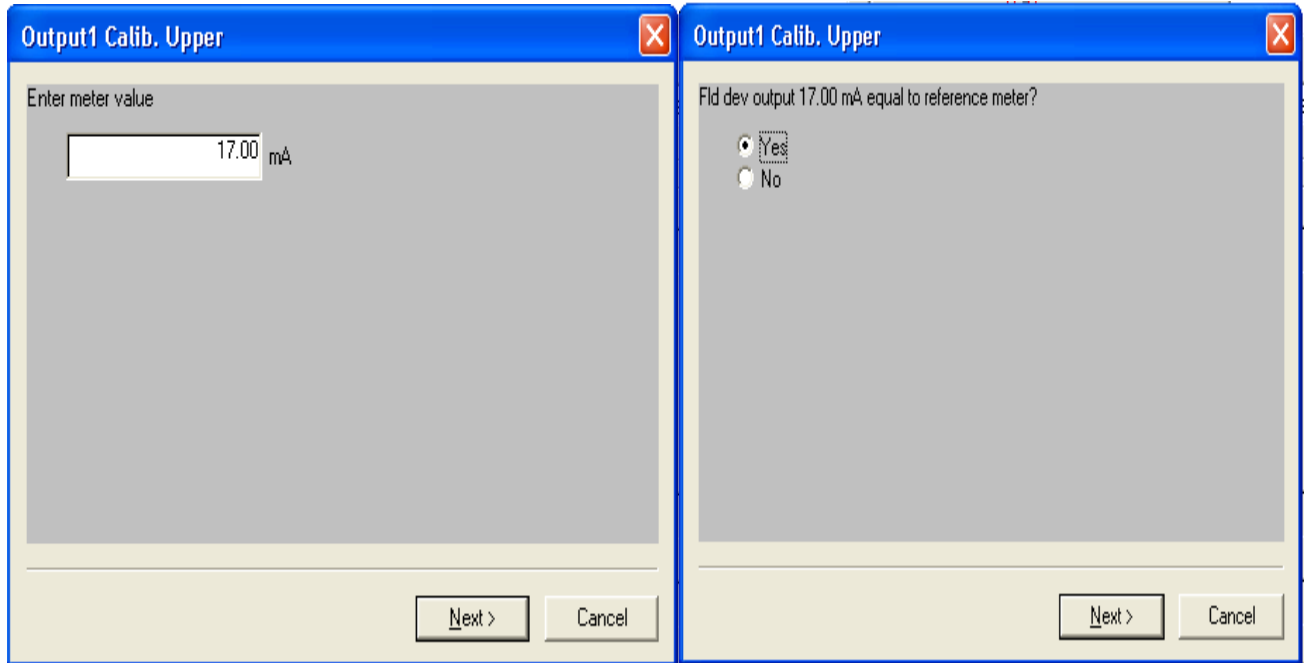


3.4.2 Output1 Upper

In Output1 Upper, user allows to trim current output1.

The user start to fix the current to 20mA, after entering the current value he read on a voltmeter, this value is sent to the device. This method allows adjusting to have exactly the good current value of output1 loop.

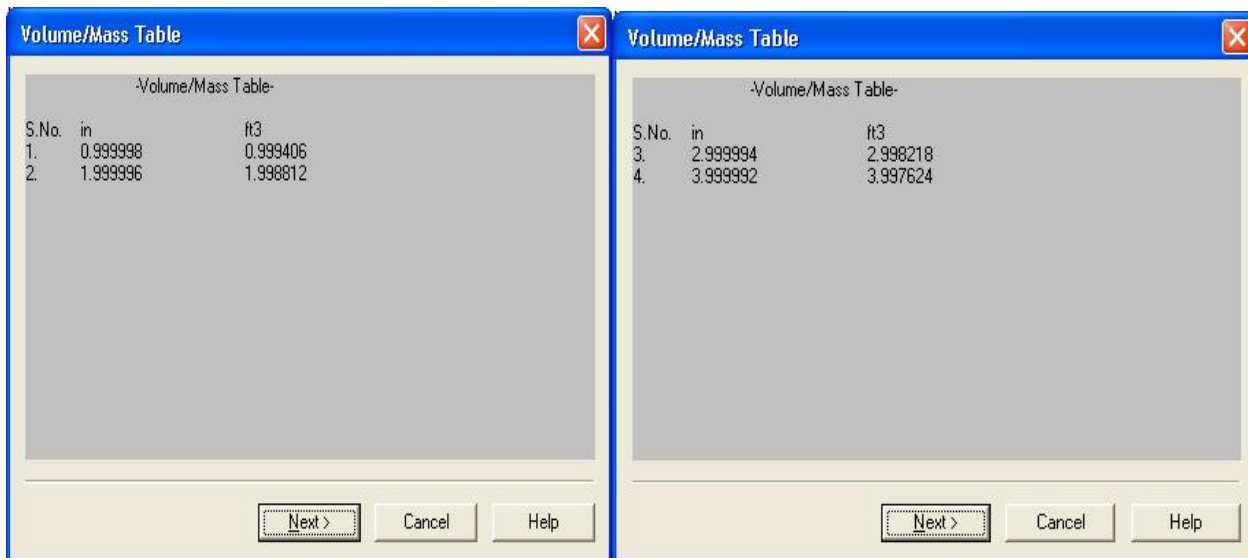




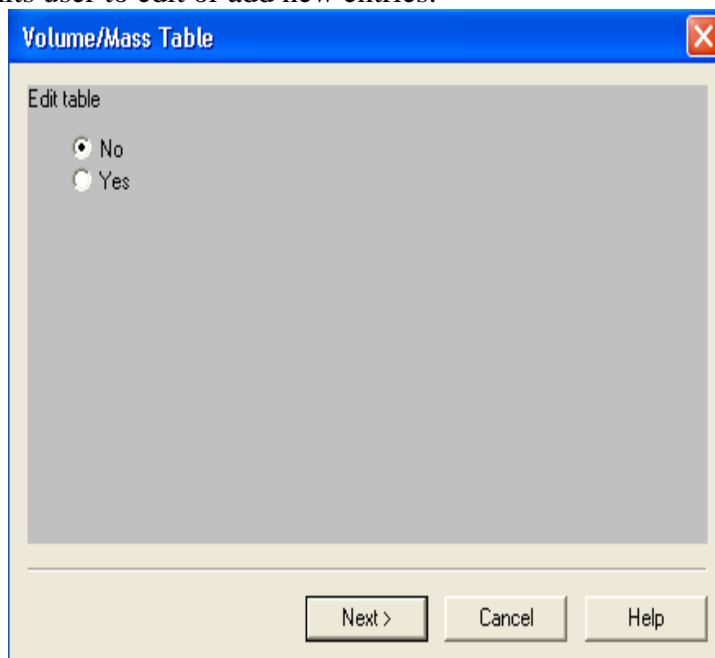
3.5 Tables

3.5.1 Volume/Mass Table

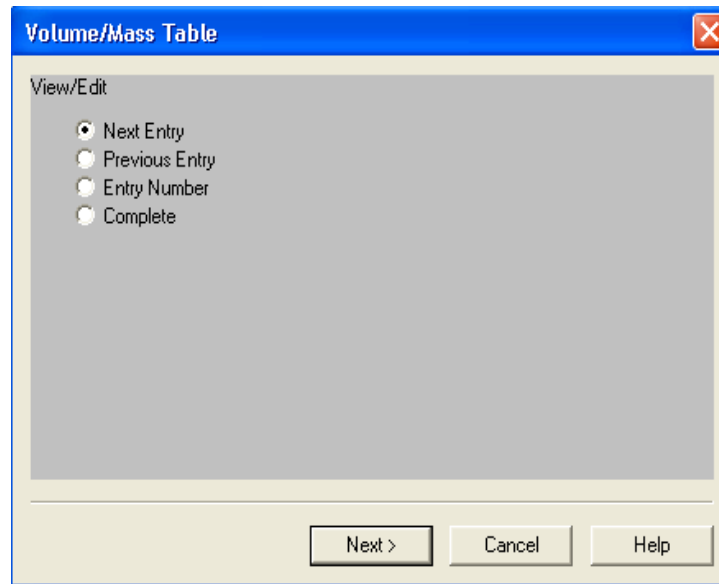
Select “Conversion Table” will display all the entries of conversion table in ‘2 x 2’ Format. Display will be in following steps



1. After Displaying all entries:
If yes is selected, it permits user to edit or add new entries.



2. Selection of Next Entry will show next entry Level to edit, after clicking Enter, Volume/Mass is displayed for next Entry to edit. After editing Level & Volume/Mass for current entry, above shown menu is displayed again.



3. Selection of Previous Entry will show previous entry Level to edit, after clicking next, Volume/Mass is displayed for previous Entry to edit. After editing Level & Volume/Mass for current entry, above shown menu is displayed again.
4. Selection of Entry Number will take Entry Number from user and will display that entry Level to edit, after clicking next, Volume is displayed for given Entry number to edit. After editing Level & Volume for entry, above shown menu is displayed again.

If Entered Entry Number is greater than Entries+1, Entry Number is made equal to Number of Entries + 1.

