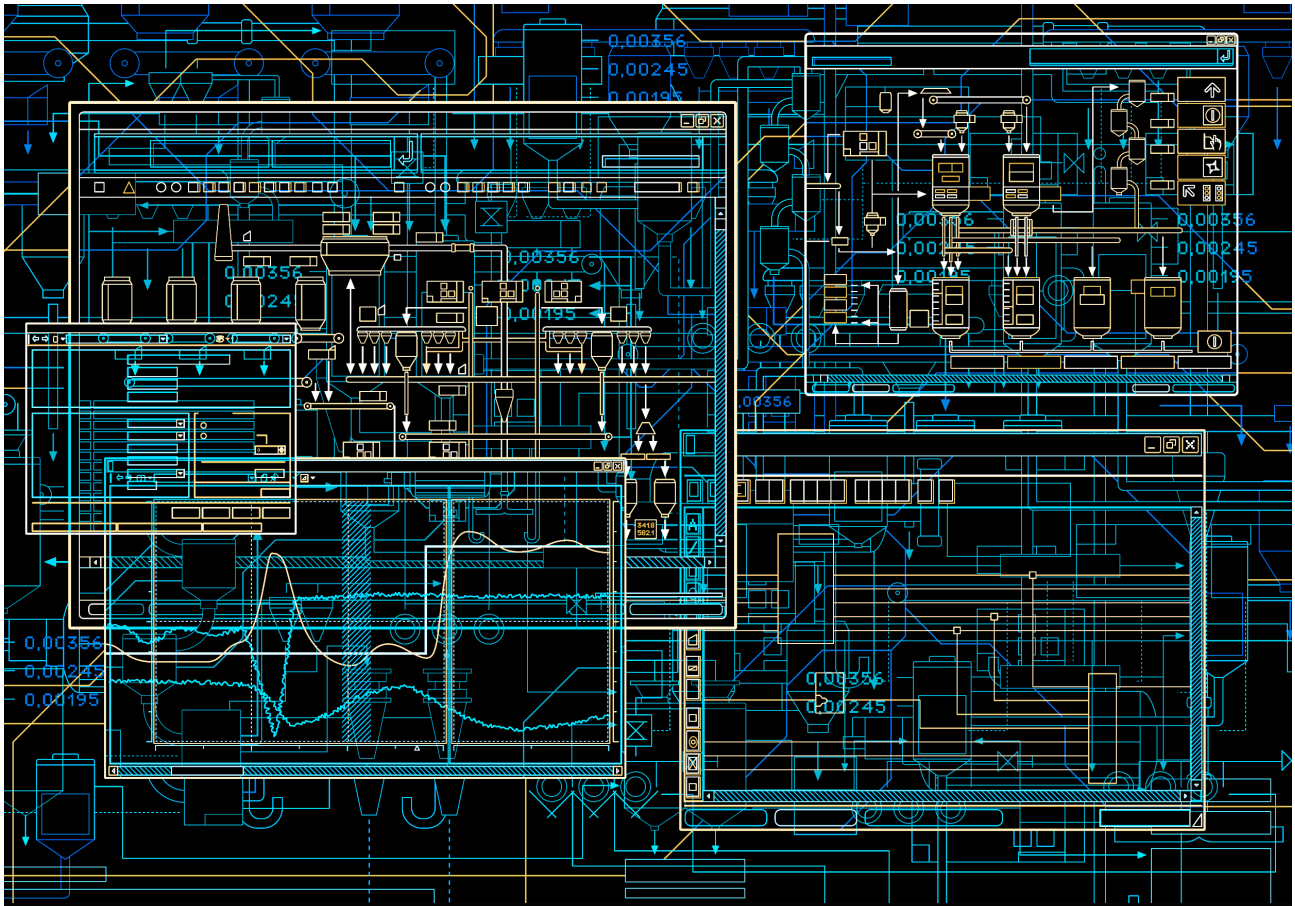

S800 I/O

DTM 5.3

Power and productivity
for a better world™

S800 I/O

DTM 5.3

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Table of Contents

Section 3 - Run-time Operation

Appendix A - Operating with HART DTMs

Appendix B - Dynamic Data

Revision History

About This User Manual

General

Any security measures described in this User Manual, for example, for user access, password security, network security, firewalls, virus protection, etc., represent possible steps that a user of a control system may want to consider based on a risk assessment for a particular application and installation. This risk assessment, as well as the proper implementation, configuration, installation, operation, administration, and maintenance of all relevant security related equipment, software, and procedures, are the responsibility of the user of the control system.

This User manual provides a description of the S800 I/O DTM product which includes DTMs for the S800 I/O (see Product Overview on page 15). It provides instructions for installation and for operation of the DTMs.

User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

Feature Pack

The Feature Pack content (including text, tables, and figures) included in this User Manual is distinguished from the existing content using the following two separators:

Feature Pack Functionality

<Feature Pack Content>

Feature Pack functionality included in an existing table is indicated using a table footnote (*):

* Feature Pack Functionality

Unless noted, all other information in this User Manual applies to 800xA Systems with or without a Feature Pack installed.

Warning, Caution, Information, and Tip Icons

This User Manual includes Warning, Caution, and Information where appropriate to point out safety related or other important information. It also includes Tip to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

Electrical warning icon indicates the presence of a hazard that could result in *electrical shock.*

Warning icon indicates the presence of a hazard that could result in *personal injury*.

Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard that could result in *corruption of software or damage to equipment/property.*

Information icon alerts the reader to pertinent facts and conditions.

Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, fully comply with all Warning and Caution notices.

Terminology

A complete and comprehensive list of terms is included in *System 800xA System Guide Functional Description (3BSE038018*)*. The listing includes terms and definitions that apply to the 800xA System where the usage is different from commonly accepted industry standard definitions and definitions given in standard dictionaries such as Webster's Dictionary of Computer Terms.

Terms that uniquely apply to this User Manual are listed in the following table.

Term	Abbreviation	Description
Device Type Manager	DTM	Software components (device drivers) for configuring, diagnosing, simulating, displaying the measured values, etc. of a field device.
Fieldbus Communication Interface	FCI	The Fieldbus Communication Interface (FCI) device contains the interface to the fieldbus, ModuleBus interface and power regulators. The FCI module can manage 24 I/O devices (up to 12 directly and the others in 1 to 7 I/O clusters).
Frame Application	FA	Frame application (run time environment) in accordance with the FDT specification for operating DTMs.
Field Device Tool	FDT	Interfaces for integrating device-specific components into a frame application.
Graphical User Interface	GUI	Graphical user interface.
Highway Addressable Remote Terminal	HART	Digital communication protocol developed for applications in industrial process metrology.
I/O module	-	In this book the term I/O module is related to a S800 I/O module.
Instrument	-	In this book the term instrument is related to a HART instrument.
Intrinsic Safety	I.S.	Intrinsic Safety is a protection technique to prevent explosion in hazardous areas of a process plant.

Term	Abbreviation	Description
Outputs Set as Predetermined	OSP	A user configurable action on an output module when communications is lost to the FCI or Controller.
Universal Asynchronous Receiver/Transmitter	UART	A microchip used to exchange data with modems and other serial devices.
Sequence of Events	SOE	A feature to realize the time stamp for events from digital input signals.

Applicable Specifications

This product conforms to applicable parts of the requirements specified in FDT version 1.2 and addendum.

Released User Manuals and Release Notes

A complete list of all User Manuals and Release Notes applicable to System 800xA is provided in *System 800xA Released User Manuals and Release Notes (3BUA000263*)*.

System 800xA Released User Manuals and Release Notes (3BUA000263)* is updated each time a document is updated or a new document is released. It is in pdf format and is provided in the following ways:

- Included on the documentation media provided with the system and published to ABB SolutionsBank when released as part of a major or minor release, Service Pack, Feature Pack, or System Revision.
- Published to ABB SolutionsBank when a User Manual or Release Note is updated in between any of the release cycles listed in the first bullet.

A product bulletin is published each time *System 800xA Released User Manuals and Release Notes (3BUA000263*)* is updated and published to ABB SolutionsBank.

Section 1 Introduction

FDT/DTM - General

The FDT concept describes the interface between a frame application and the DTMs (DTM = Device Type Manager) from the device manufacturer. It enables devices from different manufacturers and different fieldbuses to be integrated in a single system.

Product Overview

The DTM is a software component, which is usually supplied by the manufacturer together with the intelligent field device or I/O component. The DTM is familiar with the way the field device works (plausibility), offers graphical user dialogs, manages device configuration and diagnosis, and supplies the device-specific documentation.

The product S800 I/O DTM covers the following S800 I/O modules:

Table 1. S800 I/O Units

Units	Description
CI801	Remote PROFIBUS DPV1 Communication Interface
CI840	Remote PROFIBUS DPV1 Communication Interface for redundant applications
AI801	Analog Input 1*8 channels, 0...20 mA, 4...20 mA
AI810	Analog Input, 1*8 channels, 0..20 mA, 4..20mA, 0...10 V, 2...10 V

Table 1. S800 I/O Units (Continued)

Units	Description
AI815	Analog Input,1*8 channels, 0..20 mA, 4..20 mA, 0..5V, 1..5 V, HART Interface, Extended Diagnosis
AI820	Analog Input differential, 1*4 channels, -20..20 mA, 0..20 mA, 4..20 mA, -5..5 V, 0..5 V, 1..5 V, -10..10 V, 0..10 V, 2..10 V
AI825	Analog Input 4*1 channels for applications requiring galvanic isolated channels, -20...20 mA, 0(4)...20 mA, -10...10 V, 0(2)...10 V
AI830	Analog Input, 1*8 channels, Resistance Temperature Detector (RTD)
AI835	Analog Input,1*8 channels, Thermocouples (TC)
AI835A	Analog Input,1*8 channels, Thermocouples (TC) with remote Cold junction compensation
AI843	Analog Input, 1*8 channels, Thermocouples (TC)
AI845	Analog Input,1*8 channels, 0..20 mA, 4..20 mA, 0..5V, 1..5 V, HART Interface, Extended Diagnosis, Redundant Applications
AI880	High Integrity Analog Input 1*8 channels, 0...20 mA, 4...20 mA
AI890	Analog Input, 1*8 channels, 0..20 mA, 4..20 mA, I.S. Interface
AI893	Analog Input, 1*8 channels, RTD and Thermocouple, I.S Interface

