

## ***Using the F809F Fieldbus diagnostic module with the Yokogawa CS3000***

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**Introduction**

This technical support note is intended to give the user an understanding of how to integrate the F809F diagnostic module into the CS3000 from Yokogawa.

**References**

**INM F809F** FOUNDATION fieldbus diagnostics module manual.

*FOUNDATION fieldbus is a trademark of the Fieldbus Foundation*

**Overview**

This document is intended to provide details of how the F809F module easily integrates into the Yokogawa control platform and PRM. The F809F fieldbus module monitors the health of fieldbus segments and provides an indication of possible network failure.

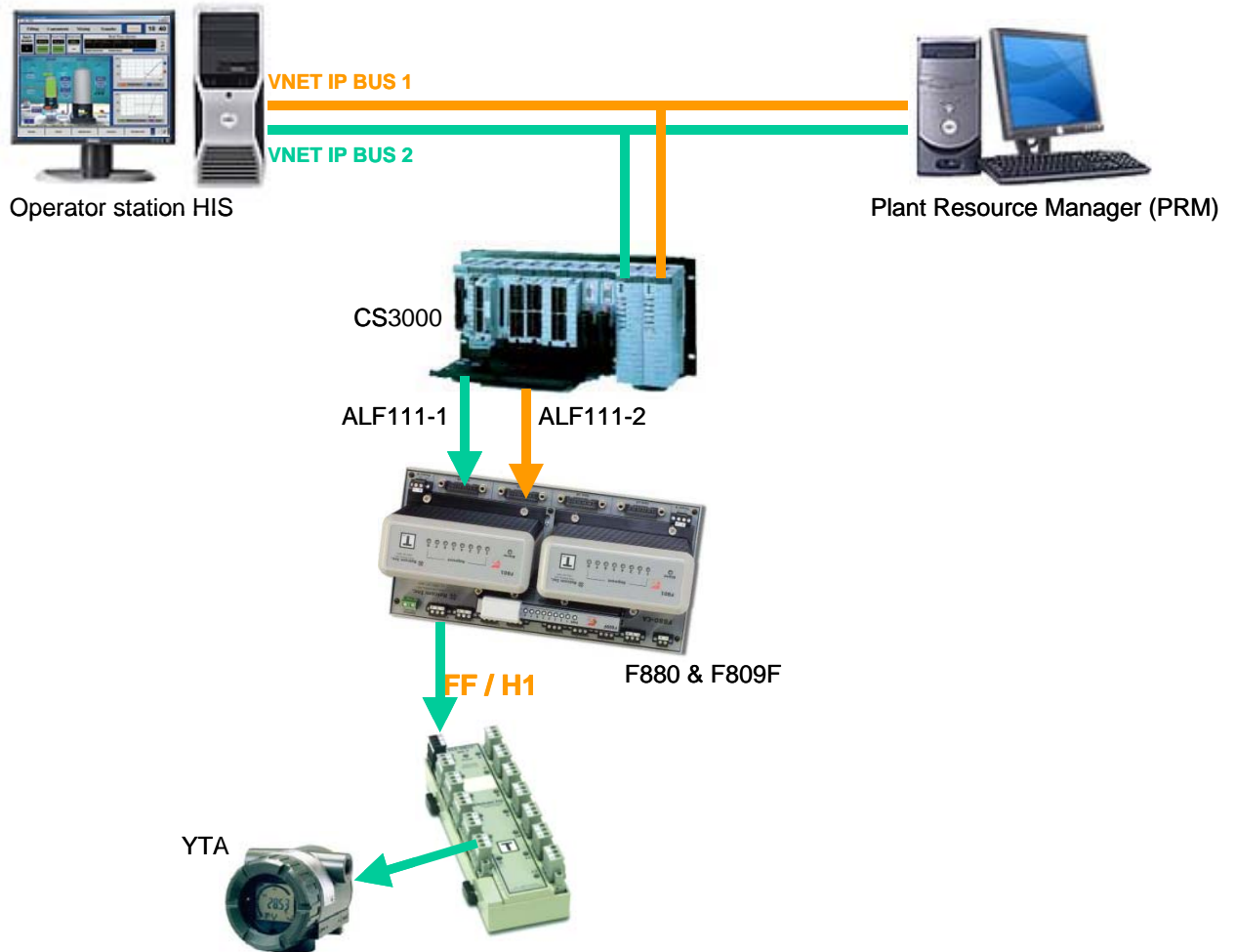
The Technical Support Note provides a detailed description of the many options for integration of the F809F diagnostic module into the Yokogawa system.

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# 1 Hardware Requirements / Installation

## 1.1 Installation for communication



## 1.2 Configuration of fieldbus communication segment

The F809F is shipped preconfigured to communicate on segment 8.

The communication segment that will be used may be changed by configuring the connector on the front face of the module. A 6 pin comb, supplied with the module is used to define the communication segment by inserting it into one of the two ways into the connector.

For communication on segment 8, place the comb in the connector so that the number 8 is visible on the top left surface.

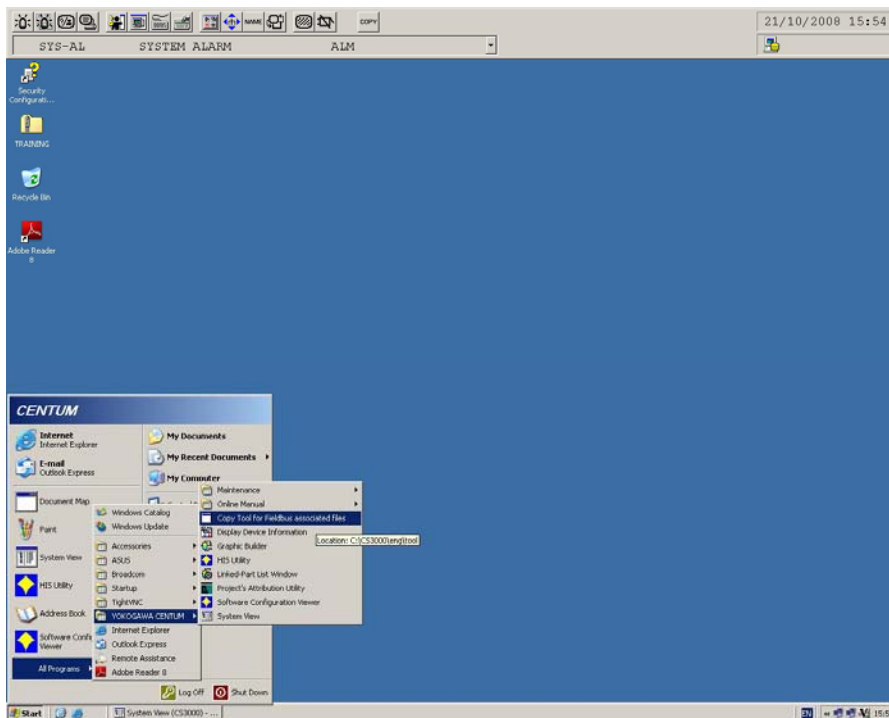
For communication on segment 1, place the comb in the connector so that the number 1 is visible on the top left surface.

For communication on a separate segment, remove the comb and connect the segment to connections 3+4 in the top connector or, in some cases, through dedicated connectors on the carrier. See INMF809F for further details.



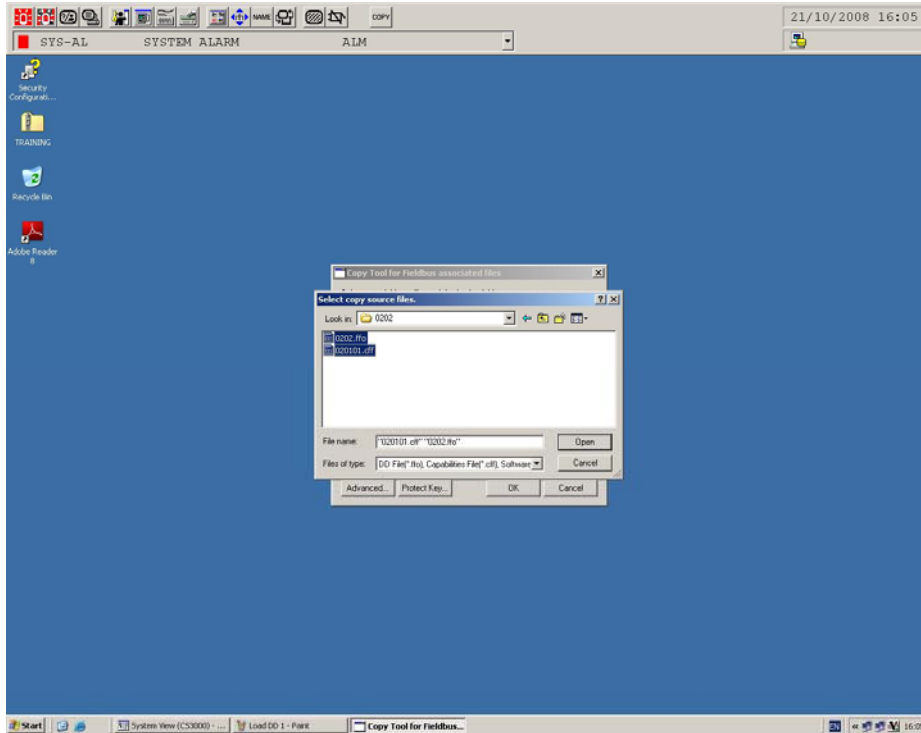
## 2 DD File: Tool for Fieldbus associated files

To load the DD file in the CS3000 we need to launch the Fieldbus associated files tool. To do so click on Start – Alls Programs – YOKOGAWA CENTUM – Copy Tool for Fieldbus associated files



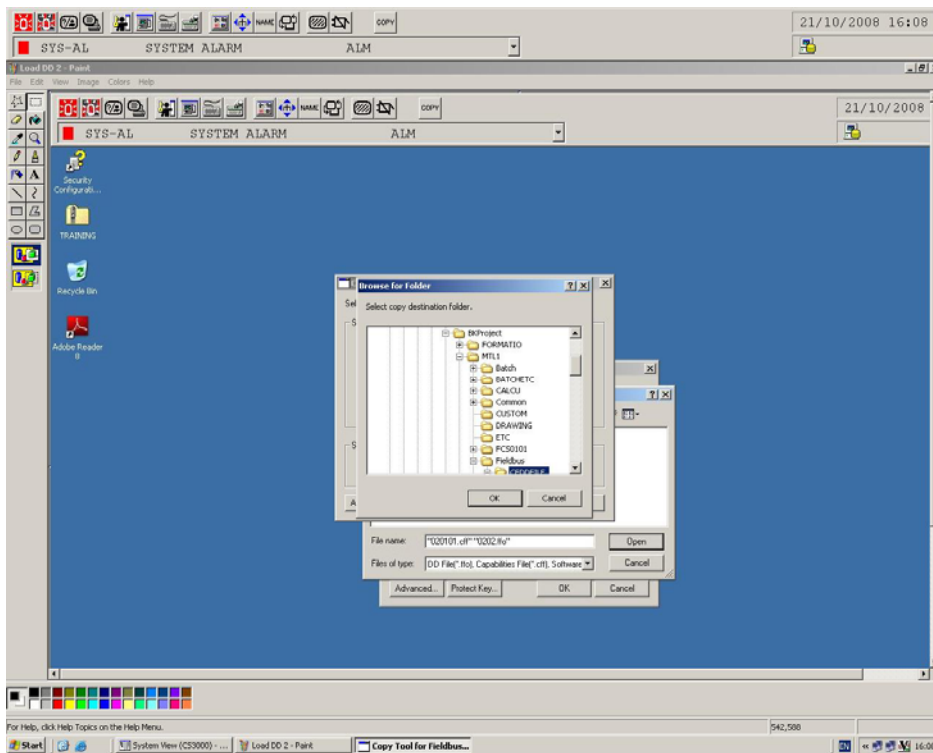
*Launch the DD Tool from windows*

Select the source files, you should select here the FFO and the CFF files



Select FFO and CFF files for the FF device

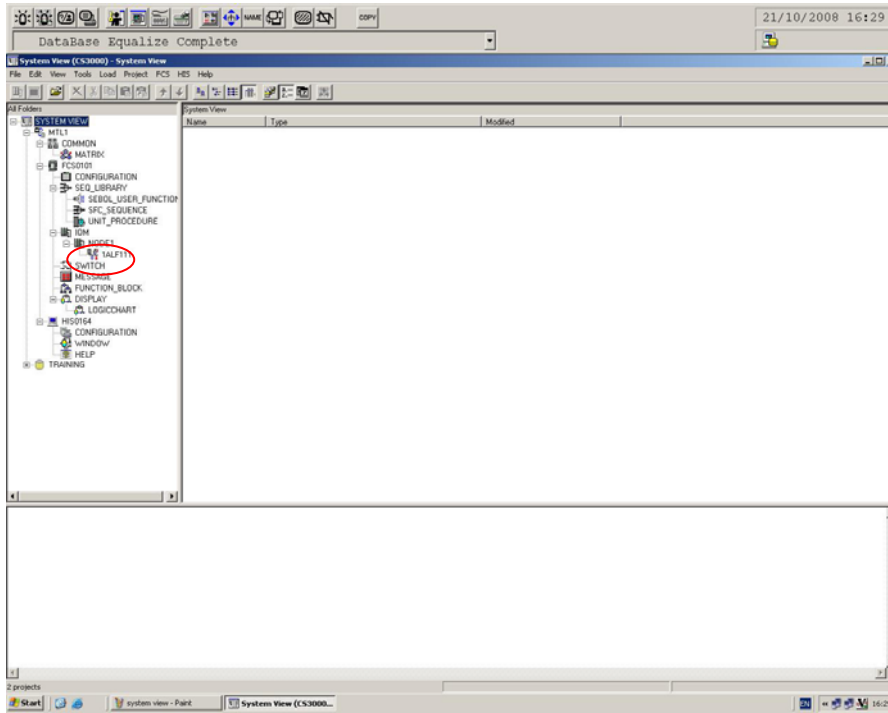
And choose the destination folder. The destination folder is the CFDDFILE in your project directory.



Project directory *c:\CS3000\bkproject\mtl1\fieldbus\cfddfile*

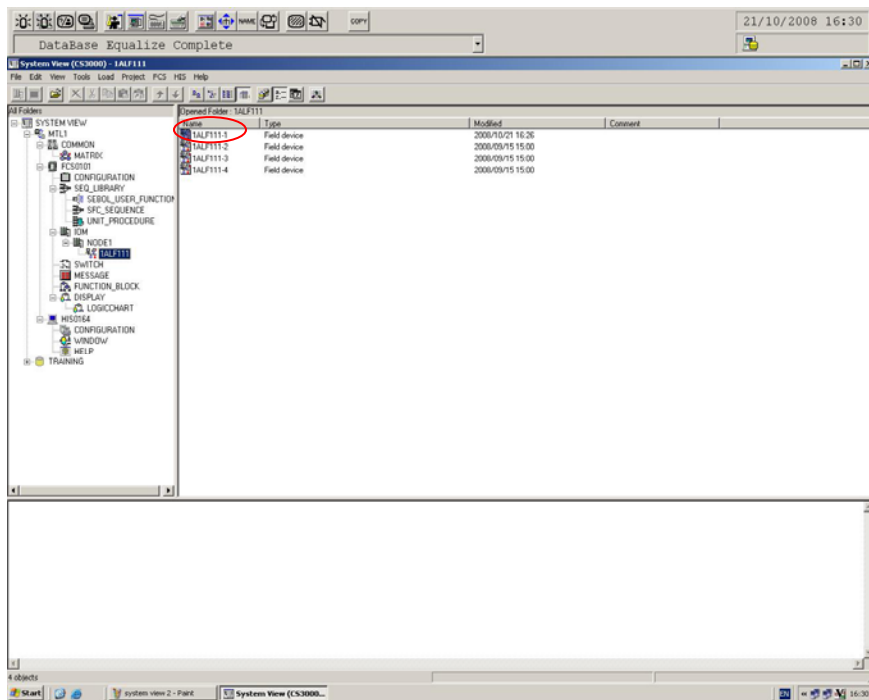
### 3 Workstation and controller configuration

System view is the engineering tool where you will configure the Hardware, the Fieldbus Module, the I/O and where you will launch different tools to develop the control strategy, build the graphic windows and configure the FOUNDATION fieldbus™ H1 segment.



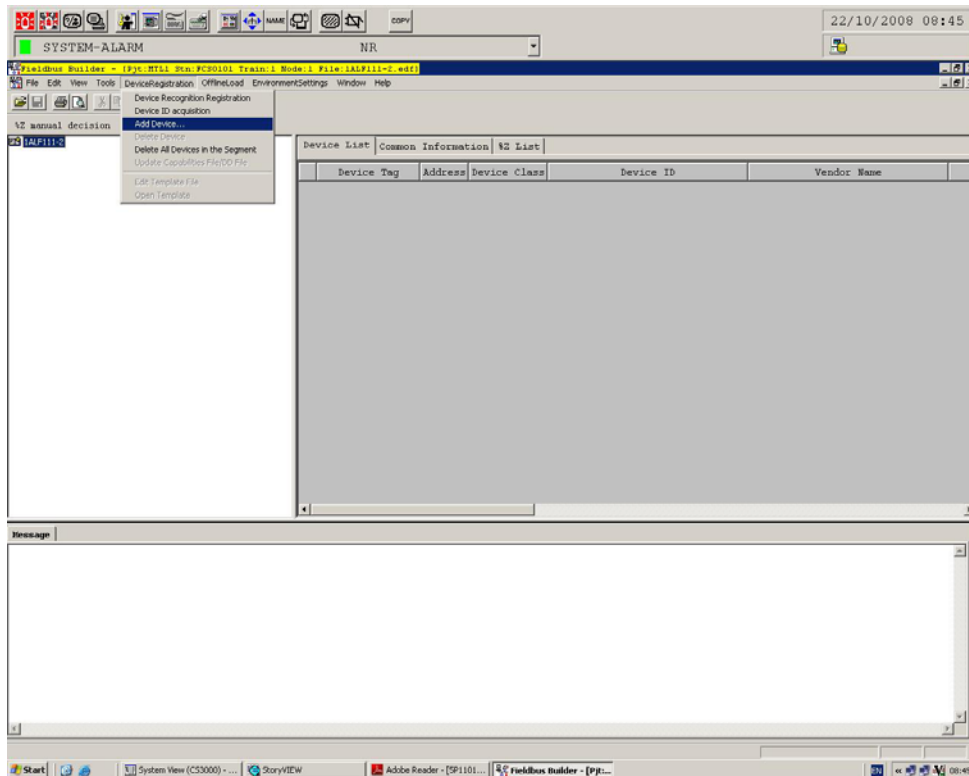
System view

Once you have added the ALF111 Fieldbus communication card, double click on the ALF111-1 icon in order to launch the Fieldbus Builder.



System view – ALF111-1

Fieldbus Builder is the tool that will allow you to do the segment management and the device registration.



Fieldbus Builder

## 4 Fieldbus devices

### 4.1 Fieldbus Devices General Information

Each fieldbus device must have a unique physical device tag and a corresponding network address. The device tag is assigned to the device when it is commissioned and (for most devices), the device retains the tag in its memory when it is disconnected. The network address is the current address that the fieldbus is using for the device. The Fieldbus Foundation uses addresses in the range 0-255.