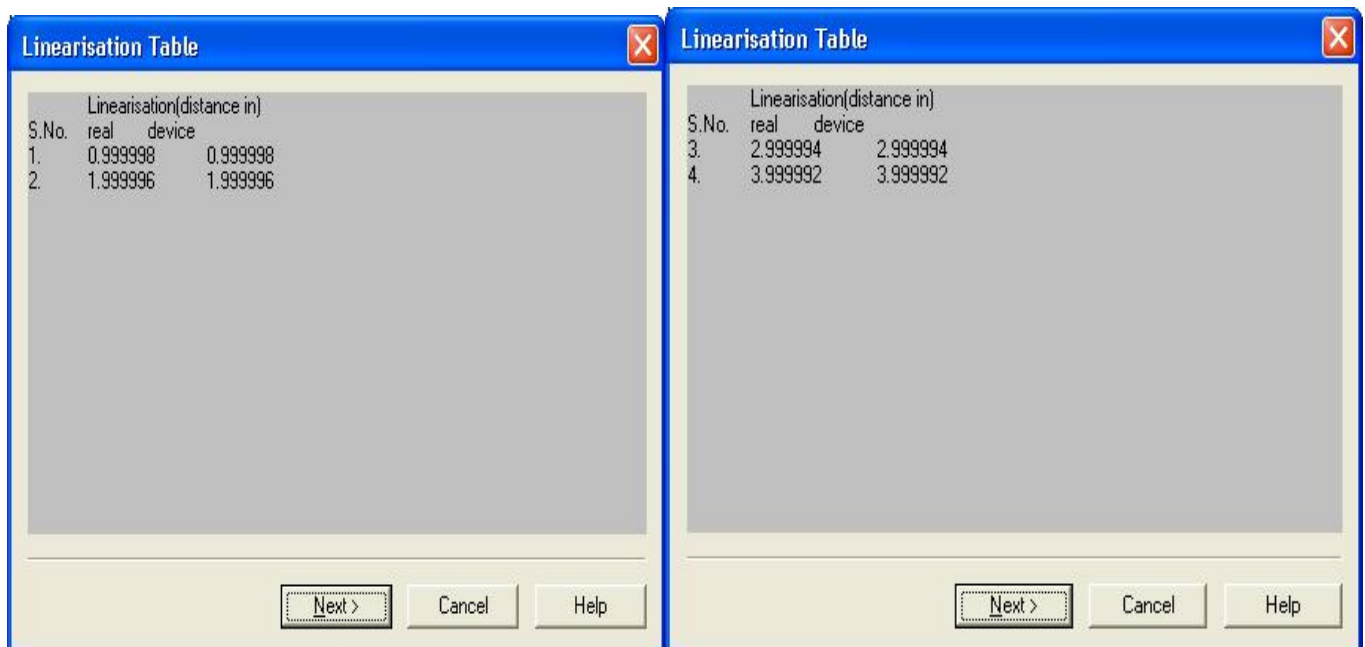
If Yes is entered, table with edited values is stored in to the Device (If table entered is monotonous).

Note: All values entered for Level and Volume should be in increasing order with Entry numbers (Corresponding warnings are displayed). Level value entered can not exceed Tank Height.

3.5.2 Linearisation Table

Above explained steps for volume/mass Table are to be followed, with Distance Real, Distance Device instead of Level and Volume respectively.

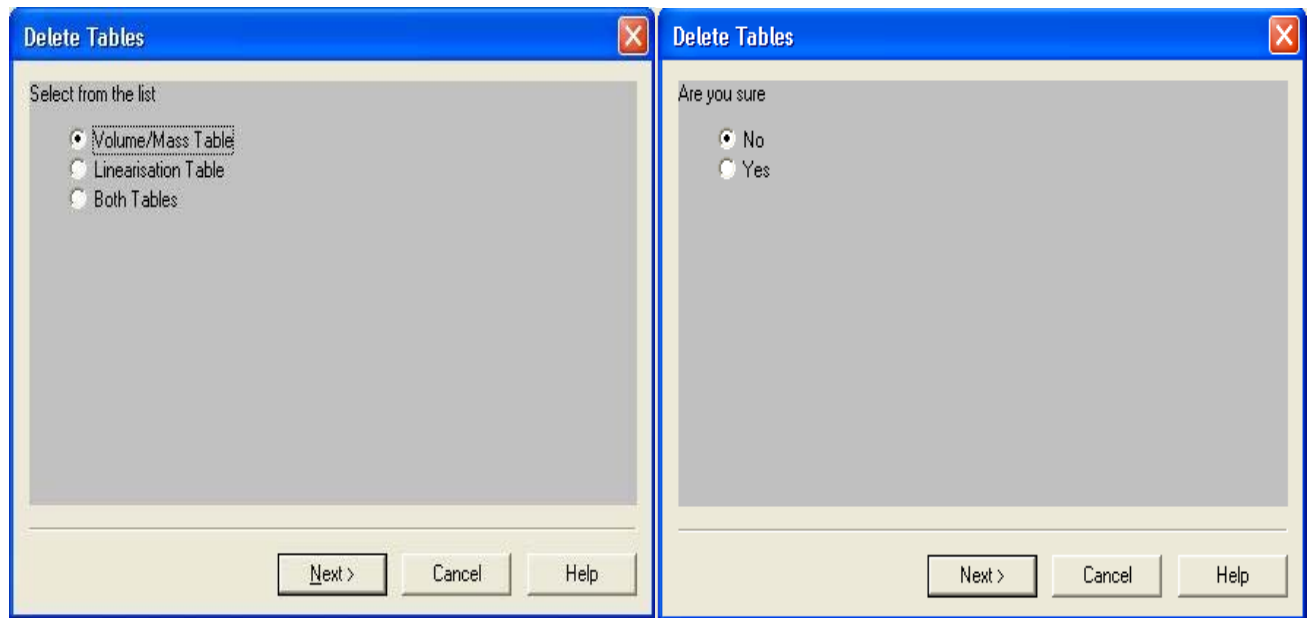
The editing and displaying wizard is the same as that of volume/mass table .The display of the Linearisation table is shown below



