

SVI FF Firmware Upgrade

From Version 1 to Version 2

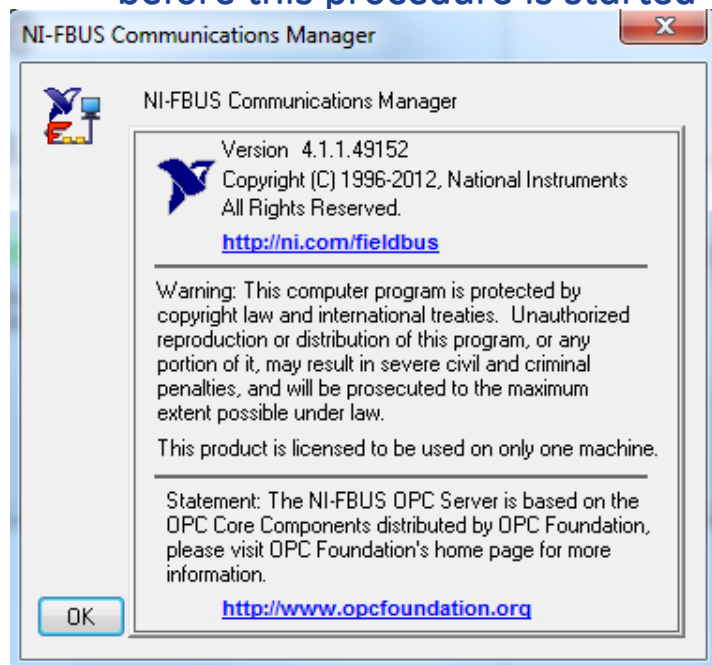


imagination at work

Prerequisites

National Instruments software

- NI FBUS software version 4.1.1.49152 must be installed and configured before this procedure is started



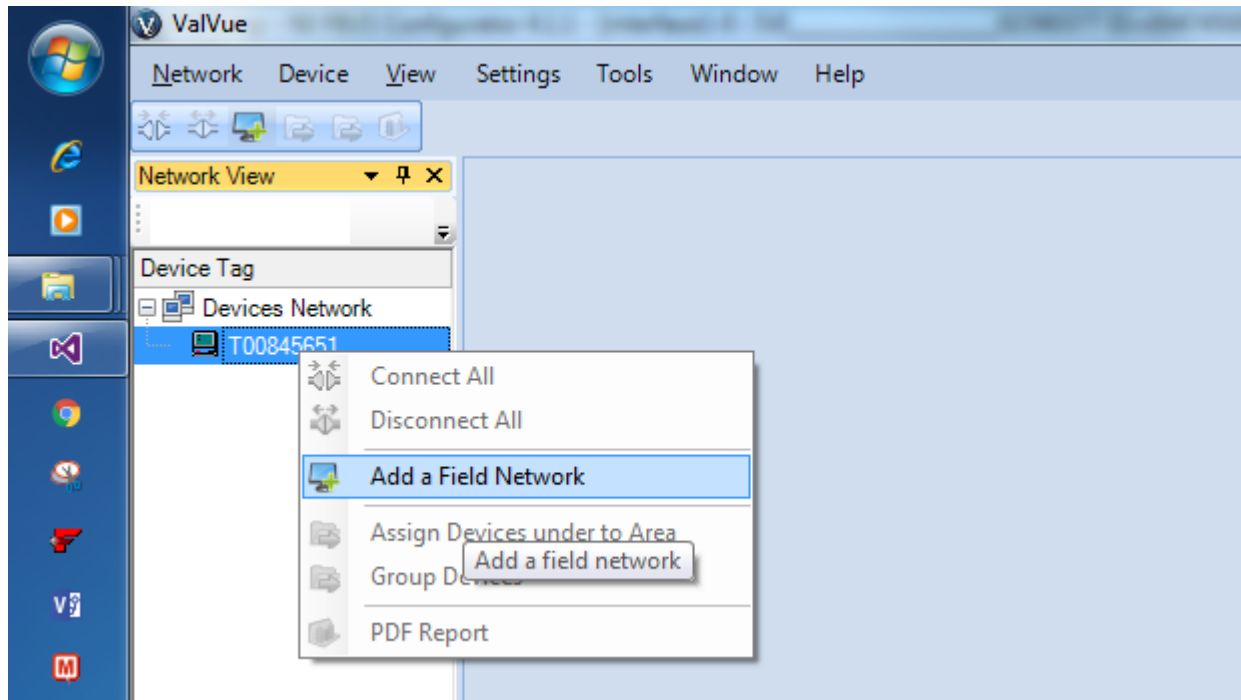
SVI FF Device Description Files (DDs)

- DD files for SVI FF for shall be imported in the NI Software
 - Version 1
 - Version 2

Name	Date modified	Type	Size
0202.ff5	8/27/2015 1:05 AM	FF5 File	734 KB
0202.sy5	8/27/2015 1:05 AM	SY5 File	345 KB
0202.ffo	8/27/2015 1:05 AM	FFO File	693 KB
0202.sym	8/27/2015 1:05 AM	SYM File	345 KB
020101	8/27/2015 12:56 AM	CFF File	21 KB
010101	7/2/2015 2:43 PM	CFF File	21 KB
0102.ff5	6/4/2015 4:06 PM	FF5 File	730 KB
0102.sy5	6/4/2015 4:06 PM	SY5 File	342 KB
0102.ffo	6/4/2015 4:05 PM	FFO File	690 KB
0102.sym	6/4/2015 4:05 PM	SYM File	342 KB

Create a fieldbus network

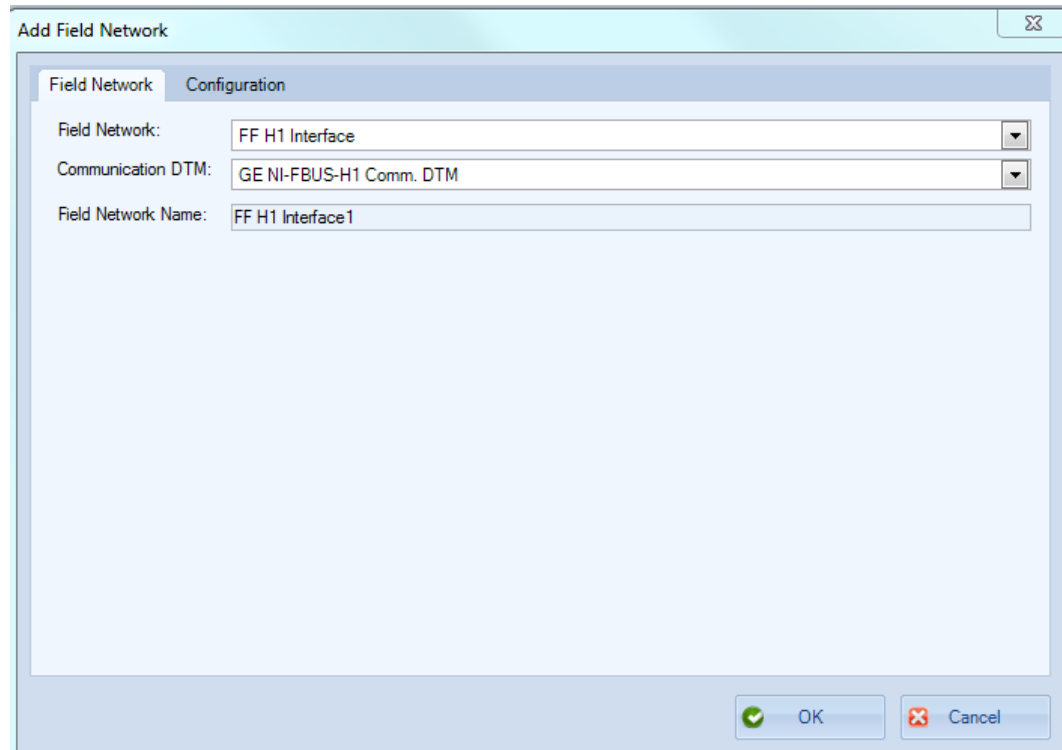
If the FF network does not exist, Add a Field Network:



Add Field Network

Select FF H1 Interface

Make sure that GE NI-FBUS-H1 Comm. DTM is selected



The screenshot shows a software window titled "Add Field Network". It has two tabs: "Field Network" and "Configuration". The "Configuration" tab is active. Inside this tab, there are three configuration fields:

- Field Network:** A dropdown menu with "FF H1 Interface" selected.
- Communication DTM:** A dropdown menu with "GE NI-FBUS-H1 Comm. DTM" selected.
- Field Network Name:** A text input field containing "FF H1 Interface1".