Table 1. S800 I/O Units (Continued)

Units	Description
AI895	Analog Input, 1*8 channels, 4..20 mA, I.S. and HART Interface
AO801	Analog Output 1*8 channels, 0...20 mA, 4...20 mA
AO810	Analog Output, 1*8 channels, 0..20 mA, 4..20 mA
AO815	Analog Output, 1*8 channels, 4..20 mA, HART Interface, Extended Diagnosis
AO820	Analog Output, 4*1 channels, -20..20 mA, 0..20 mA, 4..20 mA, -10..10 V, 0..10 V, 2..10 V, individually isolated
AO845	Analog Output, 1*8 channels, 4..20 mA, HART Interface, Extended Diagnosis, Redundant Applications
AO890	Analog Output, 1*8 channels, 0..20 mA, 4..20 mA, I.S Interface
AO895	Analog Output, 1*8 channels, 4..20 mA, I.S. and HART Interface
DI801	Digital Input 24 V d.c., 1*16 channels(1)
DI802	Digital Input 120 V a.c., 110 V d.c., 8*1 channels
DI803	Digital Input 230 V a.c., 220 V d.c., 8*1 channels
DI810	Digital Input 24 V d.c., 2*8 channels(2), current sinking
DI811	Digital Input 48 V d.c, 2*8 channels current sinking

Table 1. S800 I/O Units (Continued)

Units	Description
DI814	Digital Input 24 V d.c., 2*8 channels, current source
DI818	Digital Input 24 V d.c., 32 channels
DI820	Digital Input 120 V a.c., 110 V d.c., 8*1 channels
DI821	Digital Input 230 V a.c., 220 V d.c., 8*1 channels
DI825	Digital Input 125V d.c, 1*8 channels, SOE (Sequence of Events)
DI828	Digital Input 120 V a.c., 16 channels
DI830	Digital Input 24V d.c, 1*16 channels, current sinking, SOE (Sequence of Events)
DI831	Digital Input 48V d.c, 1*16 channels, current sinking, SOE (Sequence of Events)
DI840	Digital Input 24 V d.c. 1*16 channels(1), Extended Diagnosis, Redundant Applications
DI885	Digital Input 24V/48V d.c, 1*8 channels, current sinking, SOE (Sequence of Events)
DI890	Digital Input, I.S. Interface, 8*1 channels, Galvanic isolation between channels
DO801	Digital Output 24 V d.c., 0.5 A short circuit proof, 1*16 channels(1)
DO802	Digital Output Relay 1*8 channels, 24-230 V a.c./110 V d.c. 2 A cos φ > 0,4 d.c. < 60 W

Table 1. S800 I/O Units (Continued)

Units	Description
DO810	Digital Output 24 V d.c. 0.5 A short circuit proof, 2*8 channels
DO814	Digital Output 24 V d.c. 0.5 A short circuit proof, 2*8 channels, current sink
DO815	Digital Output 24 V d.c. 2 A short circuit proof, 2*4 channels
DO818	Digital Output 24 V d.c., 32 channels
DO820	Digital Output Relay 8*1 channels 24-230 V a.c.3 A cos $\varphi > 0.4$ d.c. < 42W
DO821	Digital Output Relay 8*1 normally closed channels 24-230 V a.c./d.c. 3 A cos $\varphi > 0.5$ d.c. < 42 W
DO828	Digital Output 230 V a.c., 16 channels
DO840	Digital Output 24 V d.c. 0.5 A, 2*8 channels, Extended Diagnosis, Redundant Applications
DO890	Digital Output 12 V 40 mA, I.S. interface, 1*4 channels, Galvanic isolation between channels
DP820	Incremental Pulse Counter, 2 channels, maximum 1.5 MHz. Interface for RS422, current 5 V, 12 V and 24 V.
DP840	Incremental Pulse Counter, 8 channels, maximum 20 kHz. Interface for NAMUR 12 V and 24 V. For single and redundant applications.

(1) 1*16, equals 1 group of 16 channels
(2) 2*8, equals 2 groups of 8 channels

All DTMs are used to operate the S800 I/O modules in a frame application conforming to applicable parts of FDT version 1.2 and addendum.

ABB Standard Drive Integration

ABB Standard drives can be connected to the S800 I/O system. The FCI works as a communication link between the fieldbus master and the drives. No application software concerning this functionality is stored in the FCI. Check the available support for each FCI type.

The following drives are considered to be standard drives:

- ACS600 with standard application
- ACS800 with standard application
- ACS600 with crane application
- ACS800 with crane application
- ACS600 with pump and fan application (PFC)
- ACS800 with pump and fan application (PFC)
- ACS400 with standard drive
- DCS400 with standard drive
- DCS500 with standard drive
- DCS600 with crane application

Product Scope

The S800 I/O DTM version 5.3 is suitable for executing various tasks, also referred to as applications in the following description. The applications have a graphical user interface. The product also contains DTMs that has HART tool routing functionality. Tool routing describes a mechanism to enable sub connected DTMs, such as the Basic HART DTM to communicate through a S800 I/O DTM to HART instruments connected to a S800 I/O module. For this function no graphical user interface is required.

The following are examples of available applications:

- About DTM

- Identification
- Diagnosis
- Configuration
- Observe
- Parameterization
- Service

Prerequisites and Requirements

The S800 I/O DTM conforms to applicable parts of FDT 1.2 and addendum and requires a frame application conforming to FDT 1.2.

For details about the supported operating systems and FDTs, see System Prerequisites on page 23.

Intended User

This manual is designed specifically for application engineers, commissioning engineers and maintenance personnel. It provides for easy installation and operation of the S800 I/O DTM.

Those using this document should be familiar with the basic method of operation of computers and software installation.

Section 2 Installation

System Prerequisites

The following are the prerequisites to install and operate S800 IO DTM version 5.3:

- Operating System (any of the following):
  - Windows Server 2008
    - 32-bit (x86) R1 with Service Pack 2 or
    - R2 with Service Pack 1 (64-bit)
  - Windows 7 with Service Pack 1
    - 32-bit (x86) or
    - 64-bit (x64)
- ABB FDT Shared Components:
  - Version 13.0.0.0
- ABB FDT Base Container:
  - Version 13.0.0.0

For remote I/O, a PROFIBUS master DTM is required (for example AC800F DTM).
To use the HART functionality together with the DTMs AI815, AI845, AI880, AI895, AO815, AO845 and AO895, a HART DTM has to be installed (for example Basic HART DTM).

The S800 I/O DTM version 1.0/0 and higher will not run in frame applications conforming to version 0.98 of the FDT specification. The FDT versions differ in the expanded number of interfaces, their meaning and data management.

Installation Directory

The S800 I/O DTM files are stored in the following path and directories:

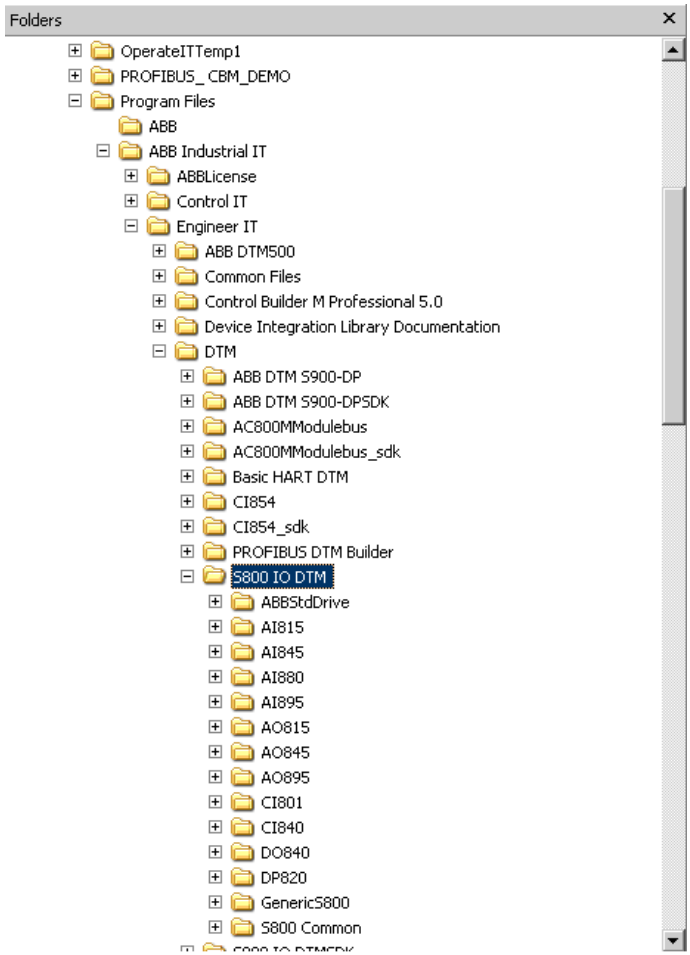


Figure 1. Installed DTMs

Language Setting

S800 I/O DTM supports English.

Backup

It is recommended to use a standard software to create a backup of the memory medium (CD). This backup helps to save the data if the medium is damaged, or in the event of a fatal error on the computer.

Ensure that the backup is clearly marked and carefully maintained.

Initial Installation

Sequence

The S800 I/O DTM consists of a single program to install all DTMs.
The installation process is the same for all components and is therefore described only once.

Installation Procedure

This procedure describes the manual installation, and needs to be referred only if the automatic installation of S800 IO DTM is not performed along with the Control System installation.

To install S800 I/O DTM:

1. Insert the S800 I/O DTM installation CD.

   The S800 IO DTM installation dialog automatically appears, which contains the name and version of the S800 IO DTM.

   If the installation dialog does not appear, open the **Setup.exe** file in the CD.

   Figure 2 shows the S800 IO DTM installation dialog.