Note : The length and volume/mass unit can be changed from installation plate2

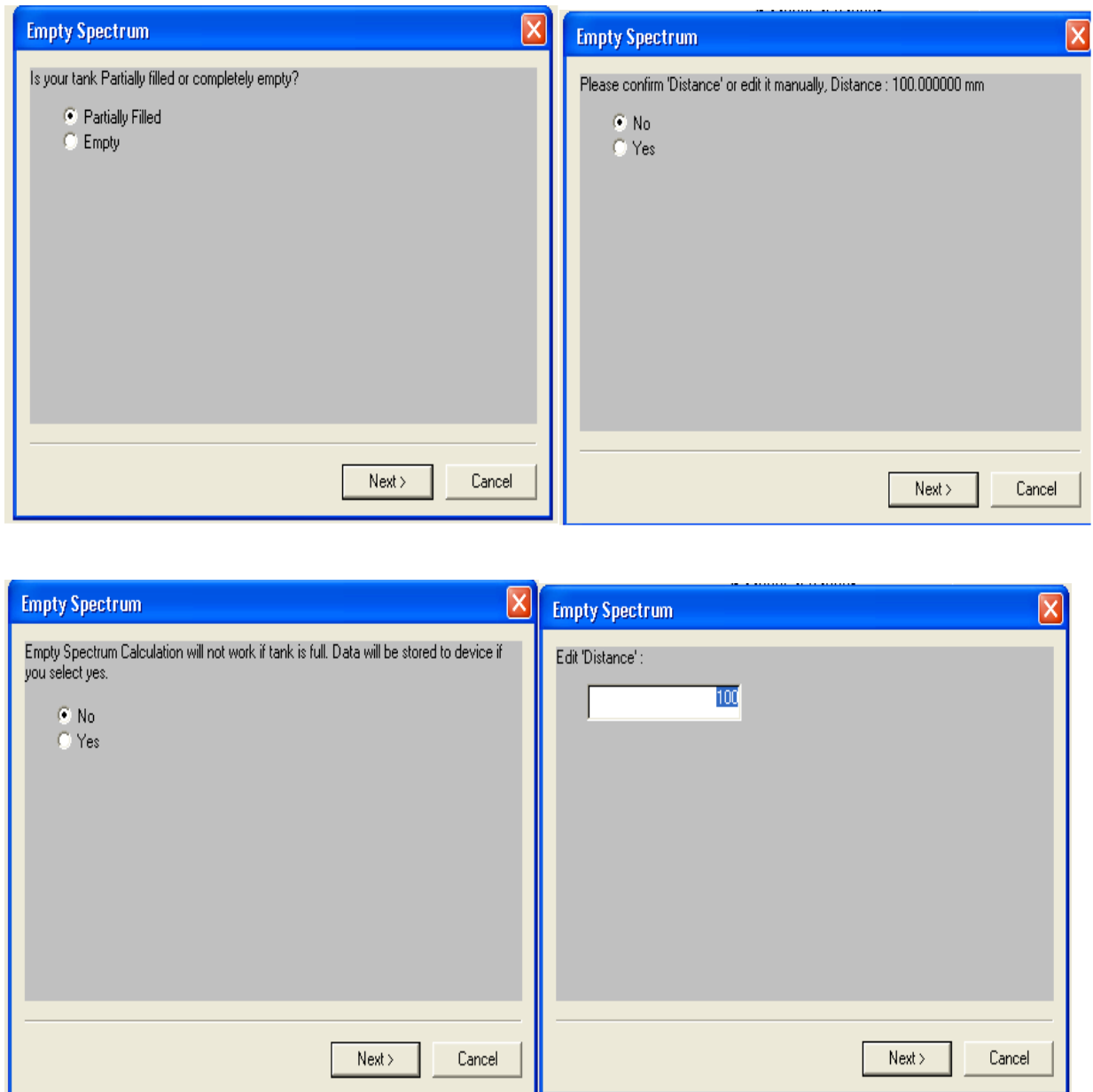
3.5.3 Delete Tables

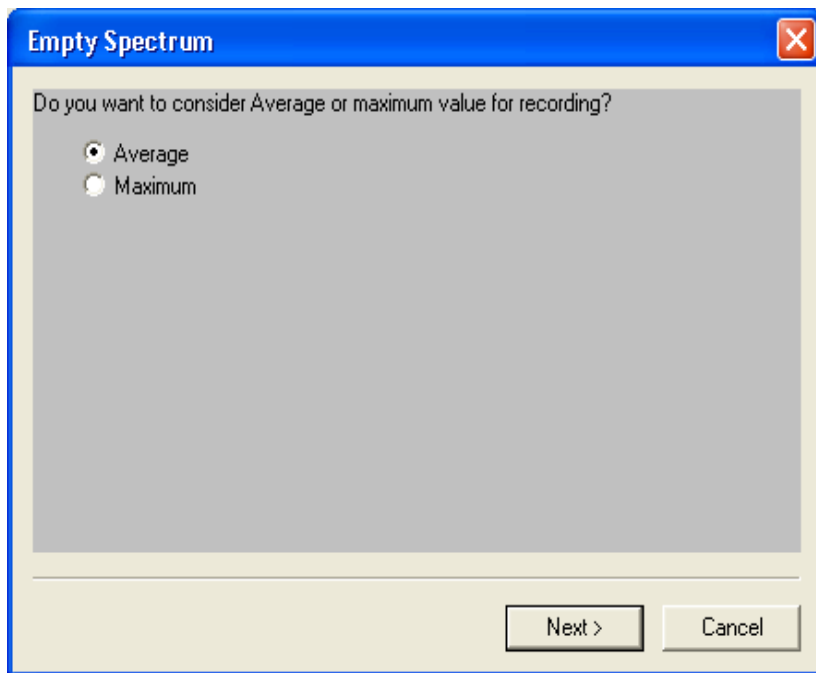
Delete tables allow user to delete the volume/mass and Linearisation tables entirely.



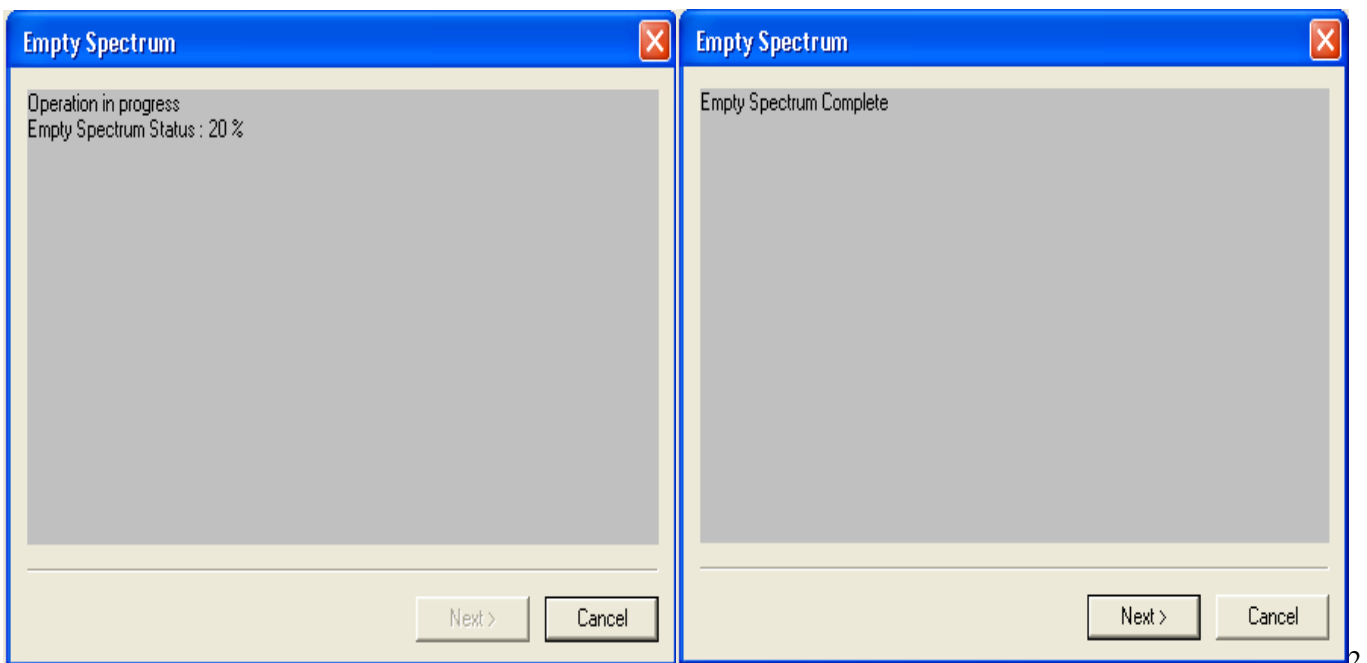
3.6 Empty Spectrum Recording

The following figure in order illustrates the steps for Empty Spectrum Recording.





After validating all the depending parameters required for the empty spectrum process, It starts the recording, displaying the current status of it.

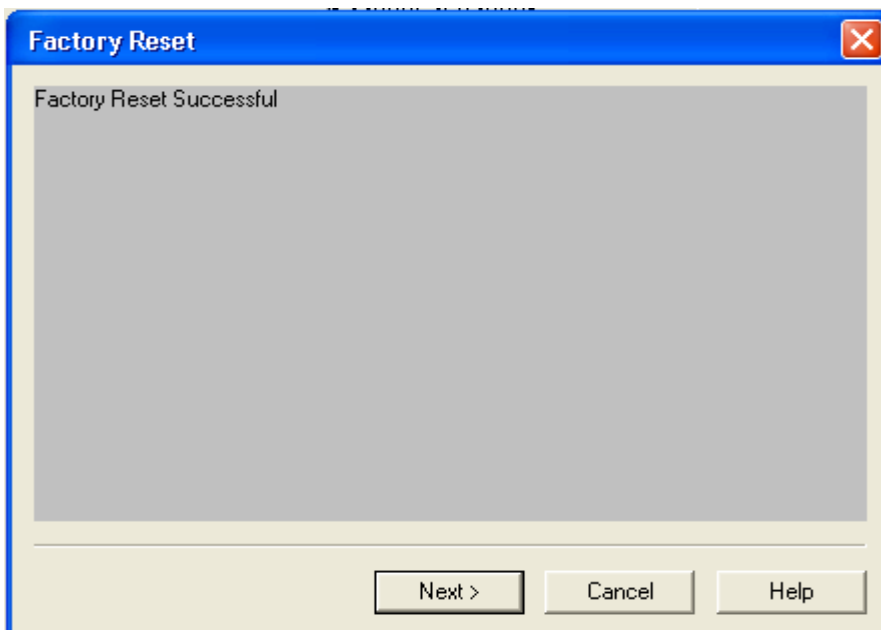
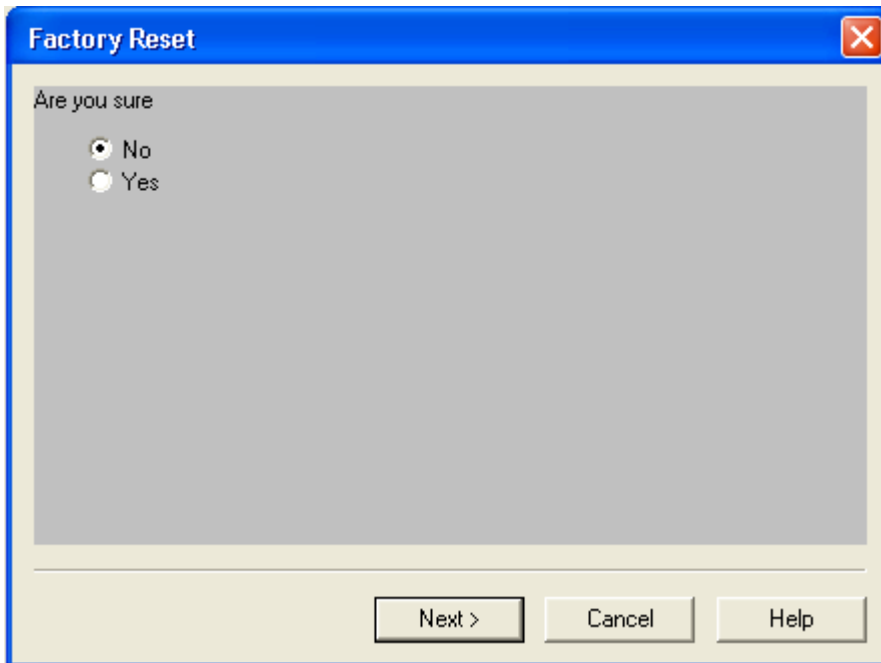


3.7 Reset

There are three types of reset. For the security reasons it re-ensures for the reset.