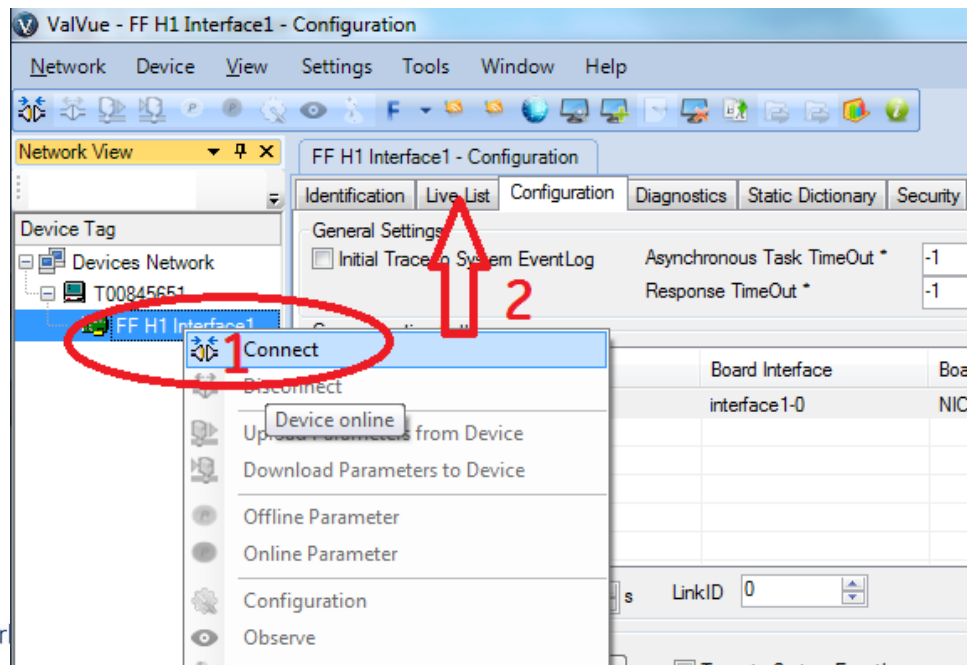
At the bottom right of the window, there are two buttons: "OK" (with a green checkmark icon) and "Cancel" (with a red X icon).

Connect to FF H1 Interface

Connect the Device Version 1 to FF segment

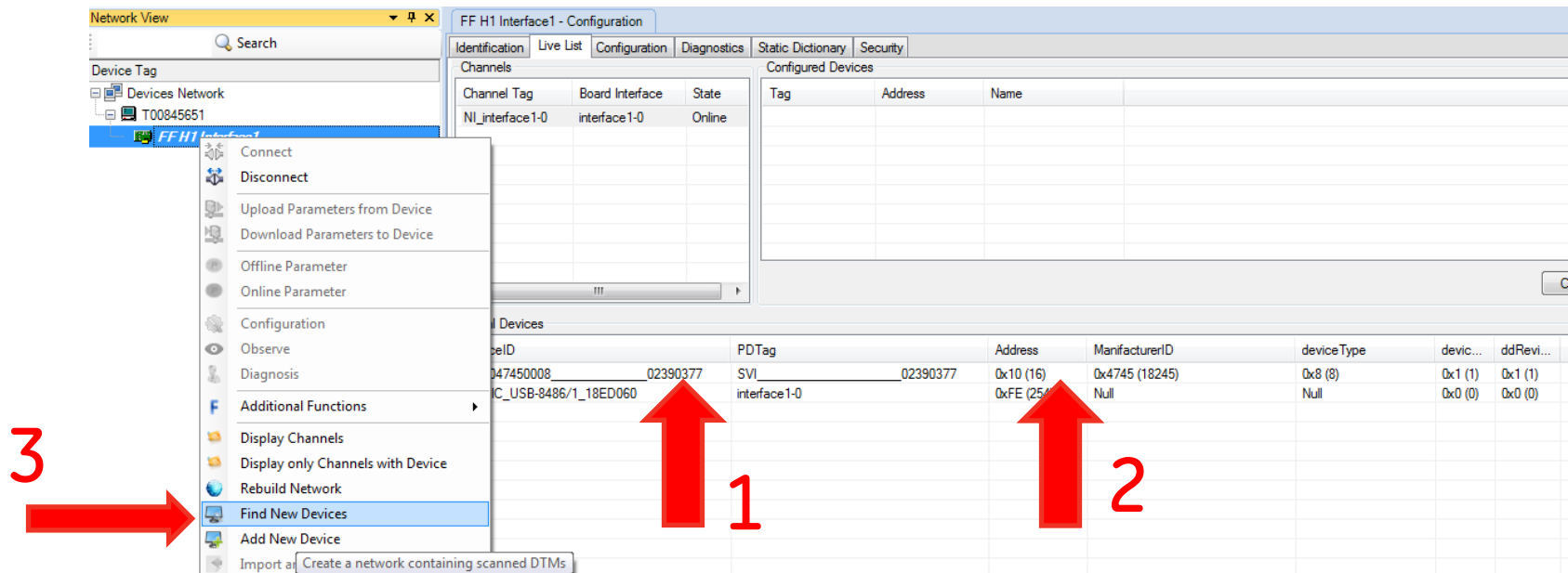
Right Click on the FF H1 Interface and select connect

Select Live list tab



Find New Devices

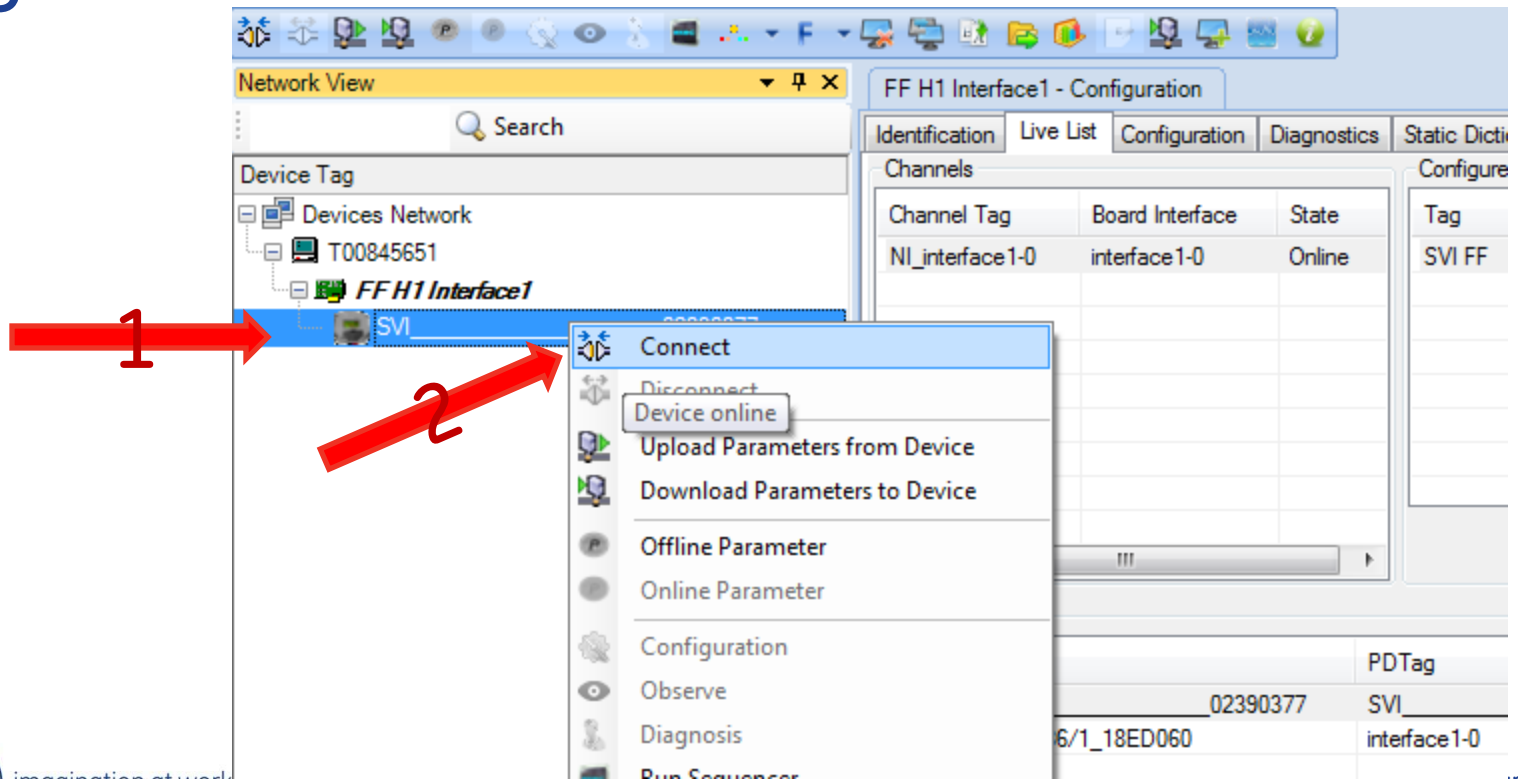
1. Observe that the device is in the live list
2. Preserve the Address of the device
3. Right Click on the FF H1 interface and select Find New Devices



Connect to Device (Version 1)

The new device will appear on the Network View in disconnected state.