**Basic device** - sends and receives messages on the fieldbus but does not control when devices have access to the fieldbus. The F809F diagnostic module is a basic device.

**Link Master** - controls when devices access the fieldbus and executes the link schedule which synchronizes communications with function block execution on the fieldbus. Link Master devices are capable of taking over as LAS if the Primary Link Master device fails.



## 4.2 Device Descriptions and Methods

### 4.2.1 Device Description

A Device Description is similar to a driver for a device. For fieldbus devices, the Device Description includes the calibration procedures, parameter procedures, and other information required by the control system to communicate with the fieldbus device. The host system such as the CS3000 system uses library functions called Device Description Services to read the Device Descriptions. Device Description technology enables interoperability among fieldbus devices. Interoperability, a key benefit of fieldbus technology, is the ability of a host system to operate multiple devices, independent of manufacturer, on the same fieldbus segment without loss of minimum functionality.

The CS3000 system supports a number of fieldbus devices from different manufacturers. The device description files necessary to support these devices are included in the CS3000. If a fieldbus device is not included in the CS3000, you must install the device description for that device. The device description is specific to the device type and revision.

### 4.2.2 Methods

Device Descriptions can also include a set of processing routines called Methods. Methods provide a way to access and manipulate parameters within a device. For example a DD for a Valve Controller might include methods for automatically calibrating valve travel, manually calibrating travel, restarting a device, and calibrating the internal pressure sensor information for display. Methods are available from the DD viewer in PRM.

There are 3 configuration methods available in the MTL F809F Systems Transducer block.

- o Setting Date and Time
- o Resetting retransmission counter
- o Deleting device data

## 4.3 Autosensing Fieldbus Devices or manual registration

The H1 card automatically detects the fieldbus devices, recognizes the device types, and makes this information available to the CS3000.

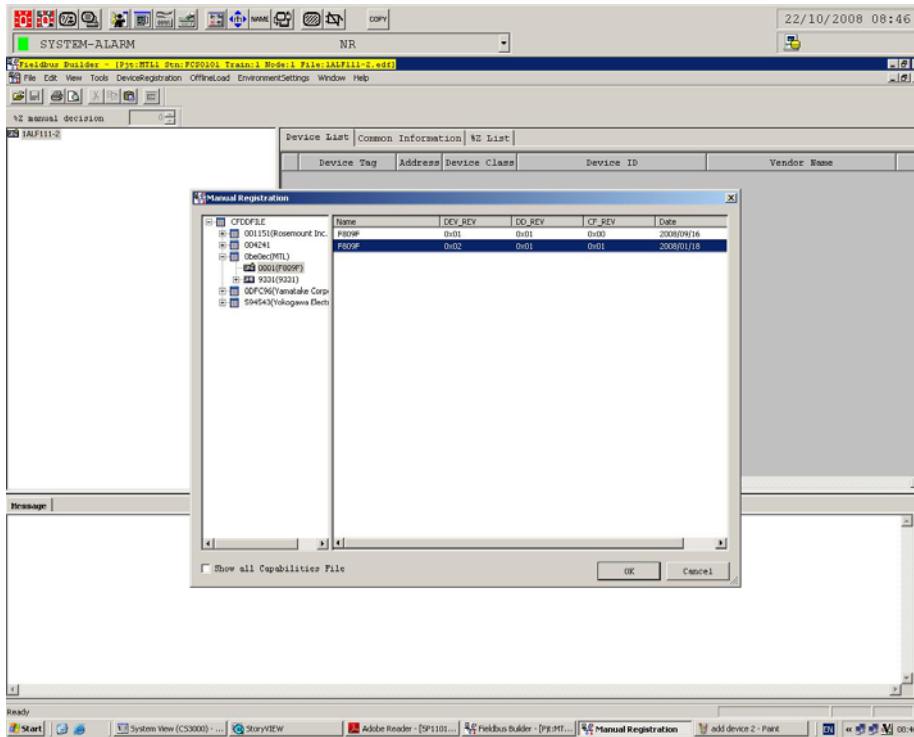
By default the CS3000 is configured with a value of 4 for the MaxResponseDelay some devices needs more than 4 and will not be automatically detected. In this situation the user needs to add the device manually .

The F809F for example needs a value of 5 for the MaxResponseDelay and by default will not be detected by the CS3000 such devices need to be installed manually in the CS3000 or we need to manually change the MaxReponseDelay to 5 first.

Manual registration of Fieldbus devices can be carried out even when the Fieldbus devices are not connected to Fieldbus segments.

The following steps explain the sequence of manual registration by going through each procedure.

In Tree View of Fieldbus Builder, select the segment to which a Fieldbus device is to be added by clicking the right mouse button in order to display the pop-up menu and select [Add Device]. Alternatively, select the segment and then [Add Device] from the [Device Registration] menu. The "Manual Registration dialog box" is displayed. (see screenshot)

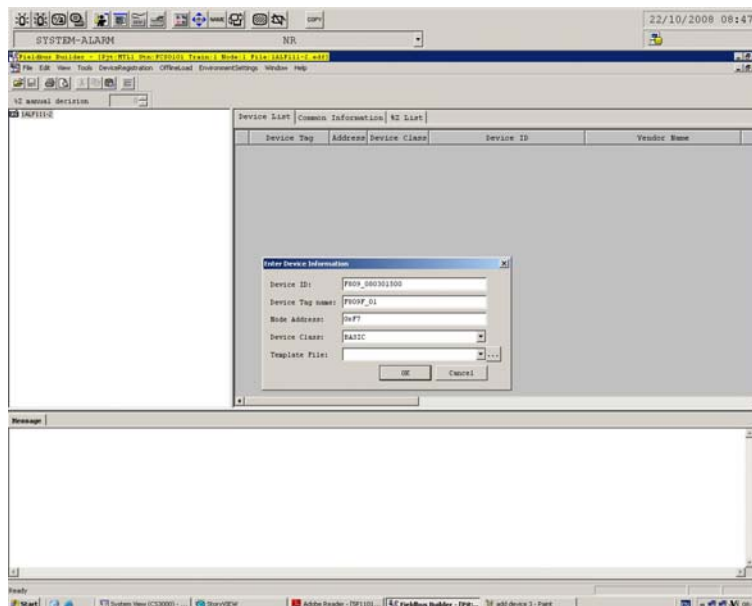


Manual registration

Tree View on the left side of the “Manual Registration dialog box” displays folders where capabilities files are stored along with sub-folders, etc. Select “Manufacturer ID” so that “Device Type” will be expanded and displayed, for the F809F select 0BE0EC (MTL) and select 0001 (F809F).

A list of Fieldbus devices that can be registered is in the list on the right side. The figure above shows the “Manual Registration dialog box” that displays the Fieldbus device list.

Select the device to be registered from the displayed Fieldbus devices and click the [OK] button. The Enter Device Information dialog box is displayed



Device ID

Enter the device ID. This information is required when performing tag assignment. It is also acceptable to keep the device blank.

Device Tag Name

Enter the device tag name of the selected device.

Node Address

The node address of the selected device is displayed. Change this information as necessary. In normal cases, it is not necessary to change this information.

Device Class

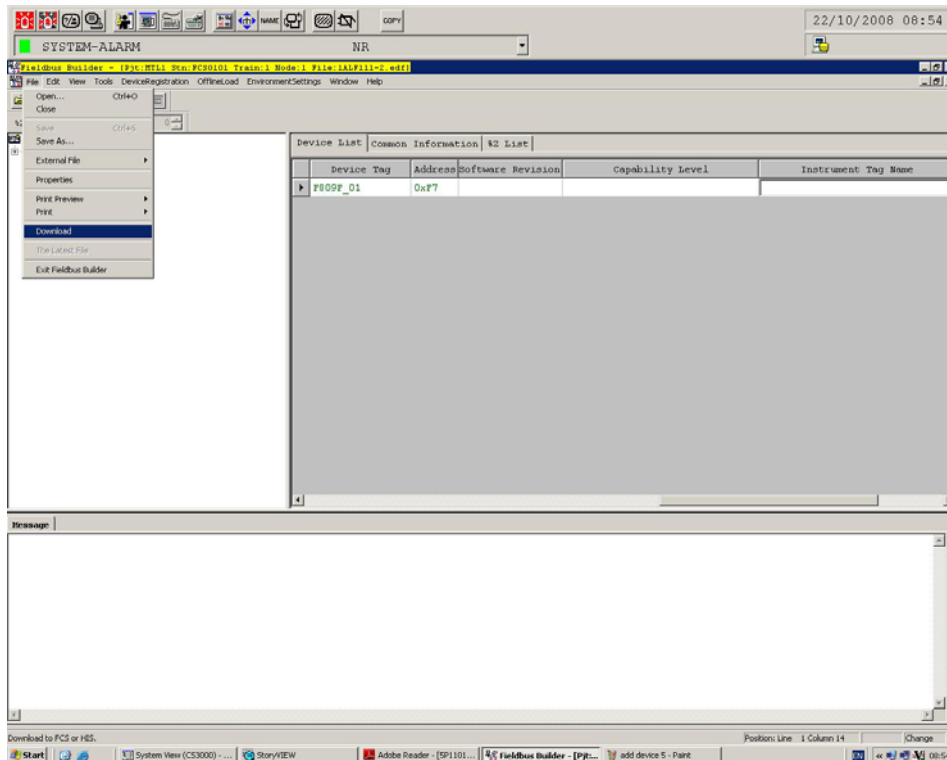
The device class of the selected device is displayed. This value indicates the communication ability of the Fieldbus device. Change this value as necessary. In normal cases, it is not necessary to change this value.

Template File

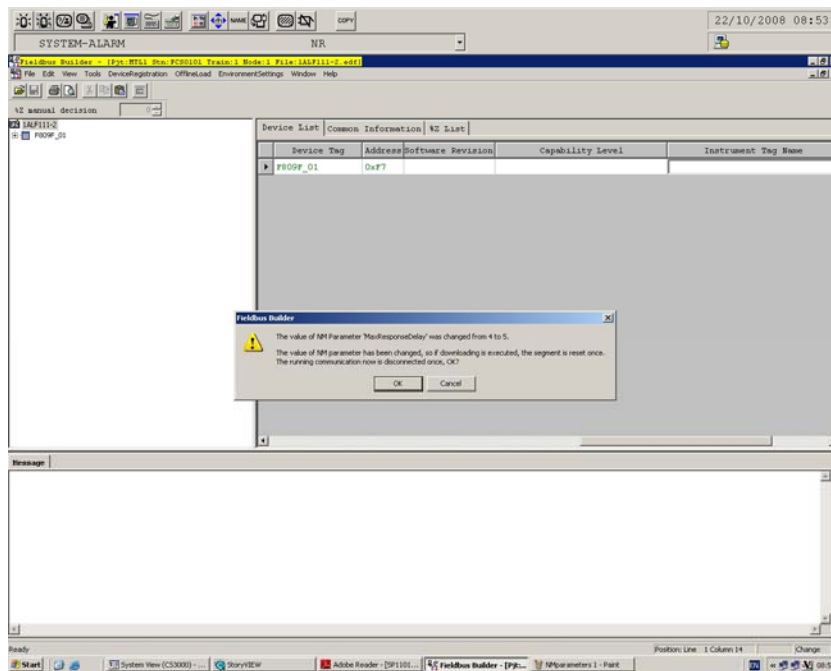
The default template file will be displayed. However, a different template can be selected if required.

When a device is added, the NM parameter value is recalculated according to the capability of the device described in the capability file. If the calculation results in a change to a lower capability (the value becomes larger), a dialog box to confirm the device addition is displayed. Select [Yes] to add the device, and [No] to cancel the device addition. If the calculation results in a change to a higher capability, the current value rather than the result of the recalculation, is used to register the device.

If the capability becomes lower when [Make NM Parameter the optimum value] is designated in the Environment Settings dialog box, the parameter cannot be automatically changed even by selecting [Yes]. The registration will be cancelled automatically in this case. If the capability becomes higher, the device is registered.

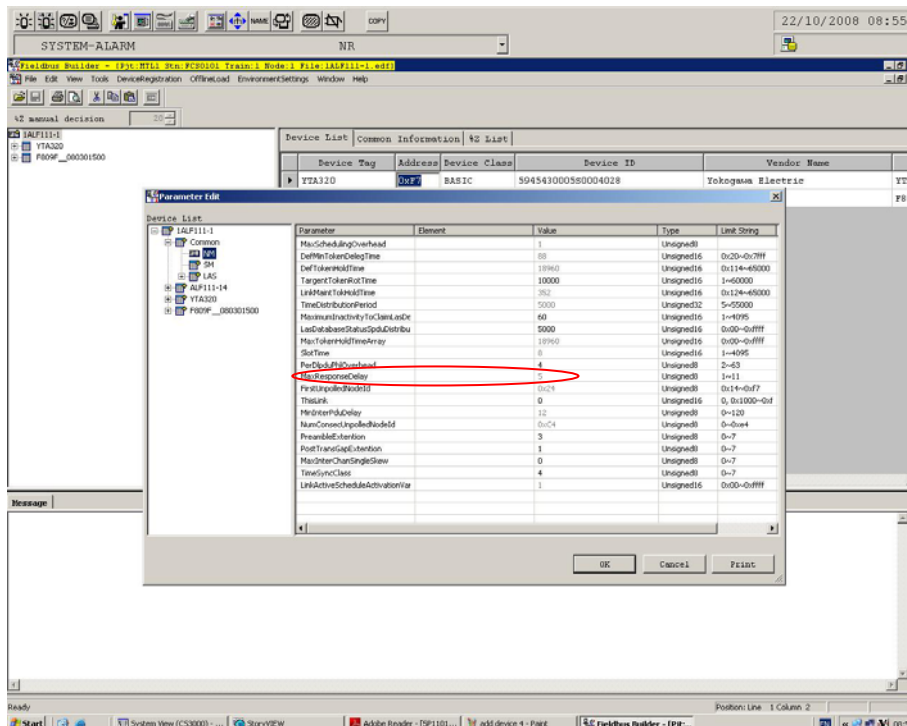


*Download the configuration*

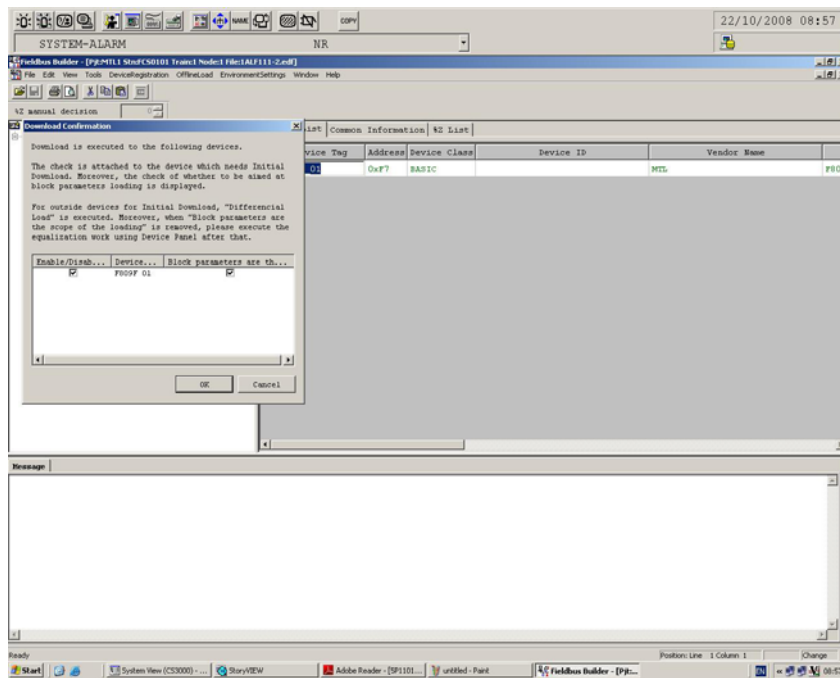


Change MaxResponse Delay, click OK

To see what the setting is for the MaxResponse delay time, select the segment number in the Fieldbus Builder expand Common and select NM. It should be set to 5 when you use the F809F.



NM parameters



Download options, check both boxes

Offline download and download to the fieldbus devices have different meanings. Moreover, offline initial download and offline master data download are also different.

The details as well as the downloading operations are explained as follows.

Offline master data download means to download all the configuration data on the fieldbus builders and function block builders to the fieldbus device.

Offline initial download means to import the local parameters of the fieldbus device first to the fieldbus builder and then to download the configuration data on the fieldbus builders and function block builders to the fieldbus device.

Initial download is used for the first time downloading to the fieldbus device after the fieldbus device is connected. With the template of the fieldbus device, the initial downloading can be performed according to the equalization directions described in the template.

When changing environment, the tag assignment, address assignment can be performed for offline download. Thus, the offline download can be performed to a segment, a field device or a function block.

## 4.4 PRM setup tool

Logon Windows using an account with the Administrator privilege.

Click [Start] > [All Programs] > [YOKOGAWA PRM] > [Tools] > [PRM Setup Tool] to start PRM Setup Tool.

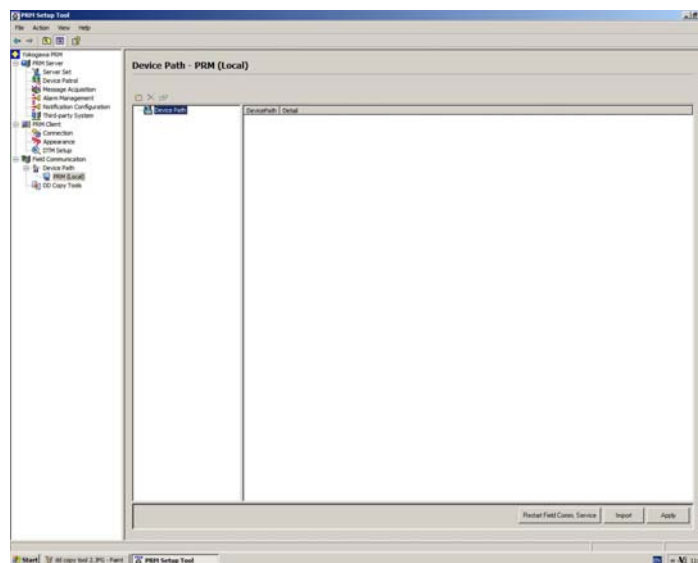


*Start PRM Setup Tool*

### 4.4.1 Setup Device Path

The Field Communication Server connects the field devices through the communication path which is defined by device path.