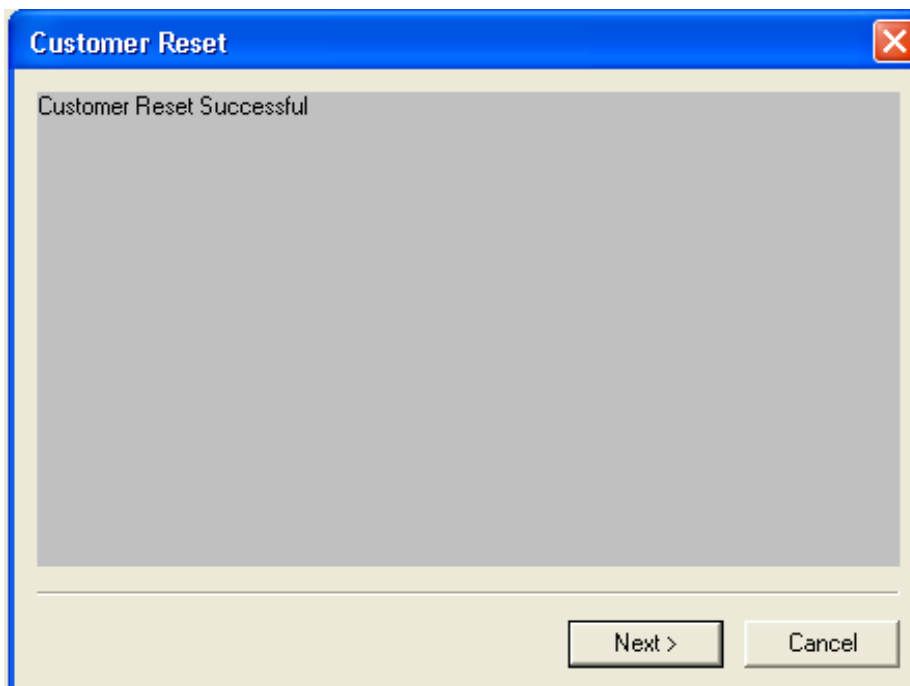
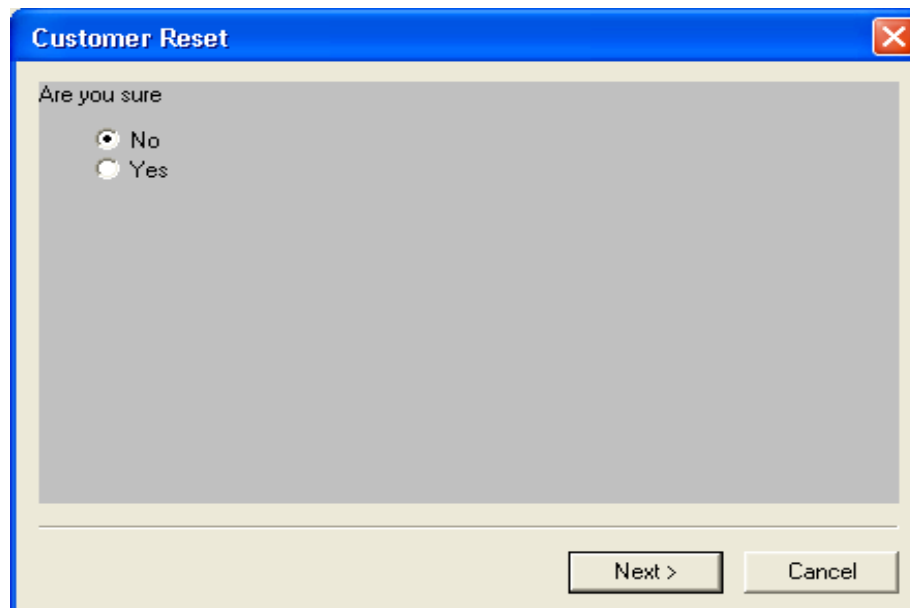
3.7.1 Factory Reset

In the Factory Reset, the device or configurations are set to the factory default values.



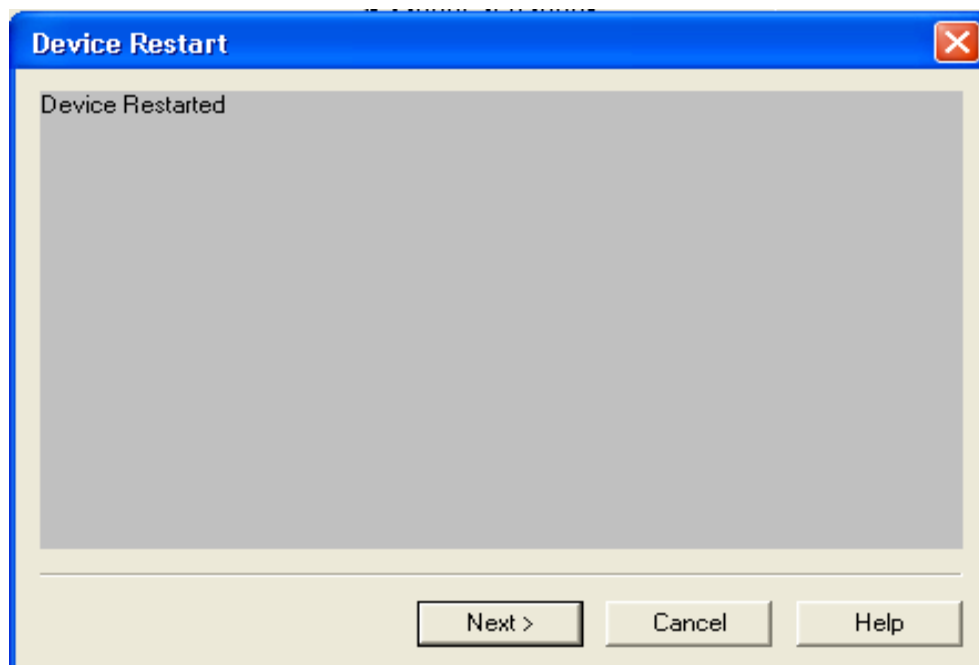
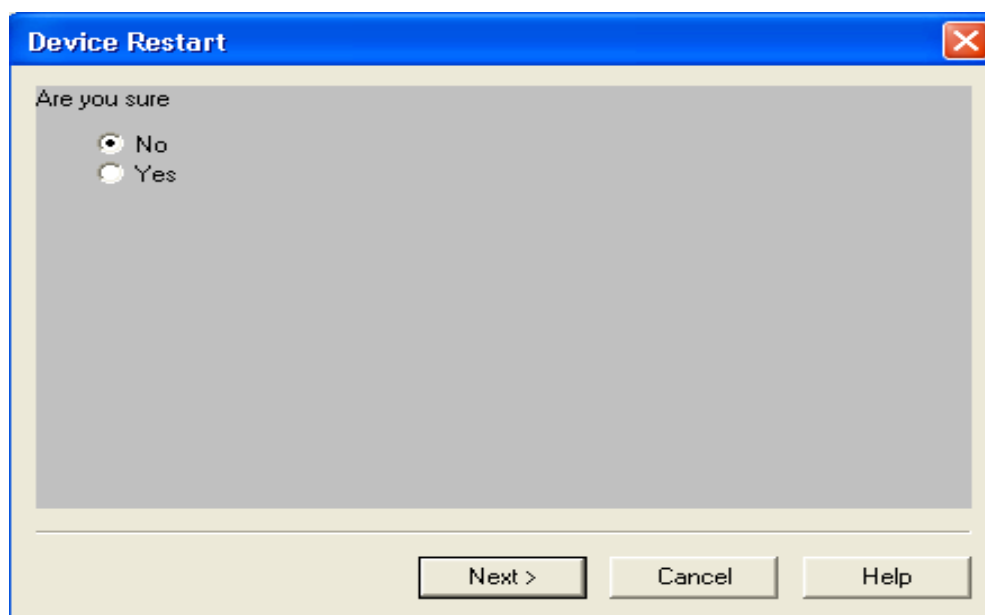
3.7.2 Customer Reset

This makes the parameter values to user default values.



3.7.3 Device Reset

It is used to restart the device.