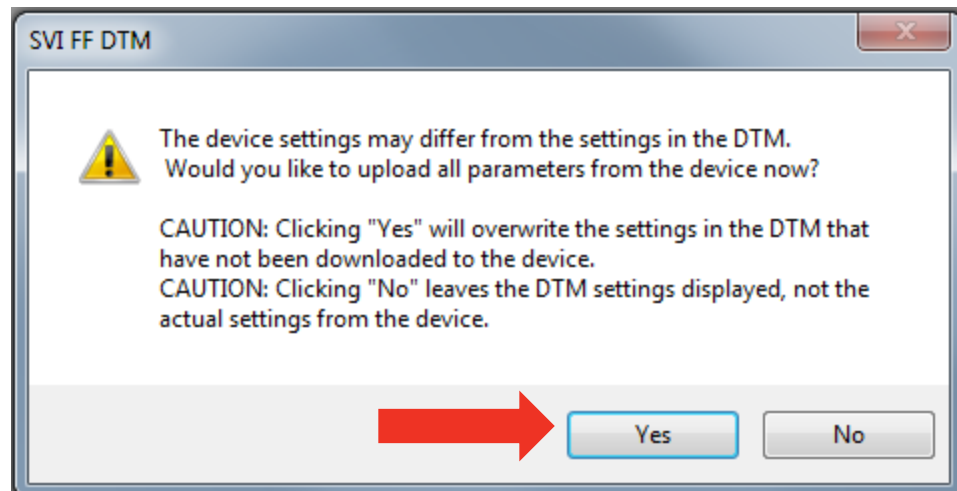
Right Click on the device and select connect



Upload all parameters from the device

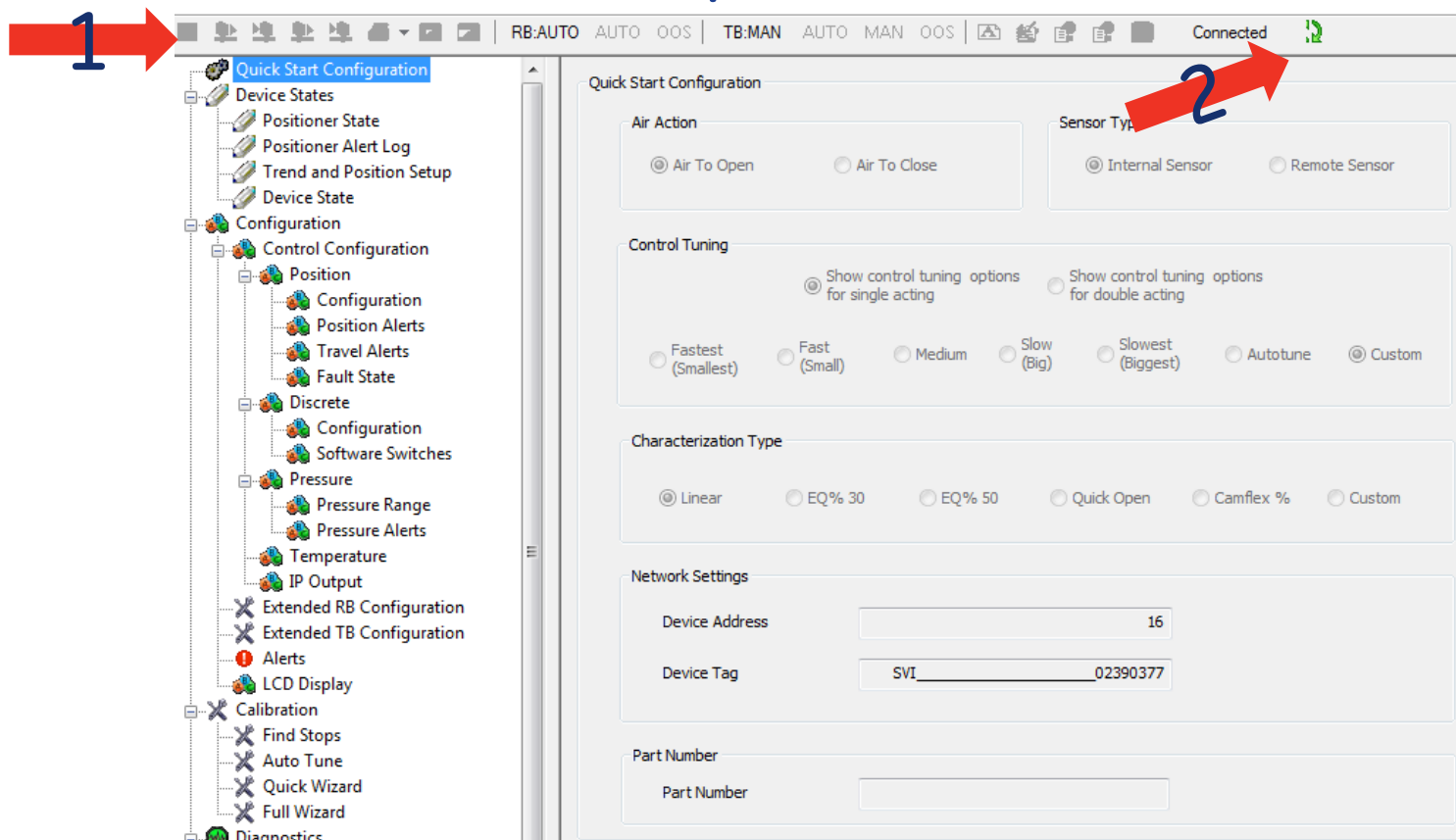
The SVI FF DTM will ask to upload the parameters from the device.