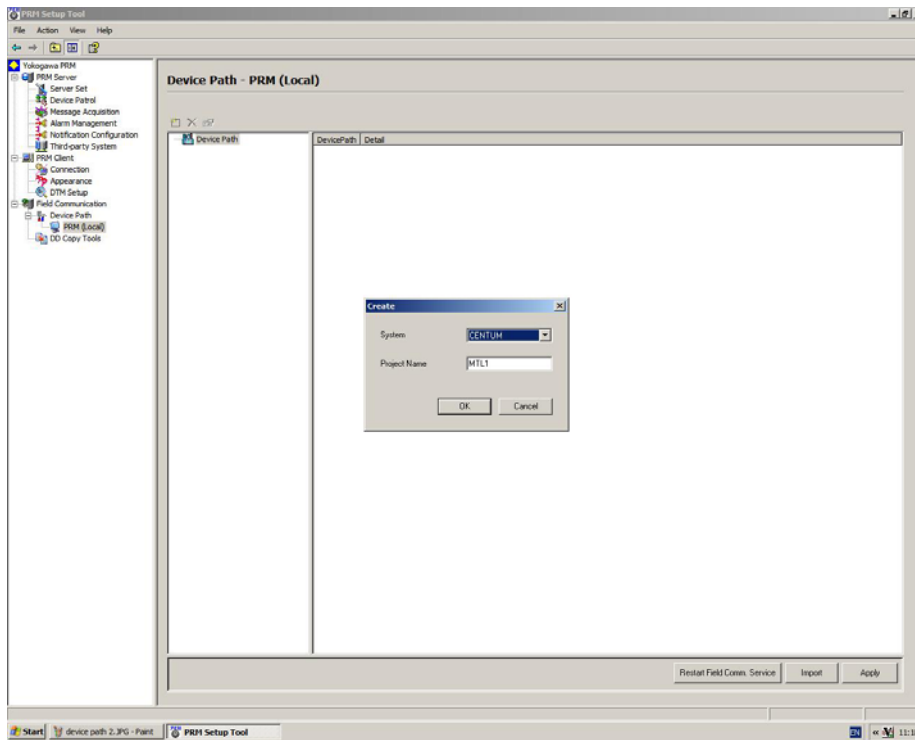
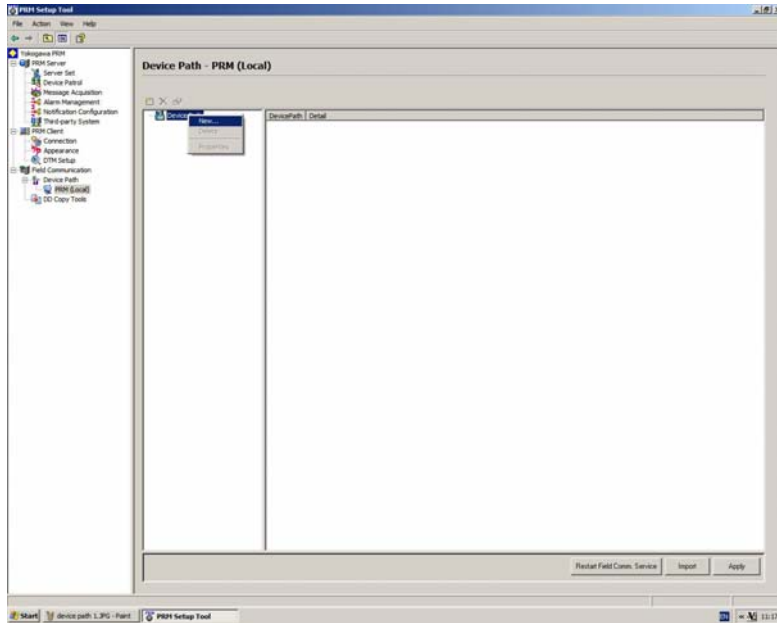
In the left pane of PRM Setup Tool, select [Yokogawa PRM] > [Field Communication] > [<Device Path>] to display the window for setup the device path



*Device Path*

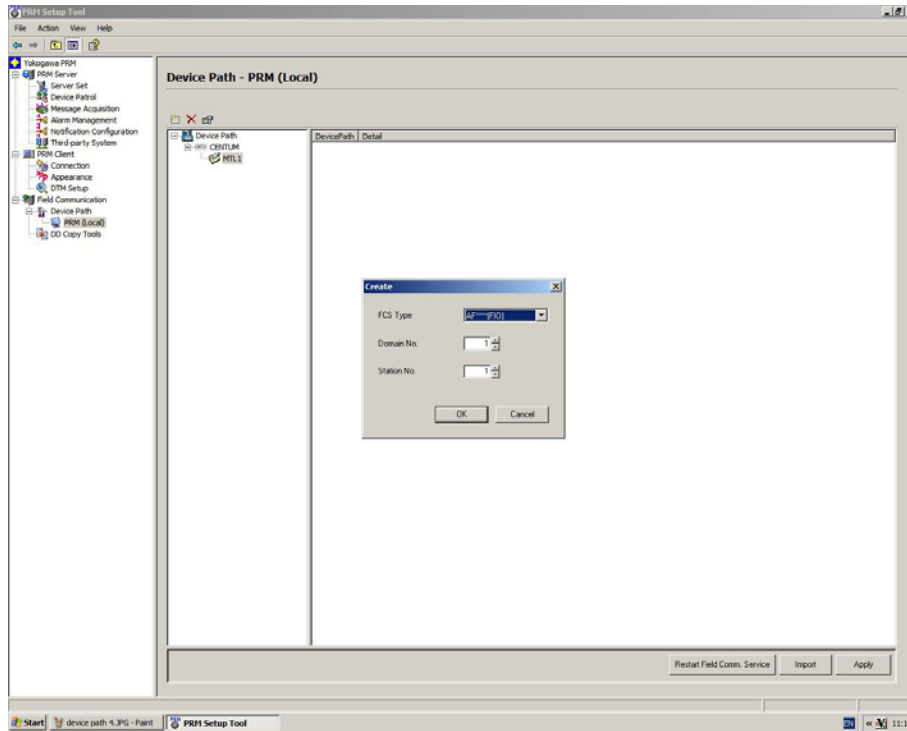
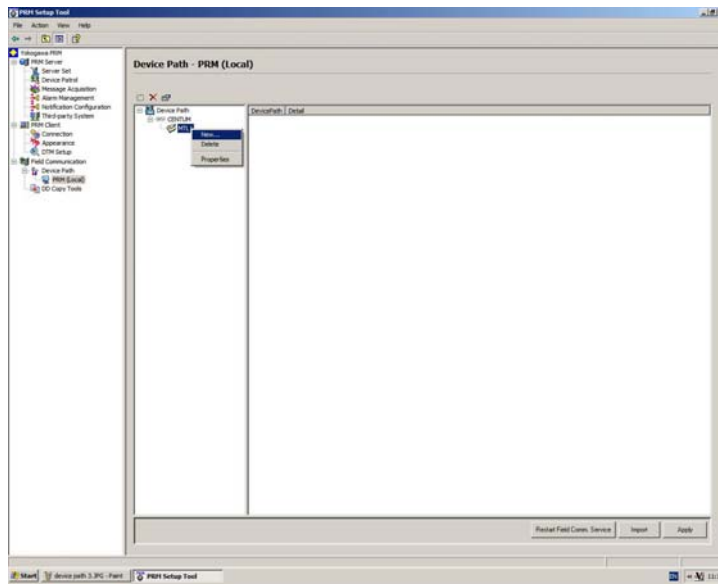
Right Click on Device Path and select New

Add the system type and the project name. The project name should be the same as the CS3000 project name (MTL1) and click OK



*Create the system and project configuration*

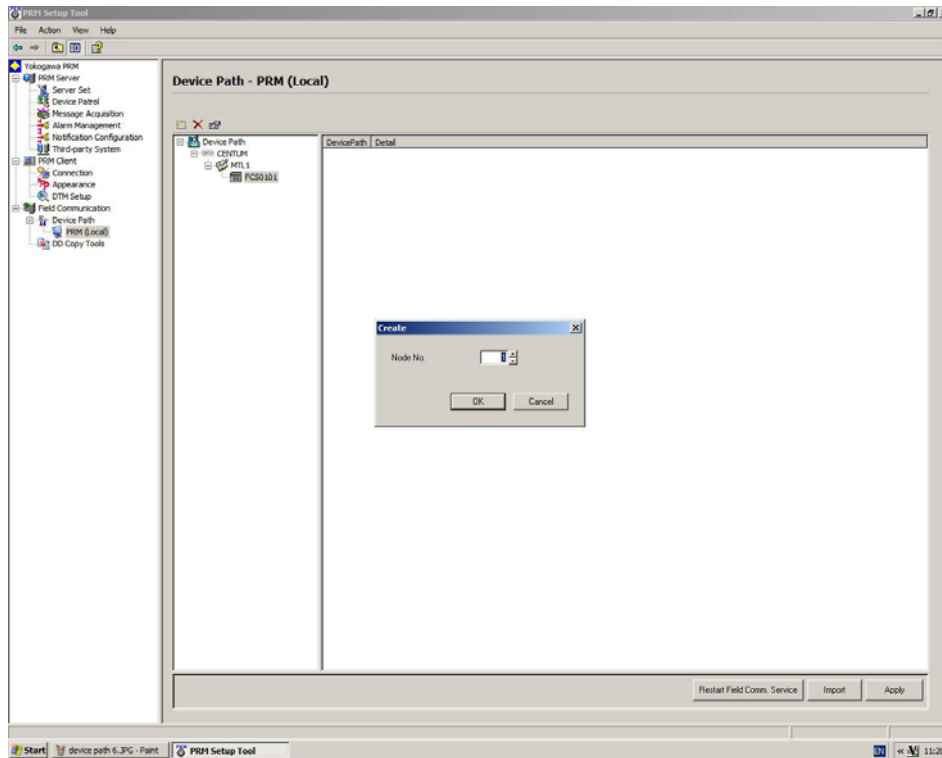
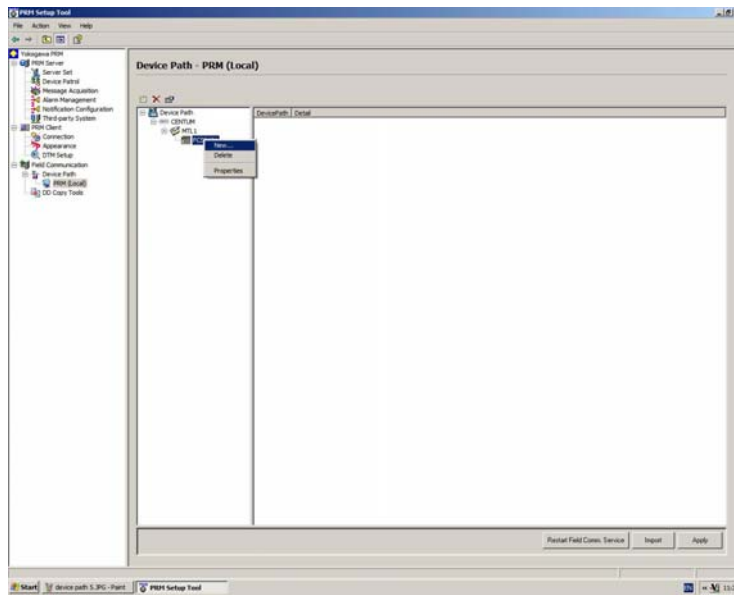
Right click on the project name (MTL1) and select New.  
Choose the FCS type, enter the domain and the station number of the FCS  
Click OK



*FCS type, Domain and Station number*

Right click on the FCS select New.  
 Create the Node Number (1) and click OK





*Add the Node*

To add a new I/O module in the newly-created node, right-click on the node and select [New].

Select [ALF111] in the IOM Type drop-down list.

Enter the slot number of the ALF111 in the [Slot No.] field.

Click [OK].

An ALF111 I/O module appears under the node, with four channels automatically created.

To save the change to the device path configuration file, click [Apply].

### 4.4.2 DD Copy tool

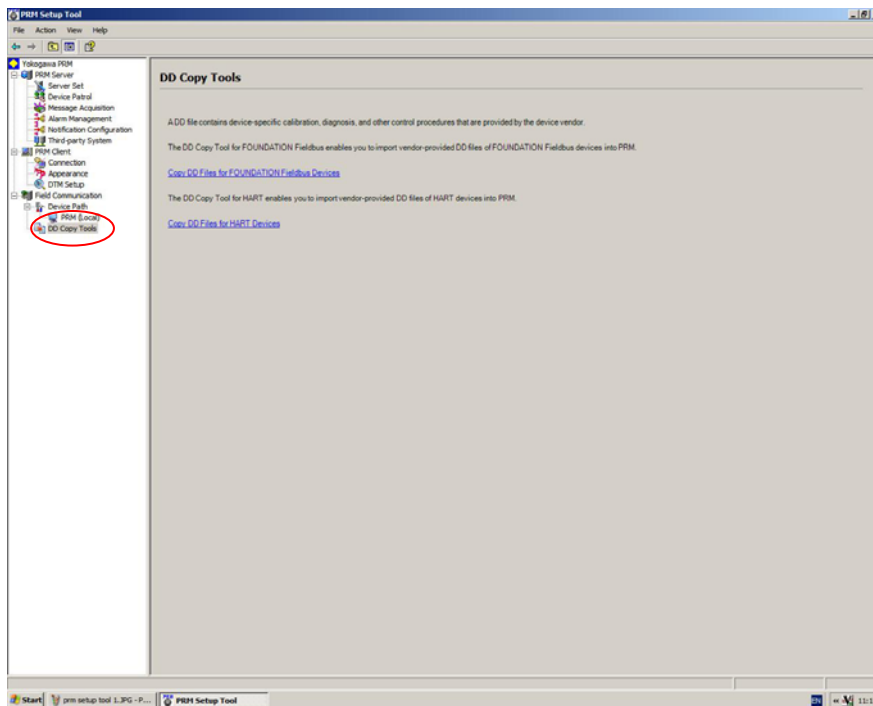
DD files for FF-H1 devices that are available from the Fieldbus Foundation™ at the time of shipment of your PRM product are included in the PRM installation disks and will be copied to the computer when PRM is installed.

You can use the DD Copy Tool for FOUNDATION fieldbus Devices to:

- Update existing DD files to the latest versions.
- Import new DD files that are not bundled in the PRM installation discs.

This tool is available on a computer installed with PRM Client or Field Communications Server:

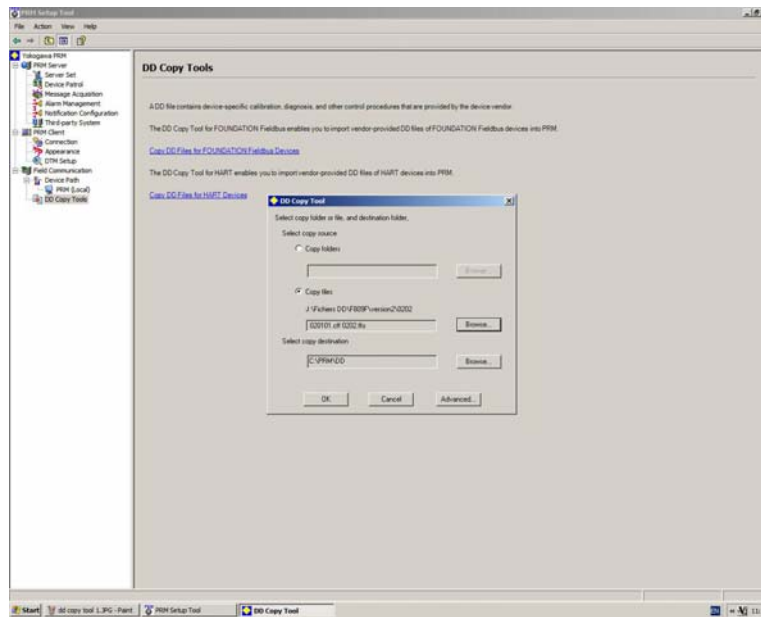
To copy DD files for FF-H1 devices launch the PRM setup tool again as describe earlier and select the DD Copy Tools program.



1. In the left pane, select [Yokogawa PRM] > [Field Communication] > [DD Copy Tools].

2. In the right pane, click [Copy DD Files for FOUNDATION fieldbus Devices].

The following dialog box appears.



DD Copy tool

Specify whether to copy files or a folder.

- When [Copy folders] is selected:

All subfolders and files in the selected folder will be copied to the copy destination folder.

- When [Copy files] is selected:

A subfolder will be automatically created in the copy destination folder in accordance with the FOUNDATION fieldbus specification, and DD files will be copied to this subfolder.

Select files or folders to copy from.

- When [Copy folders] is selected:

Clicking the [Browse] button will open the Browse for Folder dialog box. Select the top folder to copy from.

- When [Copy files] is selected:

Clicking the [Browse] button will open the Select Copy Source Files dialog box. You can select DD files (\*.ffo) and capability files (\*.cff) of names conforming to the FOUNDATION fieldbus specification. You can select multiple files to be copied.

Each DD file (\*.ffo) must have a symbol file (\*.sym) of the same name.

Select a copy destination folder.

The top directory for installing DD files is already entered by default.

- When [Copy folders] is selected:

Specify the destination folder

- When [Copy files] is selected:

Specify “<PRM installation folder>\DD.” Normally, you need not change the default directory.

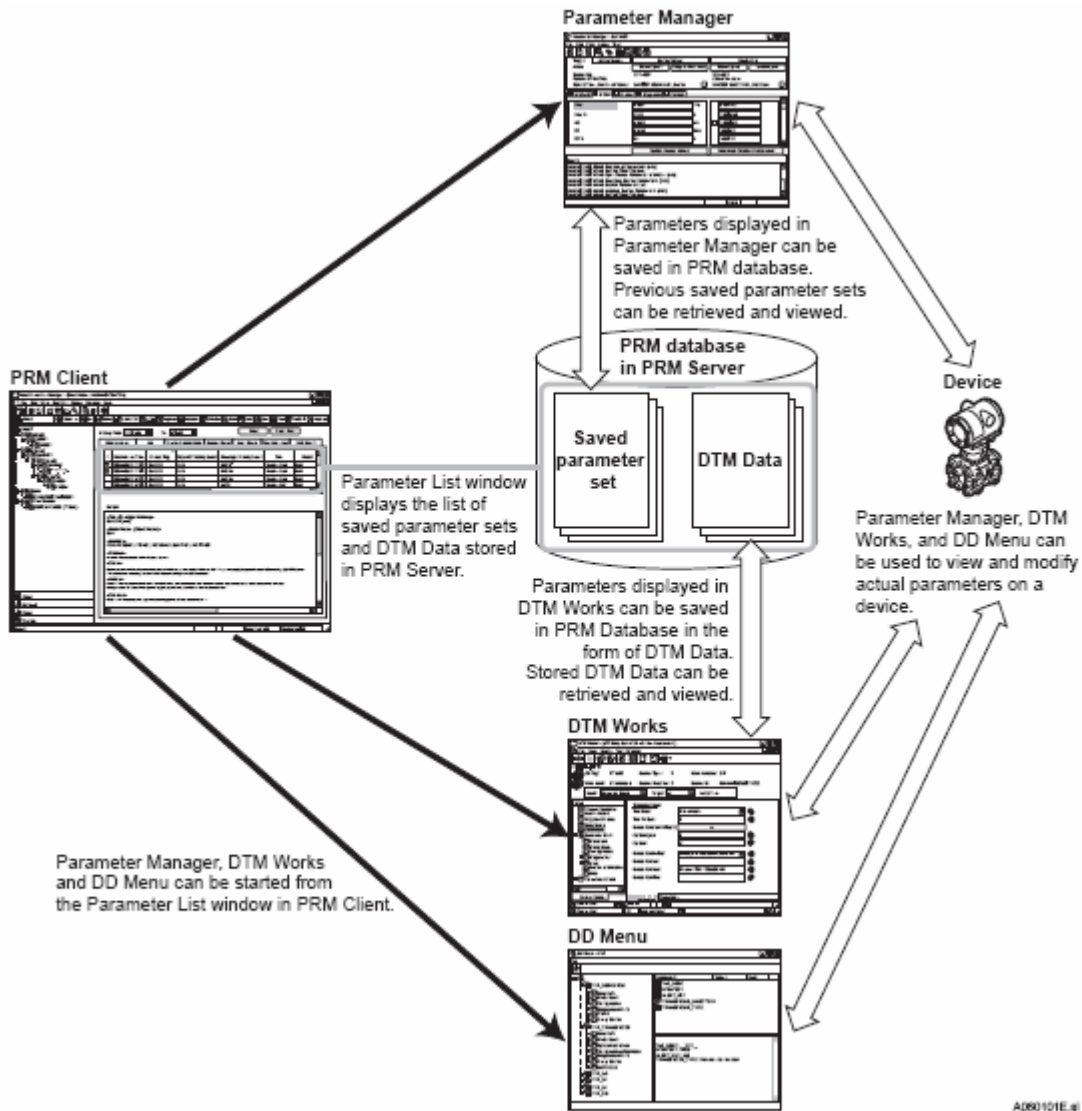
If the setting is correct, the selected files or folders will be copied to the copy destination. Select the [OK] button.