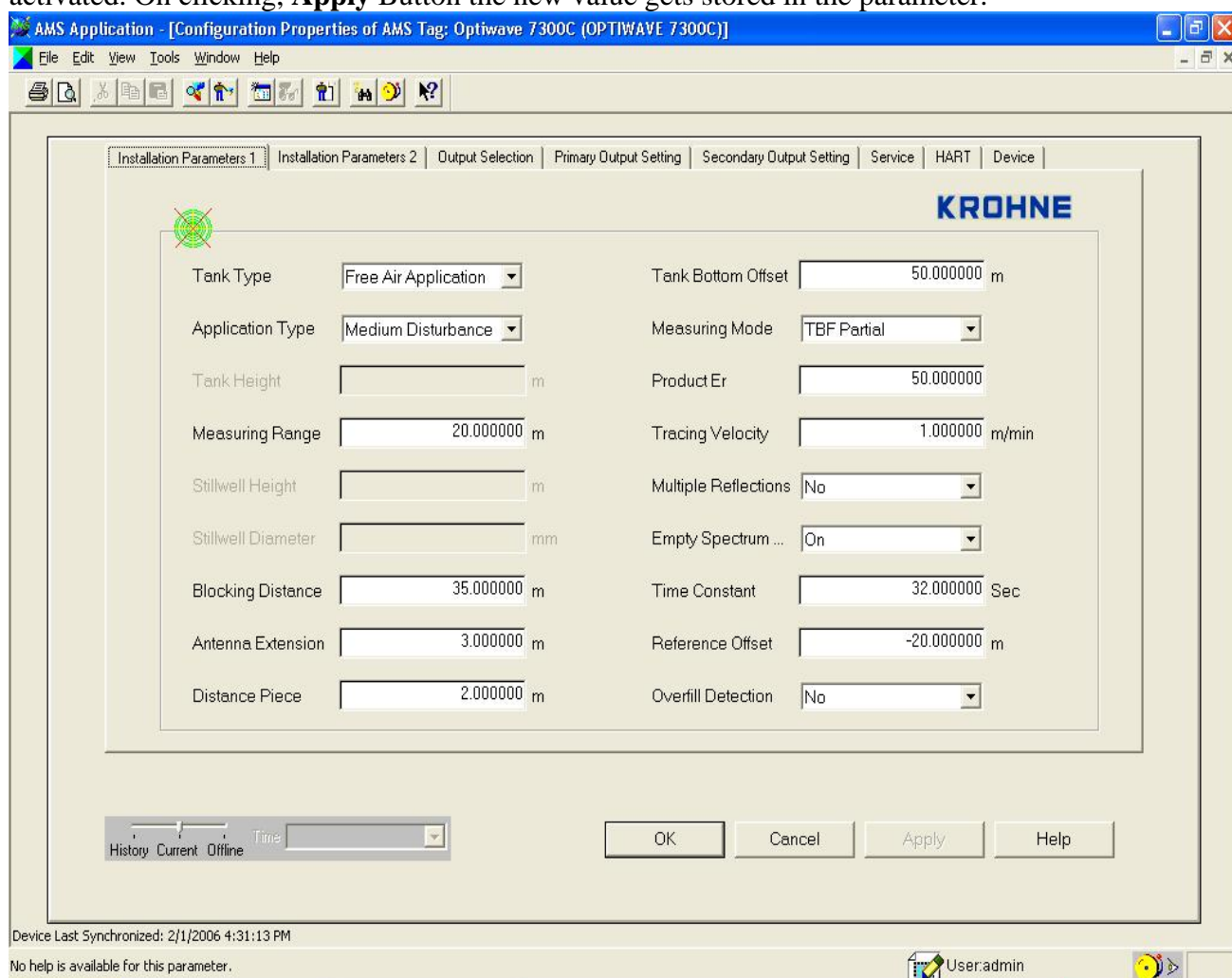


3.8 Configuration Variables

To view Help for each configuration parameter, first click on Help button on toolbar & then click on the parameter for which help is to be viewed.

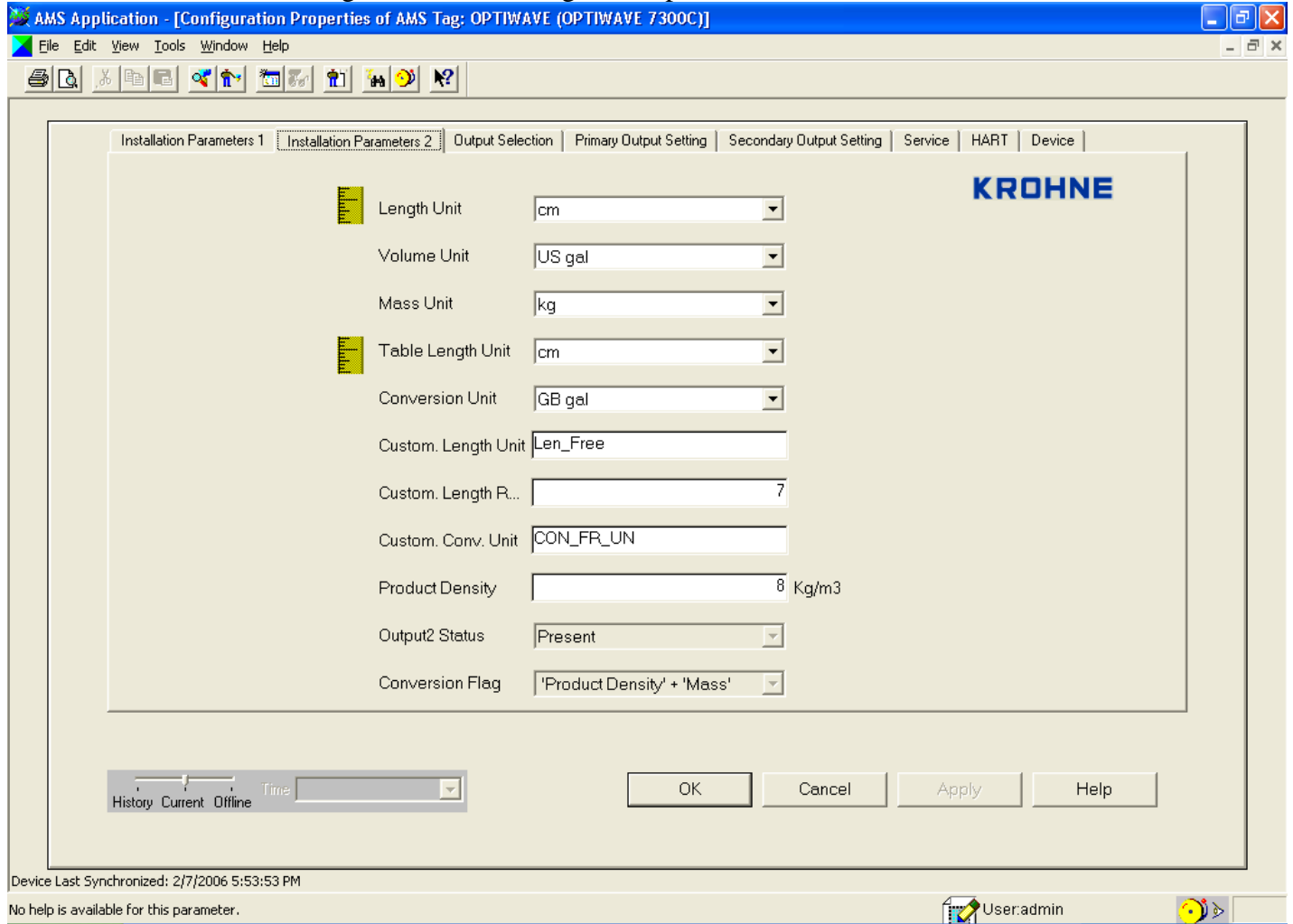
3.8.1 Installation Parameters1

This plate consists of the editable parameters of the device like Tank Type, Tank Height etc. In this plate some of the parameters are dependent on other parameters like Measuring Range, Tank Height, etc is dependent on Tank Type, Stillwell Height, Stillwell Diameter depends upon the Application Type which gets disabled. On editing particular parameter it gets yellow in color and **Apply** button get activated. On clicking, **Apply** Button the new value gets stored in the parameter.



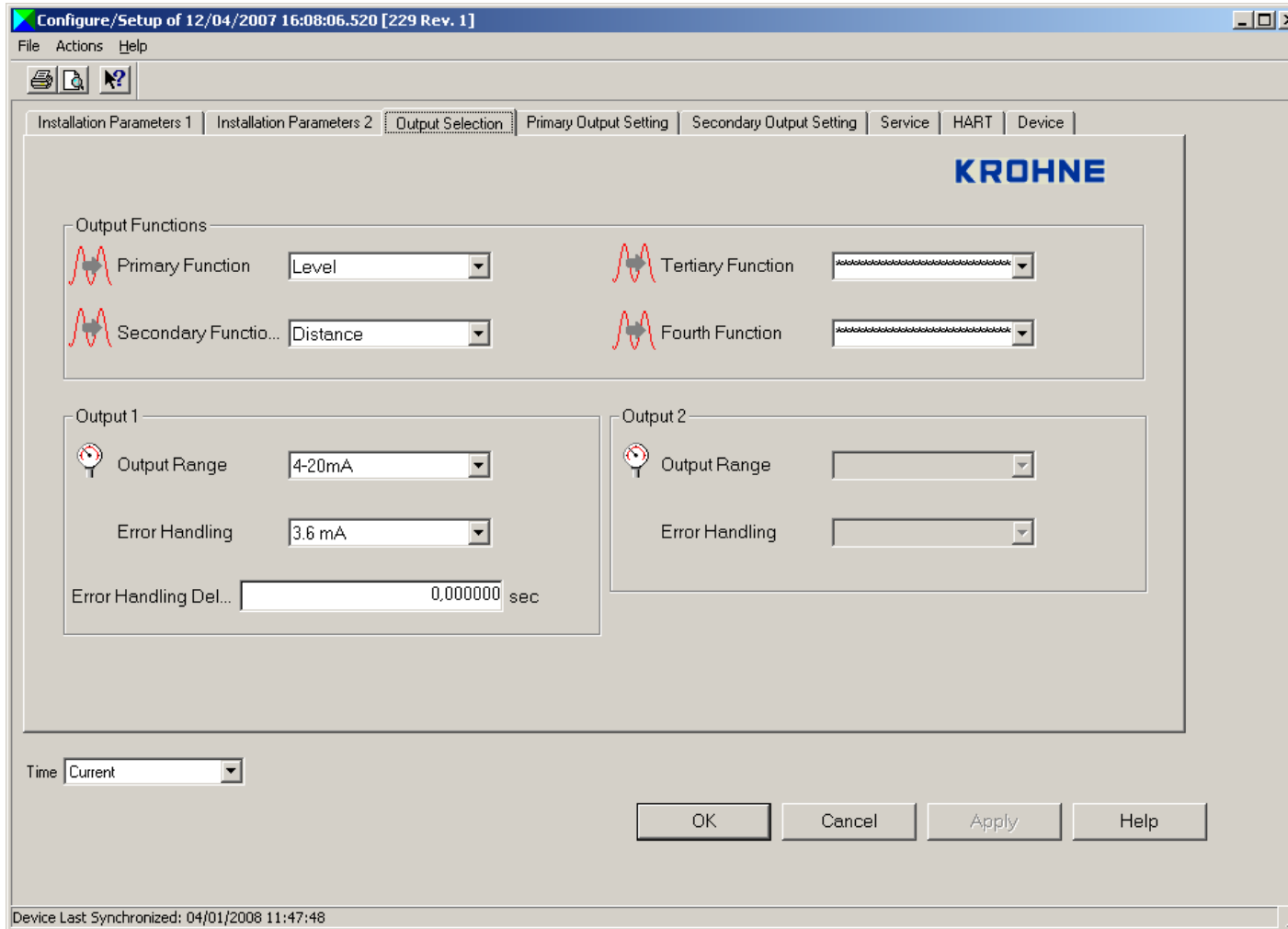
3.8.2 Installation Parameters2

It allows user to change the unit of configuration parameters.