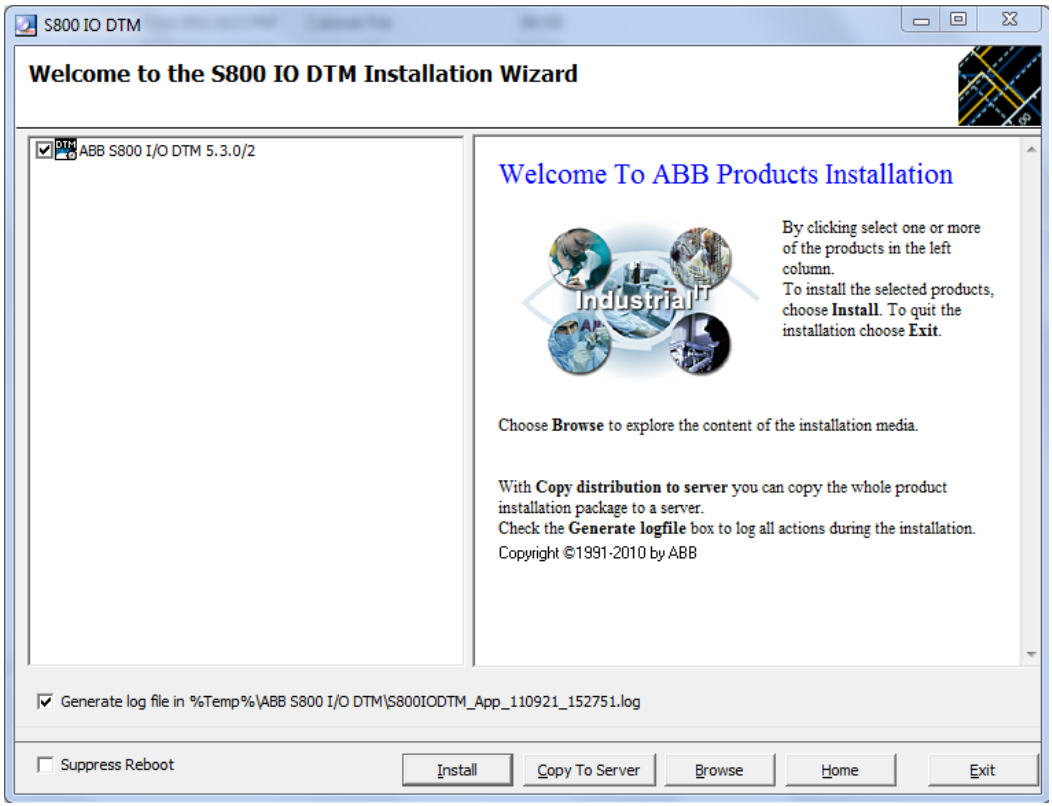


Figure 2. S800 IO DTM installation dialog

2. Click the checkbox corresponding to ABB S800 I/0 DTM 5.3.0/2.
3. Click **Install** to start installing the product, or use any of the following options in the dialog:
   - Click **Browse** to access a list of the files to be installed from the CD.
   - Click **Copy To Server** to copy the installation files to a folder on the server. The subsequent installations can be performed from this folder, instead of installing from the CD.
   - Click **Exit** to close the installation dialog without installing the product.

Check the **Generate log file** checkbox to generate a log file with detailed information about the installation. This log can be used for error analysis.

If the **Install** option is selected, a progress information dialog showing the progress of installation appears.

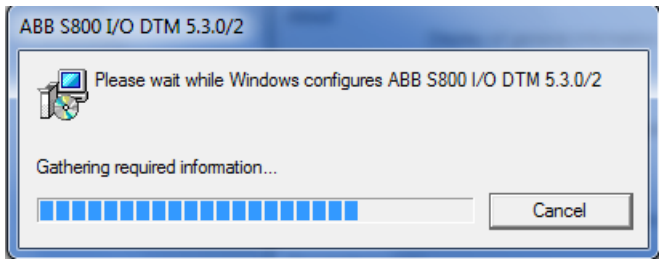


Figure 3. Progress information dialog for installation of S800 IO DTM

When the installation process is completed, this dialog closes.

Maintenance Mode

If S800 IO DTM is already installed, go to **Control Panel > Programs > Programs and Features**, and select any of the following modes corresponding to the installed ABB S800 IO DTM:

- Uninstall
- Change
- Repair

Figure 4 shows these three options corresponding to ABB S800 IO DTM installed on Windows 7.

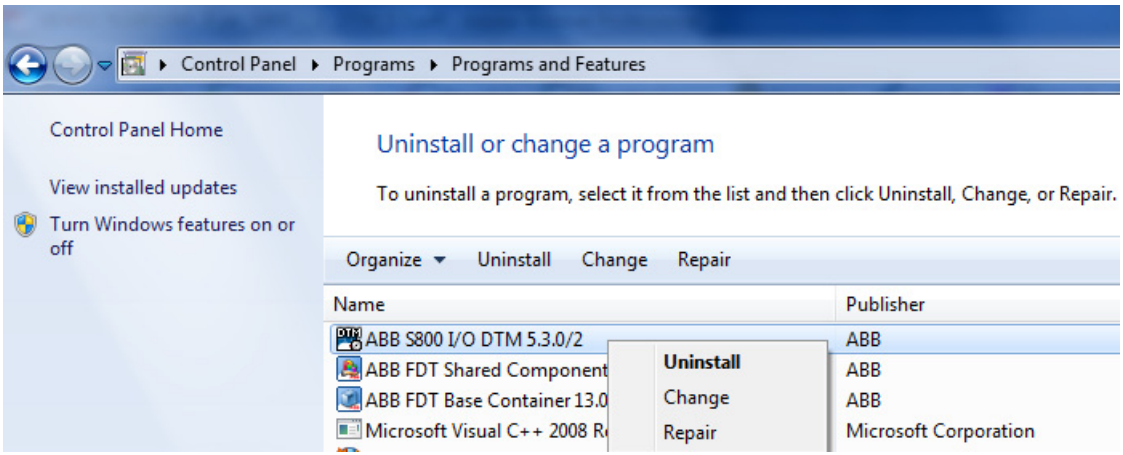


Figure 4. Maintenance mode for S800 IO DTM

Figure 5 shows the Maintenance dialog for S800 IO DTM, which appears when the **Change** or **Repair** option is selected.

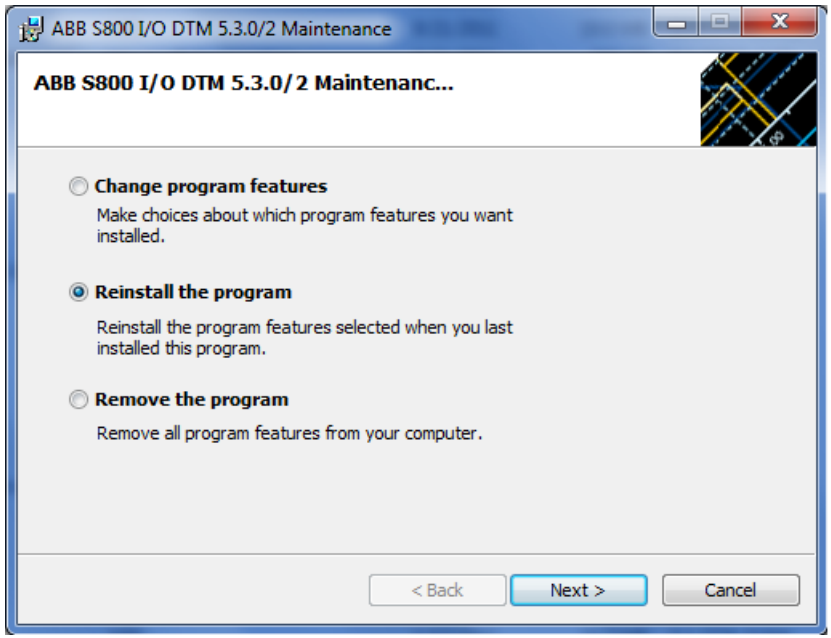


Figure 5. Maintenance dialog for S800 IO DTM

Change Program Features

The **Change program features** option in the Maintenance mode helps to change the installed DTM components of S800 I/O DTM.

Using this option, it is possible to:

- Add one or more DTMs that were not installed earlier.
- Remove one or more DTMs.
- Change the install path.

Figure 6 shows the dialog to change the DTM components.

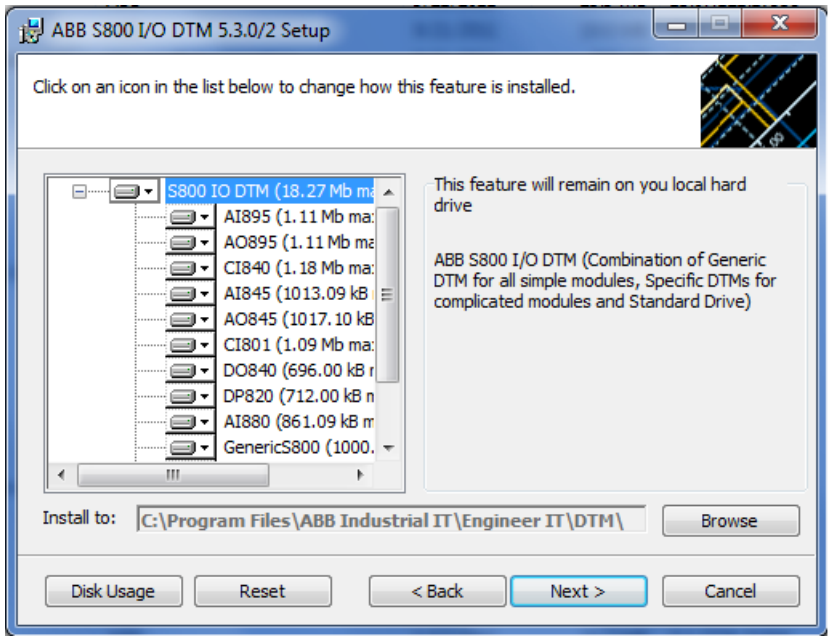


Figure 6. Changing the DTM components

Figure 7 shows the Change dialog, which confirms the updates to S800 IO DTM.