The files or folders will be copied. If any folder or file of the same name already exists in the copy destination, an overwrite confirmation dialog box will appear. Check the message, and select whether or not to overwrite the existing folder/file.

### 4.5 Plant Resource Manager

PRM provides the following functionalities for performing online adjustments of device parameters. The word “online” means that adjustments can be performed remotely using PRM Client, without having to be at the physical location of the device.

- Parameter Manager
- Device Type Manager (DTM) Works
- DD menu



Relationships between parameter adjustment features

#### 4.5.1 Device registration method

You need to register a device before you can manage it on PRM. Upon registration, the device appears in the Device Navigator, and you can use various PRM functions applicable for that device. This chapter describes the various methods to register devices.

#### Plug & Play

Plug & Play is a PRM feature that automatically detects field communication devices connected to PRM through the Field Communications Server, and registers the devices in PRM. Plug & Play also reads the device paths on the field network, and represent them as device path hierarchy nodes on the Network view, which detected devices placed under the appropriate device path hierarchy nodes.

Plug & Play is the most convenient method to register devices as the system reads in all required information and performs device registration at the same time. You do not need to do any manual data entry after running Plug & Play.

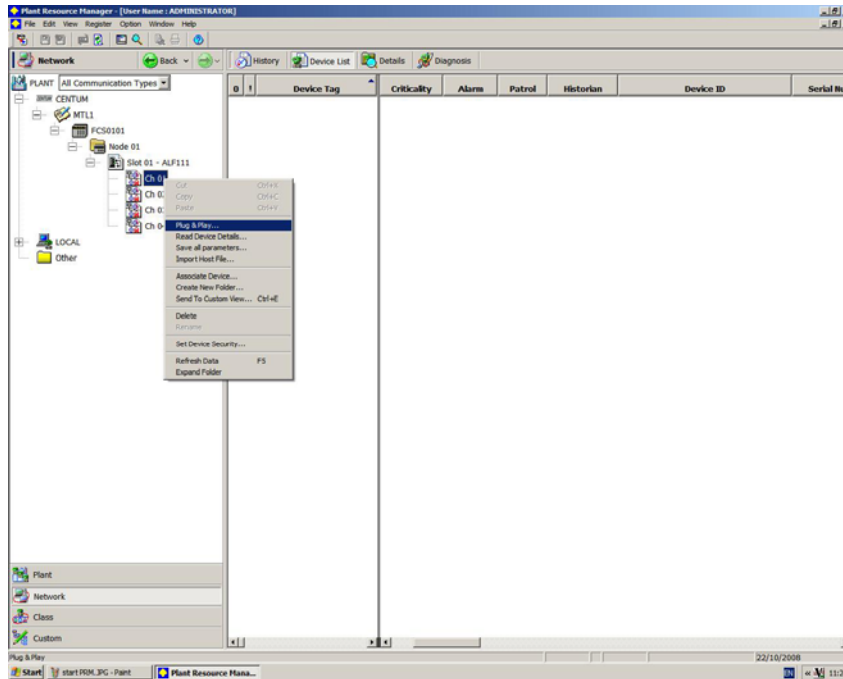
Follow these steps to run Plug & Play:

Click [Network] in the Device Navigator toolbar.

The Device Navigator displays the Network view.

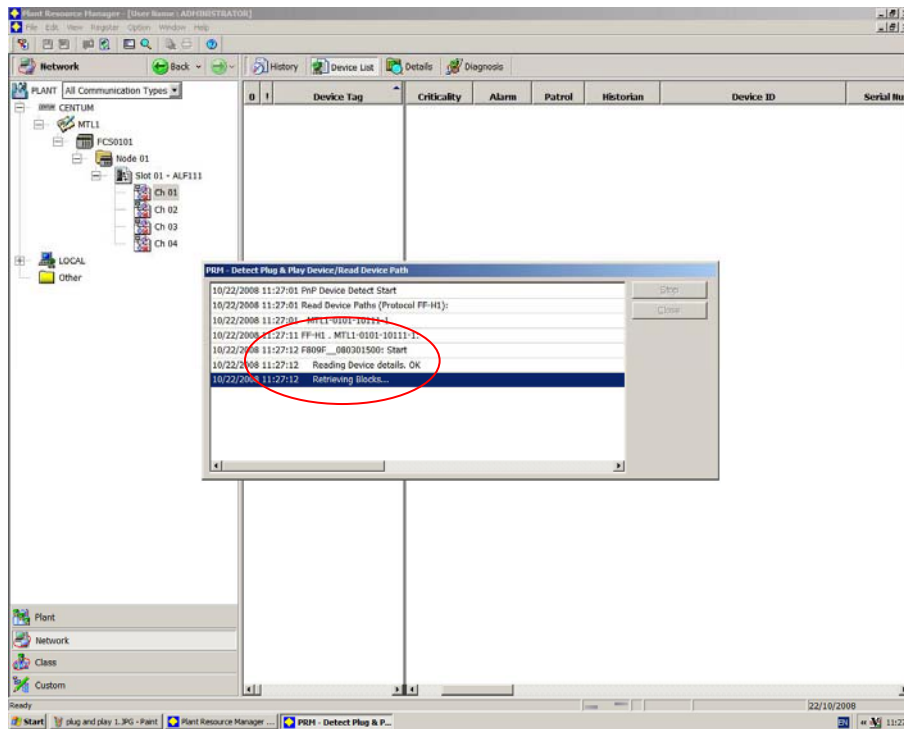
Select the PLANT node, and select [Foundation Fieldbus] if you only want to perform Plug & Play for FF-H1 devices.

Select the device node for which you want to do Plug & Play. PRM performs Plug & Play for the selected node and all its child nodes. You can also select only the ALF111 card where you want to perform the Plug & Play or the segment as shown below.



*Plug and Play*

Plug & Play may take a long time to complete, depending on the number of devices detected.



Plug & Play Reading blocks

## 4.5.2 Using Parameter Manager

### 4.5.2.1 Resource Block

The resource block defines the physical resources of the device including type of measurement, memory, etc. The resource block also defines functionality, such as shed times, that is common across multiple blocks. The block has no linkable inputs or outputs.

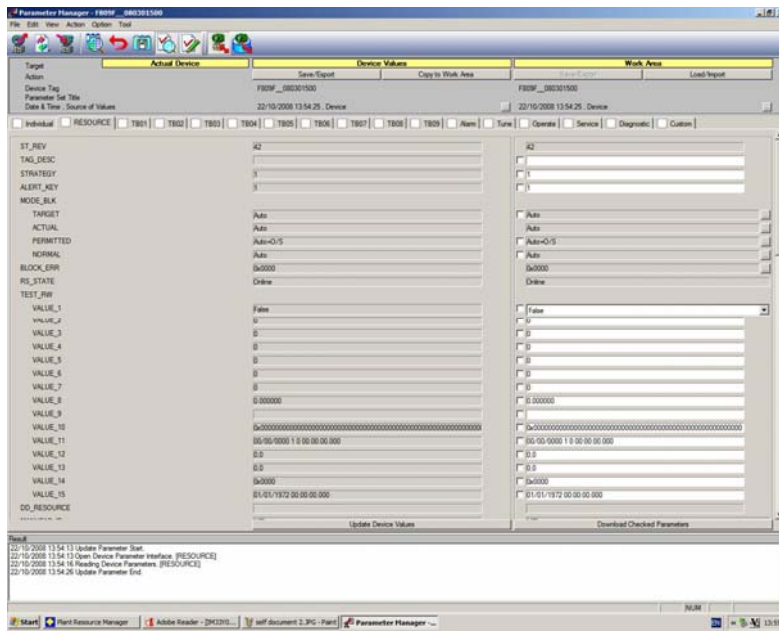
The resource block supports two modes of operation as defined by the MODE\_BLK parameter:

**Automatic (Auto):** The block is processing its normal background memory checks. In this mode, changes can be made to all configurable parameters.

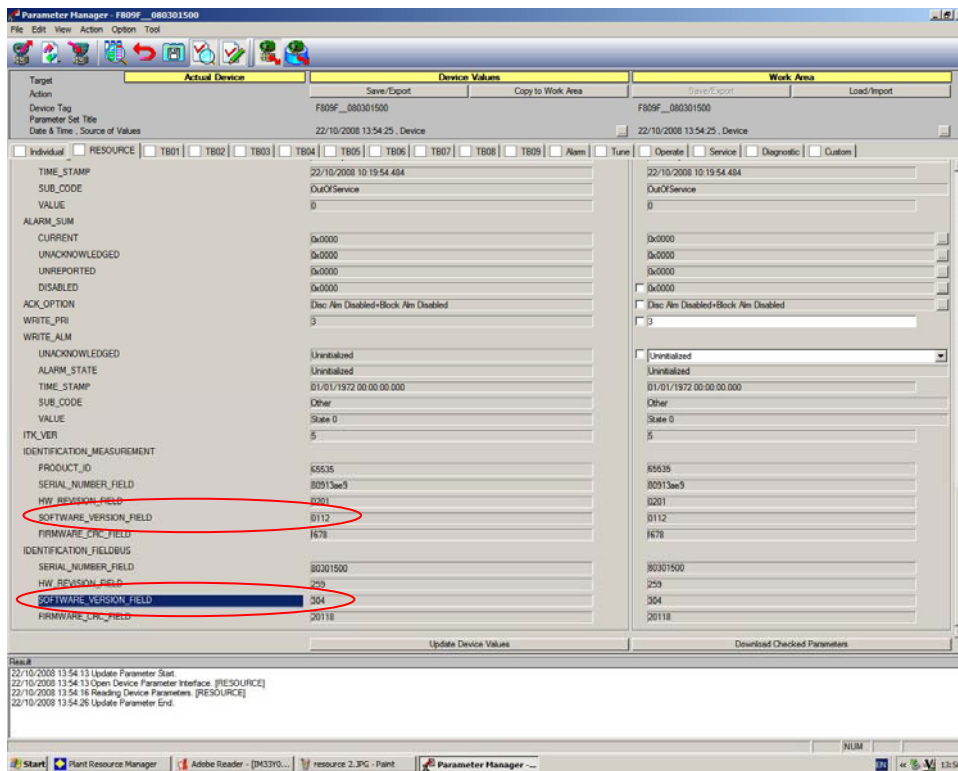
**Out of Service (OOS):** The block is not processing its tasks. The BLOCK\_ERR parameter shows Out Of Service. In this mode, changes can be made to any configurable parameter.

In normal operation, the Block should be in AUTO.

Click on the resource block TAB to view the parameters.



*Resource block Tab*



*Resource block Tab, software and firmware revisions*

Identification Measurement Software: Identification of the F809F measurement board (1.12)

Identification Fieldbus Software version: Identification of the F809F fieldbus communication card (304 Dec = 130 Hex version 1.30)

#### 4.5.2.2 Transducer blocks

There are two types of transducer block in our device:

Sys TB: System Transducer Block

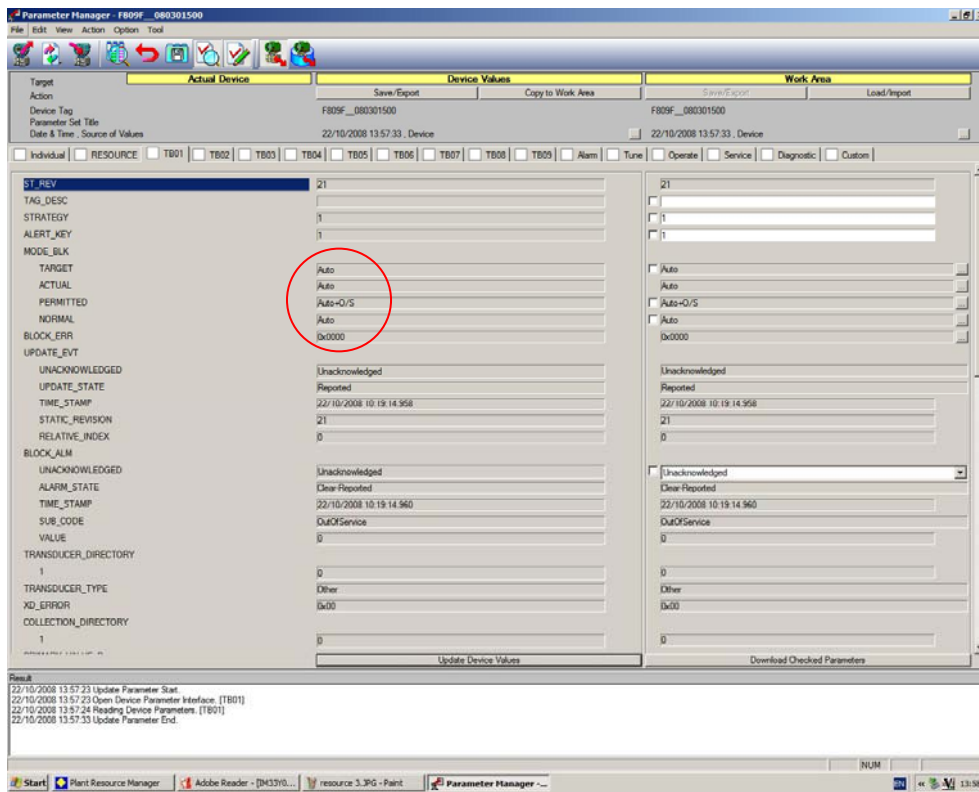
Seg TB: Segment Transducer Block

The transducer block supports two modes of operation as defined by the MODE\_BLK parameter

**Automatic (Auto):** The block is processing its normal background memory checks. In this mode, changes can be made to all configurable parameters.

**Out of Service (OOS):** The block is not processing its tasks. The BLOCK\_ERR parameter shows Out Of Service.

In normal operation these blocks should be in AUTO. In order to change the actual mode, you can open the transducer block and change the actual mode with the actual mode field or you can select all the blocks you want to modify the mode, right click and then select activate, selected items.



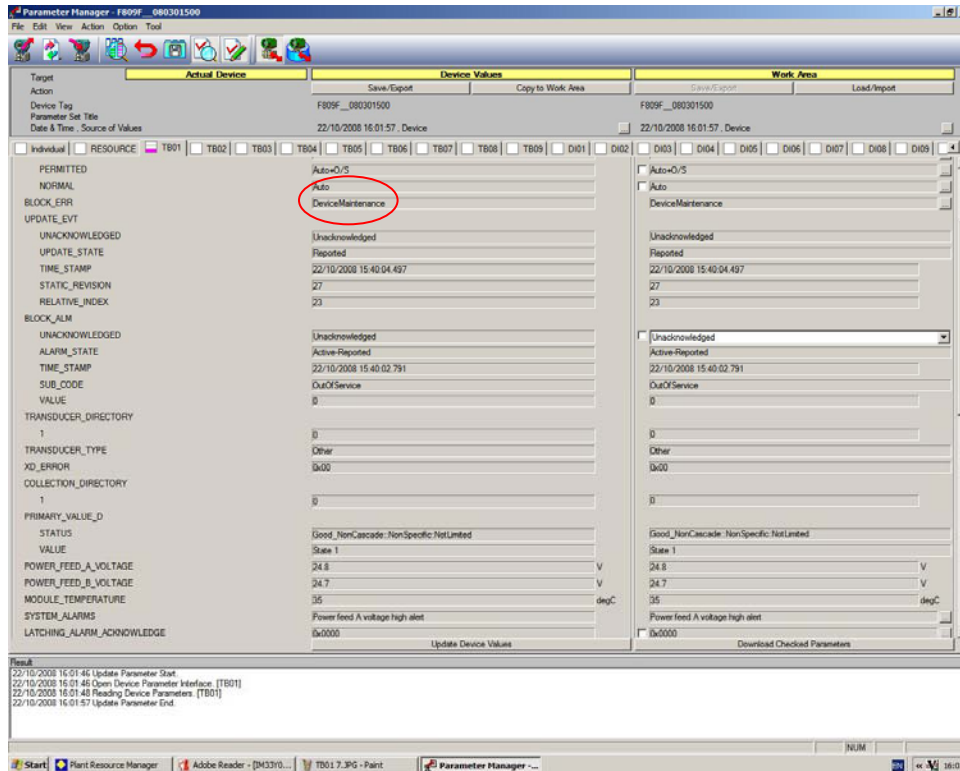
Block mode



### 4.5.2.3 Transducer Block Alarm Detection

If any alarm (except the new and removed device alerts) is set within the Transducer Block then the “NEED MAINTENANCE SOON BIT” is set in the BLOCK\_ERR parameter.

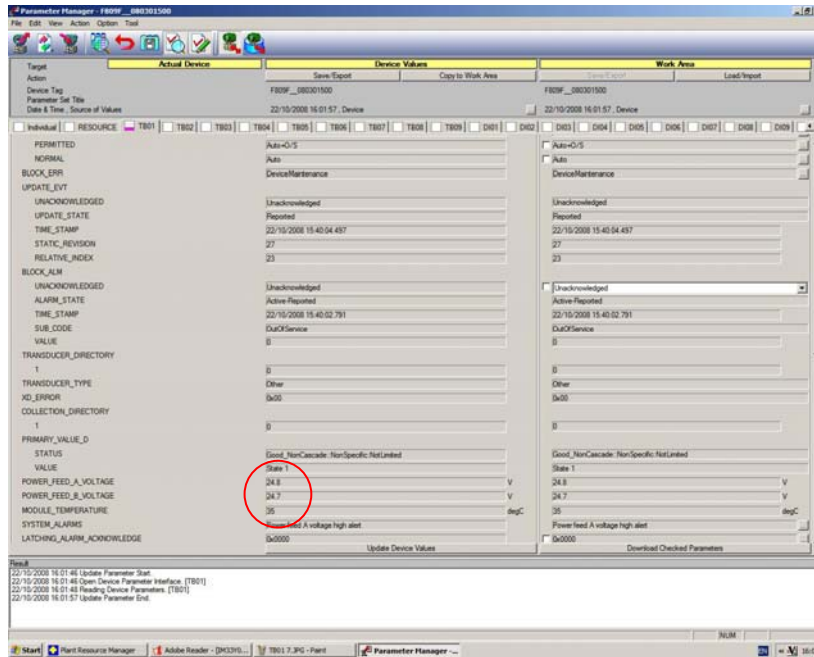
Additionally, if any alarm is set in the Transducer Block, then the Segment alarm DI BLOCK PV\_D will be set to 1. See chapter “configuring the DI block in the fieldbus cyclic messaging”.