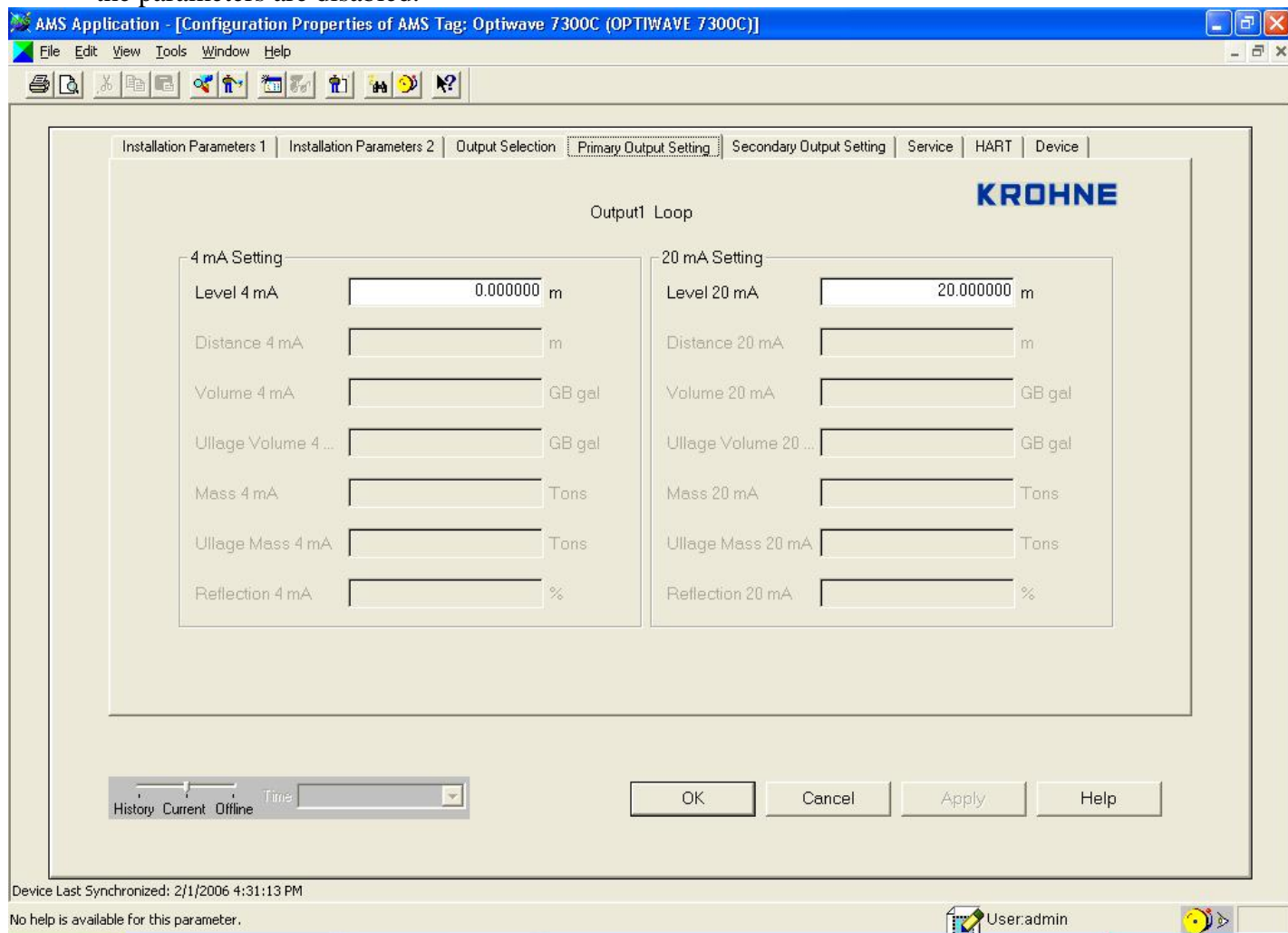
3.8.3 Output Selection

It allows user to change the Primary Output Function, Secondary Output Function, Tertiary Output Function and Fourth Output function. Beside this it provides detail's of primary and secondary output as differentiated by the group box namely output1 and output2.



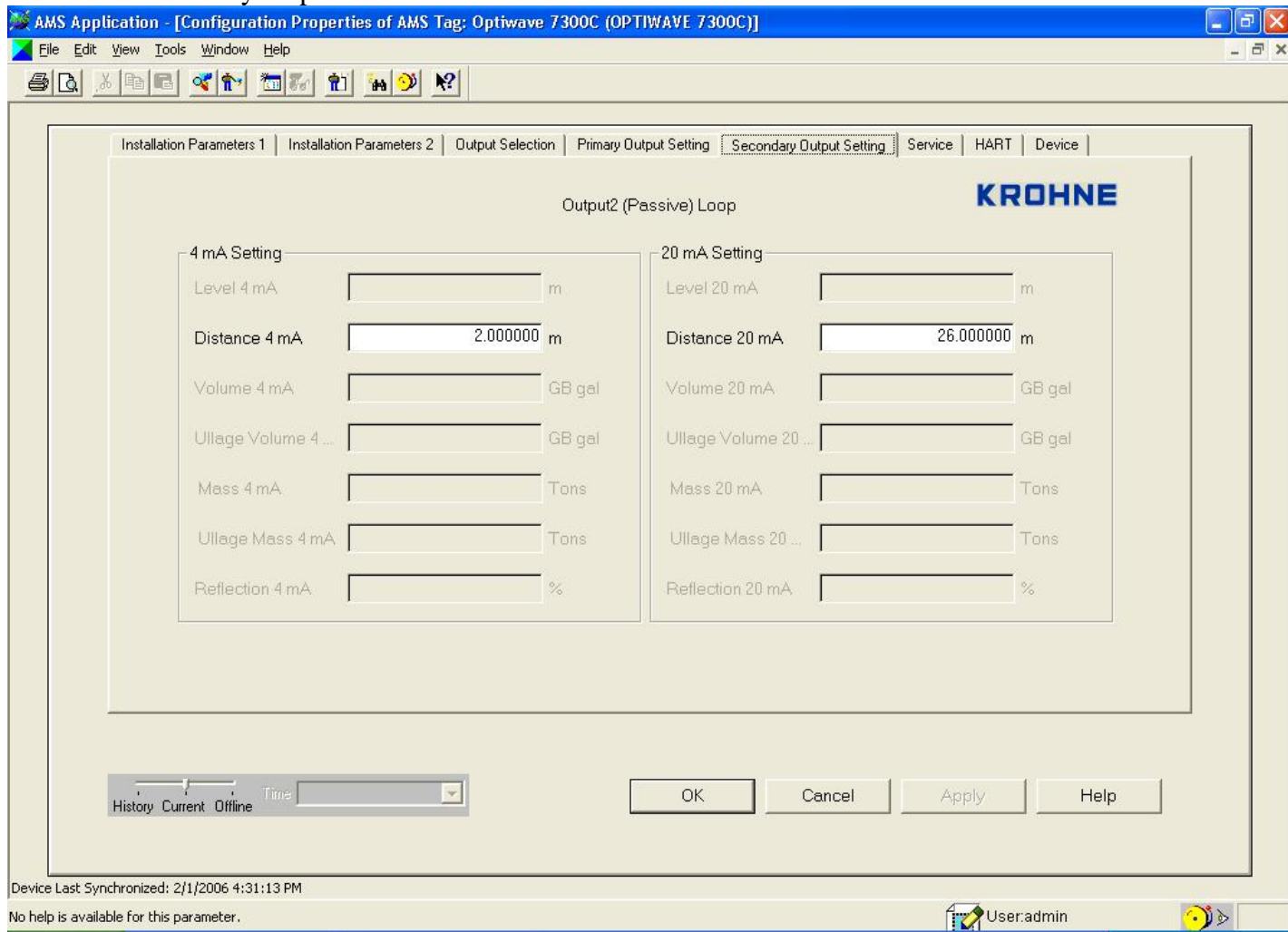
3.8.4 Primary Output Setting

It allows user to change the upper and lower limit of the parameters set in the output selection plate for the primary output function. The units of all these parameters are shown as set in the installation plate2. Since only one pair of parameters can be set to the primary output function, hence the rest of the parameters are disabled.