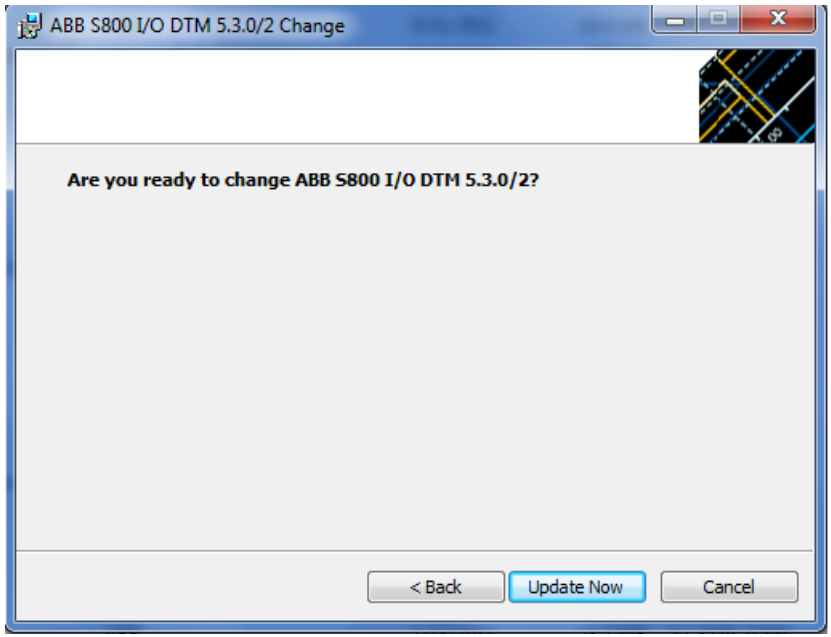


Figure 7. Change dialog to confirm the change to S800 IO DTM

Reinstall the Program

The **Reinstall the program** option in the Maintenance dialog reinstalls the S800 I/O DTM.

The type of re-installation can be selected (Normal / Minimal / Complete/ Updates). See Figure 8 for details.

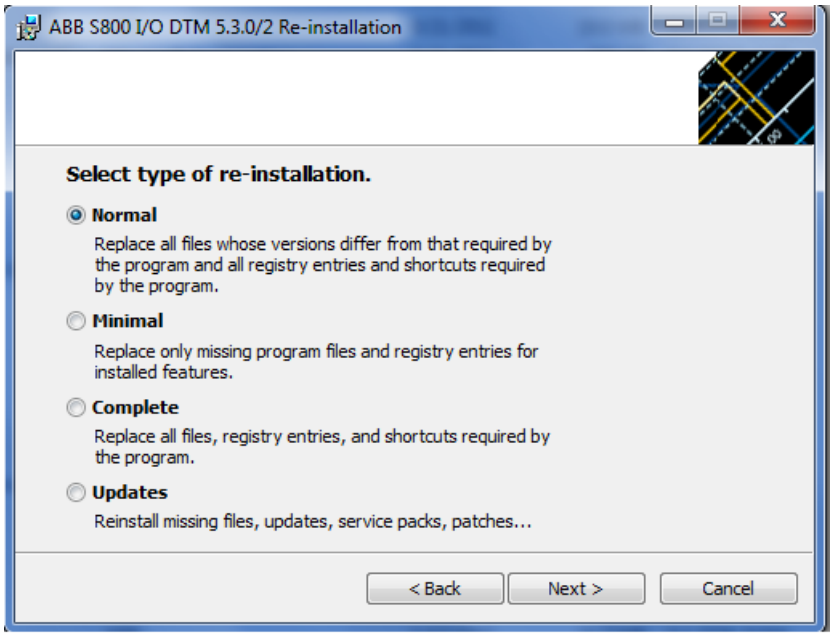


Figure 8. Re-installation dialog

Remove the Program

The **Remove the program** option removes all the S800 IO DTM files and all the related entries in the Windows registry. In the program setup, this corresponds to removing the product from the Control Panel. For more information, see Removing S800 I/O DTM on page 33.

Removing S800 I/O DTM

To remove S800 I/O DTM:

1. Go to **Control Panel > Programs > Programs and Features**.
2. Select **Uninstall** corresponding to S800 IO DTM. See Figure 9.

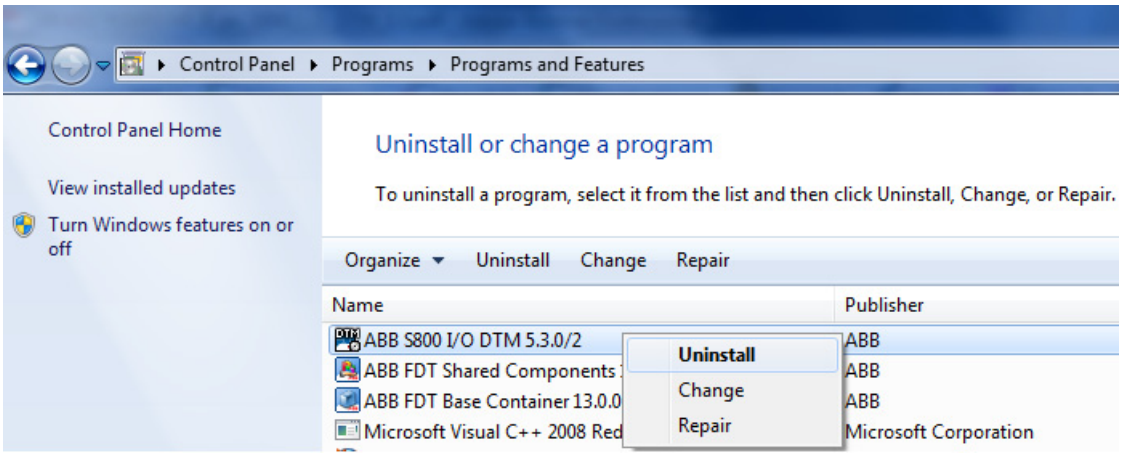


Figure 9. Uninstall option for S800 I/O DTM

3. Confirm the uninstall operation by clicking **Yes**.

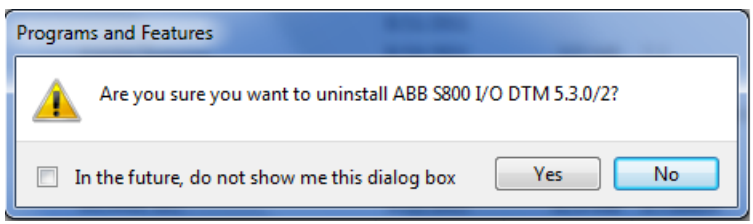


Figure 10. Confirming the uninstall operation

A progress information dialog showing the uninstall process appears.

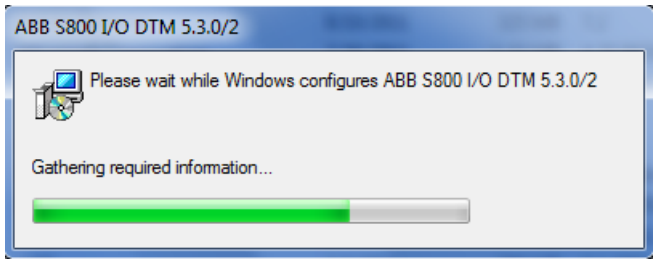


Figure 11. Progress information dialog for uninstall of S800 I/O DTM

When the S800 I/O DTM is completely uninstalled, this dialog closes.

Section 3 Run-time Operation

Introduction

This section describes how to operate the DTM with the applications in a frame application, for example Fieldbus Builder.

After the DTMs are installed, start the frame application and locate the S800 I/O DTM. See appropriate documentation for handling of the frame application.

This section is also available as Online Help.

Data Storage

The data (parameters) is only available temporarily in the DTM for processing. When a user interface is closed or data is buffered, the DTM saves the data permanently.

In off-line mode, data is saved in Frame Application. In on-line mode, data is saved first to the I/O module and then to the database.
However, the DTM will only update the data in the database if the I/O module has accepted the data.

User Interfaces

Most DTM applications have a graphical user interface for display variables, input/output parameter values or executing commands. Only two applications (download/upload) do not have a graphical user interface. They are controlled exclusively by the frame application (the DTM works in the background).

The user interface comprises a header, which is provided by the frame application. If possible, the header should contain the process point, the device name and the active application.

The DTM adds the application-specific area in the middle and two footer lines. The footer contains the standard buttons and status bar.

DTM user interfaces may be different for different Frame Applications. For example, some DTM GUI may not be offered in 800xA Control System compared to Melody or Freelance Control System.

Frame Application

The DTM informs the frame application about the possible applications. The frame application usually provides a drop-down menu for selecting an application or similar. Depending on the user's rights or the operating state (on-line/off-line), some applications may not be available for selection.

The title bar and tool bar shown in the examples should be made available by a frame application. They provide assistance when working with several DTMs or applications in parallel.

More detailed information about the selection and presentation of the DTM can be found in the instruction manual for the frame application.

System Structure

The figure below is an example of a system structure for the hardware hierarchy and the corresponding DTMs were the S800 I/O is used.

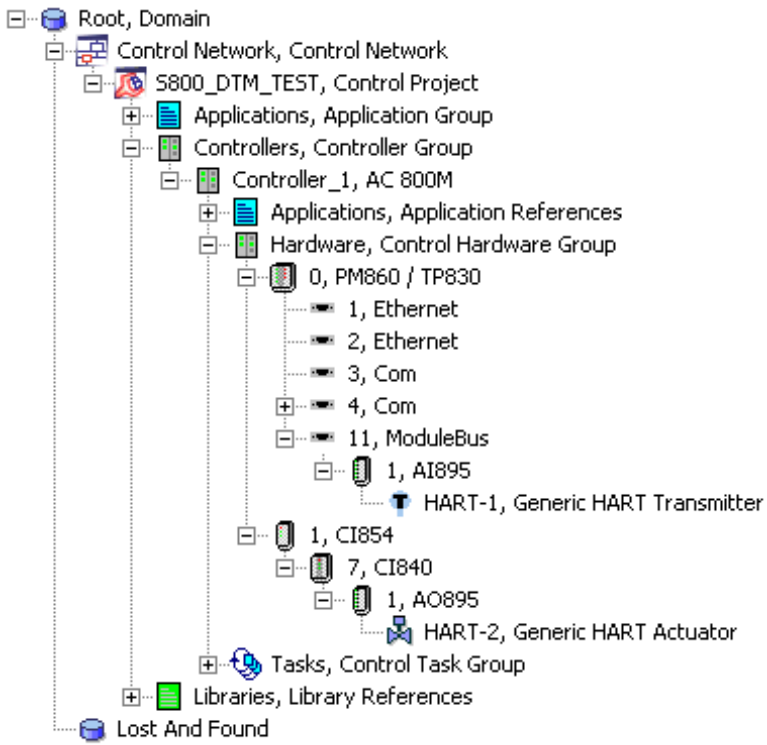


Figure 12. Example of System Structure

User Roles

The DTM checks the user rights when an application starts up. Certain users may even be prohibited from using some applications. If access to an application is permitted, a distinction is made between restricted access (read-only) and full access (read and write) to its functions.