Select Yes



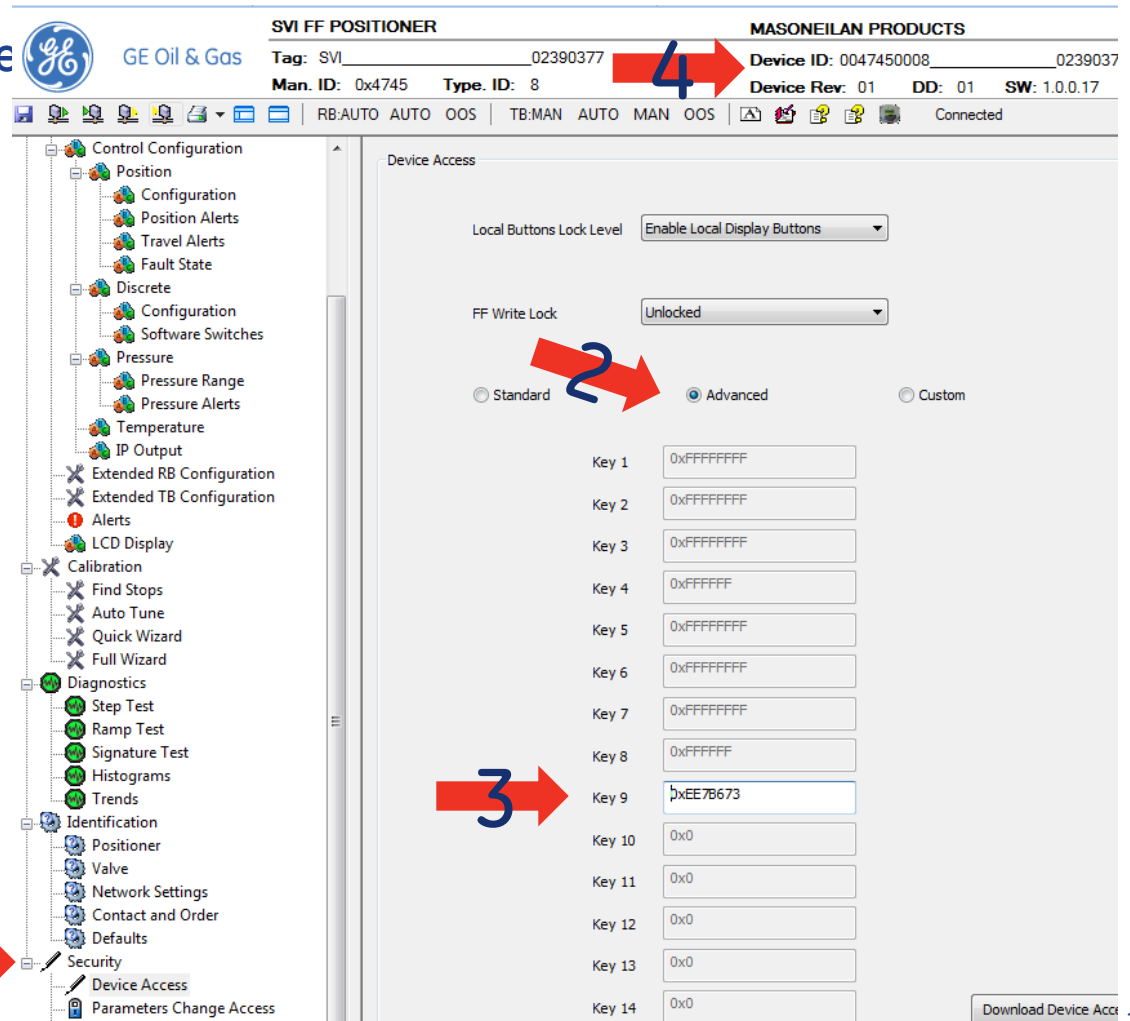
Uploading the parameters

1. The DTM icons are grayed out during Upload.
2. Green arrow indicates the upload.



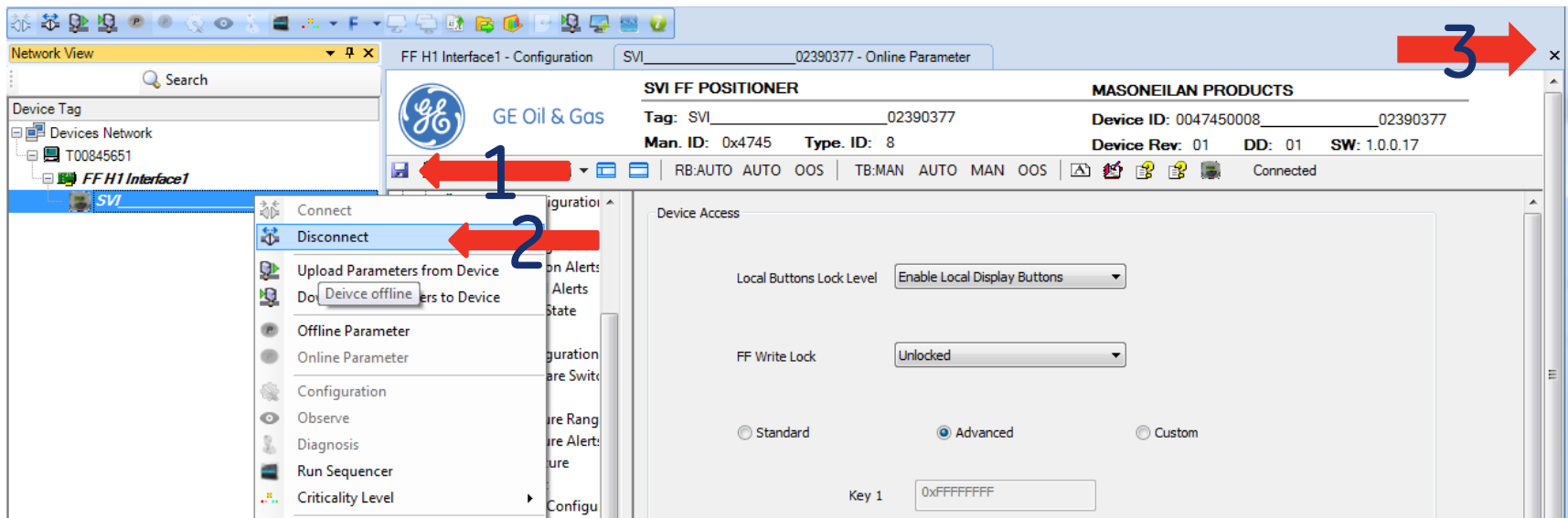
Preserve the Advance Settings

1. Click on Security-> Device Access menu
2. Write down the current advanced setting
3. Write down the current value of Key 9
4. Write down the current Device ID



Save, Disconnect and Close

1. Click on Save icon to save device settings
2. Right Click on the device in the Network View and select Disconnect
3. Close the Device DTM



Select the device and invoke Update Firmware

1. Select the device from the list of Actual Devices (Device ID or Device Tag can be used)
2. Click on Upgrade Firmware button

The screenshot shows the 'FF H1 Interface1 - Configuration' window. The 'Actual Devices' table is as follows:

DeviceID	PDTag	Address	ManufacturerID	deviceType	devic...	ddRevi...
0047450008	SVI	02390377	0x4745 (18245)	0x8 (8)	0x1 (1)	0x1 (1)
NIC_USB-8486/1_18ED060	interface1-0	0xFE (254)	Null	Null	0x0 (0)	0x0 (0)

The 'Update Firmware' button is located at the bottom right of the window.

Select the Firmware File

Process the download

1. Click on Browse button. Point to the firmware file from GE
2. Press the Process button to start the firmware Download

The screenshot shows the 'UpdateFirmware' dialog box. It contains fields for 'ManufactureId', 'Device Family', 'Device Type', 'Device Revision', 'TimeOut', 'Domain Name', 'Software Name', 'Software Revision', and 'Download Class'. Below these is a 'Domain Information' table with columns 'Domain Name' and 'File'. A red arrow labeled '1' points to the 'Browse' button in the 'File' column. At the bottom, there is a 'Log Information' table with columns 'Category', 'Message', and 'Note'. A red arrow labeled '2' points to the 'Process' button at the bottom right.

UpdateFirmware

ManufactureId: 004745
Device Family: 0008
Device Type: 0008
Device Revision: 2
TimeOut: 120 sec

Domain Name: FD-DOM
Software Name: FD-SW
Software Revision: 2-42
Download Class: Class 1

Domain Information

Domain Name	File	Browse	Status	Activate	Cancel Download
FD-DOM	C:\2015\Firmware\Builds\Release2\1_Released Software\ALLFF_Rel_C53492_F010202_31303_A010202_60953_Unsigned	...	File OK	Activate	Cancel Download

Log Information

Category	Message	Note
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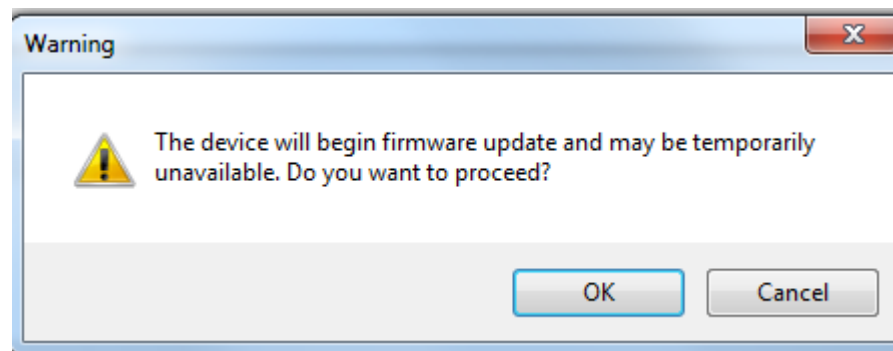
☐ Download All Devices with the same type

Process Close

Confirm the download

Click on OK button to confirm

The firmware download will be safer if the device is not connected to any running process.



Confidential – do not distribute

Successful Download

Activate

1. **WARNING** The first message in the Log Information screen should be: "Device is manufactured by GE and requires Alternative Update Process. If it is not the first message, Cancel Download and contact GE support for latest DTM."
2. A message indicating that the Domain FD-DOM is successfully Downloaded indicates that the firmware is downloaded in the device, but the original firmware is still running in the device.

WARNING the device will be rebooted (valve de-energized) during the activation.

2. Click on Activate button to activate new firmware when the process conditions allow it.

The screenshot shows the 'UpdateFirmware' application window. It contains several sections: device information, domain information, and a log of messages. Red arrows and numbers are overlaid on the image to highlight specific actions and messages.

Device Information:

- ManufactureId: 004745
- Device Family: 0008
- Device Type: 0008
- Device Revision: 2
- TimeOut: 120 sec

Domain Information:

Domain Name	File
FD-DOM	C:\2015\Firmware\Builds\Release2\1_Released Software\ALLFF_Rel_C53492_F010202_31303_A010202_60953_Unsigned.fld

Red arrow '2' points to the 'Activate' button in the Domain Information section.

Log Information:

Category	Message
✓ SUCCESS	Device is manufactured by GE and requires alternative update proced...
✓ SUCCESS	The PREPARE_FOR_DWNLD command is written successfully.
✓ SUCCESS	The domain is successfully prepared for download.
✓ SUCCESS	The domain FD-DOM is successfully downloaded.