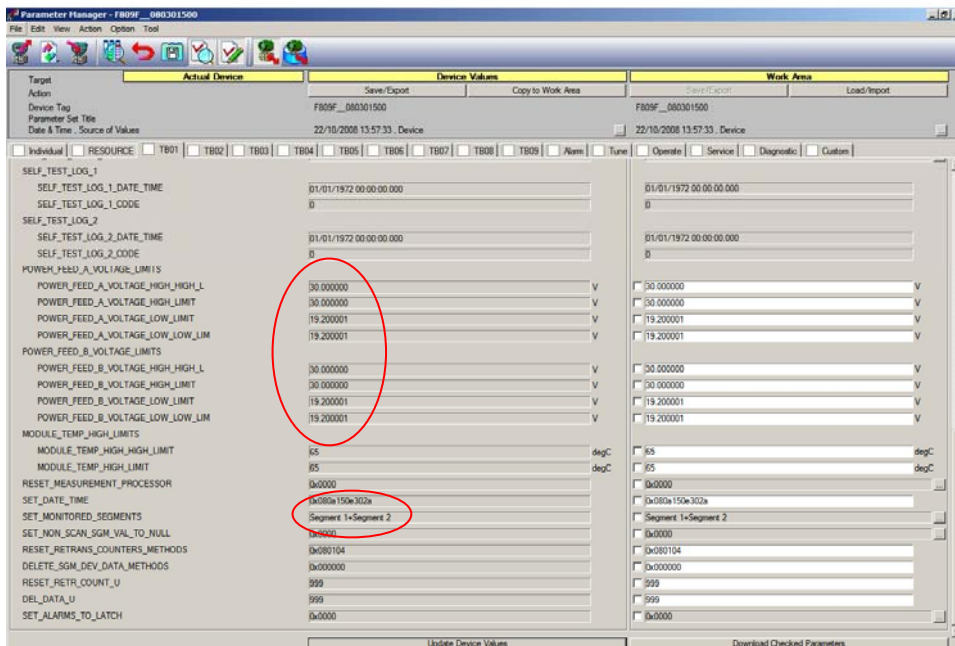
Device Need Maintenance Soon in Segment 1 Transducer Block

**4.5.2.4 System Transducer Block (SysTB)**

There is one Sys TB in the F809F, which allows the user to view system and self-test alarms together with the system power feed voltages and temperature. The SysTB allows configuration of the time, the date and the segments monitored. Additionally, for each device on each of the 8 monitored fieldbus segments, the retransmission counter can be reset and device history data can be deleted from within this block.



*System Transducer block: Measurement values for the bulk power supplies and temperature*



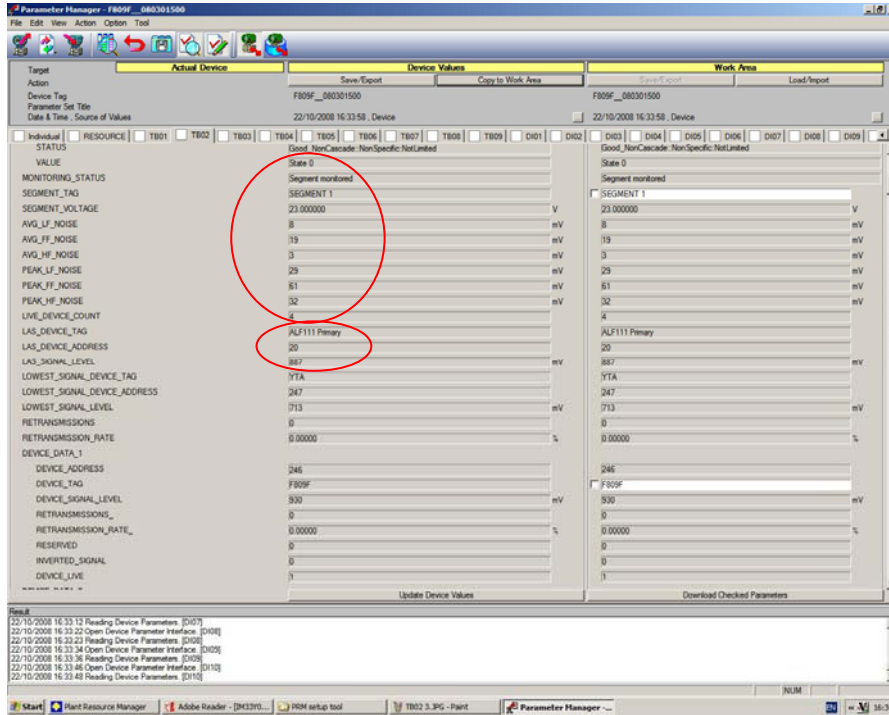
*System Transducer block: Alarm limits and monitored segment*

#### 4.5.2.5 Segment Transducer Block (SegTB)

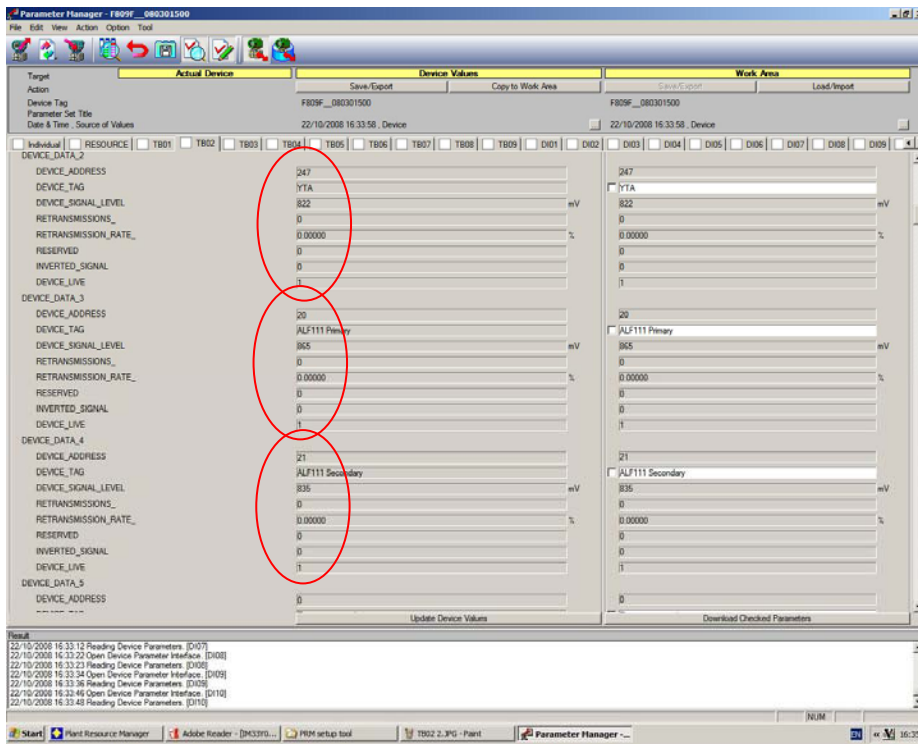
Each of the eight monitored segments are supported by a Seg TB that provides all the measured parameters and associated alarms for the fieldbus segment and devices. You can assign segment and device tags within this block.

The segment and device alarm limits may also be changed in this block.

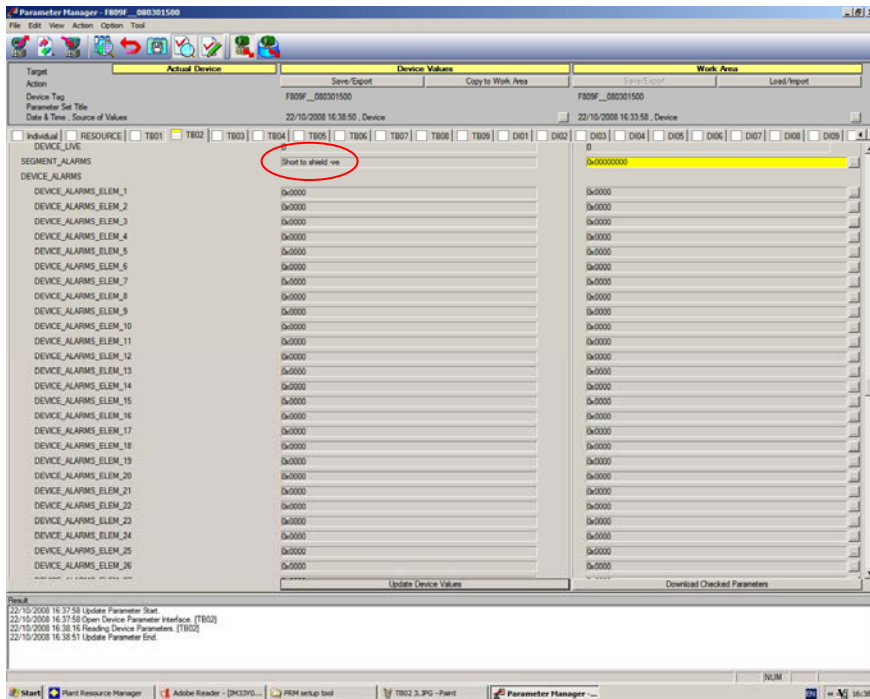
**Warning:** the tags are held in volatile memory. If both power feeds fail at the same time, or the F809F is removed from the carrier, then the segment and device tag data will be lost. This data will then require to be downloaded from the PRM database to the F809F.



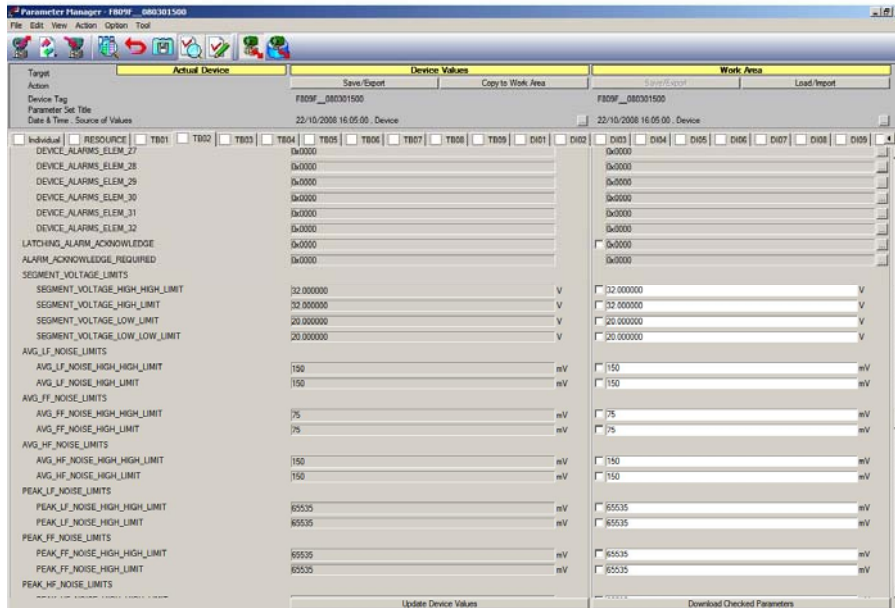
Segment tag and segment measurements, information on the LAS



*Device data for 32 devices*



*Segment alarms and Device alarms*



Segment alarm limits

#### 4.5.2.6 Custom TAB

You can configure the Parameter Manager to display up to five custom tabs for each device model. Each custom tab can be customized to display a certain set of parameters of your choice.

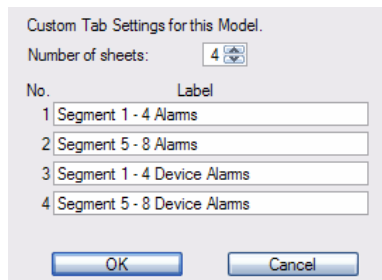
The Parameter Manager displays a single custom tab, labelled Custom, for each model of device, by default. You can choose to add more custom tabs, and to rename the custom tabs. To configure the custom tabs for a particular device model:

1. View either a saved parameter set or the actual parameters of any device of the required model.

The Parameter Manager displays the selected parameter set.

2. Select [Tools] > [Custom Tab Settings].

The Custom Tab Settings dialog box appears.



Select the number of custom tabs to display in the Number of Sheets field. You can select a number from 1 to 5.

The dialog displays a default label for each custom tab. You can rename the tabs by entering the desired name in the label fields.

4. Click [OK].

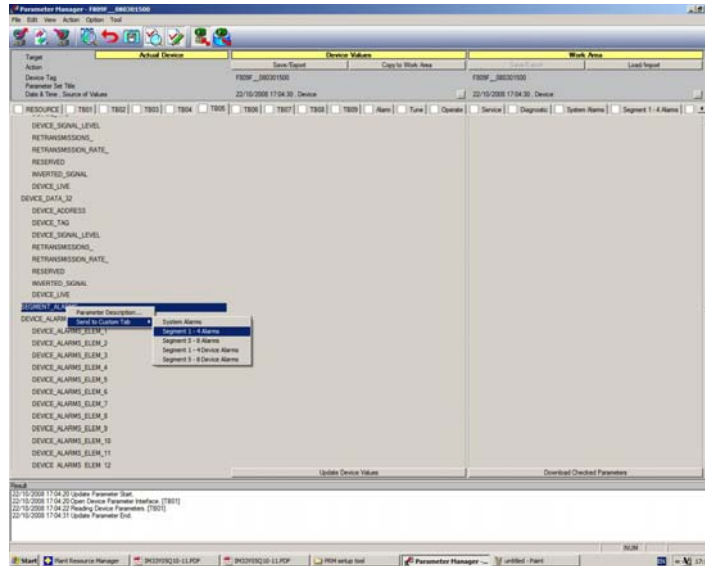
The Parameter Manager displays the appropriate number of custom tabs.

5. Select [File] > [Save Custom Tab Info].

The settings are saved, and affect all devices of that particular model.

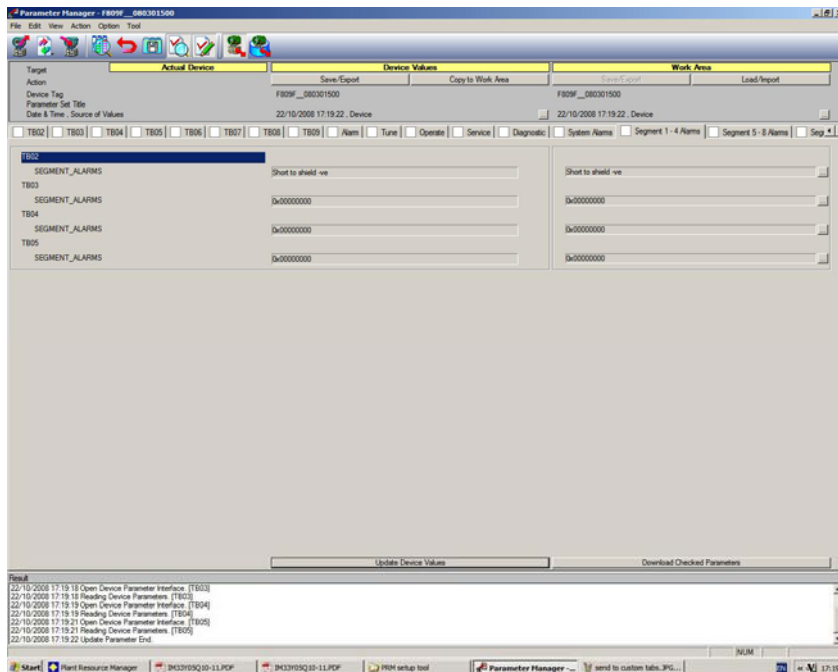
Adding parameters to a custom tab

1. Right-click on the parameter name and select [Send to Custom Tab] > [<Name of custom tab>].

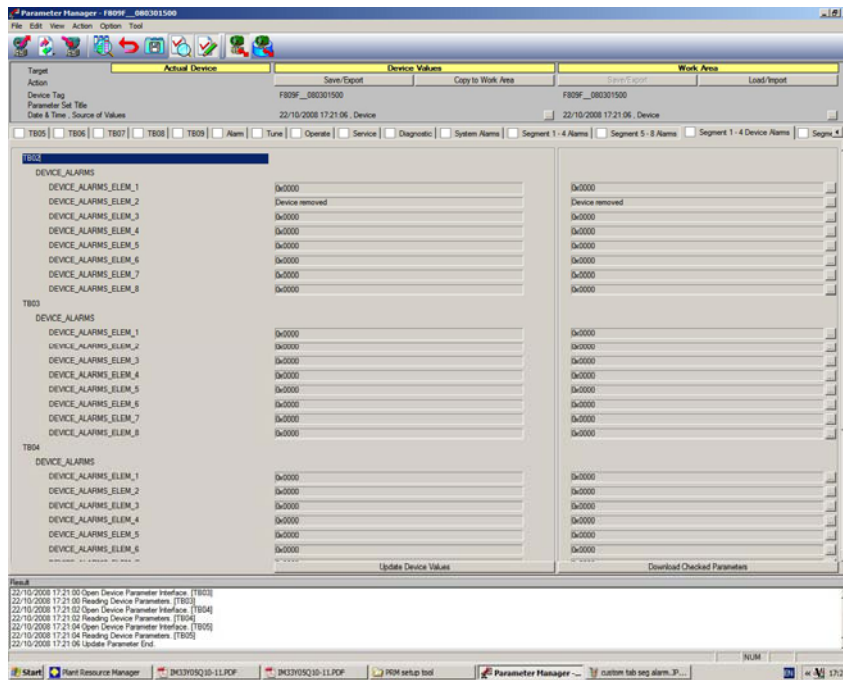


The parameter appears in the selected custom tab.

2. Select [File] > [Save Custom Tab Info] to save your changes.



*Segment Alarm custom TAB*



Device Alarms custom Tab

### 4.5.3 DD menu (Methods)

Device Descriptions can also include a set of processing routines called Methods. Methods provide a way to access and manipulate parameters within a device. For example a DD for a Valve Controller might include methods for automatically calibrating valve travel, manually calibrating travel, restarting a device, and calibrating the internal pressure sensor information for display.

PRM displays DD methods of FF-H1 devices in a hierarchical menu format.

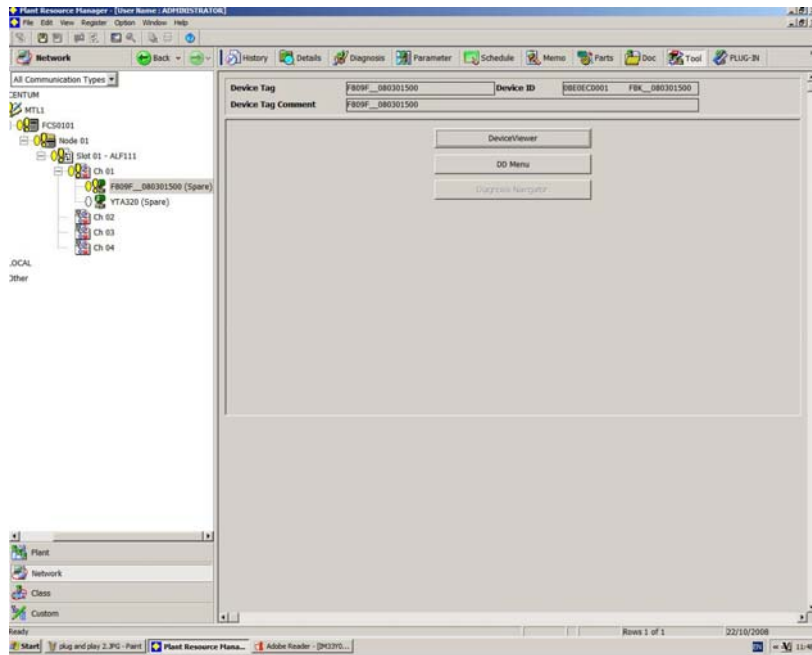
You can open DD Menu from either Device Navigator or the Tool window.