The user roles are FDT specific. They can have different names in different Frame Applications.

Table 2. User Roles

Applications	User Roles			
	Observer	**Operator**	**Maintenance**	**Planning Engineer**
About DTM	R	R	R	R
Configuration	-/-	R	R	R/W
Diagnosis	R	R	R/W	R/W
Download	-/-	-/-	-/-	R/W
Identification	R	R	R/W	R/W
Observation	R	R	R	R
Parameterization	-/-	R	R/W	R/W
Service	-/-	R	R	R/W
Upload	-/-	-/	-/-	R/W

-/- = The user interface is not available for selection

R = Data output only (read)

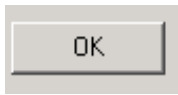
R/W = Data input (write) and output (read)

If, in addition to the roles above, you have administrators or OEM service rights, the role of an observer will grant you unrestricted access to all applications.

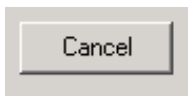
Buttons

The following buttons are not application-specific and always have the same function:

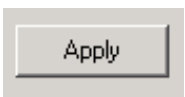
Press the **Ok** button if you want to save all data and close the graphical interface. The DTM will then save the data for that application to the database and/or device.



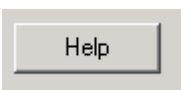
If **Cancel** is pressed, the DTM will reject all data input (since the last time data was saved/applied) and close the interface.



Press the **Apply** button to apply the number or text input and menu selections made. The DTM will save all modifications made since the last time data was applied. The interface remains open.



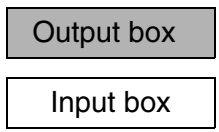
Press the **Help** button to access the Online Help for an application.



Input/Output Boxes

The input/output boxes are used to display and input data (parameter values). Depending on the meaning of the parameter, numerical values or character strings can be entered. In some cases, these values must be selected from a list containing a fixed number of default entries.

Input and output boxes are identified by means of the background brightness. The DTM highlights the fields containing modified data. Pressing the **Apply**, **Ok** or **Cancel** buttons and performing a save prompts the DTM to remove the highlighting.

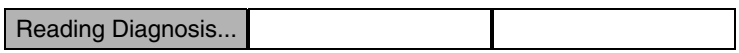


When data is entered into an input box, the DTM checks the data format, value ranges, etc. The data plausibility check can only be carried out once all data has been entered. The DTM carries out the plausibility check once the **Apply** or **Ok** button has been pressed. Entries which conflict with other entries on this user interface are identified accordingly in the appropriate fields. They must be corrected before the data can be applied.

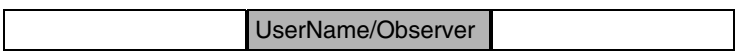
Status Bar

The status bar at the bottom of the user interface comprises a total of three fields. The status bar provides the following information:

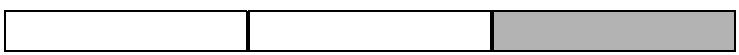
The left-hand field provides information about the on-going transactions within the application. It will tell when the communication is progressing and when it is finished. If any error occurs then a description will be displayed here.



The middle field provides information about the user name and the user role. For more information about user roles, see User Roles on page 38.



The right-hand field is currently not used for information.



Applications

Following applications are currently available for the S800 I/O DTM:

- **About DTM**
  Displays version information.
- **Identification**
  Displays information about the hardware.
- **Diagnosis**
  Displays diagnosis for the unit.
- **Observe**
  Displays the cyclic data.
- **Configuration**
  Used to set user parameters.
- **Parameterization**
  Used to set HART parameters.
- **Service**
  Used for sending special functions (commands).

Module	About DTM	Identifi-cation	Diagnosis	Observe	Configuration	Parameter-ization	Service
CI801	X	X	X		X		
CI840	X	X	X		X		X
AI801	X	X	X	X	X		
AI810	X	X	X	X	X		
AI815	X	X	X	X	X		
AI820	X	X	X	X	X		
AI825	X	X	X	X	X		
AI830	X	X	X	X	X		
AI835	X	X	X	X	X		

Module	About DTM	Identifi-cation	Diagnosis	Observe	Configuration	Parameter-ization	Service
AI835A	X	X	X	X	X		
AI843	X	X	X	X	X		X
AI845	X	X	X	X	X		X
AI880	X	X					
AI890	X	X	X	X	X		
AI893	X	X	X	X	X		
AI895	X	X	X	X	X	X(1)	X
AO801	X	X	X	X	X		
AO810	X	X	X	X	X		
AO815	X	X	X	X	X		
AO820	X	X	X	X	X		
AO845	X	X	X	X	X		X
AO890	X	X	X	X	X		
AO895	X	X	X	X	X	X(1)	X
DI801	X	X	X	X	X		
DI802	X	X	X	X	X		
DI803	X	X	X	X	X		
DI810	X	X	X	X	X		
DI811	X	X	X	X	X		
DI814	X	X	X	X	X		
DI818	X	X	X	X	X		
DI820	X	X	X	X	X		
DI821	X	X	X	X	X		

Module	About DTM	Identifi-cation	Diagnosis	Observe	Configuration	Parameter-ization	Service
DI825(2)	X	X	X	X	X		
DI828	X	X	X	X	X		
DI830(2)	X	X	X	X	X		
DI831(2)	X	X	X	X	X		
DI840	X	X	X	X	X		X
DI885(2)	X	X	X	X	X		
DI890	X	X	X	X	X		
DO801	X	X	X	X	X		
DO802	X	X	X	X	X		
DO810	X	X	X	X	X		
DO814	X	X	X	X	X		
DO815	X	X	X	X	X		
DO818	X	X	X	X	X		
DO820	X	X	X	X	X		
DO821	X	X	X	X	X		
DO828	X	X	X	X	X		
DO840	X	X	X	X	X		X
DO890	X	X	X	X	X		
DP820	X	X	X	X	X		
DP840	X	X	X	X	X		X
ABB Standard Drive	X	X	X				

(1) HART Parameterization only.

(2) The module supports SOE (Sequence Of Events), but this feature can only be used in a frame application that also supports SOE.

About DTM

For general information, directly related to the S800 I/O DTM, select the “About DTM” menu item. It will show the DTM version information.

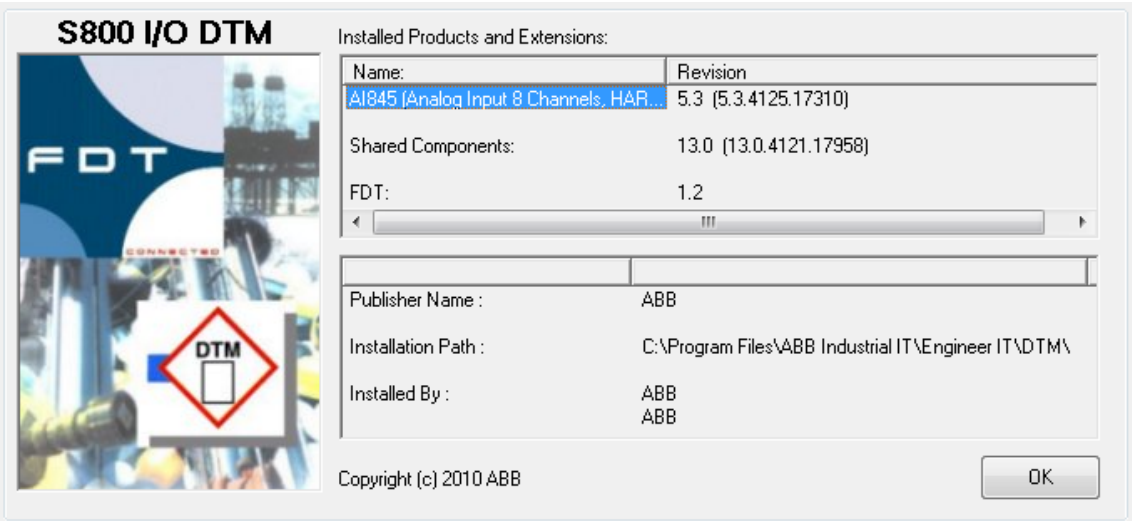


Figure 13. About DTM

Identification

The identification control is used for displaying information about the hardware. It shows the type of module, which functionality it has and the device revision. Furthermore it has a picture of the module and a comment box.

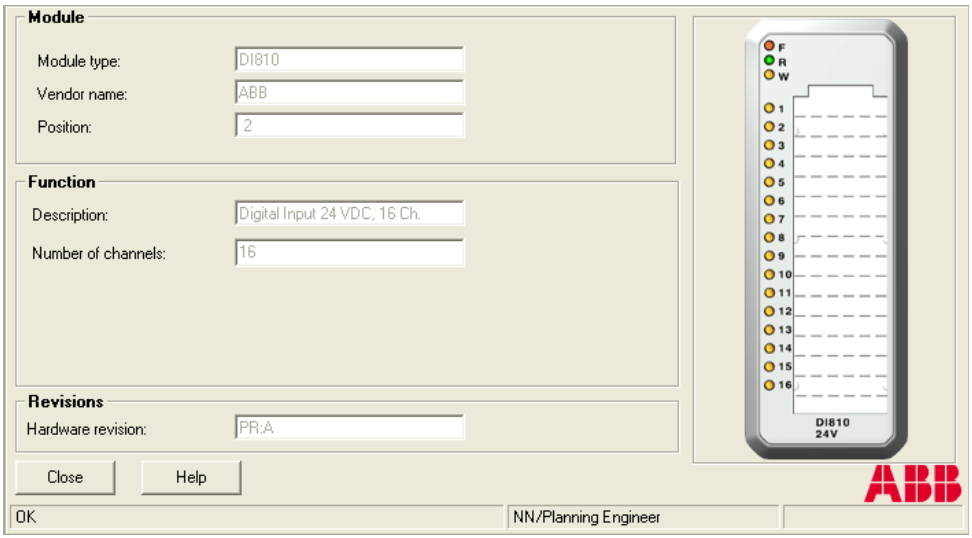


Figure 14. Identification, this example shows DI810

Module area

- **Module type**
  Shows the S800 I/O module type.
- **Vendor name**
  Shows the vendor name.
- **Position**
  Shows the address information of the module. This number correspond to the actual hardware position of the module including cluster address.