Red arrow '1' points to the first success message. Red arrow '2' points to the third success message.

Buttons: 'Process' and 'Close' buttons are at the bottom right.

Activation Processing

1. A command will be send to the device to Activate the new firmware and reboot the device. The device may reboot before the reply message is delivered to the ValVue3 application and an error may be reported.

Error: E_COMM_ERROR is **NOT** an indication that the Activation Failed.

2. "The Device is Online" is indicating that the device is detected on the network.
3. If the device comes at a temporary address (quite common), the message "Can't read Data from the device" will be reported

This is **NOT** an indication
that the activation failed

The screenshot shows a 'Log Information' window with a table of log entries. The table has three columns: Category, Message, and Note. The log entries are as follows:

Category	Message	Note
	Device is manufactured by GE and requires alternative update proced...	
✓ SUCCESS	The PREPARE_FOR_DWNLD command is written successfully.	
✓ SUCCESS	The domain is successfully prepared for download.	
✓ SUCCESS	The domain FD-DOM is successfully downloaded.	
	Write response is not supported	
✓ SUCCESS	The device is online.	
⌛ Wait	Waiting for the domain state to transition to DWNLD_NOT_READY...	
✗ FAILED	Can't read data from the device.	

Annotations on the screenshot:

- A red arrow labeled '1 - OK' points to the 'Error:E_COMM_ERROR' note.
- A red arrow labeled '2' points to the 'The device is online.' message.
- A red arrow labeled '3 - OK' points to the 'Can't read data from the device.' message.
- A red arrow labeled 'Temporary Address' points to the 'Can't read data from the device.' message.

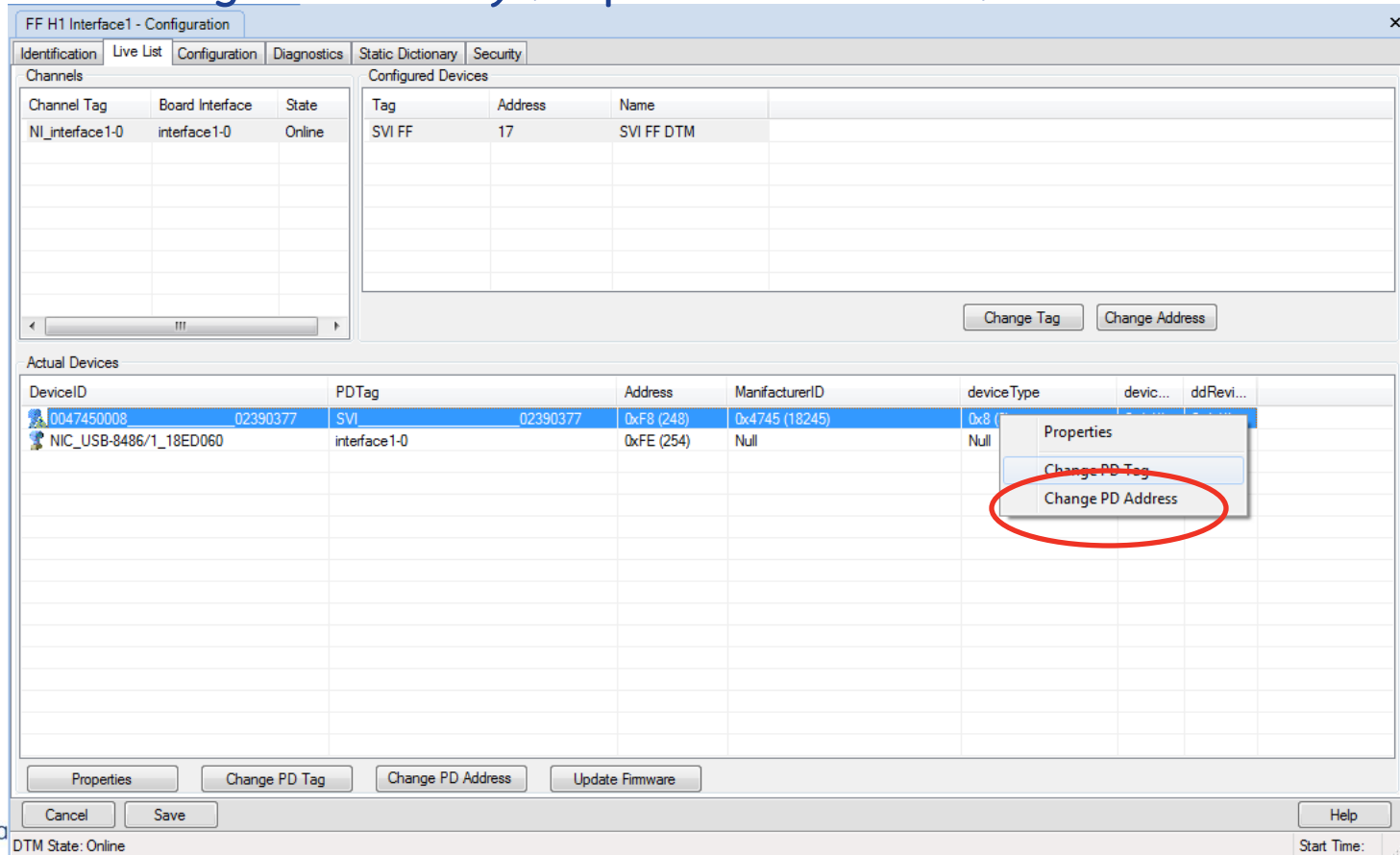
At the bottom of the window, there is a checkbox labeled 'Download All Devices with the same type'.

Change Tag and Address if necessary

New firmware device may come on a temporary Address.

Right Click on the device and select Change PD Address

Change the PD Tag if necessary (as preserved before)



Set Address Dialog

1. Type the preserved address from the Device Version 1
2. Start the Set Address procedure by clicking on Set Button
3. Wait
4. Observe the result
5. Close the dialog

Set Address or Tag of Physical Device

DeviceID 0047450008 02390377

☐ Set PD Tag SVI 02390377

☒ Set Address 16

NI Calls Interval: 5 sec.

Time interval between physical requests may has dramatic effect on the results. This interval must be enough to complete the processes in the NI FBUS layer.

Time Out: -1 sec.

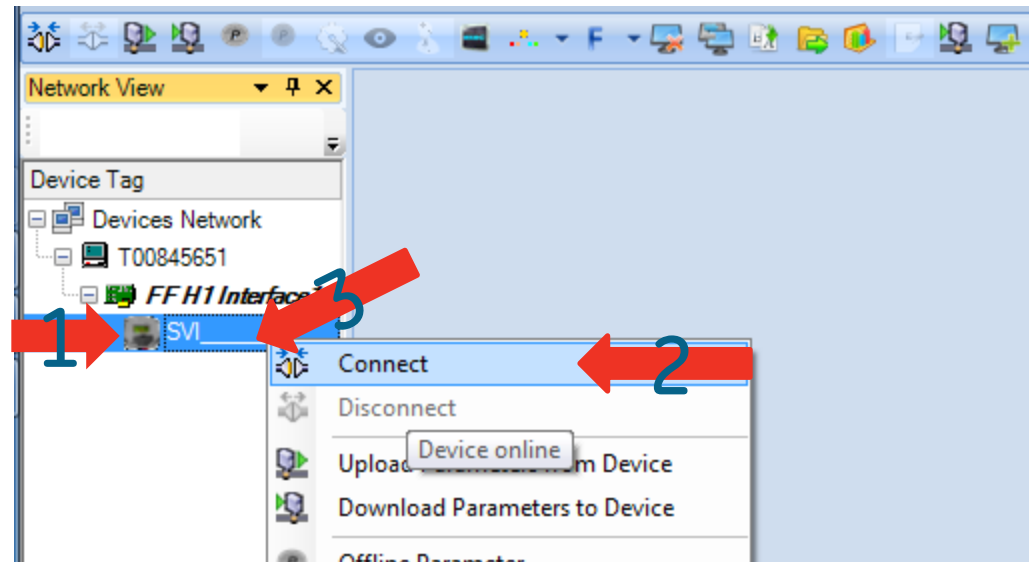
Interrupting the PD changes because of TimeOut does not interrupt the processes already started in the NI FBUS layer. The state of the PD may be uncertain.

