



# **Foundation Fieldbus DTM instructions**

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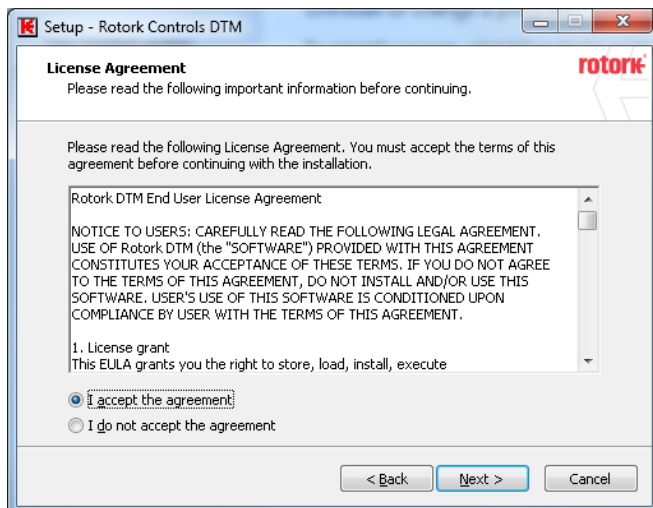
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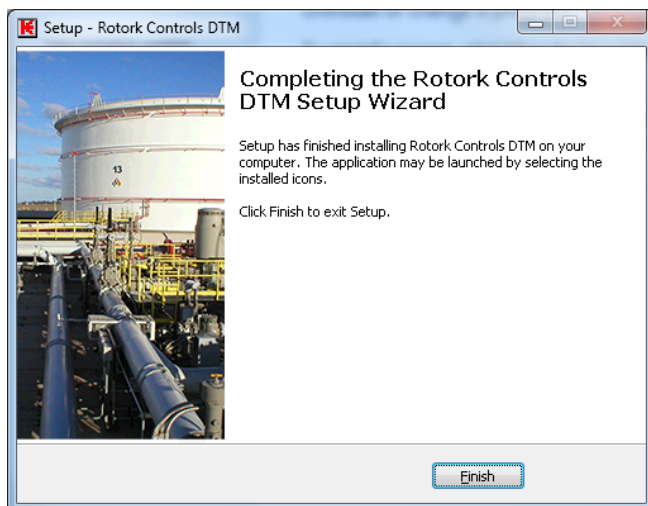
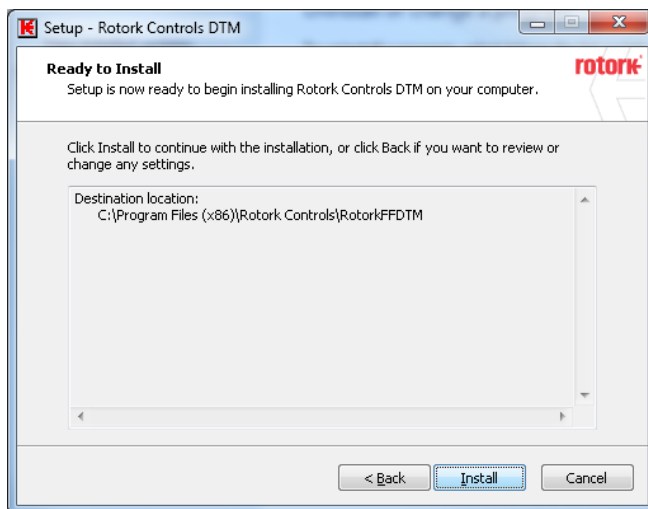
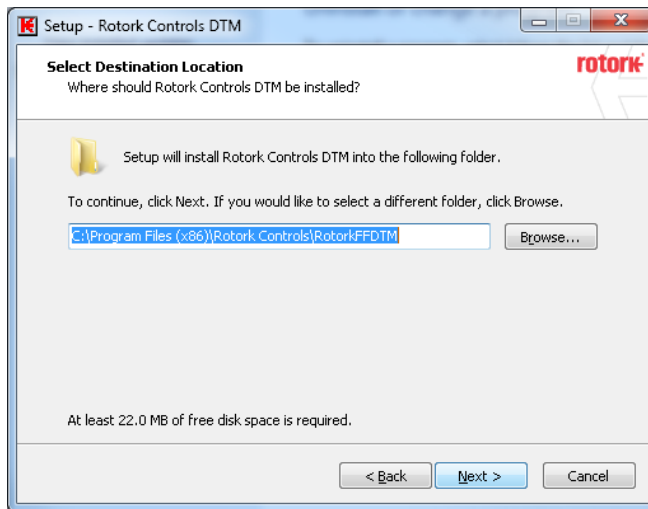
## FF DTM installation

Install the Rotork FF Device DTM by running the executable file and following the on screen instructions. Admin rights are required to perform the installation, but are not required to run the DTM once installed.

**Note: the DTM version may be newer than shown below.**

The installation steps are shown below.





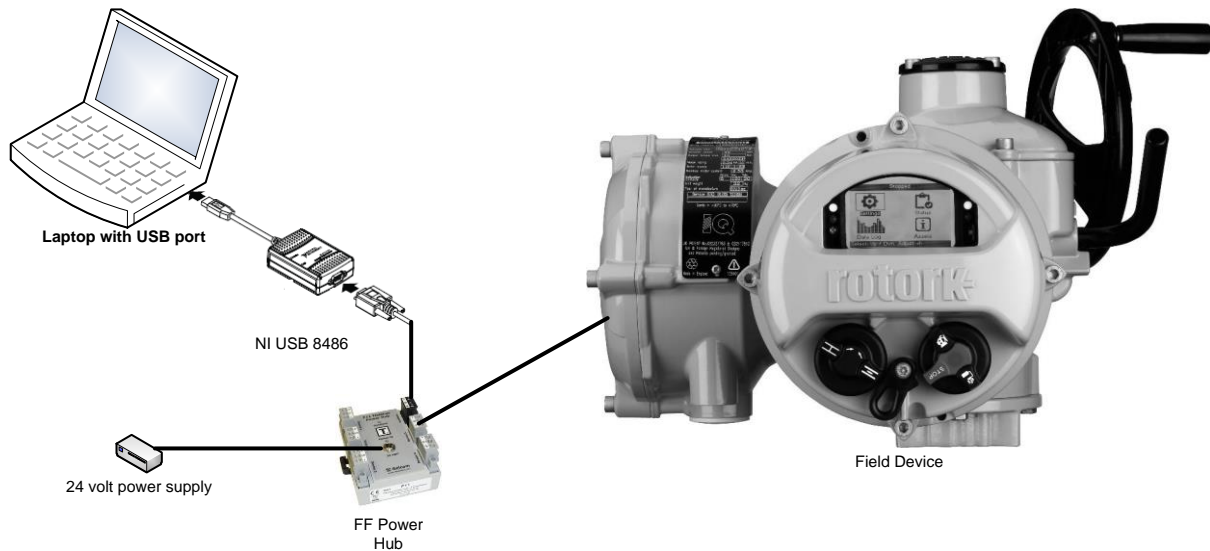
Once installed, the Rotork FF Device DTM can be opened using an FDT Container application.

**Note:** FF interface hardware and an FF Communication DTM will also be required; these are not supplied by Rotork.

## National Instruments hardware set up

Any Foundation Fieldbus hardware that supports FDT/DTM technology can be used, however an example is given using the NI (National Instruments) USB 8486 H1 interface. The NI interface also requires a FF power supply and conditioner to provide a power supply for the fieldbus network. In this example a Relcom F11 Fieldbus Power Hub is used (it includes a plug in wall power supply unit).

The diagram below shows the set up:



NI USB-8486 interface:

<http://sine.ni.com/nips/cds/view/p/lang/en/nid/207760>

CommDTM for the NI USB tool:

<http://www.codewrights.de/index.php/en/downloads/software>

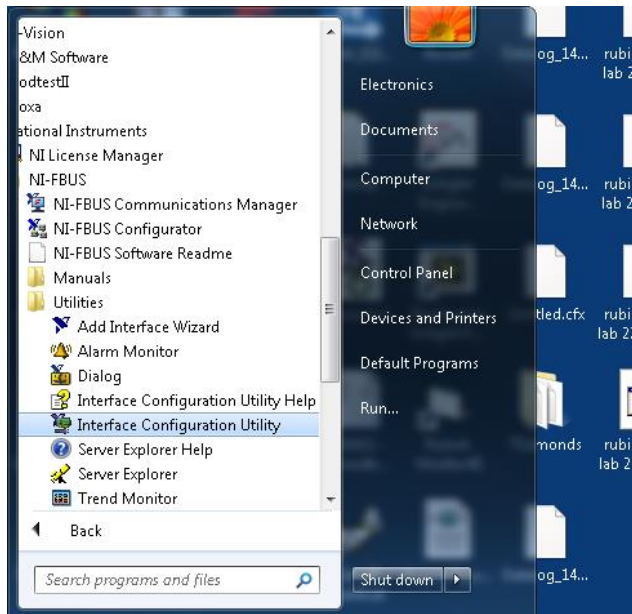
Relcom Power Hub:

<http://www.relcominc.com/fieldbus/F11.htm>

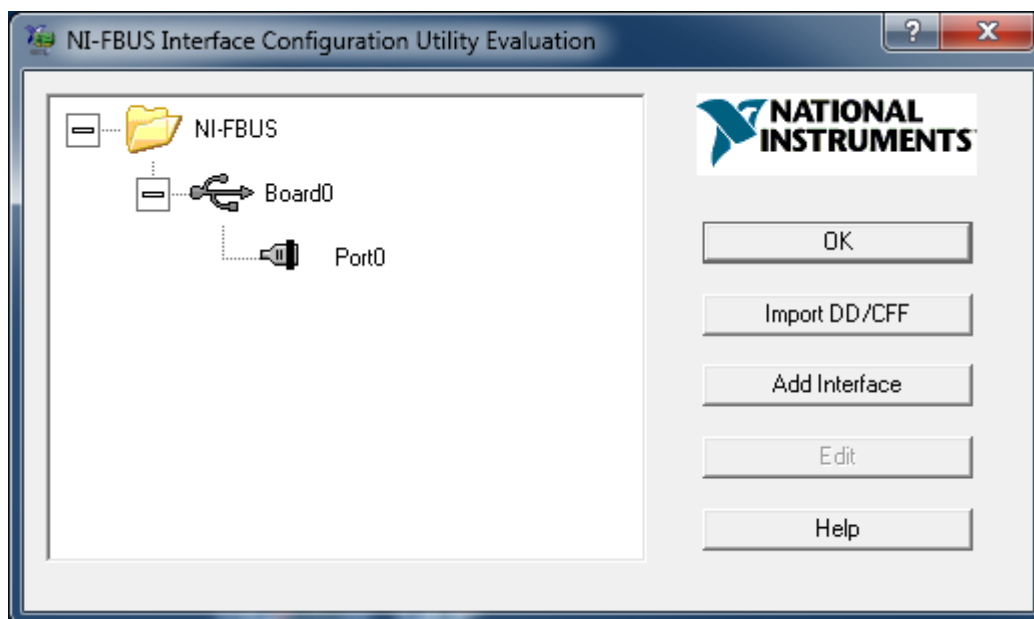
Make sure the NI-FBUS Communications Manager software supplied with the USB-8486 interface and a compatible FF Comm DTM such as the CodeWrights FF Comm DTM are installed. Refer to the vendors' documentation to install these programs.

**Note: The NI Configurator software is not required, only the NI-FBUS Communications Manager software is required which is provided free of charge with the USB-8486 interface.**

Attach the USB-8486 interface to the computer and ensure it is correctly set up by running the Interface Configuration utility.



If the USB-8486 interface is correctly detected, you should see a screen similar to below. If you do not see a Board and Port under NI-FBUS, or if they have a cross through them, refer to the NI documentation.

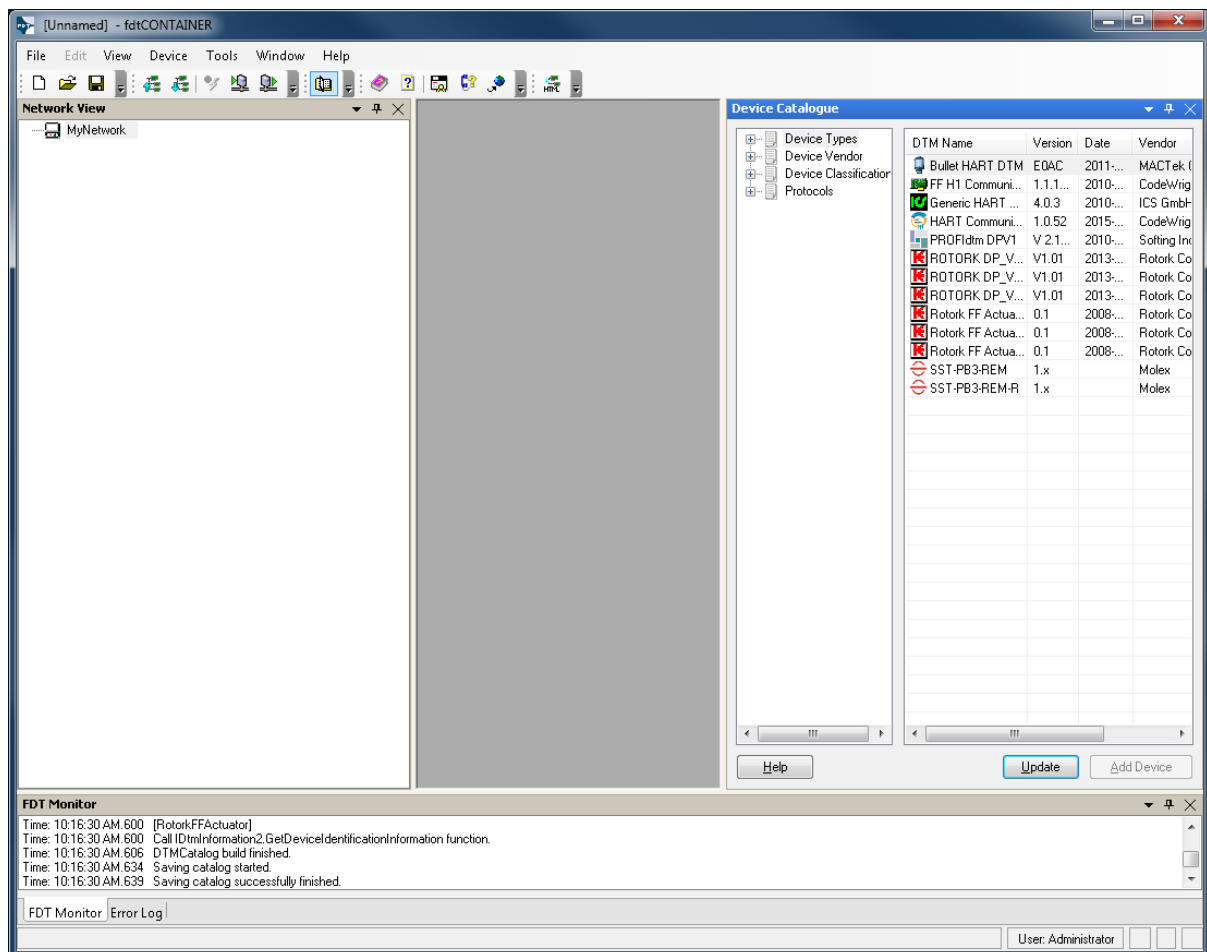


## Starting the FDT Container and selecting the CommDTM

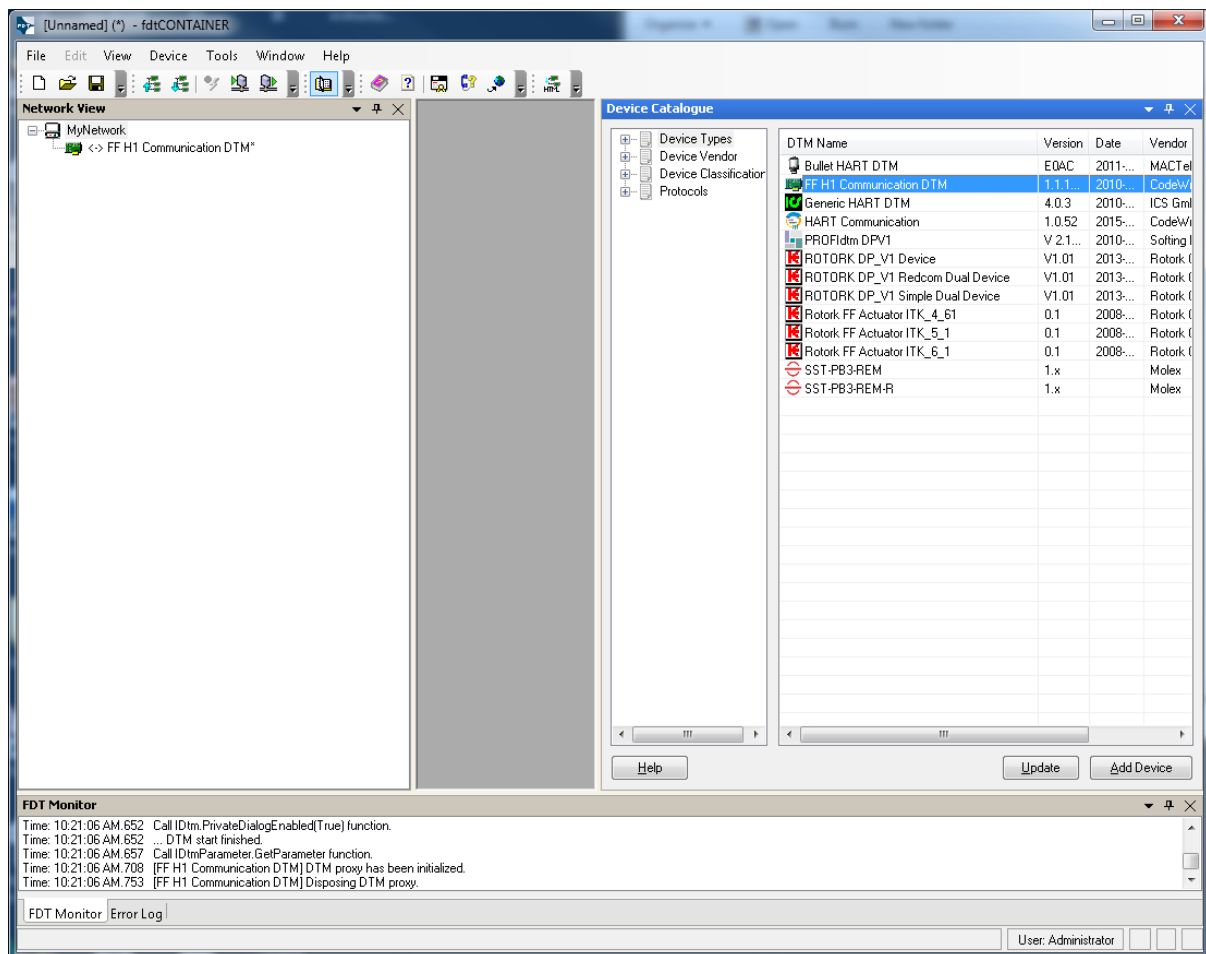
Run your FDT Container software, here we are using the M&M fdtCONTAINER version 3. After installation of a new DTM, a registry marker is set which causes the FDT Container to request an update of the device catalogue.



Select 'Yes' to update the catalogue so the newly installed DTMs are shown.