If the Identification window is open and the position of the module is changed in the Control Builder, the new position is not updated in the window. Close and open the Identification window to view the updated position.

Function area

Describes hardware specific data for the module.

See the S800 I/O manuals for more detailed information about the functions of the module.

Revisions area

- **Hardware revision**
  This revision will be read from the module and displayed in the text field in online mode.

This function is not supported in all I/O modules.

Diagnosis

The diagnosis control shows the status of the module. It displays information like Module missing, Wrong module type and Internal channel error. The available diagnosis can differ depending on the module type.

Station specific diagnosis is displayed in Diagnosis control for the CI801 or CI840 DTM. AI895 and AO895 have also specific HART diagnosis, see Diagnosis section for respective unit.

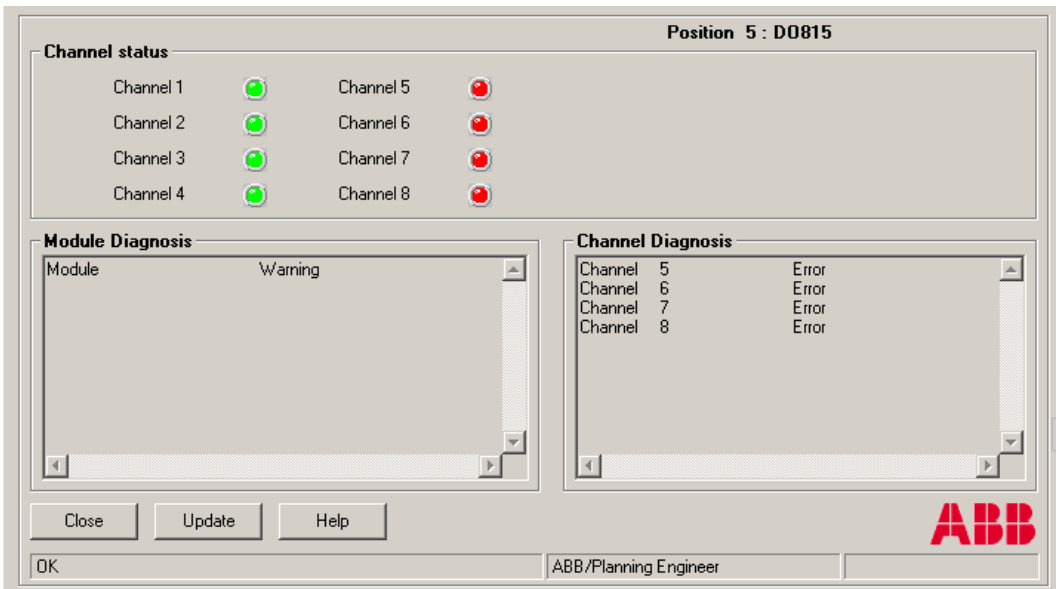


Figure 15. Diagnosis for I/O modules not supporting Diagnostic History

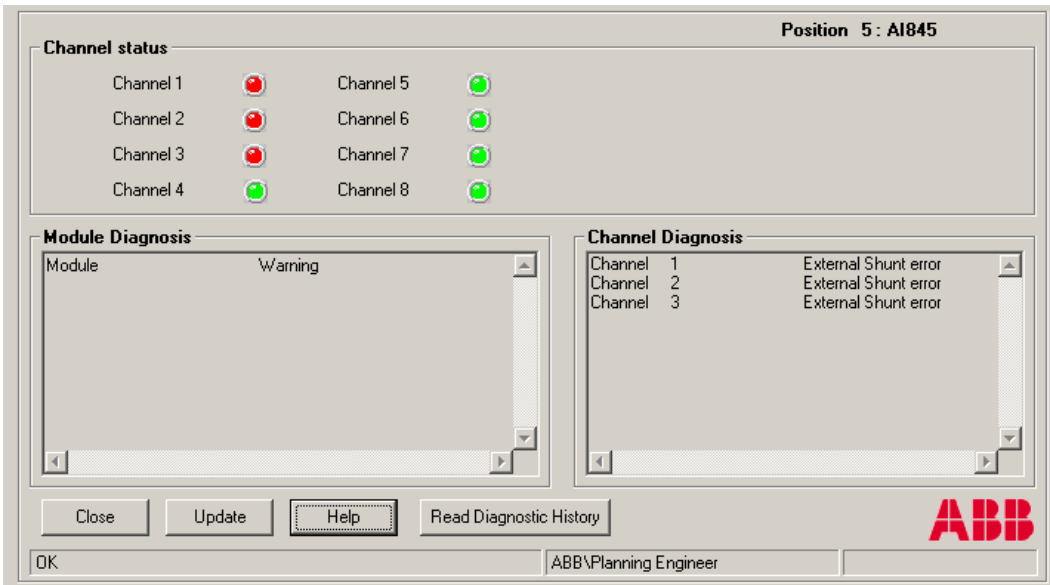


Figure 16. Diagnosis for AI815, AO815, AI830, AI835, AI835A, AI843, AI845 and AO845

Channel Status area

Displays the channel status reported by the module in cyclic data.

Module Diagnosis area

Reports diagnostic that affects the entire I/O module i.e. Wrong module type.

Channel Diagnosis area

Reports errors on separate channels.

Read Diagnostic History

Shows a list of diagnostic events that have been changed since the list was last read. When clicking this button the history on the I/O module will be erased.

Observe

The Observe control displays the dynamic data and channel status for a module in online mode. It is possible to update the value once or to read it cyclic with an interval of 30 s by checking the corresponding check box. To stop the cyclic reading, press the **Cancel** button.

Observe Analog modules

Displays the dynamic data, both in digits, percent and as a gauge bar and the chosen signal range.

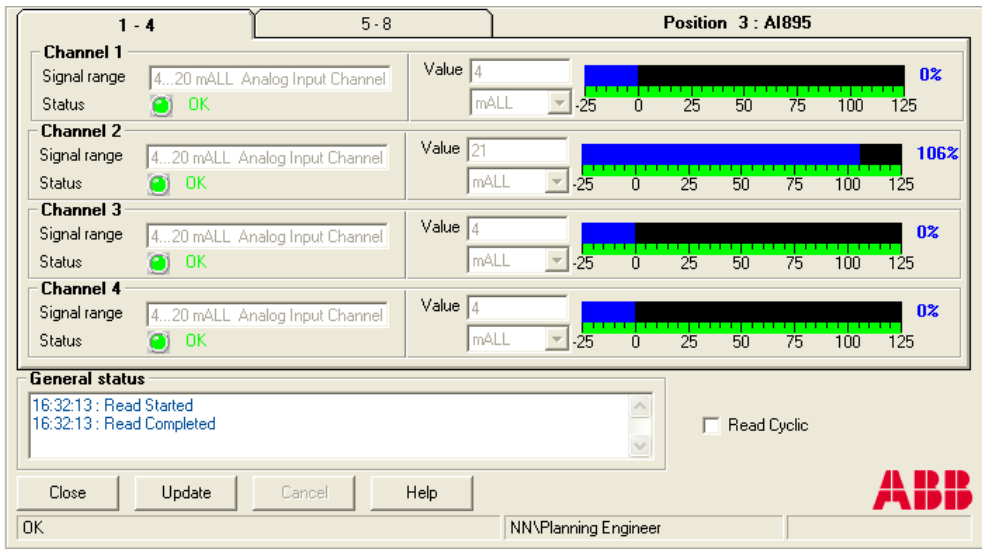


Figure 17. Observe, Analog modules, this example shows AI895 for AC800F and AC870P

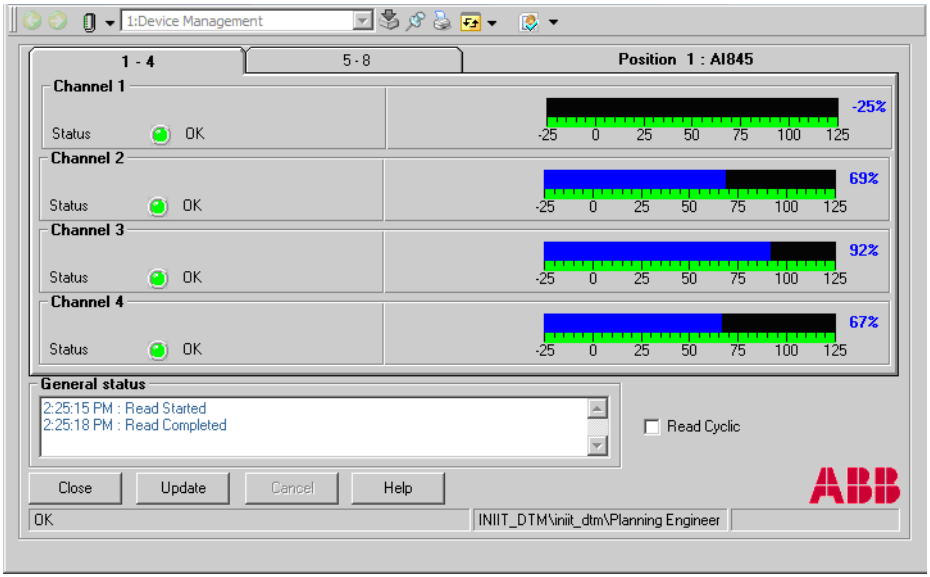


Figure 18. Observe, Analog modules, this example shows AI845 for AC800M

The Observe window can also be used to analyze overflow or underflow in the signals at each channel.
For underflow, no value is shown in the gauge bar. For overflow, a percentage value (above 100%) is shown in the gauge bar.
If AC 800M is used as the controller, the underflow/overflow information can also be read under the Unit Status tab of the module editor, in the Control Builder.