Set Close

Category	Message
Action	Open the PD ...
Success	SUCCESS
Action	Set the PD Address ...
Success	SUCCESS
Action	Wait SVI 02390377 to connect...
Action	Close the PD ...
Success	SUCCESS
Action	Wait 5s ...
Success	Finished

Connect to the device and open DTM

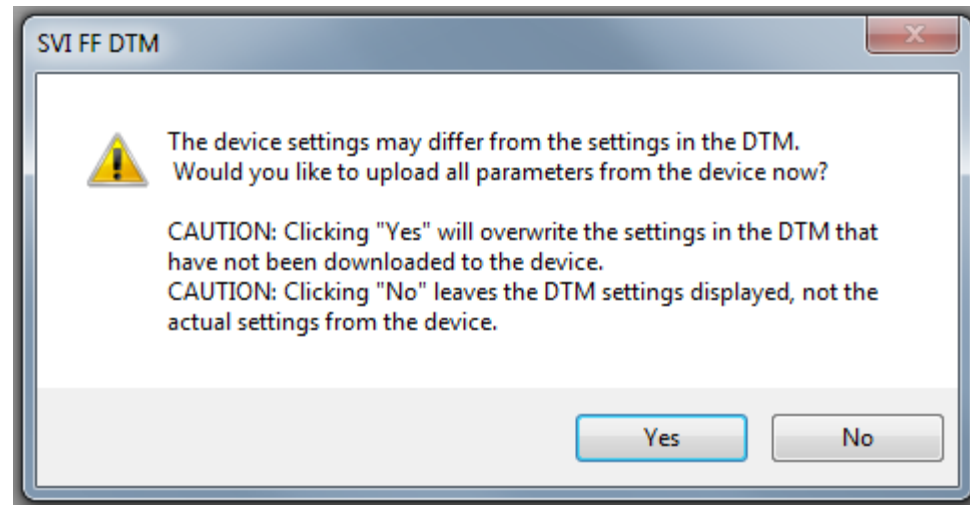
1. Right click on the device in the Network View
2. Select Connect from the menu
3. Double click on the device to open in connected state



Do NOT upload the settings

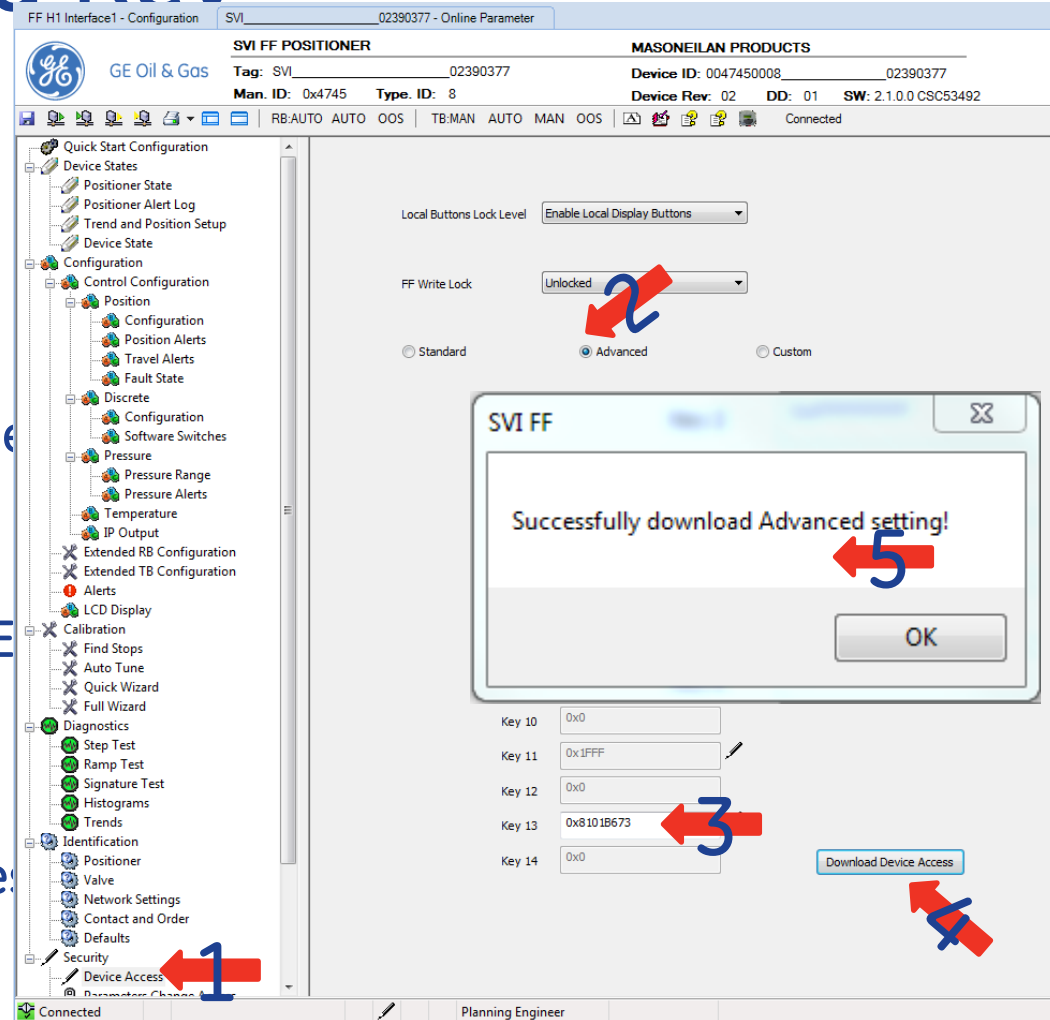
When the DTM offer to Upload the parameters from the device – do NOT upload the settings

Click No



Set the Advanced Key

1. In the DTM menu select Security -> Device Access
2. Switch TB to OOS mode.
3. Switch RB to OOS mode.
4. Select the radio button for the device, as preserved in a previous slide
5. Enter the Key, provided by GE
6. Click on Download Device Access
7. The following screen indicates that the firmware is downloaded successfully



Warning: Make sure that the Resource and Transducer Blocks are in OOS mode before you Download Device Access!

Verify the device firmware version

In the DTM, verify:


1. Device Rev is correctly reported (e.g. 2)
2. DD is correctly reported (e.g. 1)
3. SW is correctly reported: e.g. 2.1.0.0 CS53492

SVI_____02390377 - Online Parameter

SVI FF POSITIONER		MASONEILAN PRODUCTS	
Tag: SVI_____	02390377	Device ID: 0047450008_____	02390377
Man. ID: 0x4745	Type. ID: 8	Device Rev: 02	DD: 01 SW: 2.1.0.0 CSC53492