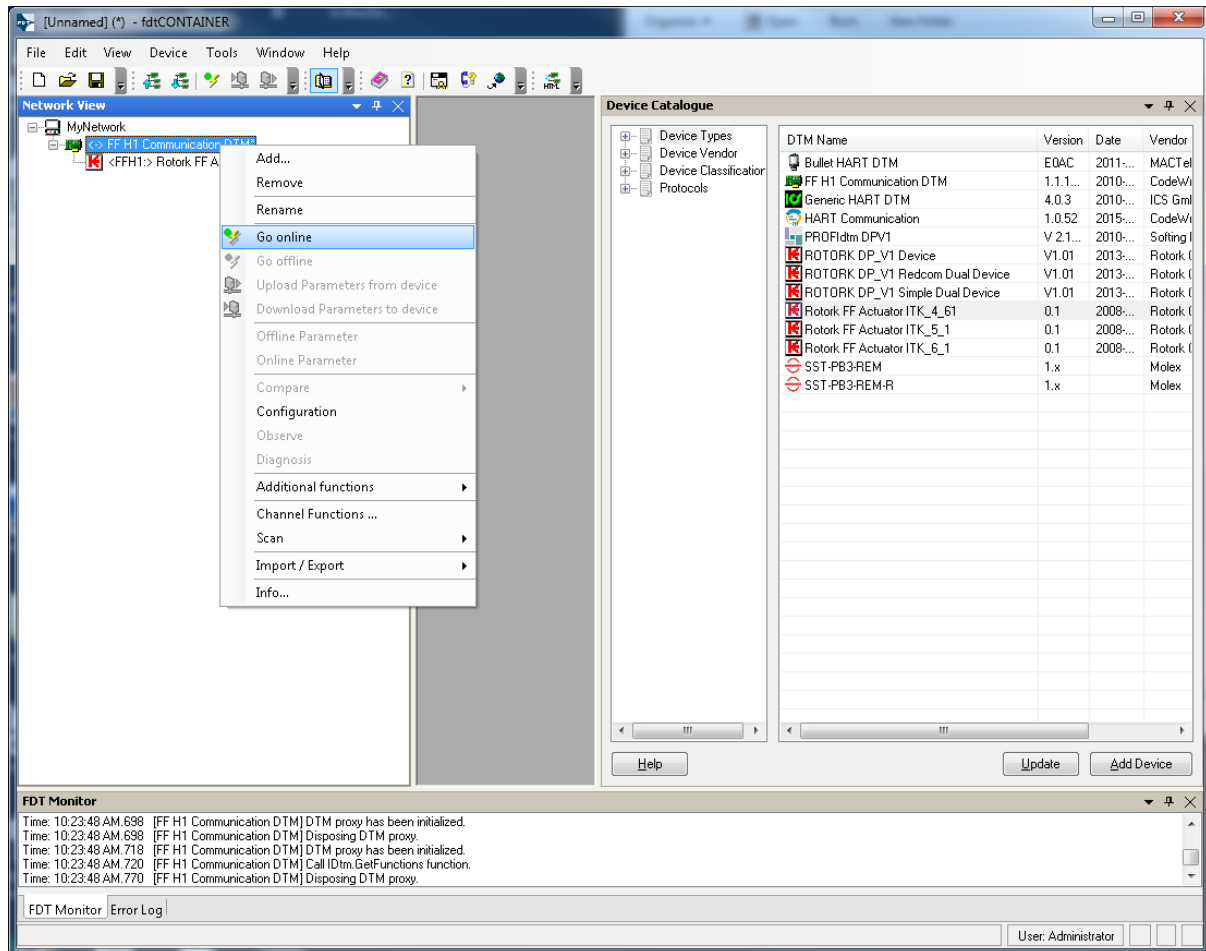
Select the CommDTM from the device catalogue and insert it into the network:



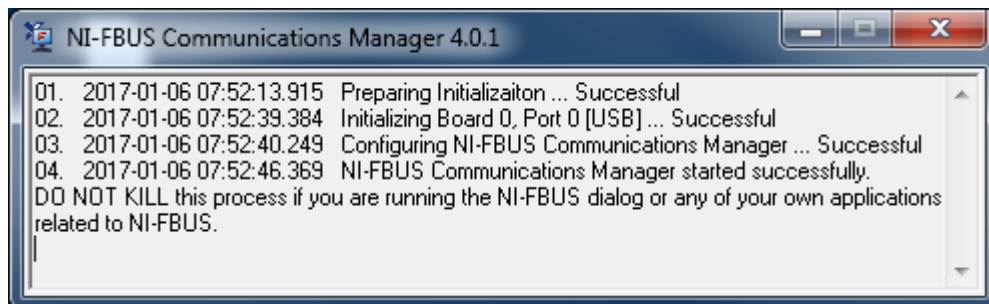


## To automatically add a device into the network

Go online with the Communications DTM:

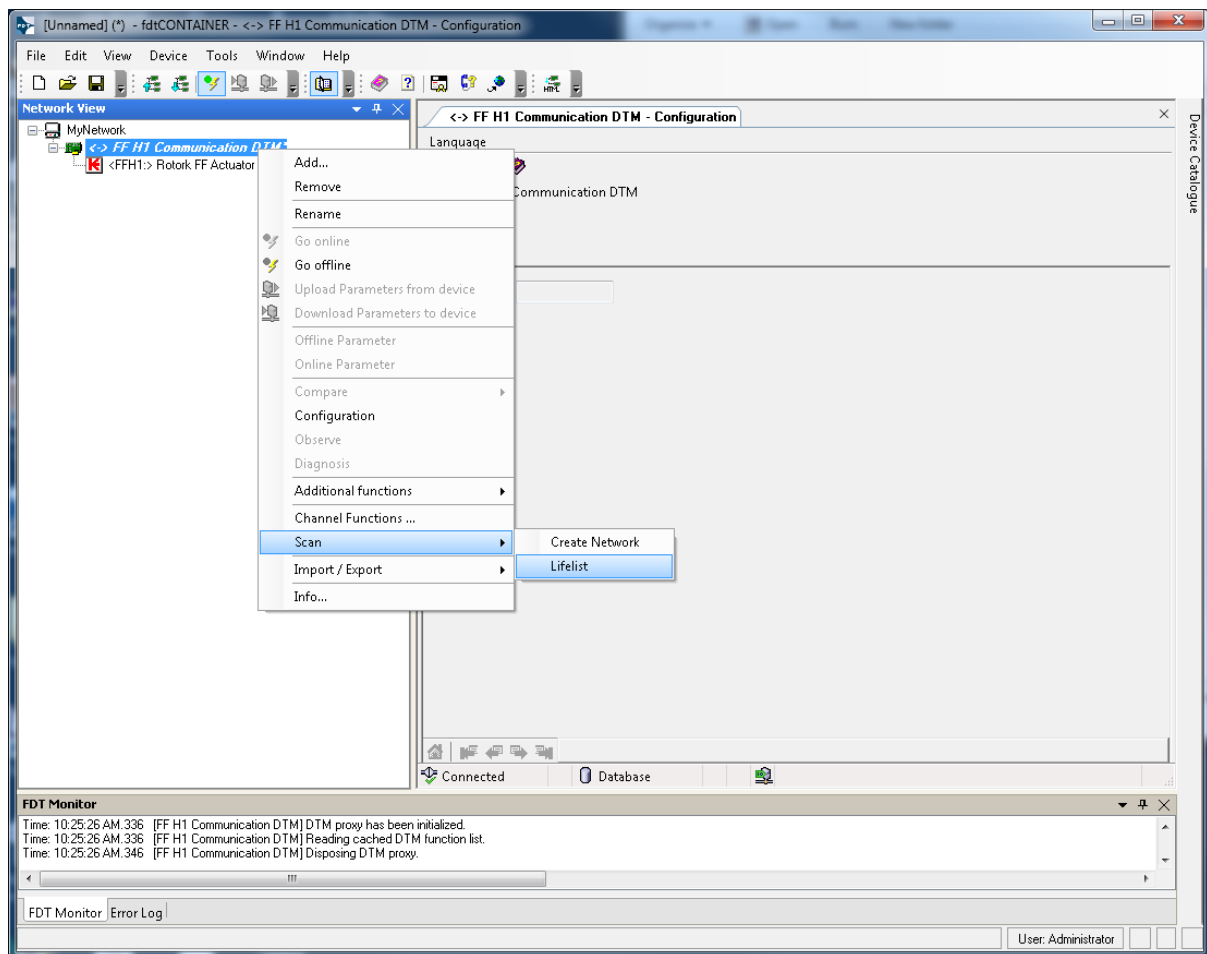


At this point, if the NI-FBUS Communications Manager software is not running, you will be prompted to start this software. Allow the software to start and check that it connects successfully as shown below.