#### Opening from Device Navigator

1. Right-click on the device in the Device Navigator and select [DD Menu].  
The DD Menu window appears.

#### Opening from Tool window

1. Select a device from Device Navigator.
2. On the function toolbar, click [Tool].  
The Tool window appears

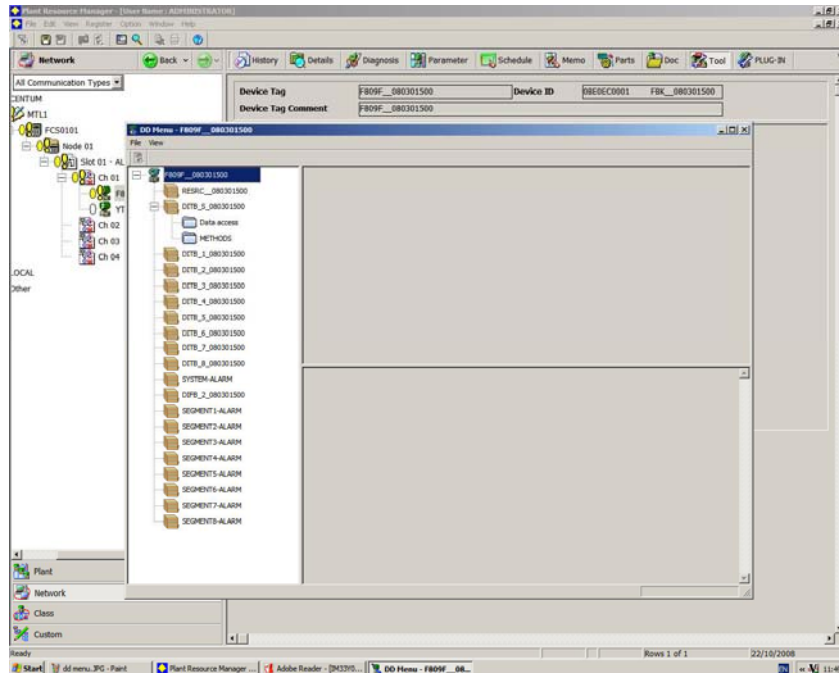


*Tool: DD Menu*

3. In the Tool window, click [DD Menu].

The DD Menu window appears.

The following figure shows the DD Menu



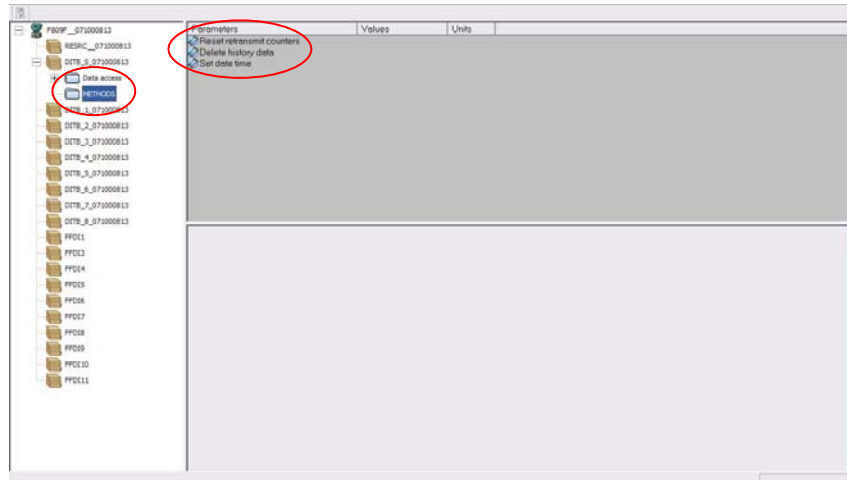
*DD Menu*

DD menus of a device are displayed in a tree structure in the menu tree display area. The following list shows the elements that are displayed in the tree structure

- Device tag name
- Block tag name
- Menu name
- Sub-menu name



To view the methods for the F809F expand the system transducer block folder and click on the METHODS sub menu as shown below.

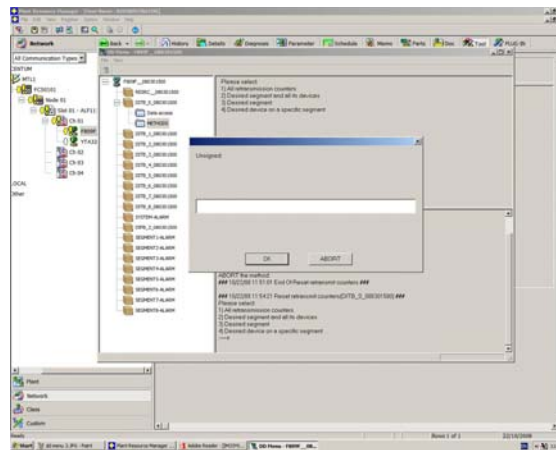


*DD Menu: F809F methods*

There are 3 configuration methods available in the MTL F809F Systems Transducer block.

- Setting Date and Time
- Resetting retransmission counter
- Deleting device data

Double click on the required method. In this example, Reset retransmit counters was selected



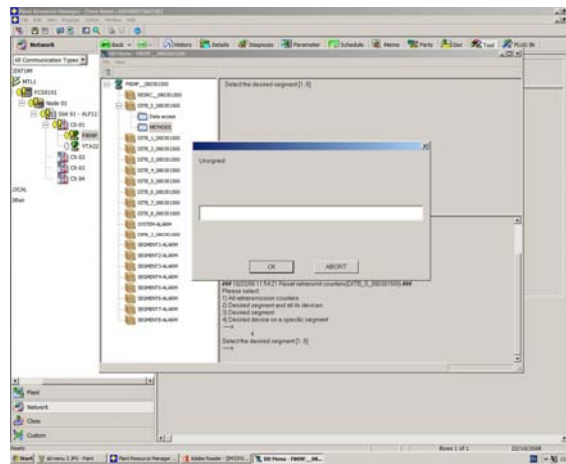
Choose the required option, in our example we'll choose option 3 (desired segment)

All retransmission counters: Delete all counters

Desired segment and all its devices: Delete counters for one complete segment with all devices

Desired segment: Delete counters for the segment (keep the devices counters)

Desired device on a specific segment: Delete counter for a specific device only



Desired segment

#### 4.5.4 Device Viewer

DeviceViewer utilizes the device configuration file provided by the device vendor to display diagnostic and trend information about FF-H1 and HART devices. It uses colours to display the status level of the device and the status level of each device parameter. DeviceViewer also creates a trend graph based from the parameter values.

DeviceViewer can either retrieve the most recent parameter values or retrieve parameter values periodically based on a specified time.

The device configuration file identifies the standard parameters, and custom parameters which are added by the device vendor to enhance device features. Without the configuration file, DeviceViewer will only display the information for standard parameters.

You can start up to five DeviceViewer windows in PRM at any one time.

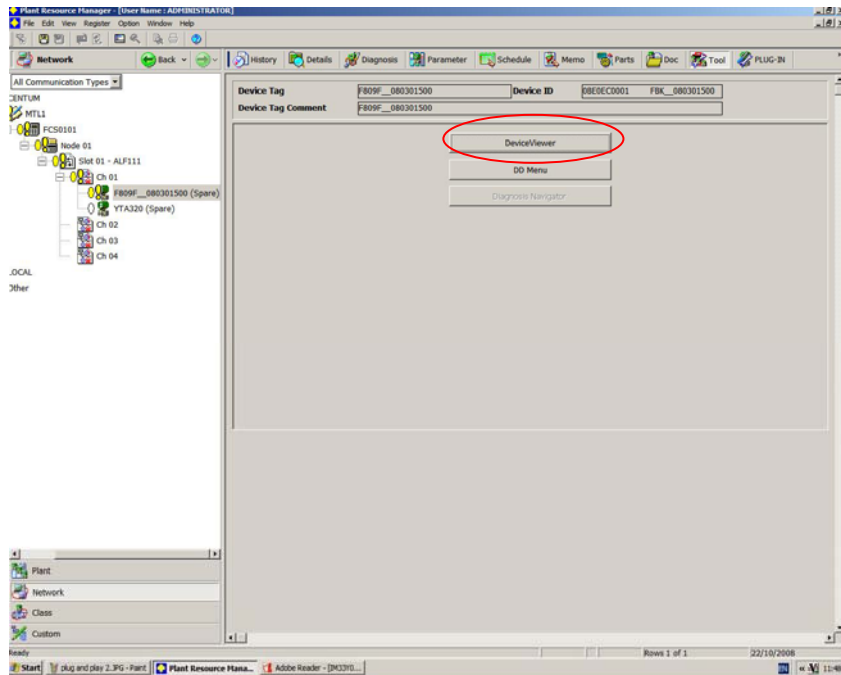
##### **From the context menu**

From any PRM view, right-click an FF-H1 or a HART device, and then select [DeviceViewer] to start DeviceViewer.

##### **From the Tool window**

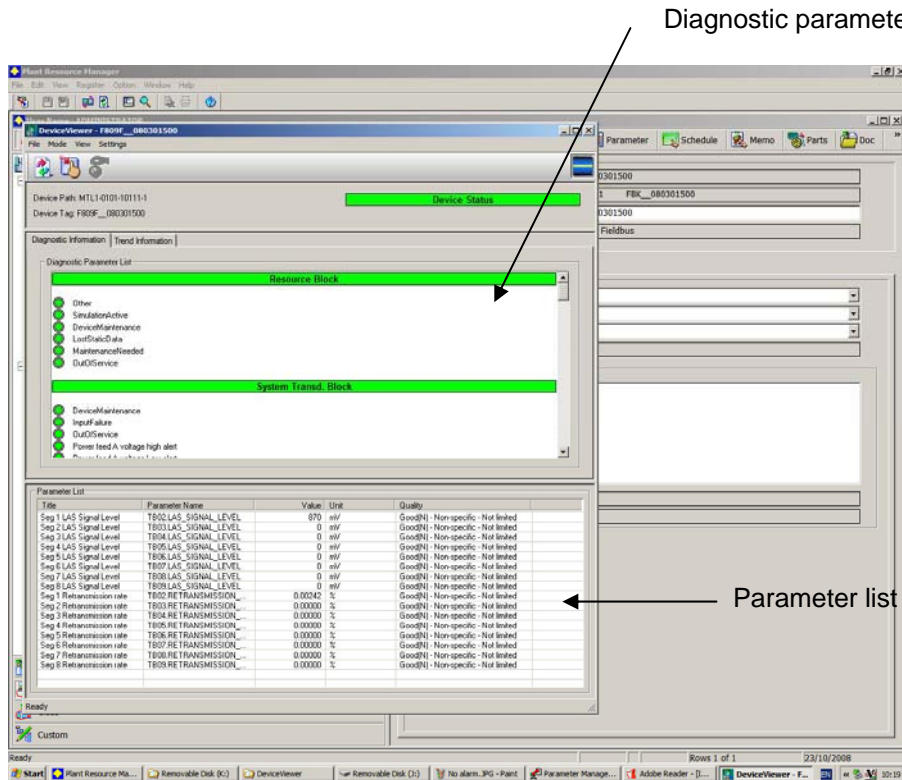
To start DeviceViewer from the Tool window:

1. In PRM's Network View, select an FF-H1 or a HART device.
2. Click [Tool] in the function toolbar. The Tool window appears in the right-pane.
3. In the Tool window, click [Device Viewer].



Launch Device Viewer

In the Diagnostic Information tab, you can view the status level of each parameter defined in the device configuration file. When you select the Diagnostic Information tab, the appropriate toolbar buttons appear. Components of the Diagnostic Information tab include Alarm Display, Diagnostic Parameter List, and Parameter List.



F809F device viewer

The parameters that appear in the Diagnostic Parameter List are derived from the device configuration file provided by the vendor. In DeviceViewer, you can view the status level of parameters included in this list. Colours are used to indicate the status level of a device parameter.

When you mouse over a parameter, the Online Help appears displaying a detailed description about the parameter.

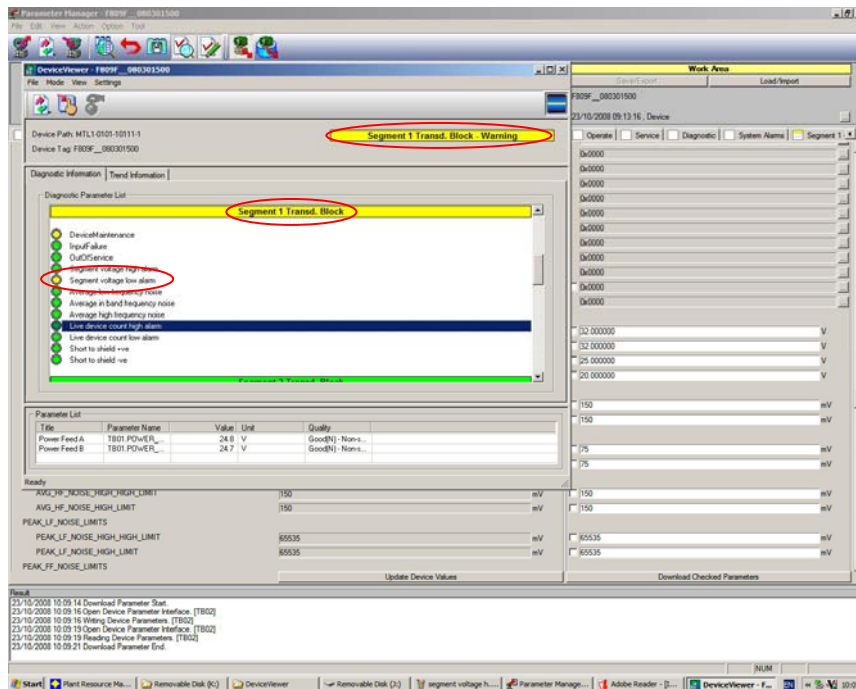
The device configuration file organizes parameters into groups. A parameter group heading appears on each group. The most critical status level in the group is used as the status level of the parameter group heading. on each group. The most critical status level in the group is used as the status level of the parameter group heading. In our config file we have 10 groups, one for the Resource file, one for the System Transducer block and one for each segment.

The following table displays DeviceViewer's colours used for each status level. Error, the most critical level, is represented by the red colour. All parameter status levels appear in grey colour when there is communication error with the device or it is not connected.

Default Status Level	Color
Normal	Green
Warning	Yellow
Error	Red
Communication Error	Grey

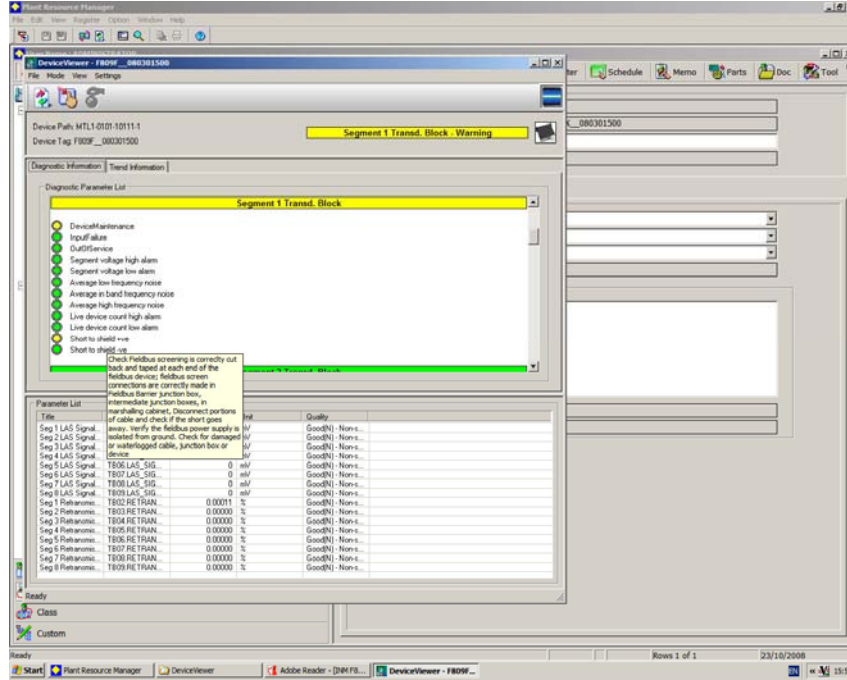
The Parameter List displays the additional parameters identified in the device configuration file.

These parameters are also displayed in the trend graph. It includes several columns that display specific values about the parameter.



*Warning in the Device viewer, segment 1 voltage low alarm*

When you hover the mouse over a parameter, the Online Help appears displaying a detailed description

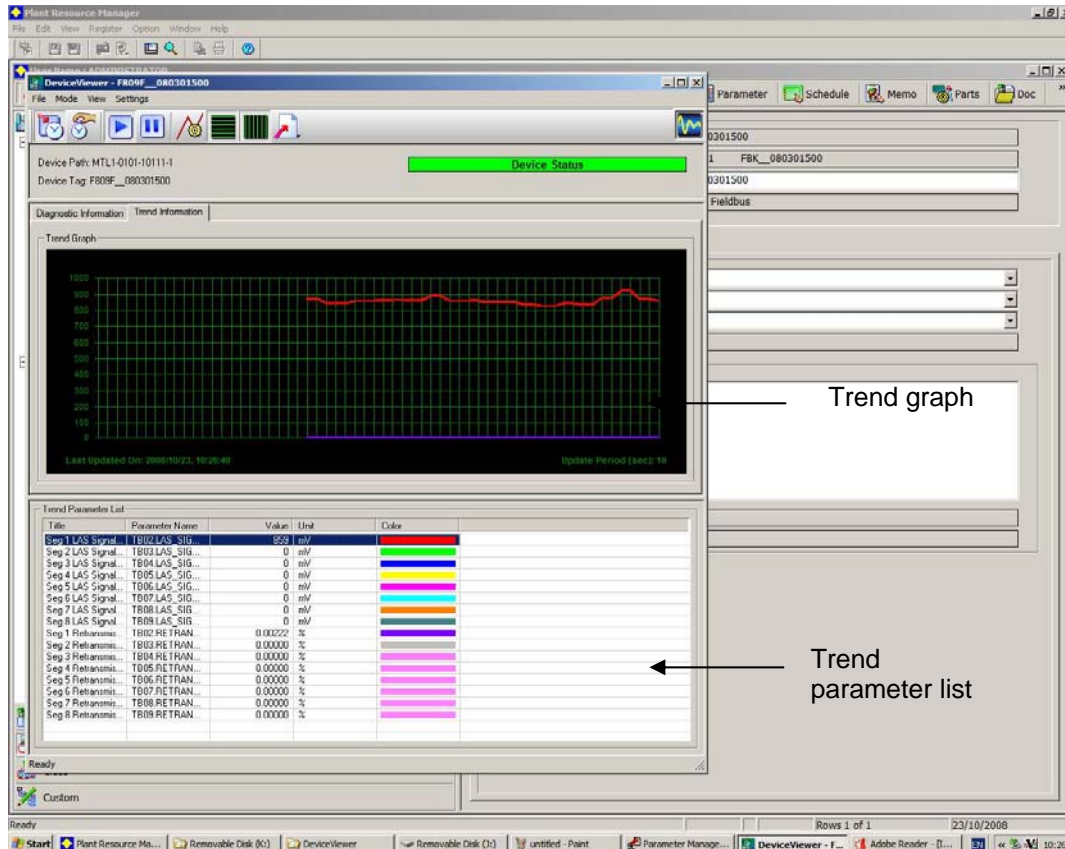


Online Help

#### 4.5.4.1 Trend graph

In the Trend Information tab, you can view the trend for specific parameters identified in the device configuration file. A trend line enables you to monitor diagnostic results and predict changes. You can then make appropriate adjustments to a device.