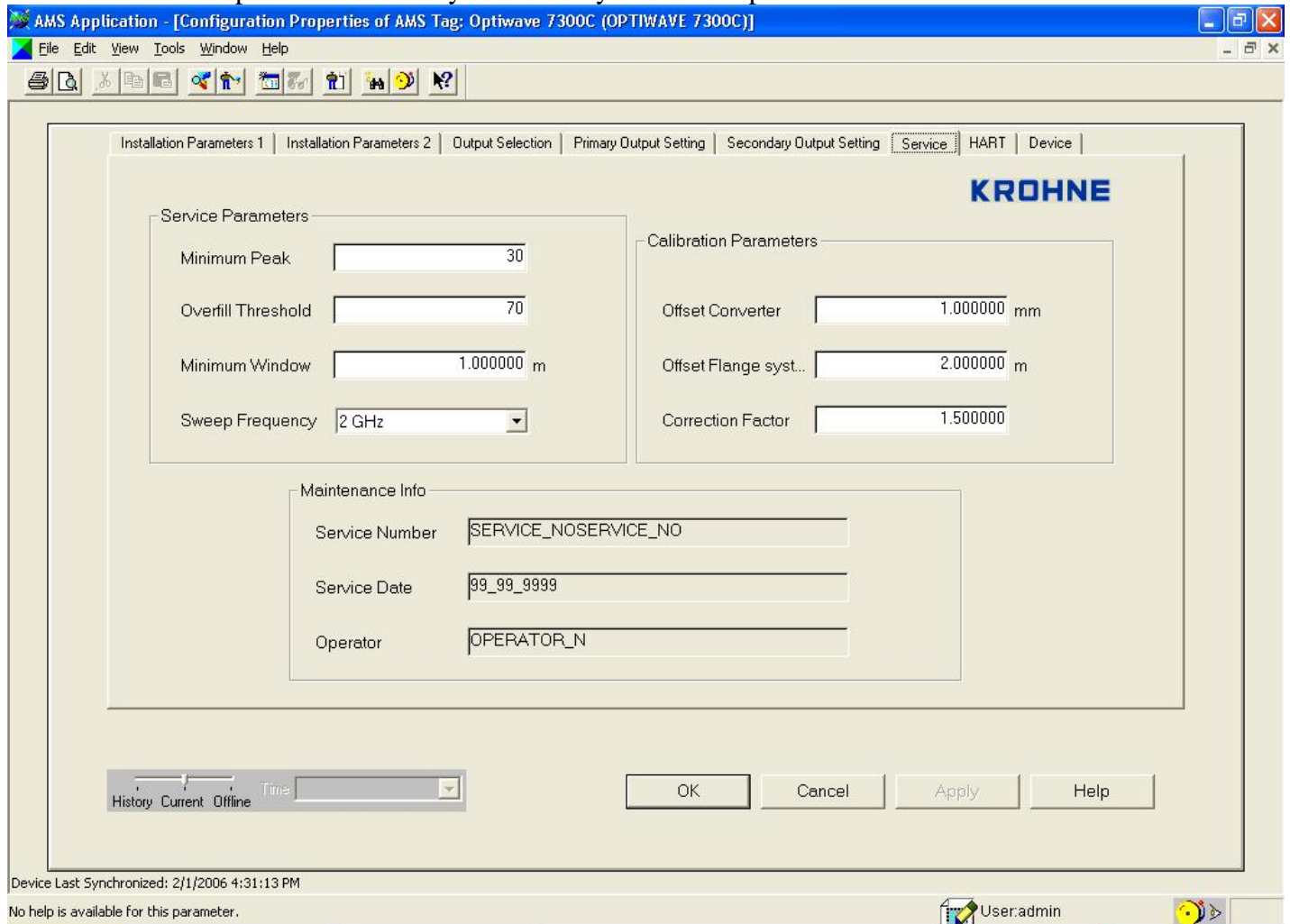
3.8.5 Secondary Output Setting

It allows user to change the upper and lower limit of the parameter set in the output selection plate for the secondary output function.



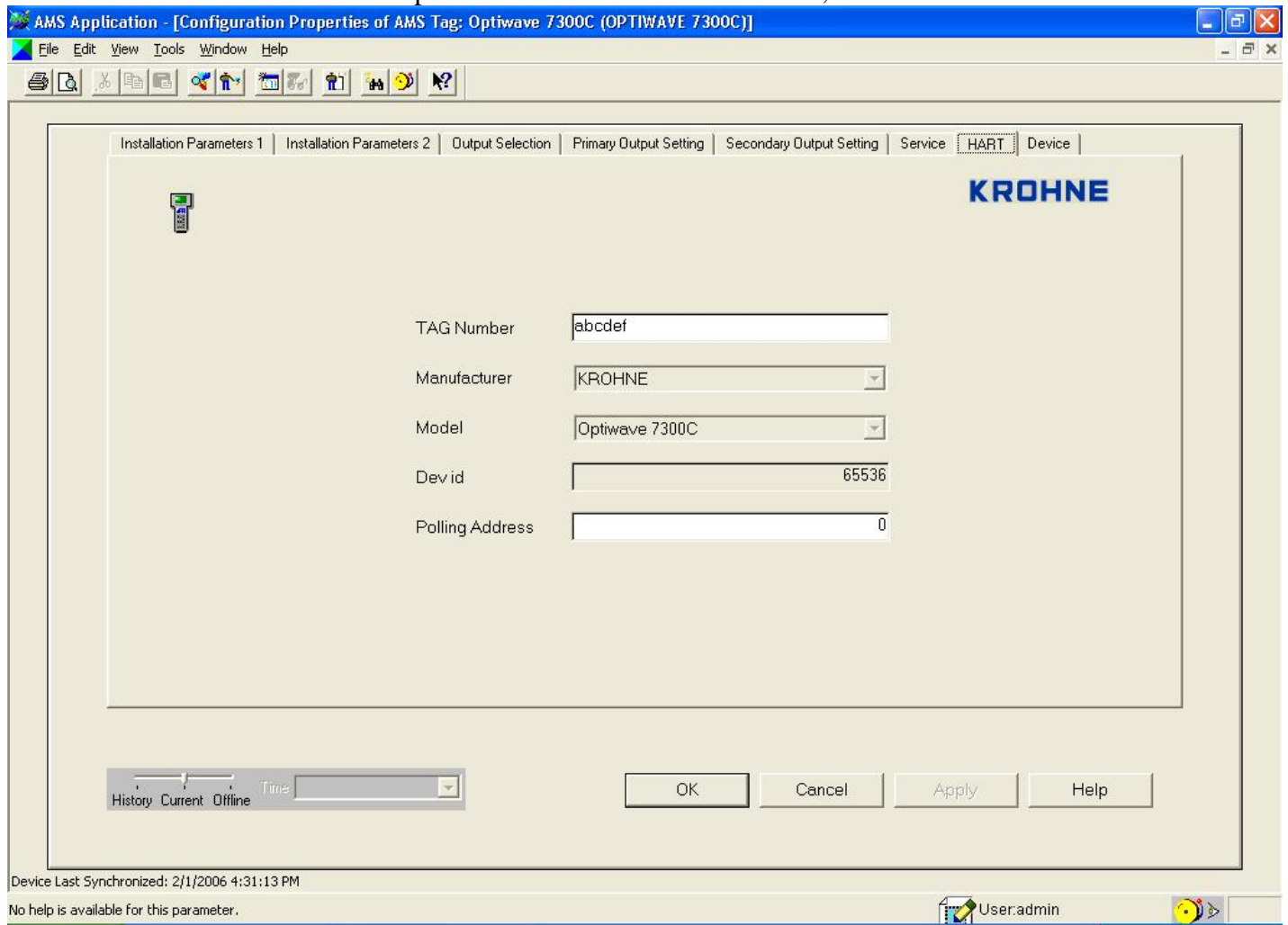
3.8.6 Service

It allows user to view all the service parameters, calibration parameters and the service information.
The service parameters are only activated by the service password.