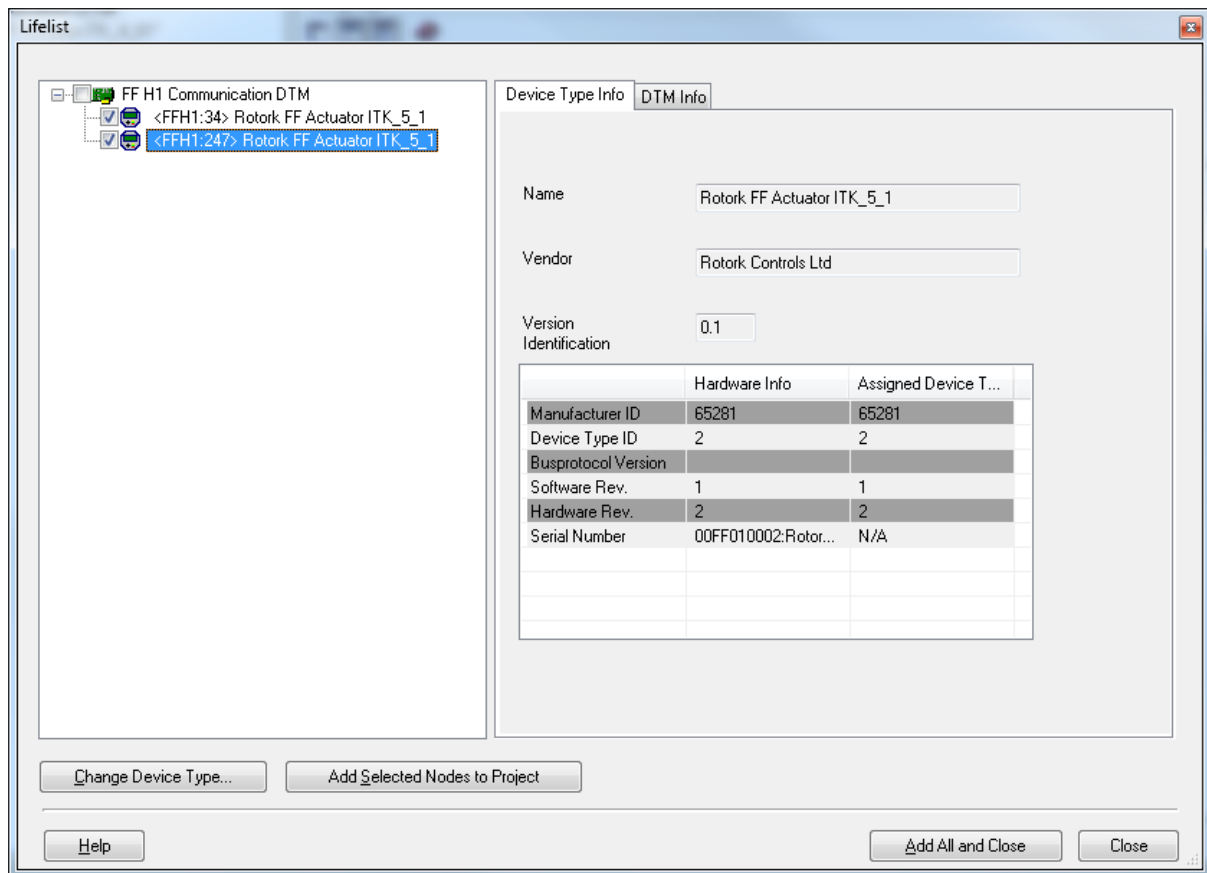


You can hide the device catalogue as it is not required any more.

Scan for devices on the network. This is a Comm DTM function and other Comm DTMs are likely to have similar scan functions which are usually accessed in a similar way. Sometimes the scan function may be under the “Additional functions” menu.

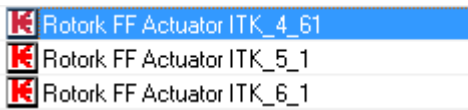


Here we have discovered 2 ITK5.1 devices. Select the device you which to communicate to and add it to the project using the appropriate button OR add all devices to the project.



## To manually add a device into the Communications DTM network

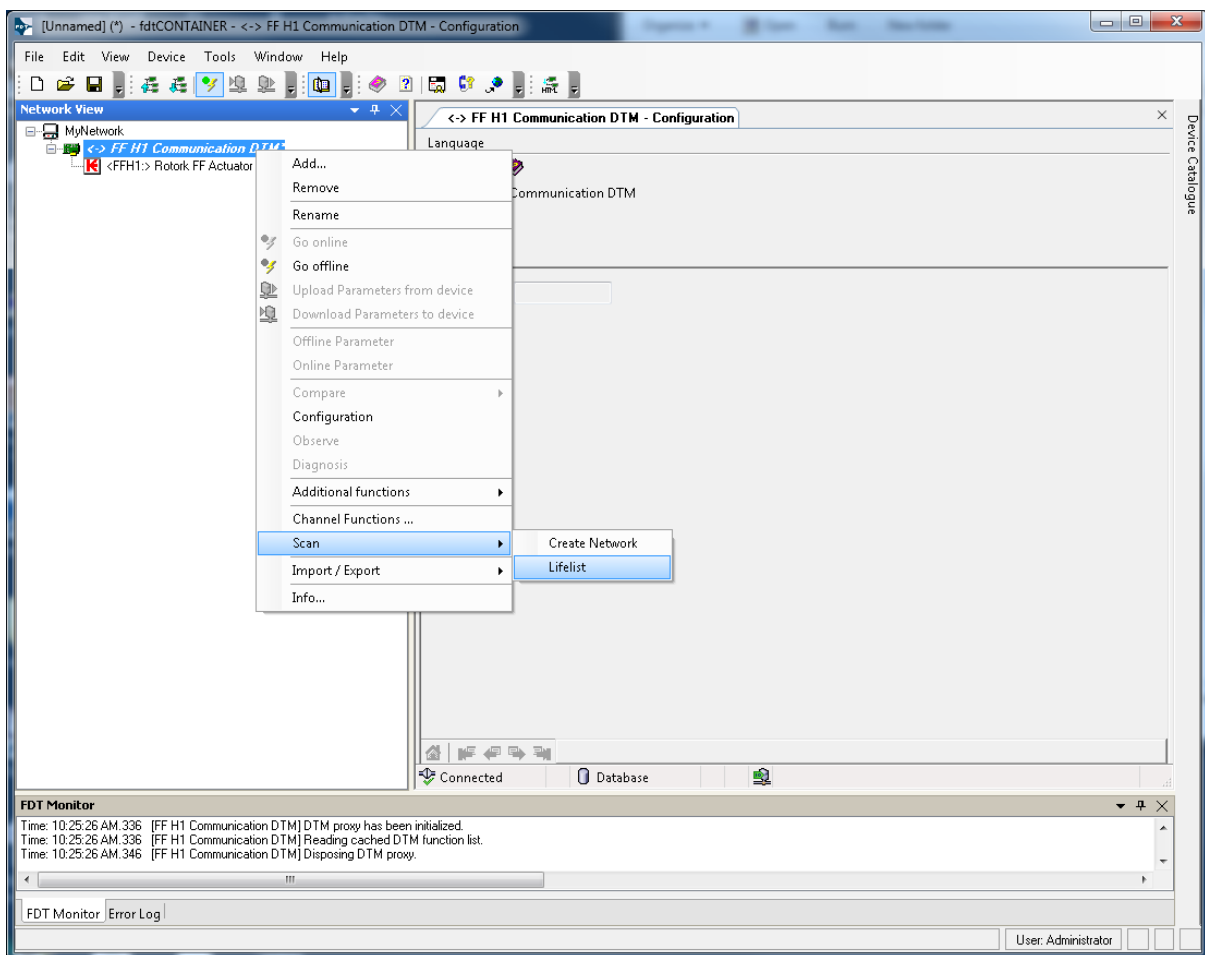
From the device Catalogue, select the Rotork fieldbus DTM for the ITK version that corresponds to the device you are connecting to – either ITK4, 5 or 6:



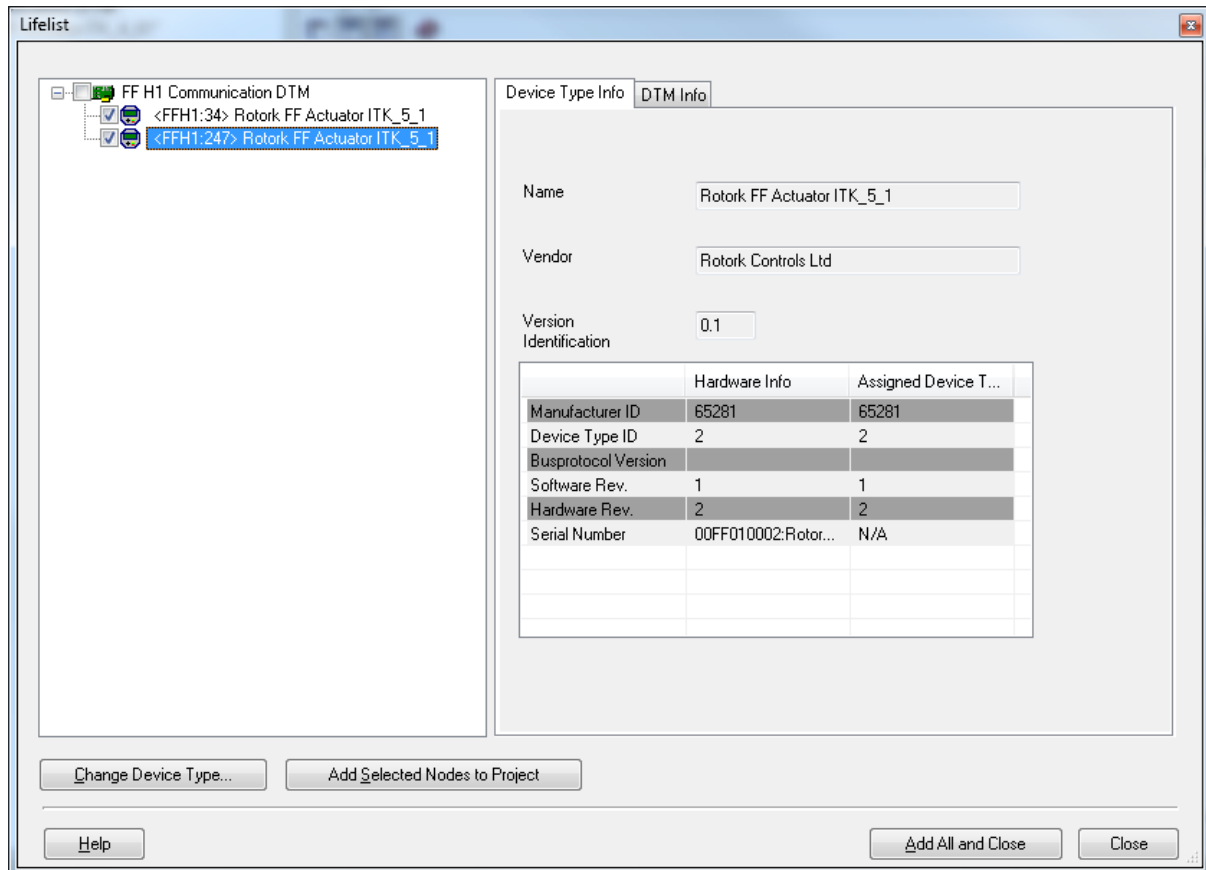
If you manually select the DTM in this way you will need to set the DTM device address to be the same as the device address.