When you select the Trend Information tab, the appropriate toolbar buttons appear. The Trend Information tab is divided into the Trend graph, which shows the trend, and the Trend parameter list. Parameters in the Trend parameter list provide the information to appear in the graph.



Trend information TAB

## 4.6 Discrete Input Block

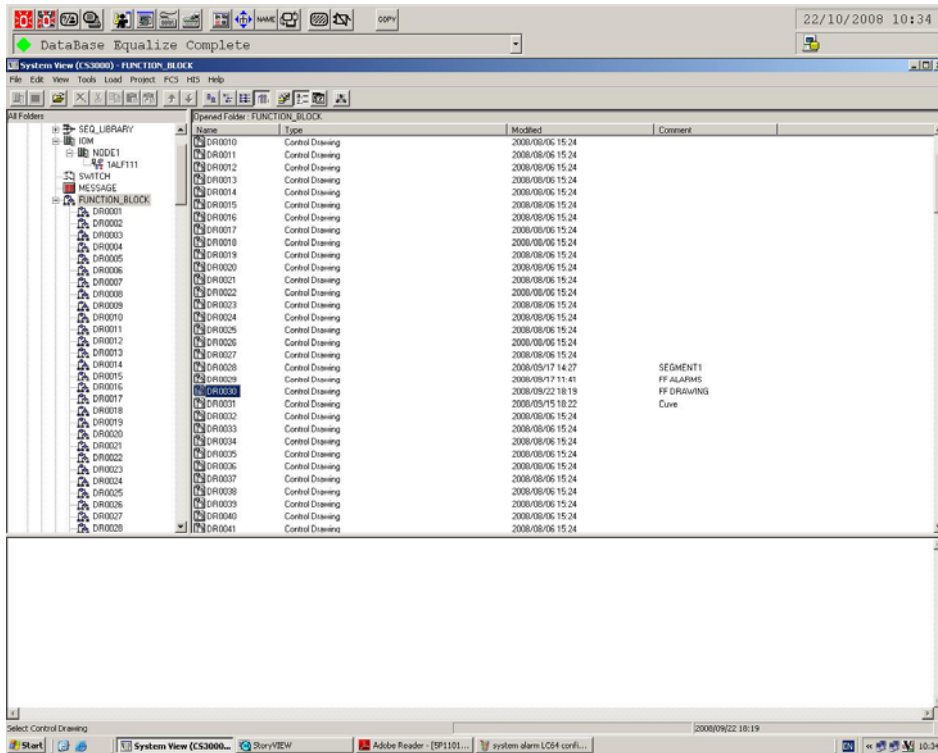
The discrete input blocks' PV\_D value is calculated from the current value of the alarm parameters of the transducer blocks and the OUT\_D value is calculated according to the Discrete Input Block algorithm.

Alarm DI Block: PV\_D will be set to 1 if any system alarm, segment / device alarm or self-test fault alarm bits are set. Selected by channel value 12.

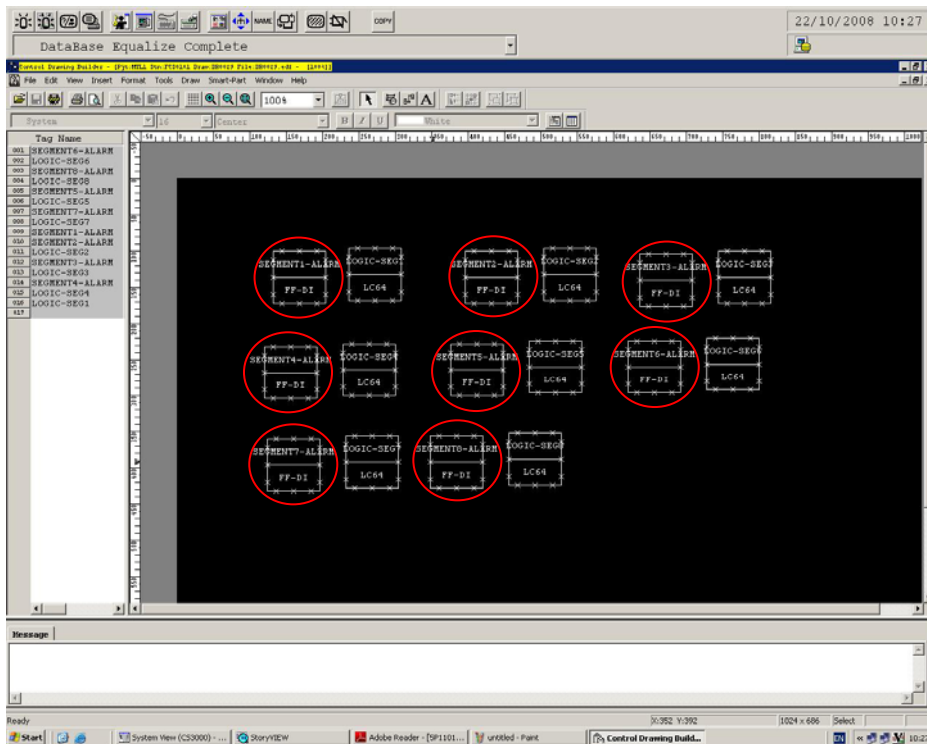
System Alarm DI Block: PV\_D will be set to 1 if any System alarm and self-test fault alarm bits are set. Selected by channel value 13.

Segment Alarm DI Block 1-8: PV\_D will be set to 1 if any of the segment / device alarm bits are set for the specific segment. Selected by channel value 14 – 21 for segments 1 – 8.

In order to use the DI block you need to create a control drawing. To create a control block drawing, go to system view, Function block and edit a new drawing.

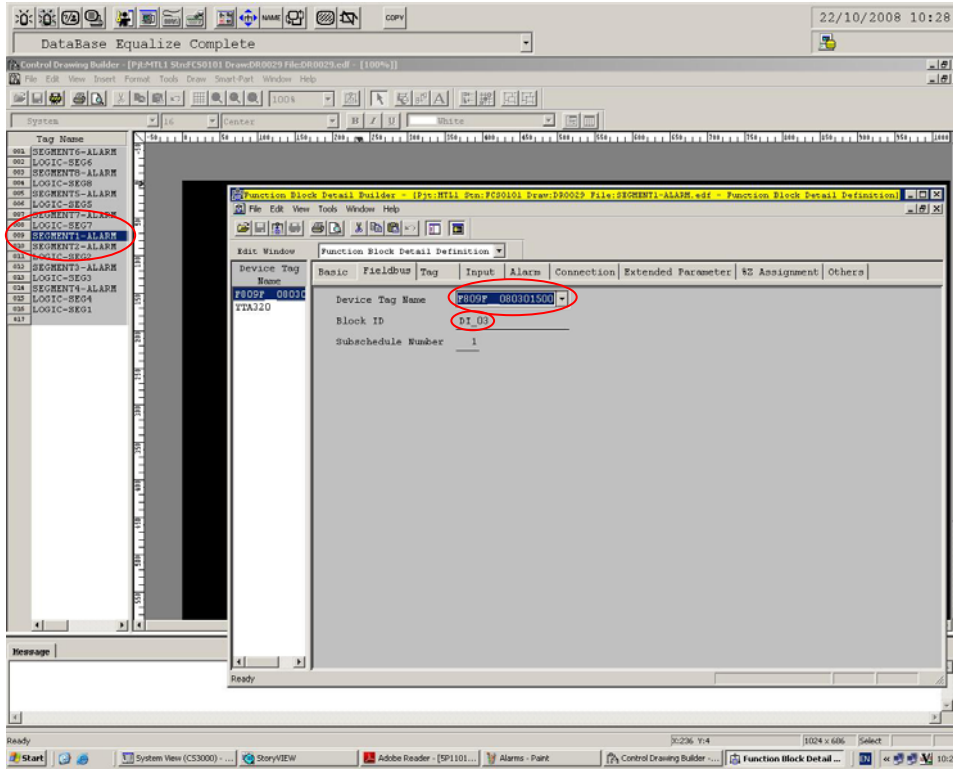


System View, function blocks



DI function blocks in the Control Drawing builder

In the above screenshot, we have used the 8 F809F DI function blocks for the segment alarms. The function block type is a FF-DI. To link the FF-DI block to the F809F DI function block, right click on the block and edit details.

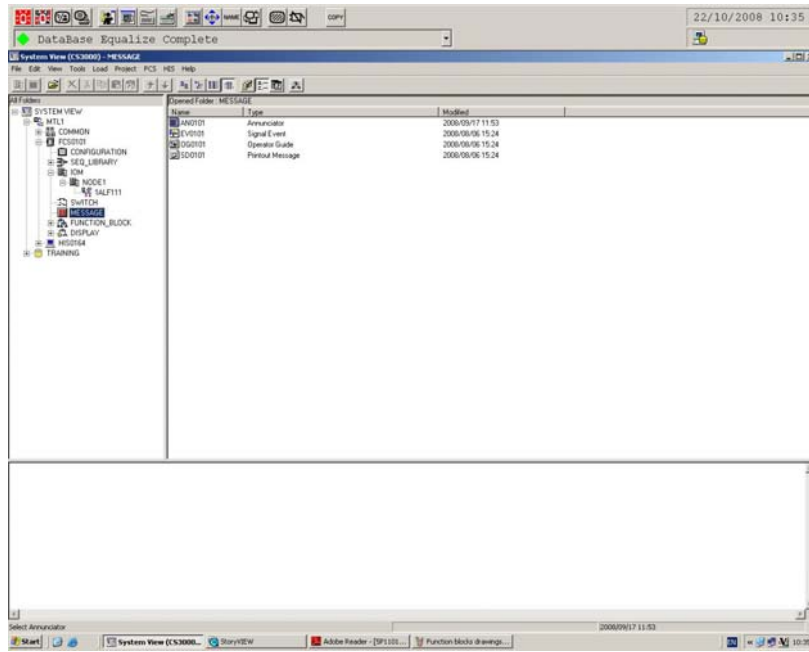


*Function block detail builder*

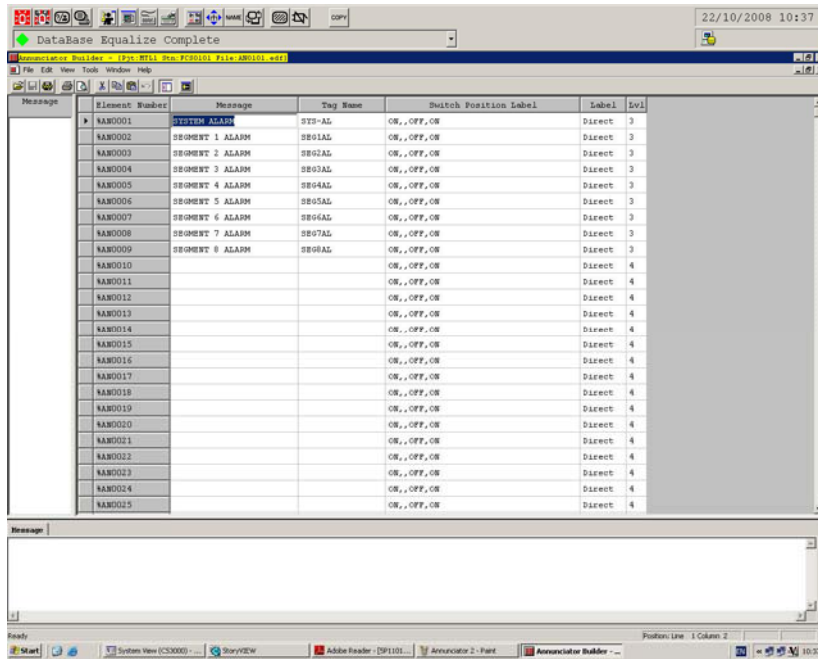
In the example above, the Segment-ALARM FF-DI block is linked to the F809F\_080301500 DI\_03 function block.

Once the FF-DI block is created we can create an annunciator message in order to display the Alarm status in the historical report.



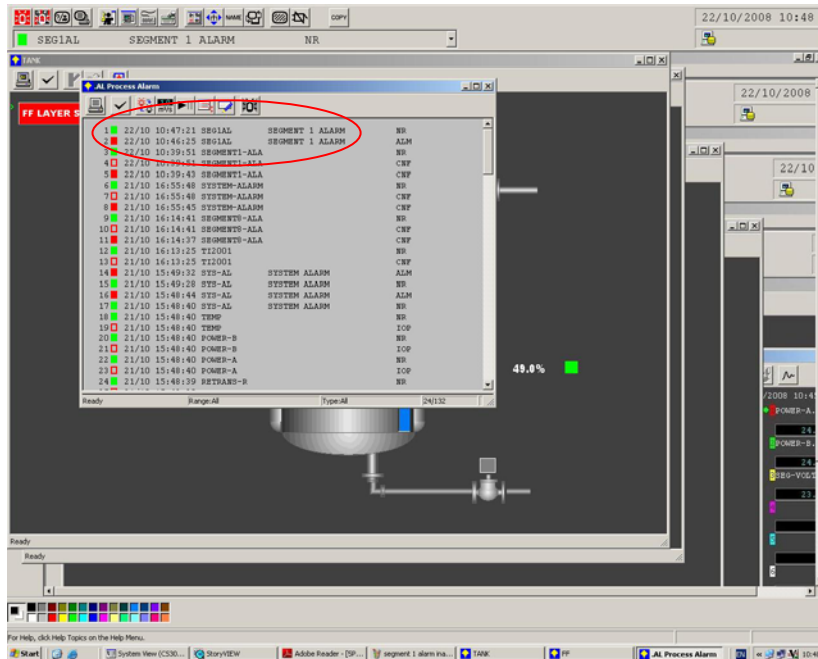


Annunciator configuration

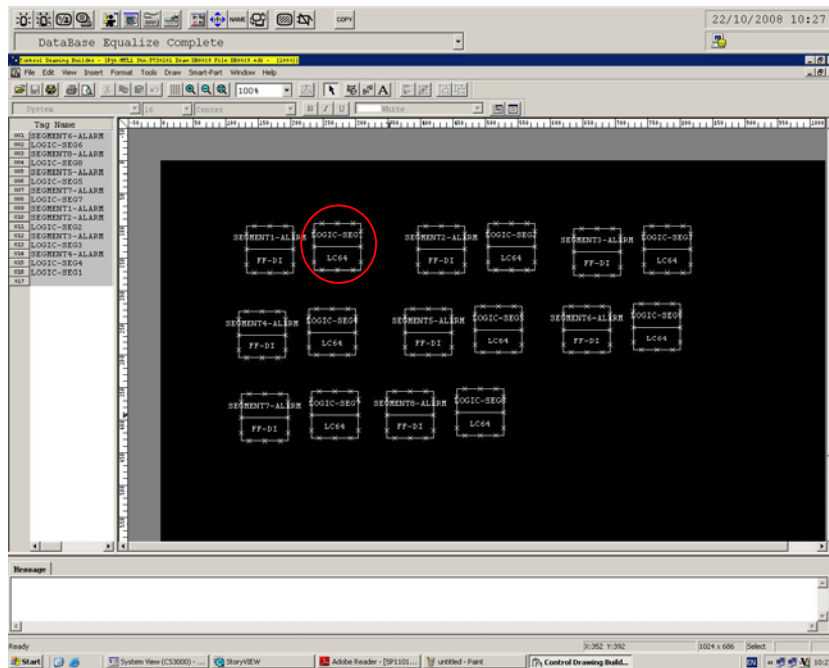


We created 9 messages,

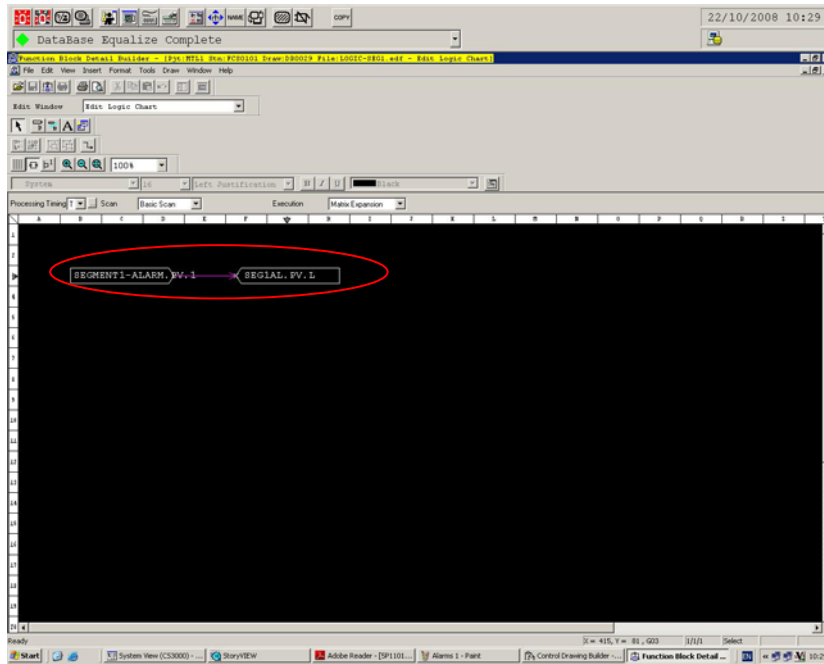
If the SEG1AL internal TAG is set to one, the historical report will display SEGMENT 1 ALARM (as shown below)



*Historical report*



*Logic chart for the annunciator*



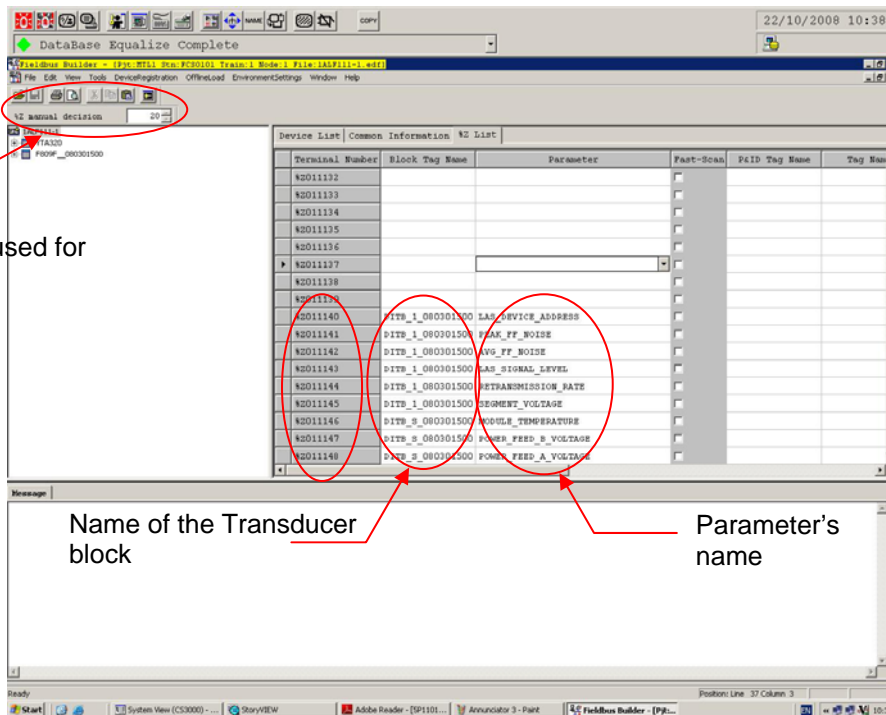
Logic chart block details

The segment alarm value will set the annunciator variable

### 4.7 F809F diagnostic parameters in the FCS

Because the F809F is a diagnostic module, the FCS can have access to all FOUNDATION fieldbus parameters read by the diagnostic module. %Z variable should be used in order to bring these parameters to the FCS.