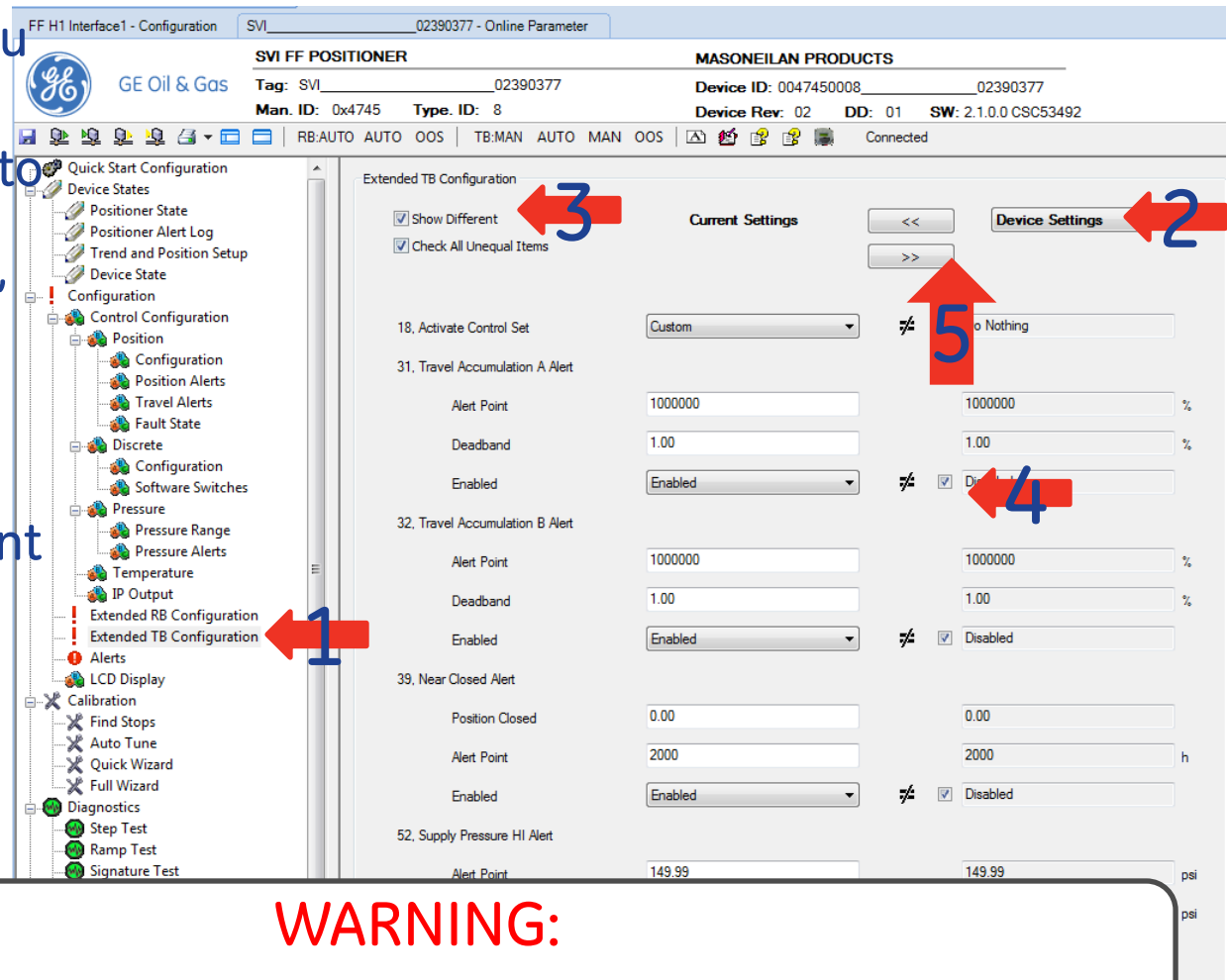
GE Oil & Gas

RB:AUTO AUTO OOS | TB:MAN AUTO MAN OOS | Connected



Download the preserved settings

1. Open Extended TB configuration DTM menu
2. Select Device Settings and wait for the values to be updated
3. Select "Show Different" and "Check All Unequal Items" check boxes
4. Uncheck the check boxes if you do NOT want the values to be downloaded to the device
5. Set the Checked items to the device



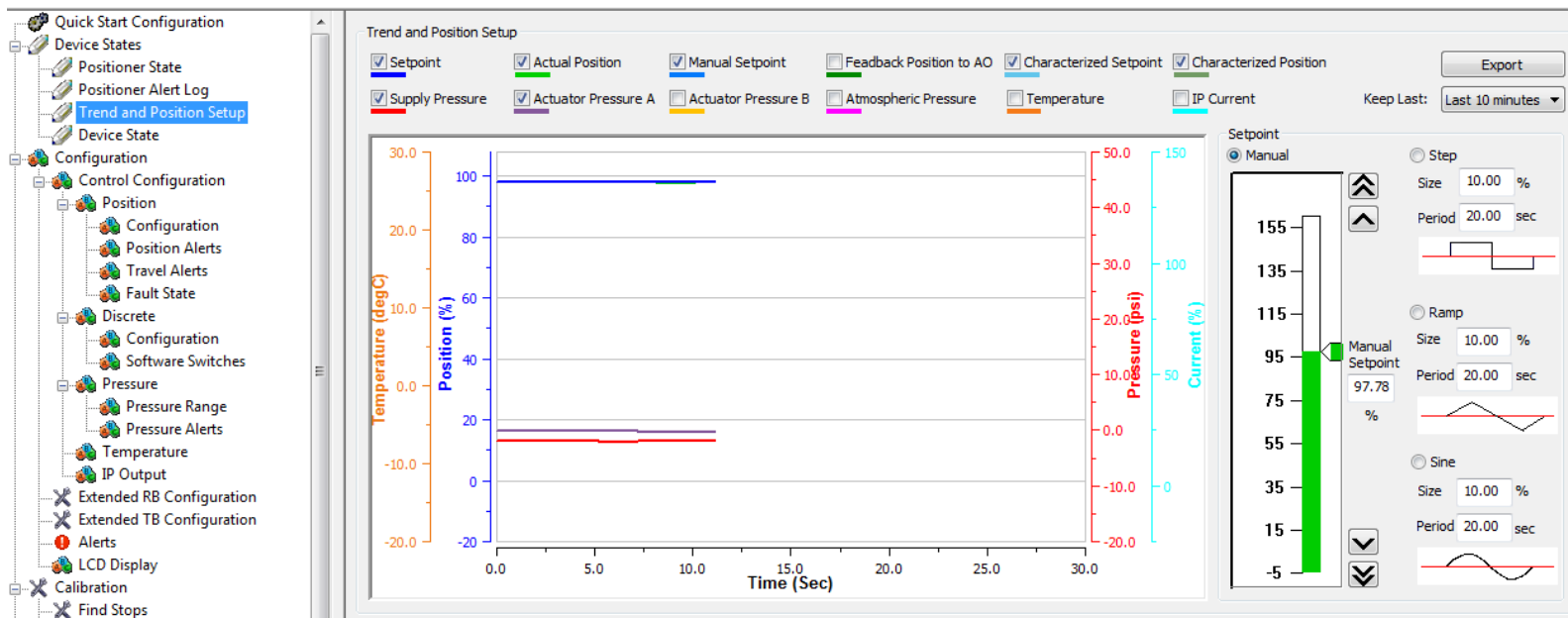
WARNING:

All checked items will be downloaded to the device

Start Using the positioner

If the steps of these process are followed correctly, the calibration and tuning of the positioner will be preserved and the positioner can be used in the applications.

Go to Trend and Position Setup menu to observe the dynamic parameter values in the positioner

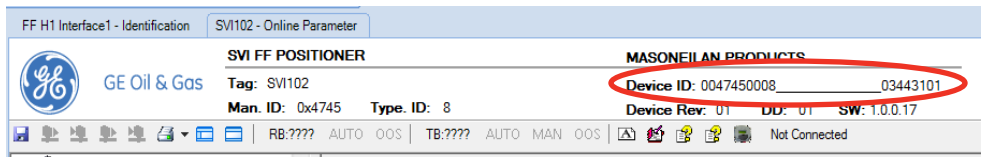


Troubleshooting

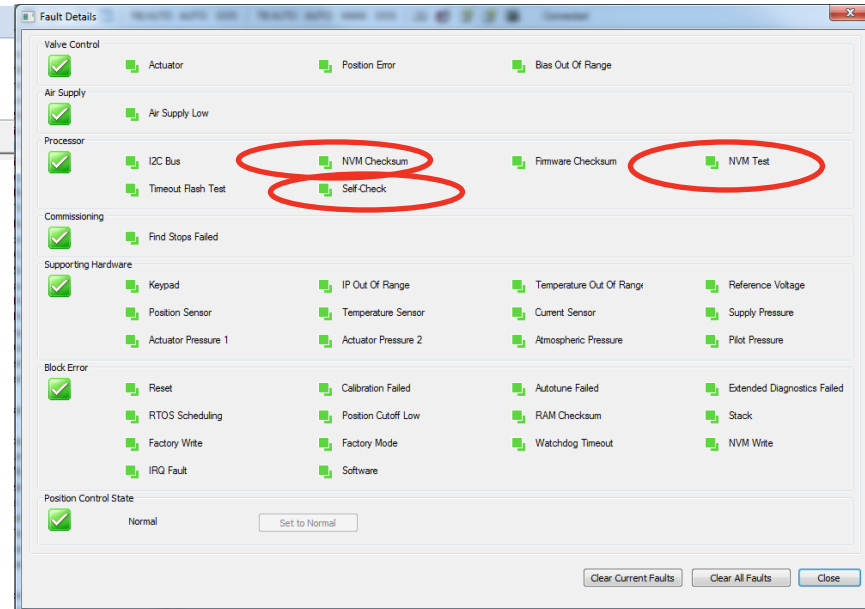
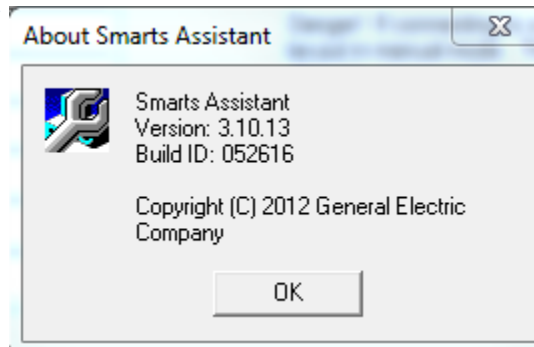
Device lost NV memory

If the power is interrupted during the process of firmware upgrade or if an old version of the ValVue3 software is used the device may lose the content of the NV Memory.

You will know that the device NV memory is lost if the last 8 numbers in the device ID are changed to 00000000 or if NV Memory error is reported.