**Note: if you select the wrong file an error will be displayed when the unit tries to connect.**

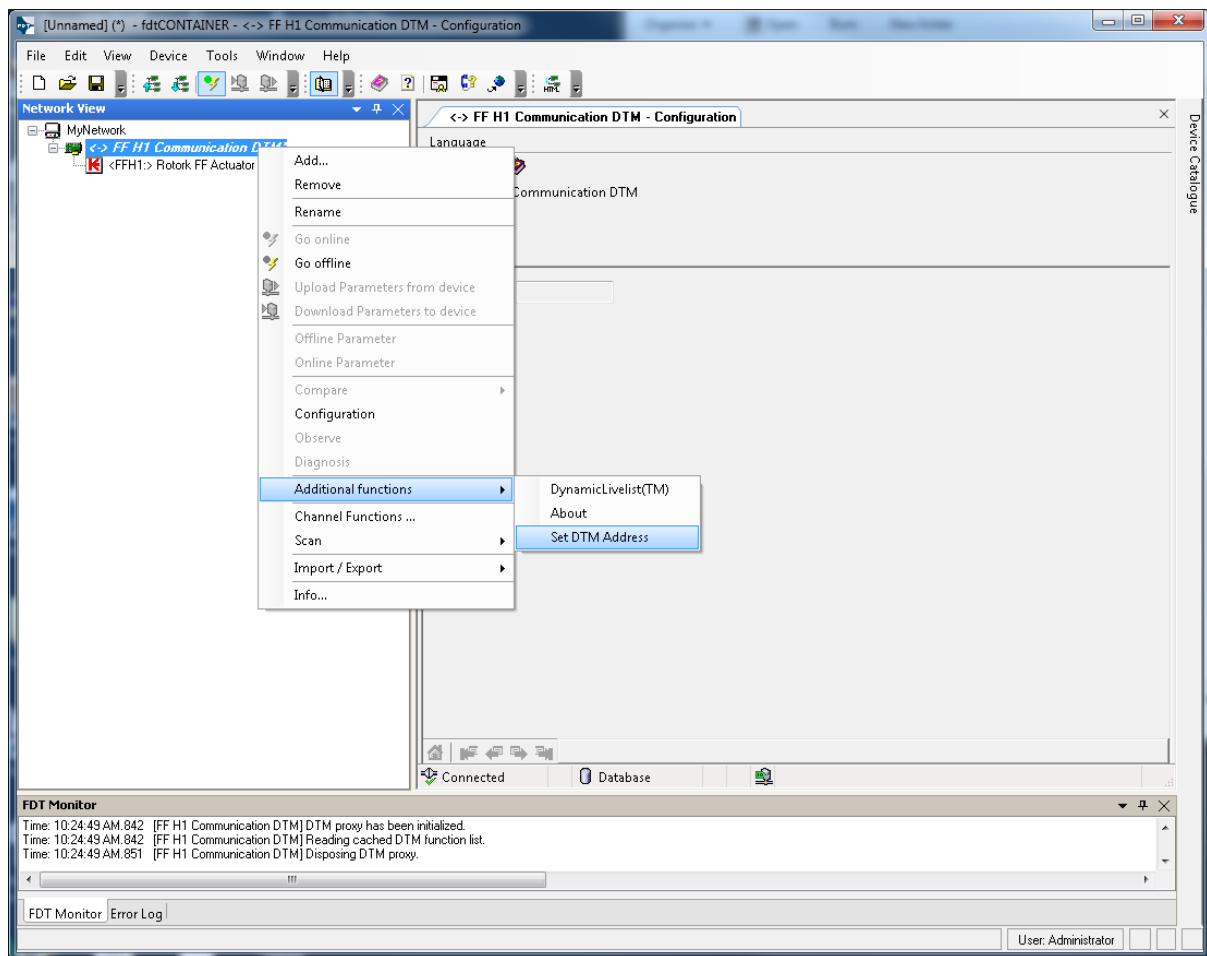
To manually set the DTM address to match a device on the network, go online with the CommDTM and scan for devices on the network, as shown below:



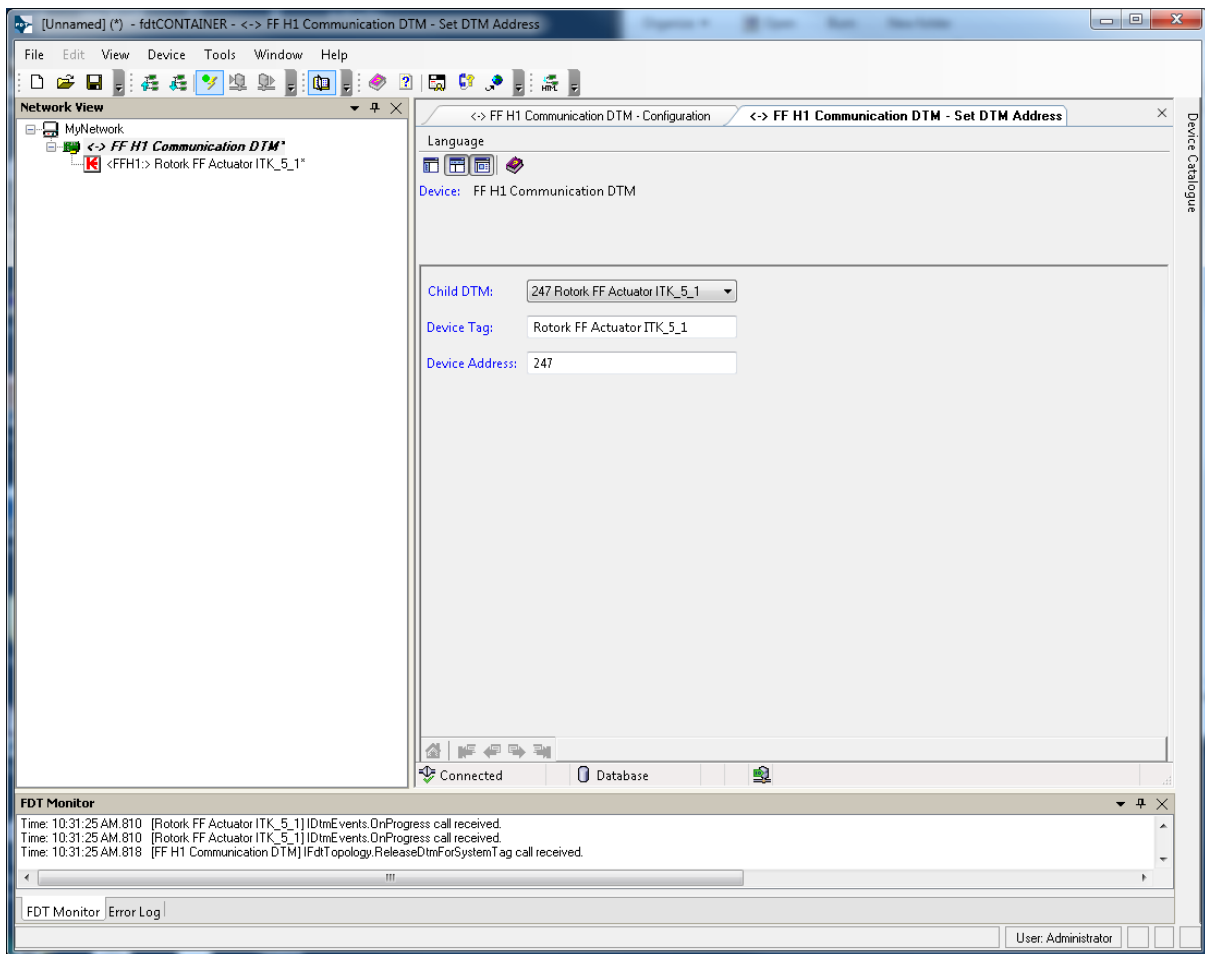
Here we have discovered 2 ITK5.1 devices. Make a note of the address listed for the device that you are interested in – here we have 2 devices one at address 34 and the other at 247 – we are interested in 247:



Use the 'Set DTM Address' function in the commDTM:

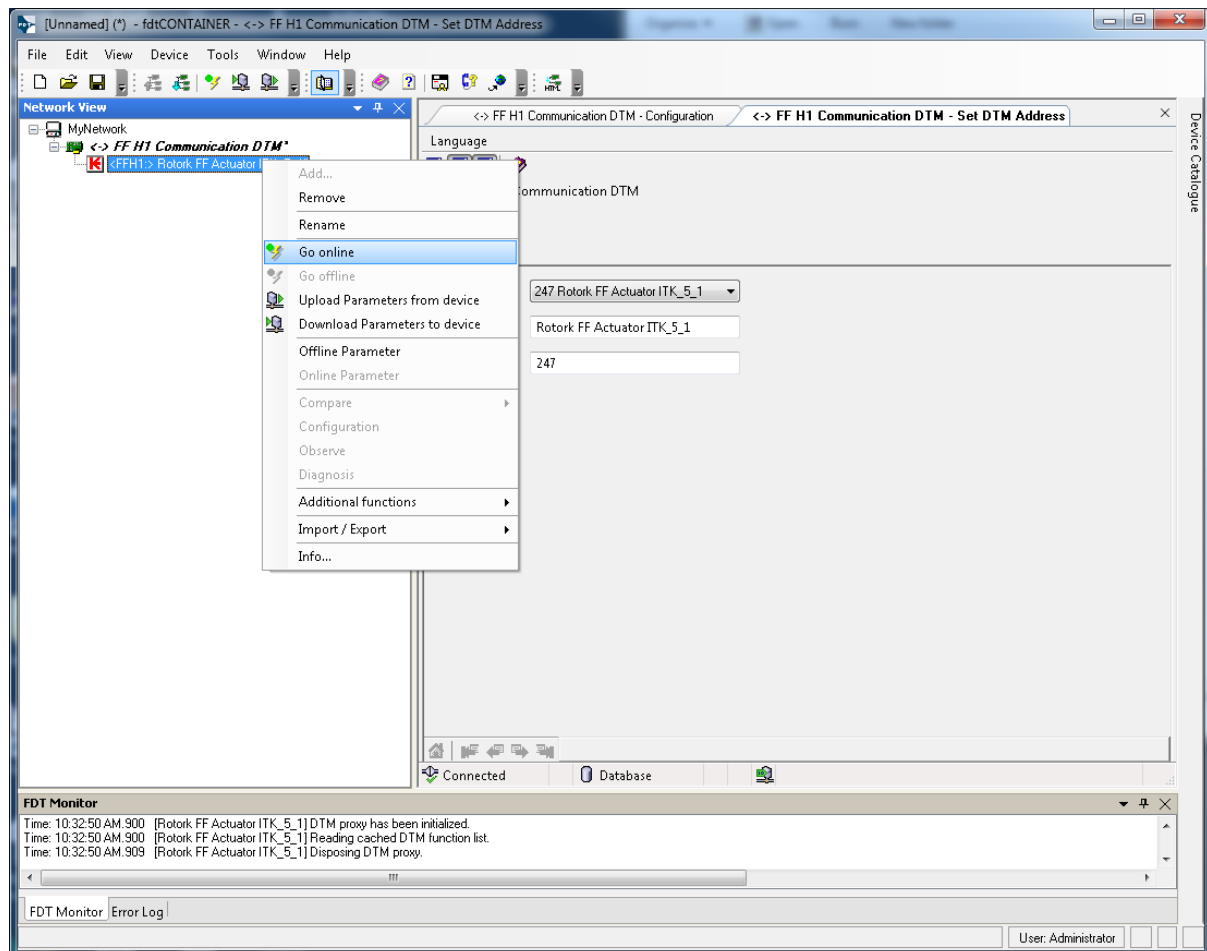


Change the address to the one noted in the life list. This allows the DTM to connect to the device on the physical FF interface.



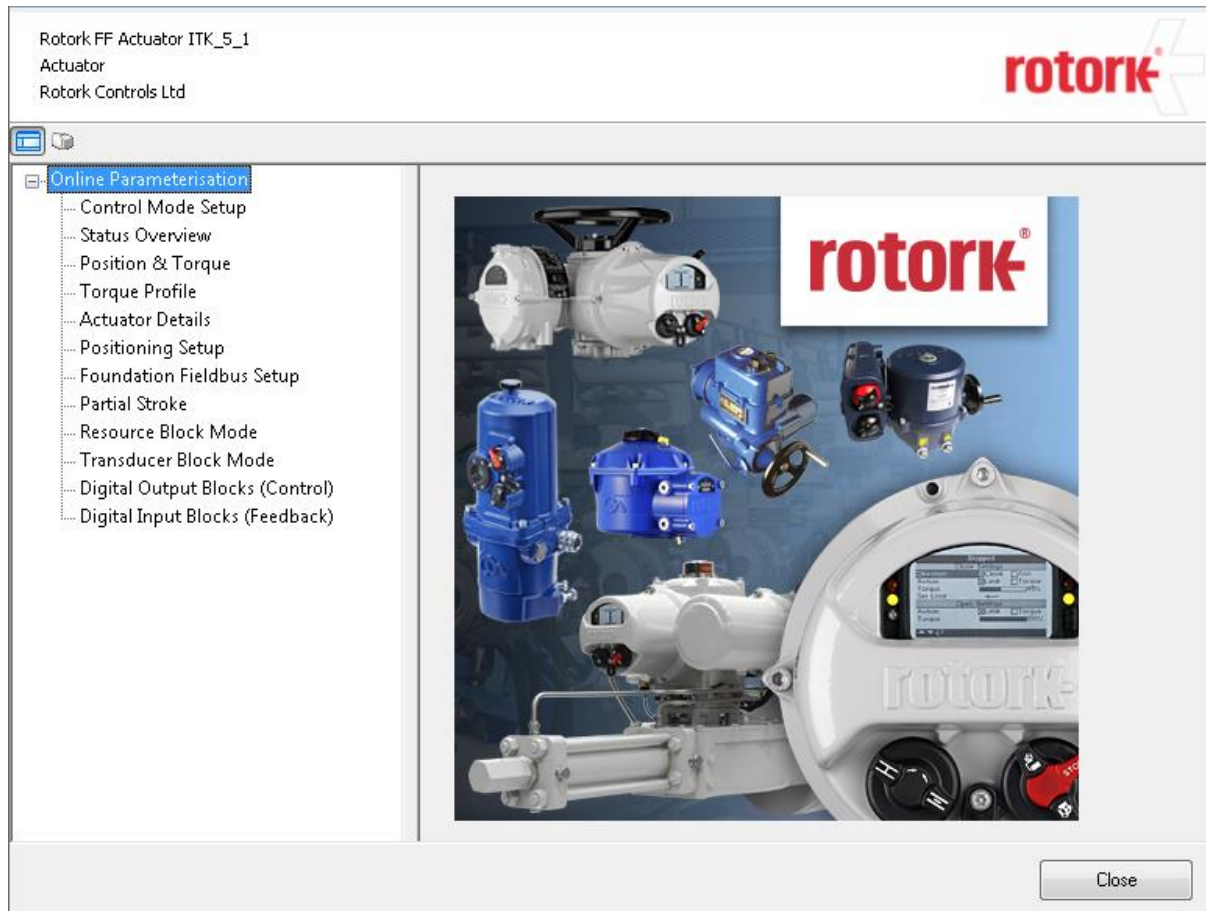
## Going online with the device

Now we can go online with the Device:





Double click on the device to get the main menu:



**Note:** When connected to a device and using the Online Parameter pages, changes made to parameters are immediately sent to the device.

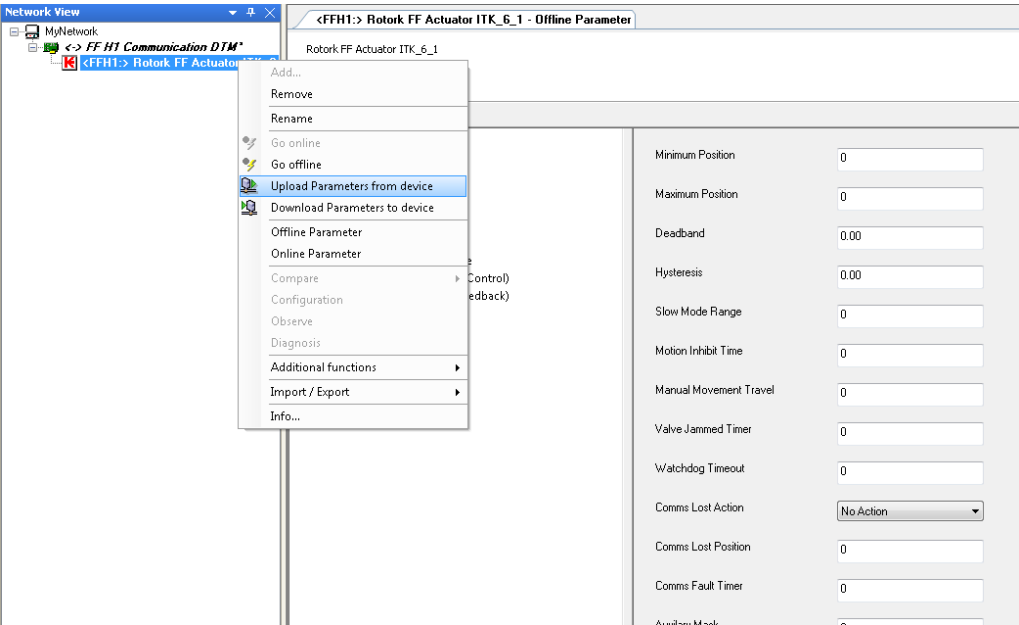
You can also open the DTM without connecting to a physical device in offline mode, you will then be shown the Offline Parameterisation main menu:



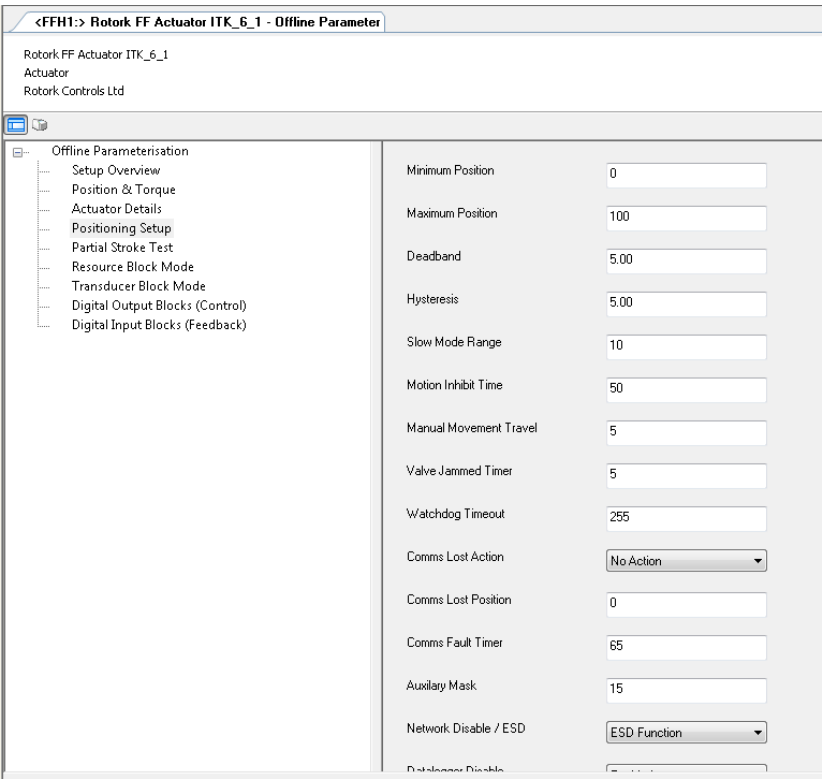
When the DTM is first opened, the Offline parameter set will initially all be zero values.