Observe Digital modules

Displays the dynamic data and the channel status.

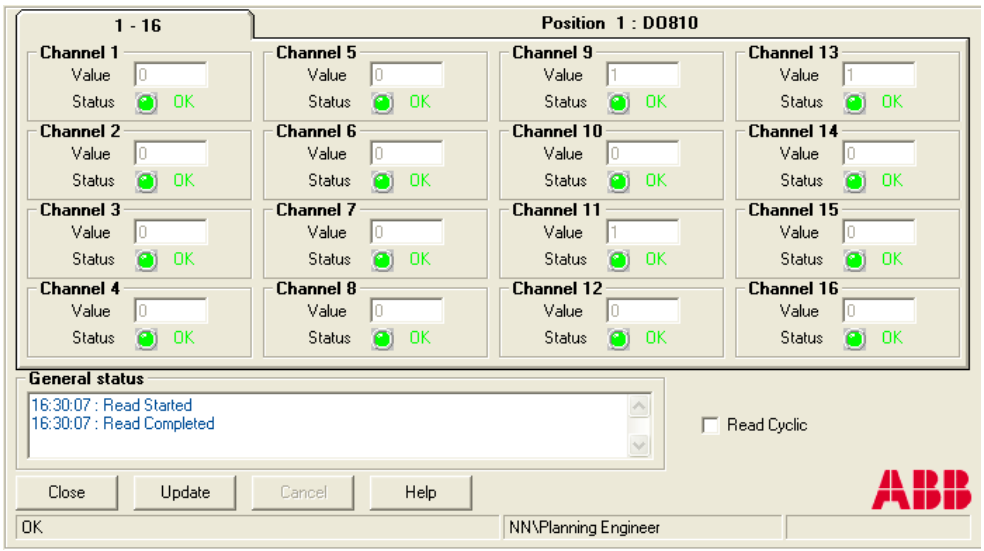


Figure 19. Observe, Digital modules, this example shows DO810

CI801

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See CI801 Dynamic values on page 165.

Diagnosis

Diagnosis control shows the status of the CI801 and node specific errors and warnings. Module specific diagnosis are displayed in the Diagnosis control for each I/O module.

General tab

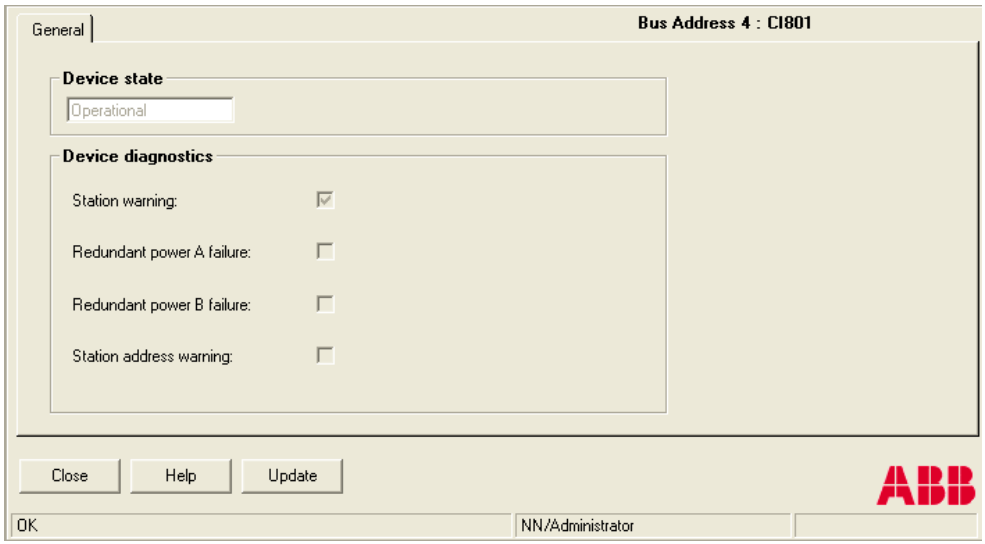


Figure 20. CI801 - Diagnosis - General Tab

Device state area

This text field shows the actual state of the FCI. Either the state is **Operational** or the text field is left blank.

Device diagnostics area

The device specific errors that are detected for the CI801 are:

- **Station warning**
  At least one error is detected within the entire CI801 station (including I/O modules etc.).
- **Redundant power A failure**
  Power fail on the optical modem.
- **Redundant power B failure**
  Power fail on the optical modem

Station address warning
There is a mismatch between the actual address on the CI801 and the one configured in the system or if the address is set above 62. The warning will be cleared when the system is restarted with the right configuration or if the switch on the CI801 is changed back to the configured address.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

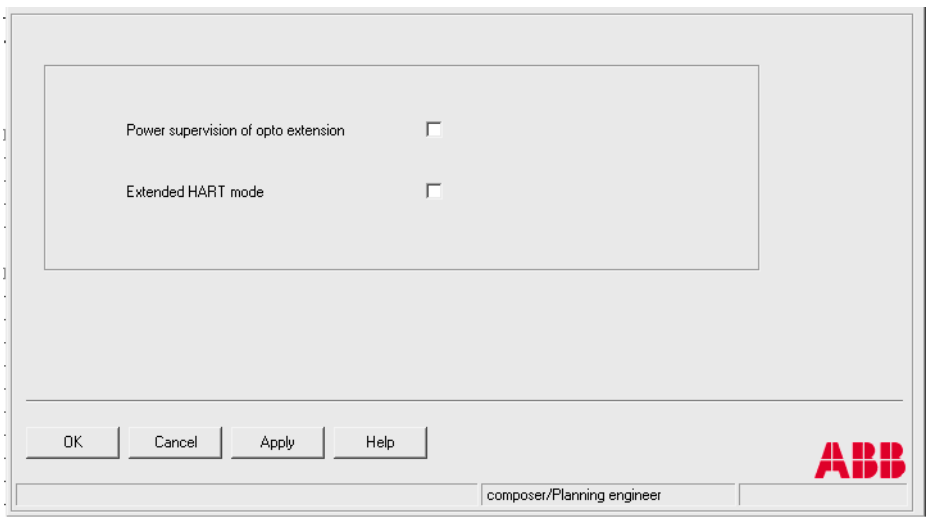


Figure 21. CI801 - Configuration for AC870P

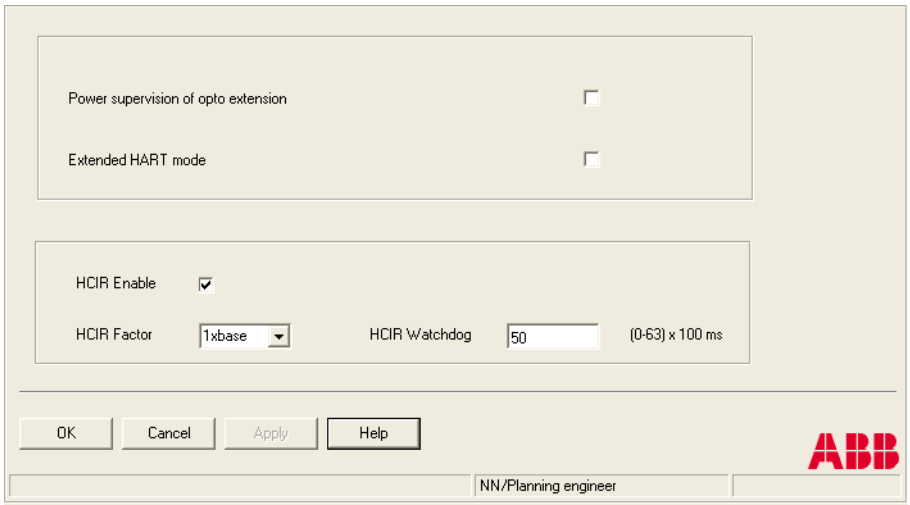


Figure 22. CI801 - Configuration for AC800F

- **Power supervision of opto extension**
  Mark the check box if the voltage supply to the cluster shall be supervised. Only if redundant power supply.
- **Extended HART mode**
  Normal mode shall always be used if HART data is ≤ 56 bytes. Mark the check box if the HART data is ≥ 56 bytes but ≤ 215 bytes. If Extended HART mode is chosen less I/O modules can be used. See *S800 I/O Manuals* for more details.
- **HCIR Enable**
  Hot Configuration In Run active
- **HCIR Factor**
  Hot Configuration In Run Factor
- **HCIR Watchdog**
  Hot configuration In Run Worst Case Bus Cycle Base

CI840

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See CI840 Dynamic values on page 166.

Diagnosis

Diagnosis control shows the status of the CI840 and node specific errors and warnings. Module specific diagnosis are displayed in the Diagnosis control for each I/O module.

General tab

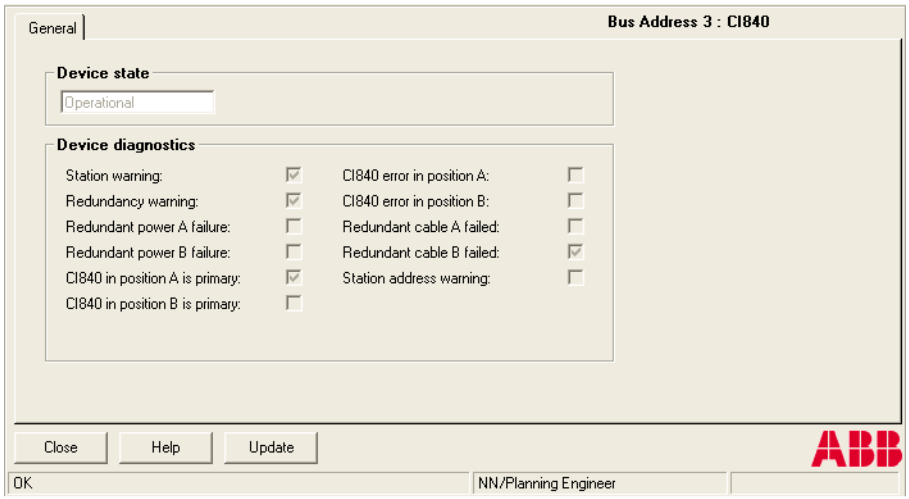


Figure 23. CI840 - Diagnosis - General Tab

Device state area

This text field shows the actual state of the FCI. Either the state is **Operational** or the text field is left blank.