48 %Z variables can be used per each ALF111 segment.



Number of %Z used for this segment

Name of the Transducer block

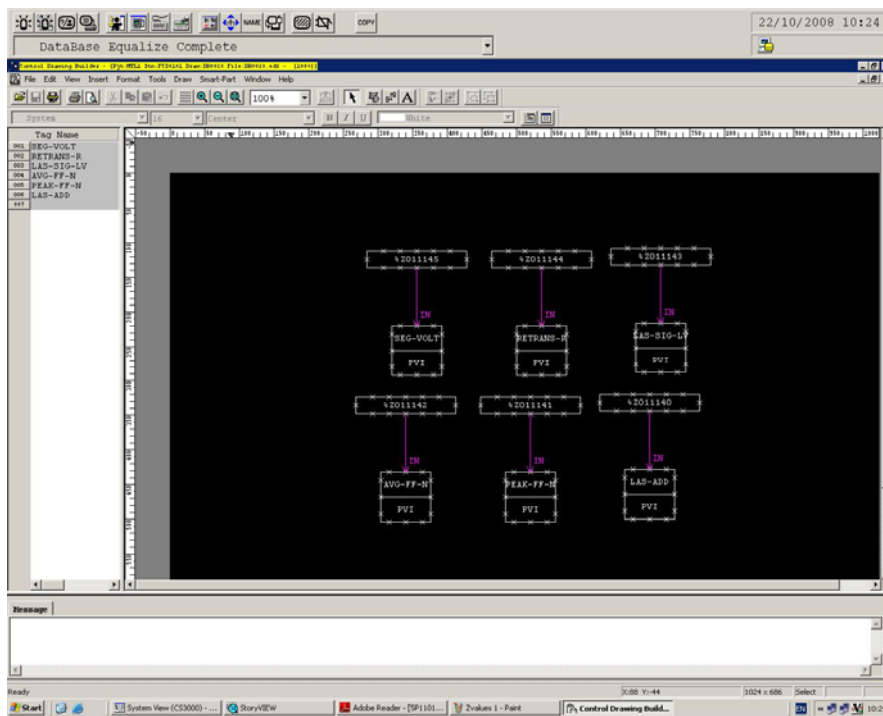
Parameter's name

Terminal assignment

In our application, we'll use 9 F809F diagnostic parameters:

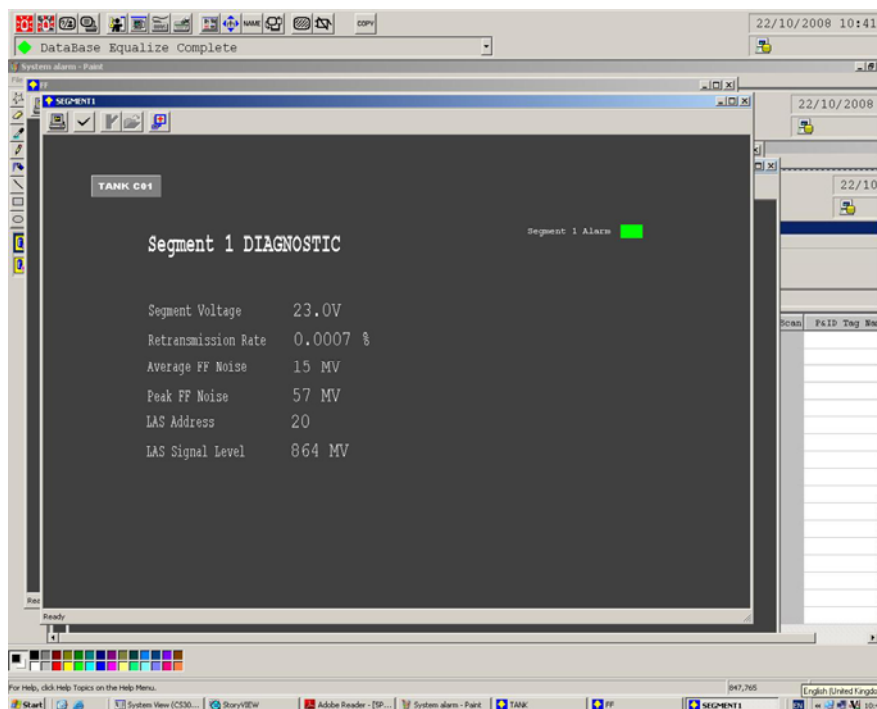
- LAS Device address
- Peak FF Noise
- Average FF Noise
- LAS signal level
- Retransmission rate
- Segment Voltage
- Module Temperature
- Power feed A and B voltage

Once created these 9 variables are accessible in the Function block control builder in order to convert them in process variables (PVI) and use them as all process variable with faceplates, trends.....



*%Z as process variables*

%Z011145 will be the SEG-VOLT process variable



*F809F diagnostic parameters in the HIS*

#### 4.7.1 Trend F809F diagnostic parameters

The Trend window acquires different types of process data and displays time-series changes in a graph. The time-series changes for the acquired process data are referred to as trend data.

In a Trend window, a maximum of eight channels of trend data may be displayed.

To acquire trend data, the following items must be defined on the definition builders:

- System View

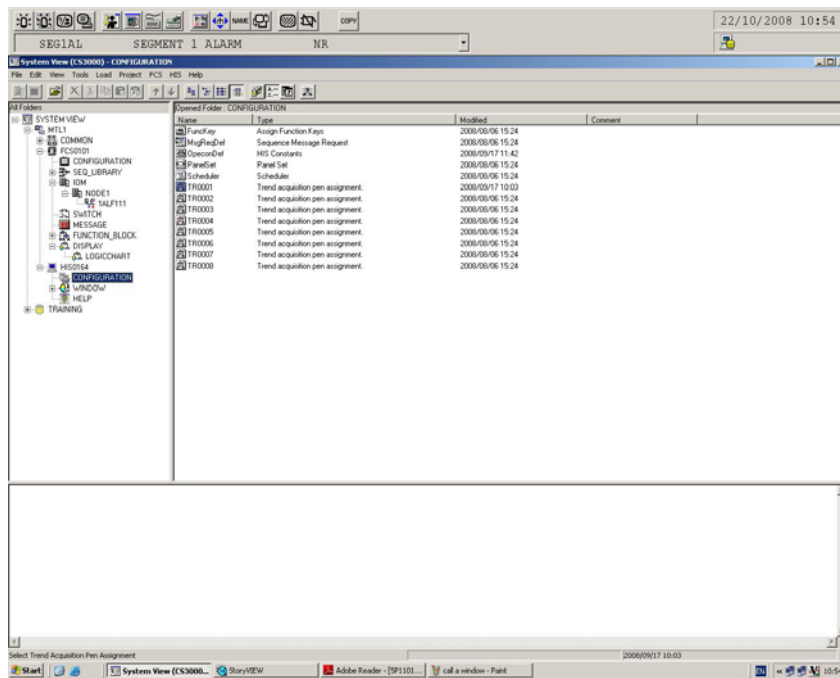
Defines the acquisition type and sampling period for each block in the property tab of the Trend Acquisition Pen Assignment Builder when creating a new HIS.

- Trend Acquisition Pen Assignment Builder:

Defines the assignment of trend acquisition pens for each Trend window.

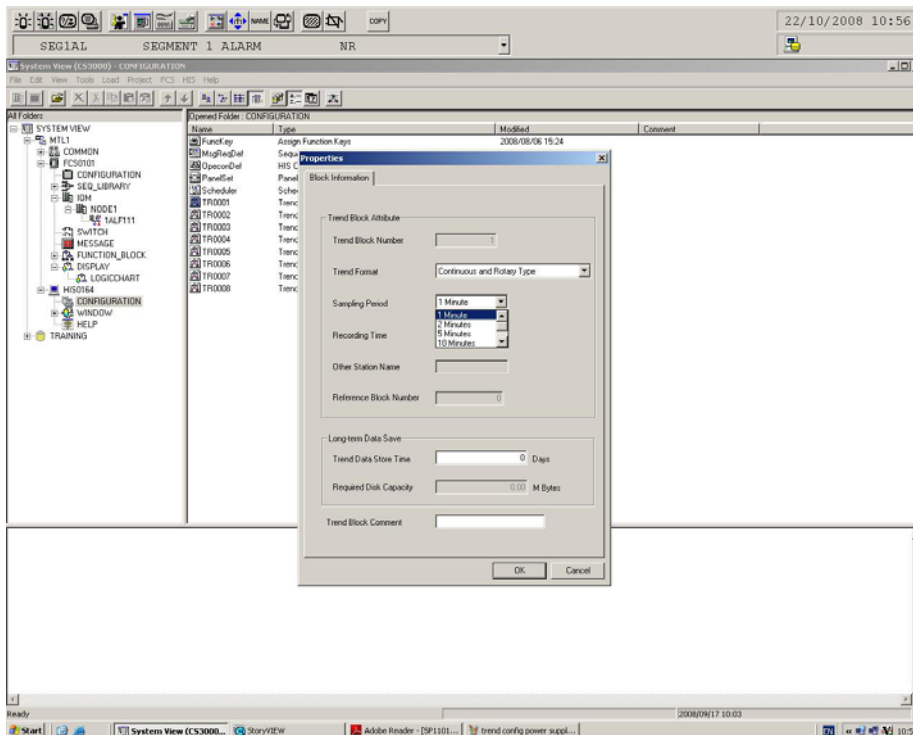
All data items, such as PV (CPV), SV, MV and FV, are regarded as target process data of trend acquisition. The PVI we have just created for the F809F could of course be trend.

The sampling period of process data are specified for each trend block. The sampling period can be selected from 1 second, 10 seconds, 1 minute, 2 minutes, 5 minutes or 10 minutes. No more than 18 blocks can be specified with the sampling periods of 1 minute, 2 minutes, 5 minutes and 10 minutes. No more than 8 trend blocks can be specified with the sampling period of 1 second or 10 seconds. (\*1) The trend data that may be used as closing data can have sampling periods of 1 minute, 2 minutes, 5 minutes and 10 minutes.



To create trends, select the HIS, configuration and the trend block number (TR0001 in our case)

To edit the Trend properties, Right click on TR0001 and select Properties



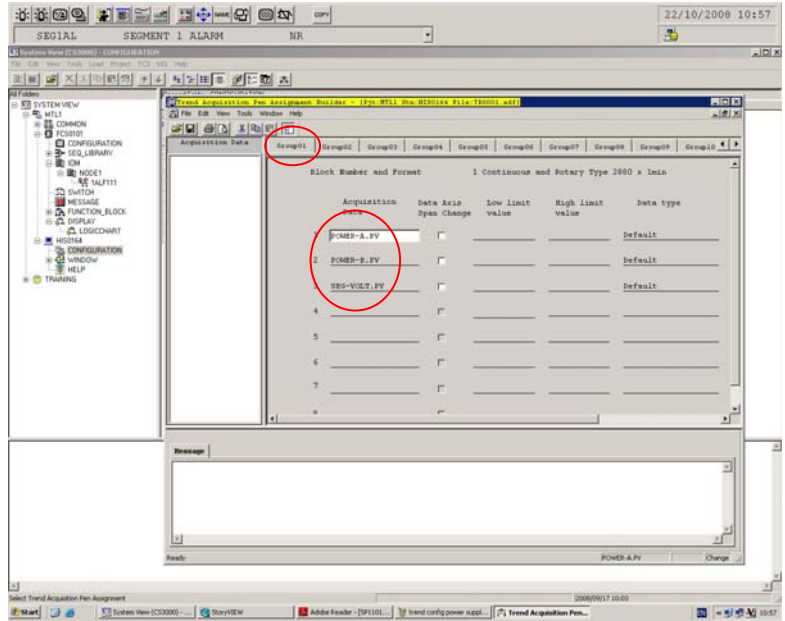
*Trend properties*

The recording span indicates the time to acquire 2,880 samples for each trend graph (maximum number of samples) in the specified sampling period.

For example, if the trend sampling period is 1 minute,  
 1 (minute) x 2 880 samples = 2 880 minutes = 48 hours = 2 days  
 2 days of process data may be recorded.

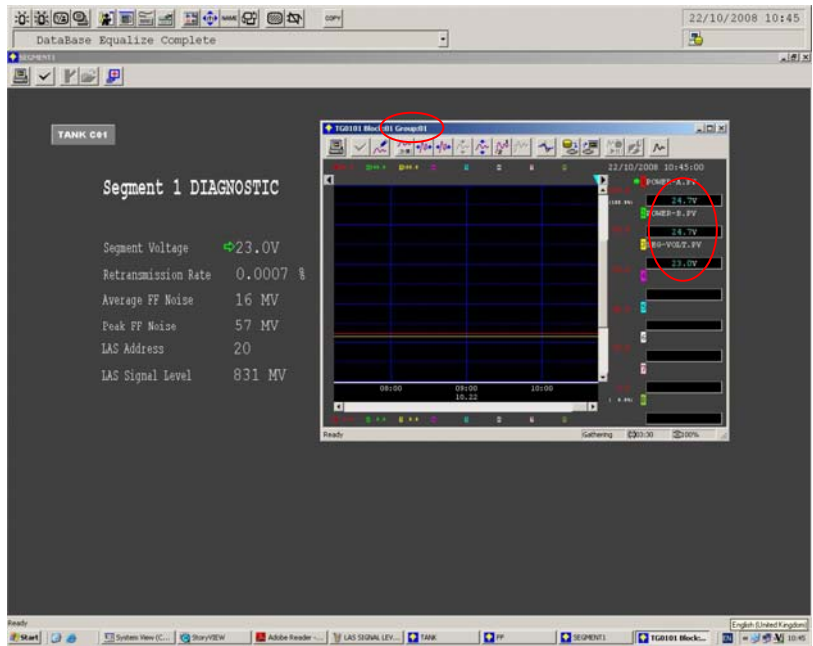
Select your sample rate and click OK (In the example above we have 1 minutes for the sample rate)

To select the parameters you want to trend double click on TR0001, you can trend multiple variables together these parameters (variables have to be in the same group)



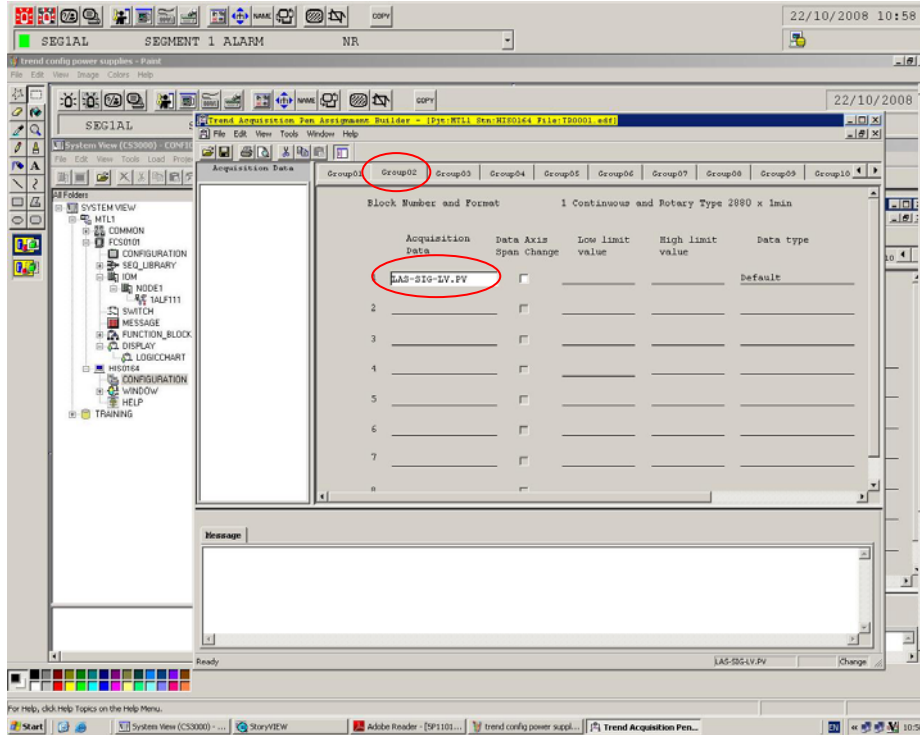
*Group 1 configuration*

This will trend Power-A, Power-B and the SG-VOLT variables in the same windows as shown below

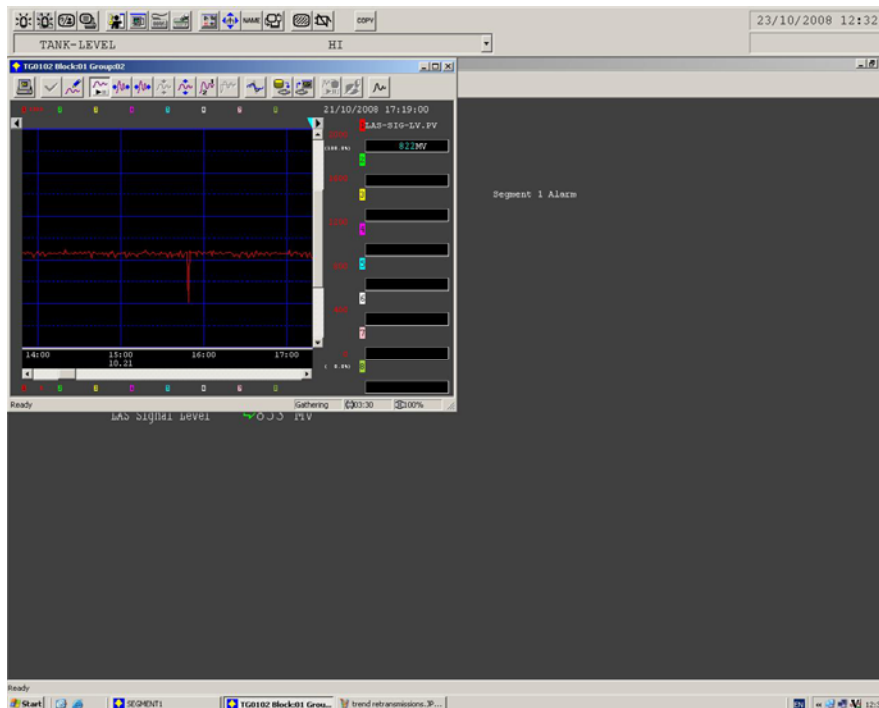


*Group 1 trending*

You can have multiple groups of variables, the example below show a trend configuration for the LAS Signal Level in the Group02.



*Las Signal Level – Group02*



*Las Signal Level*