**Note:** To avoid inadvertently sending zero values to the device and to allow the device's parameters can be viewed Offline, it is recommended to upload the parameters from the device which will populate the Offline parameter set with values from the connected device.

To upload parameters from the device, select Go Online with the device and then select ‘Upload parameters from device’ as shown below. This will populate the Offline parameter set with parameters from your attached device. Most frame applications automatically save the Offline Parameter set to disk when the FDT project is saved.

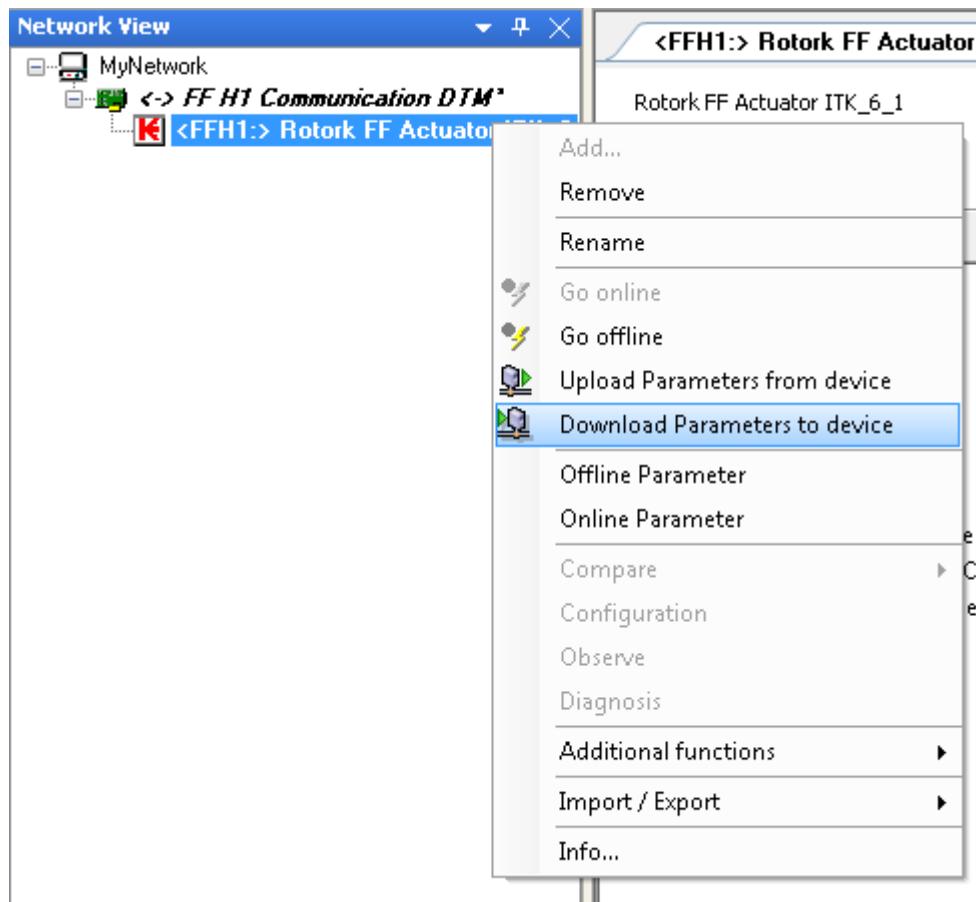


Example values populated from device:



When you save the project these values will be saved in the offline pages and can be viewed again when the project is reloaded.

The offline settings can be loaded back into the device – if required – by selecting ‘Download Parameters to device’.



## Online Parameterisation - Control Mode Setup

Changes in this page can only be made if the Transducer Block is in OOS (Online Parameterisation - Resource Block Mode and Transducer Block Mode).



Here you can change the control mode and discrete block mode of the device. The control mode defines the function of DO4 and enables the setting of a couple of control options with special requirements – for example AO only, once this is selected **ONLY** the AO block is used for control.





Positioning mode	- DO4 function
ESD	- DO4 function
S5 relay operate	- DO4 function
Partial stroke	- DO4 function
AO only	- Special Analogue only control mode
Two wire control	- Special 2-wire only control mode, uses DO4 only
Partial stroking (multibit)	- DO4 function

The discrete Block mode selects either Single bit (multiple block) or Multiple bit (single block) control mode for the DO's.

Refer to Rotork Foundation Fieldbus technical manual PUB060-007 for further information on the above functionality.























## Online Parameterisation - Status Overview

This page shows useful status data for the device:

Actuator Device Status		<ul style="list-style-type: none"><li><input checked="" type="radio"/> DO control conflict</li><li><input type="radio"/> Incorrect DO control</li><li><input type="radio"/> Control contention</li><li><input checked="" type="radio"/> Actuator interface offline</li><li><input type="radio"/> FF control overridden</li></ul>
Alarm condition		<div>No alarm ▾</div>
Actuator Control		<ul style="list-style-type: none"><li><input type="radio"/> Stop</li><li><input type="radio"/> Close</li><li><input type="radio"/> Open</li><li><input type="radio"/> ESD</li><li><input type="radio"/> Positioning</li><li><input type="radio"/> Partial stroke</li><li><input type="radio"/> No command</li></ul>
Actuator condition		<ul style="list-style-type: none"><li><input type="radio"/> Fully closed</li><li><input type="radio"/> Fully open</li><li><input type="radio"/> Moving closed</li><li><input type="radio"/> Moving open</li><li><input type="radio"/> Stopped mid travel</li><li><input type="radio"/> Unknown</li></ul>

In this example the 'Actuator Interface offline' indication is showing. This implies that the Actuator main power is off, this would mean that there is no status being received from the actuator over the Fieldbus interface. The fieldbus interface is still able to communicate to the DCS by using the network power which powers the communications processor.

For this unit, turning the actuator main power on changes the status to:

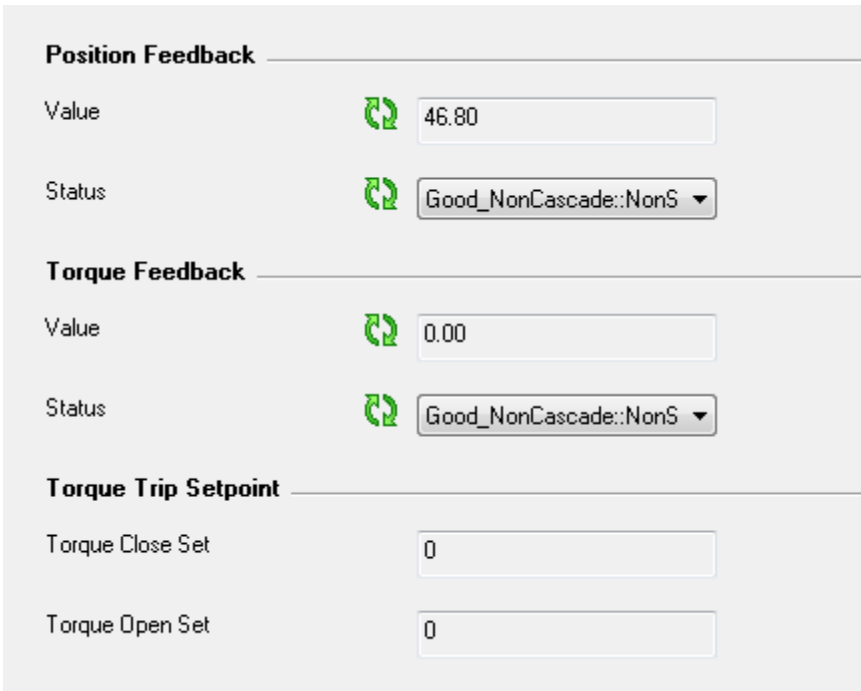
Actuator Device Status	 <ul style="list-style-type: none"><li> DO control conflict</li><li> Incorrect DO control</li><li> Control contention</li><li> Actuator interface offline</li><li> FF control overridden</li></ul>
Alarm condition	 <input type="text" value="No alarm"/>
Actuator Control	 <ul style="list-style-type: none"><li> Stop</li><li> Close</li><li> Open</li><li> ESD</li><li> Positioning</li><li> Partial stroke</li><li> No command</li></ul>
Actuator condition	 <ul style="list-style-type: none"><li> Fully closed</li><li> Fully open</li><li> Moving closed</li><li> Moving open</li><li> Stopped mid travel</li><li> Unknown</li></ul>

The only status bit which is highlighted is telling us that the unit is mid travel (between open and closed limits).

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Position & Torque

The mid travel indication shown in the previous section can be confirmed by looking at the position and Torque page:



The screenshot displays a web-based parameterisation interface for a Rotork fieldbus device. It is organized into three main sections: Position Feedback, Torque Feedback, and Torque Trip Setpoint. Each section contains input fields for 'Value' and 'Status', with green refresh icons next to the status fields. The 'Torque Trip Setpoint' section includes two additional fields for 'Torque Close Set' and 'Torque Open Set'.

Position Feedback	
Value	46.80
Status	Good_NonCascade::NonS

Torque Feedback	
Value	0.00
Status	Good_NonCascade::NonS

Torque Trip Setpoint	
Torque Close Set	0
Torque Open Set	0

We can see that this unit is at position 46.8% and has no torque present at its output. The data represented here is from the AI1 and AI2 blocks in the Rotork fieldbus device.

Refer to the technical manual for more details PUB060-007.