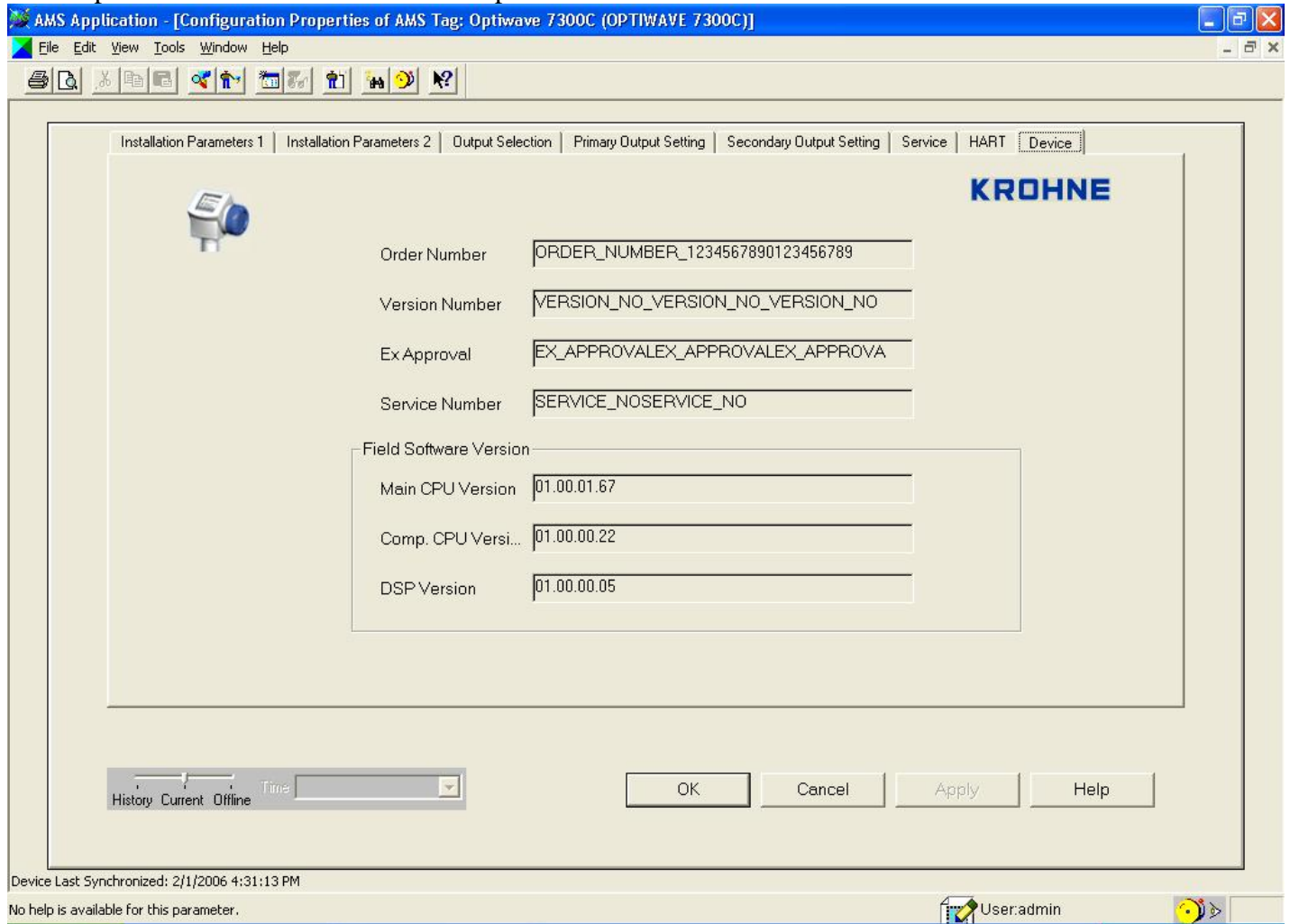
3.8.7 HART

It shows all the hart related parameters viz: manufacturer name, model name etc.



3.8.8 Device

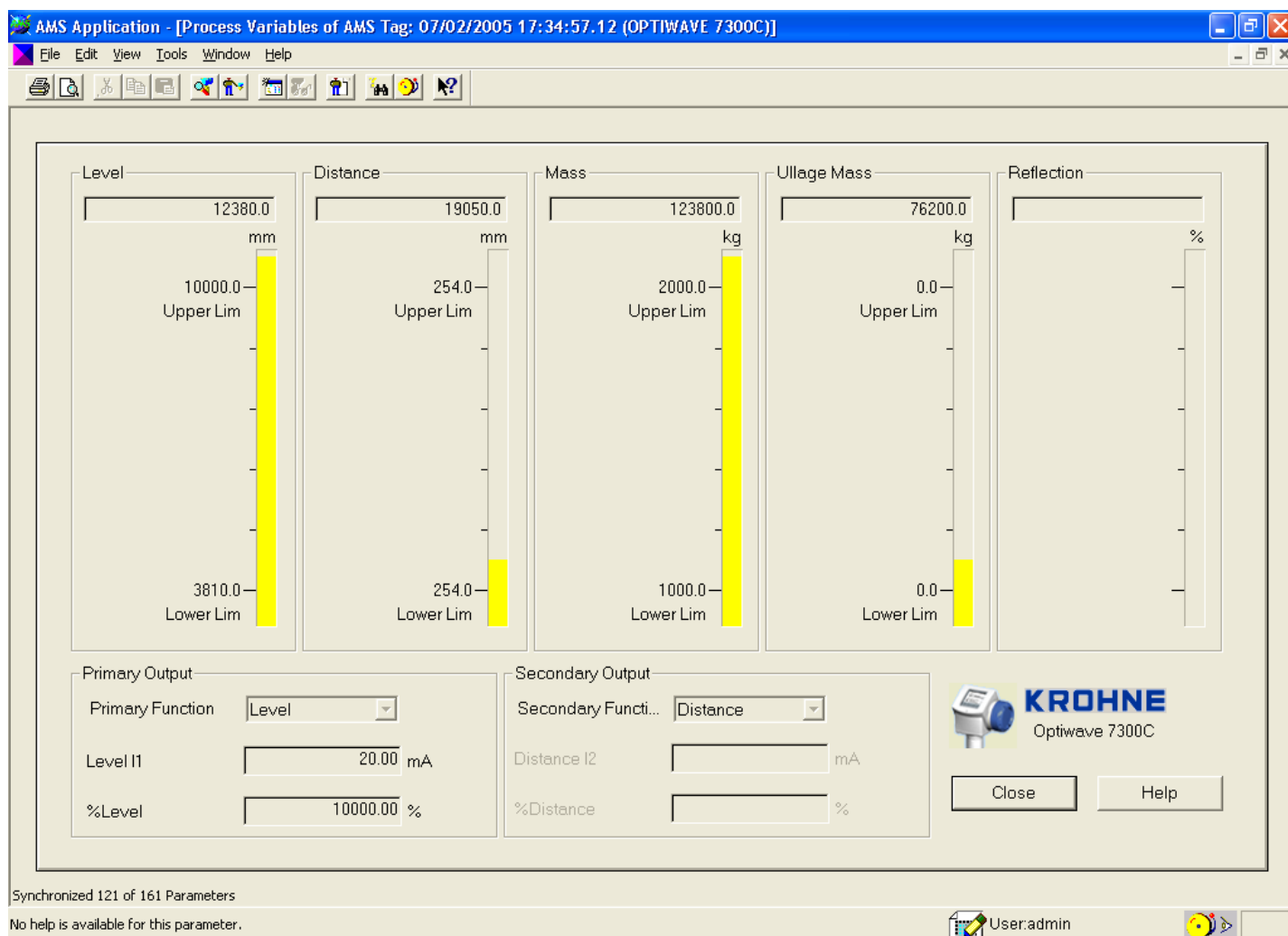
It shows the device specific information. This plate doesn't require any authentication. All the parameters can be viewed with no password.



3.9 Process Variable

The Process Variables are displayed with magnitude and its corresponding unit along with upper & lower limits. Four process variables are active on a single screen depending on the Output function setting. Primary Output Function, Secondary Output Function, Tertiary Output Function, and Fourth Output Function are used to set Primary Process Variable, Secondary Process Variable, Tertiary Process Variable, & Fourth Process Variable respectively.

If “Level” is set as Primary Output Function, then “Level” is displayed as a Primary Process Variable & respective current, percentage value for level is also displayed in below process variable face plate.



3.10 Device Diagnostic

It contains the status of the device.

Overview **Critical** Informational

General

- Primary variable out of limits
- Non-primary variable out of limits
- Primary variable analog output saturated
- Primary variable analog output fixed
- Cold start
- Configuration changed**
- Field device malfunction

Overview **Critical** Informational

Errors

- Spectrum Quality Bad
- Spectrum Invalid**
- No Peak Plausible
- Temperature Out Of Range
- Self Test Failed
- Microwave Check Failed
- Peripheral Failure
- DSPFirmwareLoadError

Overview **Critical** Informational

Warning

- Upper Current output1 has saturated
- Upper Current output2 has saturated
- Lower Current output1 has saturated
- Lower Current output2 has saturated
- Measurement Old
- Measurement Tank Overflow
- Measurement Tank Bottom
- Measurement Terminated

4 Status Meaning

Status Message	Meaning
Supervisor Password OK	Entered password for Supervisor rights is correct.
Supervisor Password Invalid	Entered password for Supervisor rights is incorrect.
Simulation Service Password OK	Entered password for Service rights in Simulation mode is correct.
Service Password Invalid	Entered password for Service rights is incorrect.
Service Password OK	Entered password for Service rights is correct.
Simulation Supervisor Password OK	Entered password for Supervisor rights in Simulation mode is correct.
Dependency failure	It appears if the dependency of the parameter being modified is failed.
Update not possible	It appears if read only parameter is modified.
Reading data from device	It appears when the entries of table being read by the device.
Dependency Warning Message	It appears if the variable is modified and is dependent on other variables. Such scenario could violate its normal operation.
Max range failure	When the entered value is more than its maximum allowed value.
Min range failure	When the entered value is less than its minimum allowed value.
Table entered is not monotonous	If the entered value is less than the next entry.
Device busy	Appears when the device is busy. Normally it appears when the device is in search mode or if it is executing a function.
Access Restricted	This message appears if we try to modify a read only parameter.
Invalid Section	You have selected a non valid item.
Too Few Bytes Received	There are not enough bytes received.
Invalid Command Request	Requested command is invalid.
Value out of range	This occurs if the entered value is out of range for that parameter.
Exceed precision	If the decimal value entered exceeds its range.

Illegal character	If any invalid character is entered.
Max range failure occurred writing level 20mA.Restore device value	It appears if entered Value for 20mA is out of range.
Method is currently invalid	It appears if access right is not

5 HART® Communicator 375 (HC375)

5.1 Offline Restriction

In order to transfer an Offline configuration to the device the Service parameter “**Supervisor Password Enable**” (C.5.2.0) must be set to “**NO**”.

In case this parameter has got the value “**YES**” the configuration is not transferred successfully to the device even if we don’t see any error messages!

5.2 Save Device Parameters

ATTENTION: This is a very important method.

Each time the device configuration is modified (after sending new values) it is necessary to execute this method. **Otherwise the modifications will not be taking into account.**

This method is only accessible in case the supervisor or service password method has been executed.