Install Smart Assistant version 3.10.13 or later:



NV Memory Bank Used

These steps determine what bank is used by the firmware:

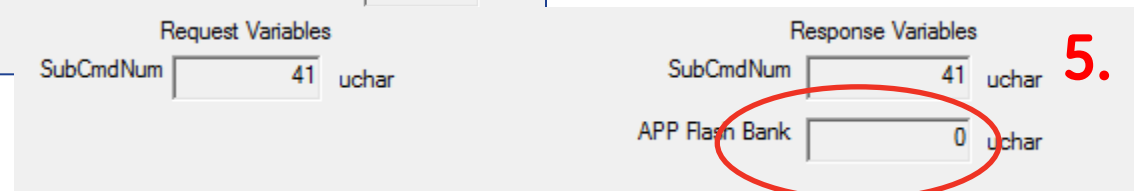
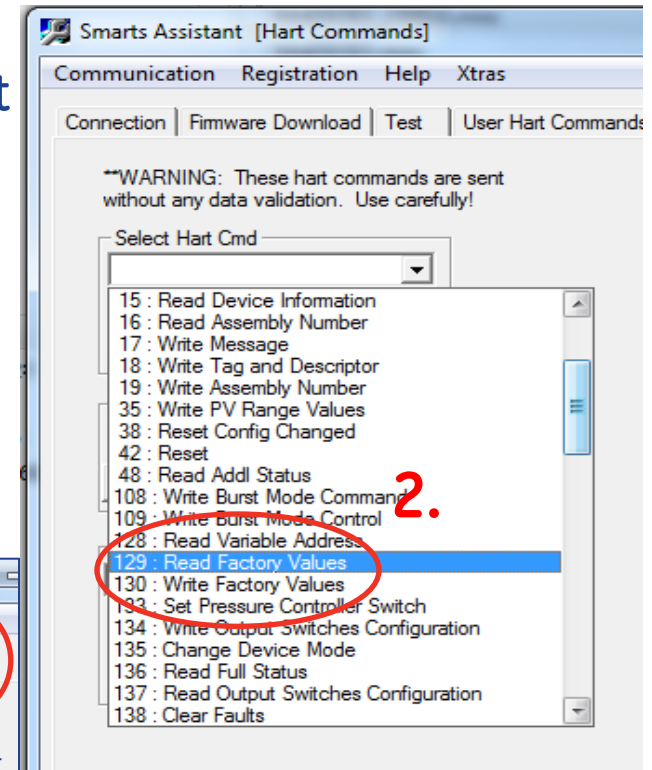
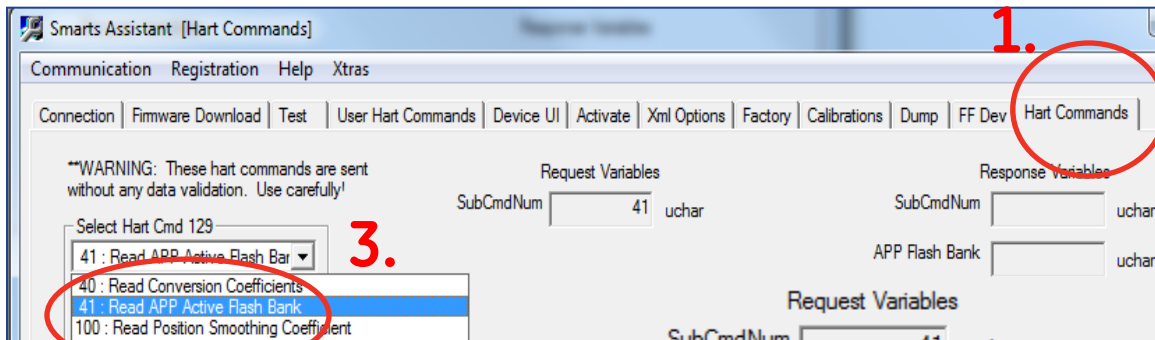
1. Connect to the device. It doesn't matter whether over ISP or over HART/FF
2. In HART Commands page,
 - Use command 129.41 to read active flash bank (0 or 1);

If the active bank is 1, the following steps describe the procedure to read the other bank 0 (at address 0000) and write it to the active bank 1 (at address 8192).

If the active bank is 0, you will need to modify the procedure to read the other bank 1 (at address 8192) and write it to the active bank 0 (at address 0000).

Active NV Memory Bank

1. Navigate to Hart Command Tab (it may look differently, depending on the version of Smart Assistant that you have)
2. Select Hart Cmd #129
3. Select sub-command 41
4. Send Command
5. Observe the value in APP Flash Bank



Verify the content of the backup bank

1. Select Command 129.130
2. If the active bank was 1, put a value of 0000 in Memory Address and send command
3. If the active bank was 0, put a value of 8192 in Memory Address and send the command

Connection | Firmware Download | Test | User Hart Commands | Device UI | Activate | Xml Options | Factory | Calibrations | Dump | FF Dev | Hart Commands

****WARNING: These hart commands are sent without any data validation. Use carefully!**

Select Hart Cmd 129
130 : Read NVMEM area

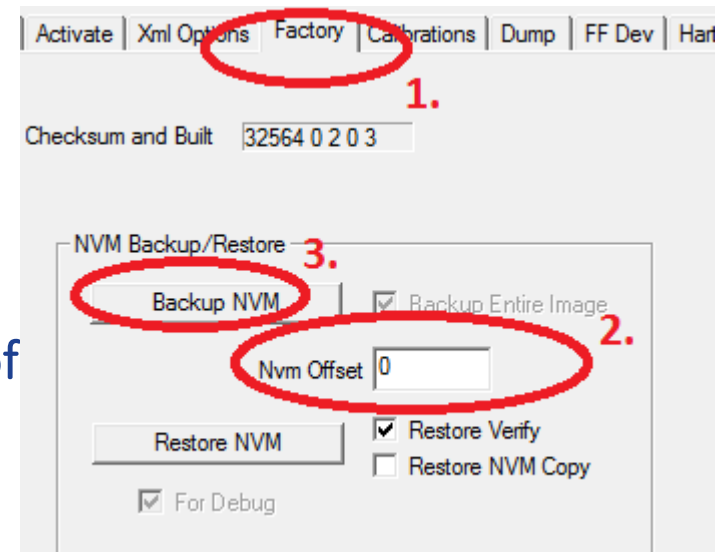
Send Command ☒ Retry On Error

Request Variables		Response Variables	
SubCmdNum	130 uchar	SubCmdNum	130 uchar
Memory Address	0000 uint2(h)	Read Block	08 00 46 46 6B uchar[24](h)

2. Review the content of the Read Block and verify that the 3rd and 4th bytes have a value of 46. If they have different value, that is the indication that the backup bank content is not reliable and the NV memory recovery may not work.

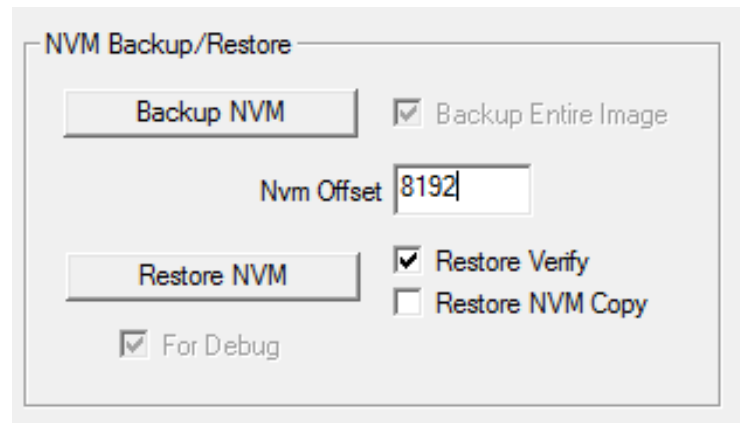
Read the content of backup bank

1. Select the Factory Tab
2. Enter the Nvm Offset value of 0 if the active bank is 1
Enter the Nvm Offset value of 8192 if the active bank is 0
3. Click the Backup NVM
4. In the Save As dialog enter the name of the file to be equal to the Serial Number of the device – e.g. 03390129
5. Wait until the operation is completed and the window is closed. It will take several minutes to upload the NV memory



Write content to Active Bank

1. Enter the Nvm Offset value of 8192 if the active bank is
Enter the Nvm Offset value of 0 if the active bank is 0
2. Click on Restore NVM
3. Select the file that was saved during the Backup NVM
4. Wait until the operation is completed and the window is closed. It will take several minutes to download the NV memory to the device



The screenshot shows a dialog box titled "NVM Backup/Restore". It contains two main sections. The top section has a "Backup NVM" button and a checked checkbox labeled "Backup Entire Image". Below this is a text field labeled "Nvm Offset" with the value "8192" entered. The bottom section has a "Restore NVM" button, a checked checkbox labeled "Restore Verify", and an unchecked checkbox labeled "Restore NVM Copy". At the bottom left of the dialog is a checked checkbox labeled "For Debug".

Verify the device in ValVue3

1. Restart the device
2. Open ValVue3
3. Re-Connect the NI DTM
4. Review the live list and verify that the device comes with the original serial number (not 00000000)