## Online Parameterisation - Torque profile



The Torque profile shows the torque values for a number of positions over the last stroke made by the actuator in the close and open directions:

Historical torque opening		Historical torque closing	
0%	<input type="text" value="2"/>	0%	<input type="text" value="0"/>
10%	<input type="text" value="1"/>	10%	<input type="text" value="0"/>
20%	<input type="text" value="3"/>	20%	<input type="text" value="0"/>
30%	<input type="text" value="2"/>	30%	<input type="text" value="0"/>
40%	<input type="text" value="3"/>	40%	<input type="text" value="0"/>
50%	<input type="text" value="4"/>	50%	<input type="text" value="0"/>
60%	<input type="text" value="4"/>	60%	<input type="text" value="0"/>
70%	<input type="text" value="3"/>	70%	<input type="text" value="0"/>
80%	<input type="text" value="3"/>	80%	<input type="text" value="0"/>
90%	<input type="text" value="2"/>	90%	<input type="text" value="0"/>
100%	<input type="text" value="2"/>	100%	<input type="text" value="0"/>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Actuator Details

The type of actuator and the number of times the contactor has been operated are shown on this page:

Actuator model	<input type="text" value="IQT"/>
<b>Operational Details</b>	
Contactor Operations Close	 <input type="text" value="33"/>
Contactor Operations Open	 <input type="text" value="29"/>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Positioning Setup

On this page, parameters related to intermediate positioning can be viewed and modified.

Minimum Position	<input type="text" value="0"/>
Maximum Position	<input type="text" value="100"/>
Deadband	<input type="text" value="5.00"/>
Hysteresis	<input type="text" value="0.00"/>
Slow Mode Range	<input type="text" value="5"/>
Motion Inhibit Time	<input type="text" value="5"/>
Manual Movement Travel	<input type="text" value="10"/>
Valve Jammed Timer	<input type="text" value="5"/>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Foundation Fieldbus Setup



Settings relating to the comms loss action (i.e. what the actuator should do in the event of fieldbus network failure) are found on this page along with other miscellaneous settings.

Comms Lost Action	<input type="text" value="No Action"/>
Comms Lost Position	<input type="text" value="0"/>
Comms Fault Timer	<input type="text" value="10"/>
Auxiliary Mask	<input type="text" value="15"/>
Network Disable / ESD	<input type="text" value="ESD Function"/>
Datalogger Disable	<input type="text" value="Enabled"/>
Watchdog Timeout	<input type="text" value="10"/>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Partial Stroke

The parameters for partial stroke performed over the Fieldbus interface are set up on this page, also the time for the last successful or failed partial stroke operation is recorded.

<b>Partial Stroke Setup</b>	
PST Percent	<input type="text" value="90"/>
PST Start Position	<input type="text" value="Open Limit"/>
PST Timeout	<input type="text" value="10"/>
<b>Partial Stroke Results</b>	
PST Success Timestamp	 <input type="text" value="2017-01-19 10:28:58.222"/>
PST Failure Timestamp	 <input type="text" value="2017-01-19 10:27:40.910"/>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Resource Block Mode and Transducer Block Mode

The mode of the Transducer and resource blocks can be modified in these pages.

Resource:

Target	<div>Auto</div>	Normal	<div>Auto</div>
Actual	<div> Auto</div>	Permitted	<div><input type="checkbox"/> ROut</div> <div><input type="checkbox"/> RCas</div> <div><input type="checkbox"/> Cas</div> <div><input checked="" type="checkbox"/> Auto</div> <div><input type="checkbox"/> Man</div> <div><input type="checkbox"/> LO</div> <div><input type="checkbox"/> IMan</div> <div><input checked="" type="checkbox"/> OOS</div>

Transducer:

Target	<div>Auto</div>	Normal	<div>Auto</div>
Actual	<div> Auto</div>	Permitted	<div><input type="checkbox"/> ROut</div> <div><input type="checkbox"/> RCas</div> <div><input type="checkbox"/> Cas</div> <div><input checked="" type="checkbox"/> Auto</div> <div><input checked="" type="checkbox"/> Man</div> <div><input type="checkbox"/> LO</div> <div><input type="checkbox"/> IMan</div> <div><input checked="" type="checkbox"/> OOS</div>

Refer to the technical manual for more details PUB060-007.

## Online Parameterisation - Digital Output Block (Control)

The digital Output control screen has 2 forms dependant on the Discrete control mode setting. With the mode set to Multiple bit, the page will show each block and the multiple bits that they can represent. Only one block can be used at a time in this mode. When swapping from multiple bit mode to single bit mode, care needs to be taken to ensure that no 'bits' outside the single bit range are set – for example below in DO1 and DO2 the Stop bit is set and it is not bit 0 (the top bit is 0, the lowest bit is bit 7). If a change to the single bit mode was made with this still set, it would cause control issues, the stop bit in DO3 is OK as it is the lowest bit and is the bit that is used for single bit mode. It is best to clear all bits when swapping between modes.

**DO1**  
Status: Bad::NonSpecific:NotLimit  
DO1: ☐ Close, ☐ Open, ☒ Stop, ☐ ESD, ☐ Position enable, ☐ DO-1 relay set, ☐ DO-2 relay set, ☐ DO-3 relay set

**DO2**  
Status: Bad::NonSpecific:NotLimit  
DO2: ☐ Open, ☐ Close, ☒ Stop, ☐ ESD, ☐ Partial stroke, ☐ DO-1 relay set, ☐ DO-2 relay set, ☐ DO-3 relay set

**DO3**  
Status: Bad::NonSpecific:NotLimit  
DO3: ☒ Stop, ☐ Close, ☐ Open, ☐ Position enable, ☐ DO-1 relay set, ☐ DO-2 relay set, ☐ DO-3 relay set, ☐ DO-4 relay set

**DO4**  
Status: Bad::NonSpecific:NotLimit  
DO4 - function set by mode selection: ☐ Custom, ☐ Custom, ☐ Custom, ☐ Custom, ☐ Custom, ☐ Custom, ☐ Custom, ☐ Custom

With the mode set to Single bit, the page will show each block and the single bit that they can represent. Multiple blocks can be used in this mode.

**DO1**  
Status: Bad::NonSpecific:NotLimit  
DO1: ☐ Close

**DO2**  
Status: Bad::NonSpecific:NotLimit  
DO2: ☐ Open

**DO3**  
Status: Bad::NonSpecific:NotLimit  
DO3: ☒ Stop














































**DO4**  
Status: Bad::NonSpecific:NotLimit  
DO4 - function set by mode selection: ☐ Custom

It is possible to swap modes using the Control Mode Setup page.











**Note:** the Transducer block needs to be in OOS for changed to the Control Mode, and should be returned to the previous mode after the setting is made.

## Online Parameterisation - Digital Input Block (Feedback)










The digital Input Block screen has 2 forms dependant on the Discrete control mode setting. With the mode set to Multiple bit, the page will show each block and the multiple bits that they can represent. In our example here we have a General alarm which is caused by a low battery and the monitor relay – set as the unit is in LOCAL. This is an alarm because the unit is not available for control.

<b>D11</b> Status  Good_NonCascade::NonS ▼ D11 <ul style="list-style-type: none"> <li> Close limit</li> <li> Open limit</li> <li> Actuator moving</li> <li> Actuator closing</li> <li> Actuator opening</li> <li> Selector in REMOTE</li> <li> Selector in LOCAL STOP</li> <li> Selector in LOCAL</li> </ul>	<b>D14</b> Status  Good_NonCascade::NonS ▼ D14 <ul style="list-style-type: none"> <li> General alarm</li> <li> Thermostat tripped</li> <li> Monitor relay</li> <li> Valve obstructed/jammed</li> <li> Partial stroke alarm</li> <li> Manual movement</li> <li> Battery low</li> <li> Watchdog recovery/fail</li> </ul>
<b>D12</b> Status  Good_NonCascade::NonS ▼ D12 <ul style="list-style-type: none"> <li> Open limit</li> <li> Close limit</li> <li> Actuator opening</li> <li> Actuator closing</li> <li> Not in remote</li> <li> General alarm</li> <li> Valve obstructed</li> <li> Valve jammed</li> </ul>	<b>D15</b> Status  Good_NonCascade::NonS ▼ D15 <ul style="list-style-type: none"> <li> Actuator moving</li> <li> D11 - open input</li> <li> D12 - close input</li> <li> D13 - stop input</li> <li> D14 - ESD input</li> <li> Open interlock active</li> <li> Close interlock active</li> <li> Partial stroking</li> </ul>
<b>D13</b> Status  Good_NonCascade::NonS ▼ D13 <ul style="list-style-type: none"> <li> Selector in REMOTE</li> <li> Selector in LOCAL STOP</li> <li> Selector in LOCAL</li> <li> MIT/Interrupter active</li> <li> Open interlock active</li> <li> Close interlock active</li> <li> Position control enable</li> <li> Slow mode</li> </ul>	

With the mode set to Single bit, the page will show each block and the single bit that they can represent.

DI1		DI4	
Status	 Good_NonCascade::NonS ▼	Status	 Good_NonCascade::NonS ▼
DI1	 Close limit	DI4	 General alarm
DI2		DI5	
Status	 Good_NonCascade::NonS ▼	Status	 Good_NonCascade::NonS ▼
DI2	 Open limit	DI5	 Actuator moving
DI3			
Status	 Good_NonCascade::NonS ▼		
DI3	 Selector in REMOTE		

After replacing the battery and putting the unit in remote, there are no alarms.

DI4	
Status	 Good_NonCascade::NonS ▼
DI4	<ul style="list-style-type: none"><li> General alarm</li><li> Thermostat tripped</li><li> Monitor relay</li><li> Valve obstructed/jammed</li><li> Partial stroke alarm</li><li> Manual movement</li><li> Battery low</li><li> Watchdog recovery/fail</li></ul>



*<http://www.rotork.com>*

Rotork reserves the right to amend and change specifications without prior notice.

Published data may be subject to change

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