Device diagnostics area

The device specific errors that are detected for the CI840 are:

- **Station warning**
  At least one error is detected within the entire CI840 station (including I/O modules etc.).
- **Redundancy warning**
  Decreased availability due to error on redundant part in the entire CI840 station.
  In system with only single CI840 this warning could be raised if the system is not correctly configured for single mode.

- **Redundant power A failure**
  For the CI840 or an optical modem.
- **Redundant power B failure**
  For the CI840 or an optical modem.
- **CI840 in position A is primary**
  CI840 in position A is primary in a redundant pair also set if used as single.
- **CI840 in position B is primary**
  CI840 in position B is primary in a redundant pair.
- **CI840 error on unit in position A**
  CI840 in position A is erroneous.
- **CI840 error on unit in position B**
  CI840 in position B is erroneous.
- **Redundant cable A failed**
  The Profibus cable to CI840 in position A is unconnected or broken.
- **Redundant cable B failed**
  The Profibus cable to CI840 in position B is unconnected or broken.

Station address warning
There is a mismatch between the actual address on the CI840 and the one configured in the system or if the address is set above 62. The warning will be cleared when the system is restarted with the right configuration or if the switch on the CI840 is changed back to the configured address.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item. It shows the user parameters for the FCI e.g. Output Hold Time.

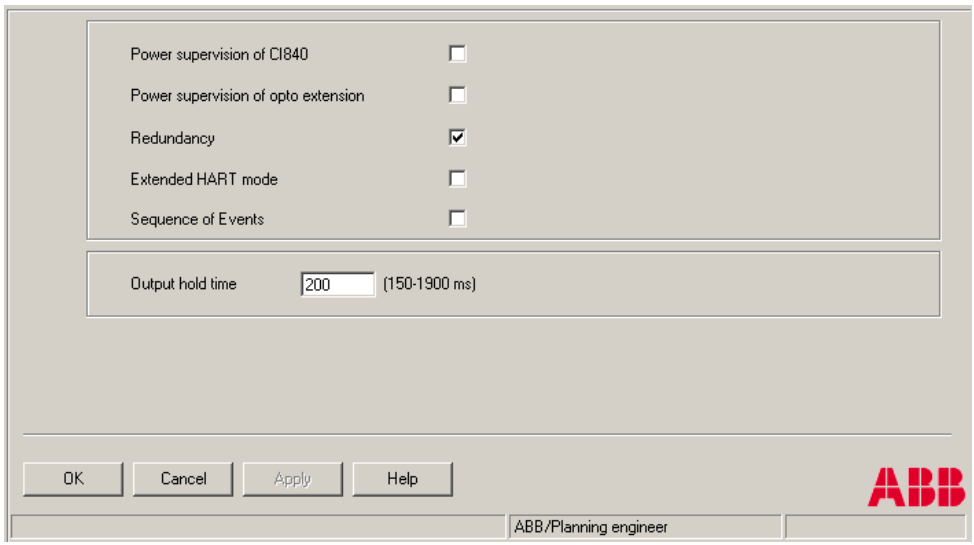


Figure 24. CI840 - Configuration for AC870P

Sequence of Events

The **Sequence of Events** checkbox determines the status of the SOE feature in the supported I/O modules:

- If this checkbox is checked, the SOE drop-down menu in the Channel Parameters tab of the supported I/O modules is activated. The user can then select the SOE status for each channel.
- If this checkbox is unchecked, the SOE is disabled for the supported modules, and the SOE drop-down menu in the Channel Parameters tab of the supported modules is not activated.

SOE is supported in DI825, DI830, DI831, and DI885 modules.

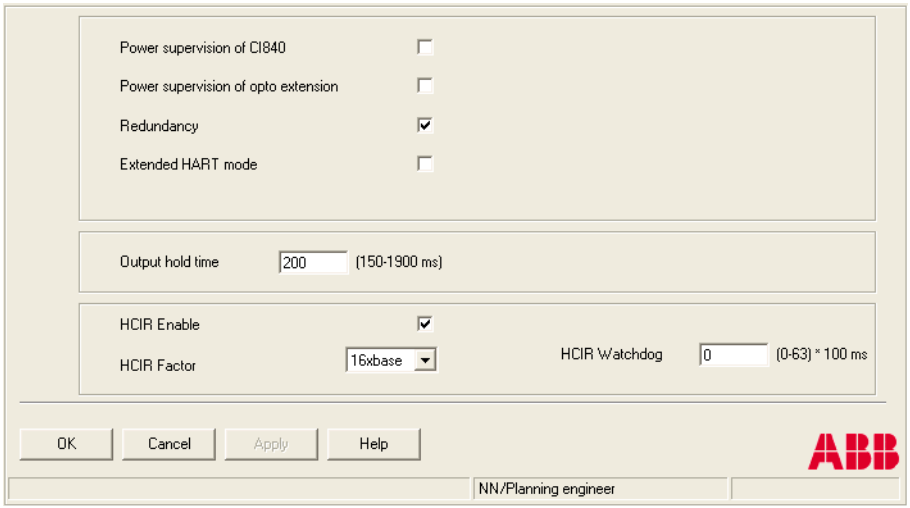


Figure 25. CI840 - Configuration for AC800F

- **Power supervision of FCI**
  Mark the check box if the voltage supply to the FCI shall be supervised. Only if redundant power supply.
- **Power supervision of opto extension**
  Mark the check box if the voltage supply to the cluster shall be supervised. Only if redundant power supply.
- **Redundancy**
  Mark the check box if the CI840 shall be configured as a redundant module.
- **Extended HART mode**
  Normal mode shall always be used if HART data is $\leq$ 56 bytes. Mark the check box if the HART data is $\geq$ 56 bytes but $\leq$ 215 bytes. If Extended HART mode is chosen less I/O modules can be used. See Memory Maps for more details.
- **Output hold time**
  After a fail over, a timer is started in the new primary CI840. This CI840 requires configuration and data from the Profibus Master within the output hold time, which is defined in the **Output hold time** text field. If no data is

received within the defined time, the channels on the output modules are set to the predefined value (OSP value).

- **HCIR Enable**
  Hot Configuration In Run active
- **HCIR Factor**
  Hot Configuration In Run Factor
- **HCIR Watchdog**
  Hot configuration In Run Worst Case Bus Cycle Base

Configuration Control of DI825/DI830/DI831/DI885 with CI840 for SOE

To use the modules DI825/DI830/DI831/DI885 for SOE, open the `ServiceEntries.xml` file, and set the value of the '**EnableSOE**' attribute to **1**.

The location of `ServiceEntries.xml` is <*ProgramData*>\ABB\800xA\S800DTM. The ProgramData folder is hidden, by default.

Table 3 describes the different configuration control options for the SOE supported modules DI825, DI830/DI831 and DI885, used with CI840 for AC870P.
It is assumed that the **EnableSOE** attribute is set to **1** globally.

Table 3. Configuration control of SOE supported modules used with CI840, for AC870P

Status of 'Sequence of Events' checkbox in CI840 Configuration Control	Displayed status in the 'SOE' drop-down menu in DI825/DI830/DI835/DI885 Configuration Control	Whether the displayed SOE status in DI8xx can be changed
Unchecked, by default, after inserting the CI840 for the first time	`SOE disable`	No
Checked after an unchecked status	`SOE disable`	Yes

Table 3. Configuration control of SOE supported modules used with CI840, for AC870P

Status of 'Sequence of Events' checkbox in CI840 Configuration Control	Displayed status in the 'SOE' drop-down menu in DI825/DI830/DI835/DI885 Configuration Control	Whether the displayed SOE status in DI8xx can be changed
Checked, after inserting the CI840 for the first time	`SOE enable`	Yes
Unchecked after a checked status	`SOE disable`	No

Service

The service control is used for reading acyclic data.

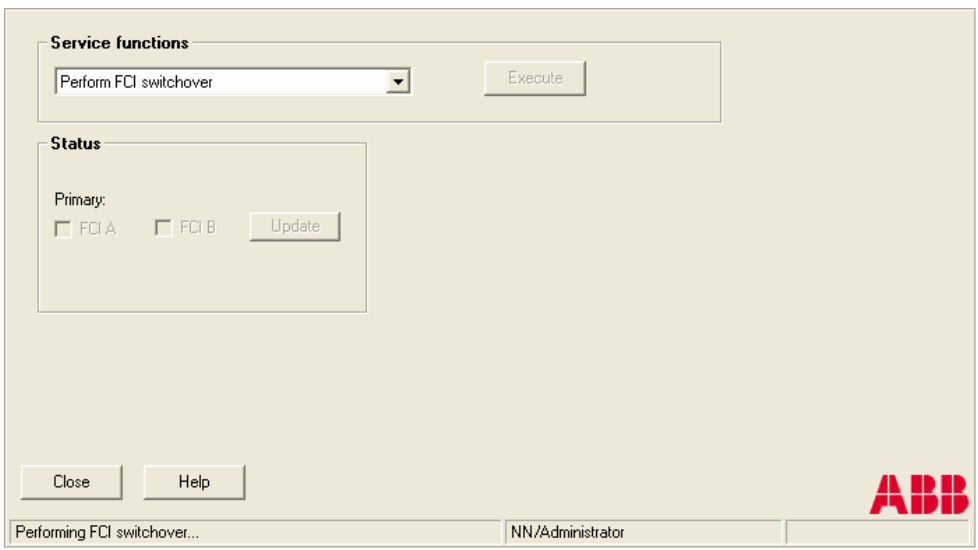


Figure 26. CI840 - Service

Service functions area

Click the **Execute** button to perform a switch over between unit A and unit B.

Status area

In the **Status** area you can see which unit that is primary. By clicking the **Update** button you update the status for which of the units that are the primary.

AI801/AI810/AI820/AI825

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167, and AI820/AI825 Dynamic values on page 168.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item. It shows the user parameters for the module i.e. Filter time, Signal range and Linearization.

Channel parameters tab

The control looks the same for all modules but for the number of channels.

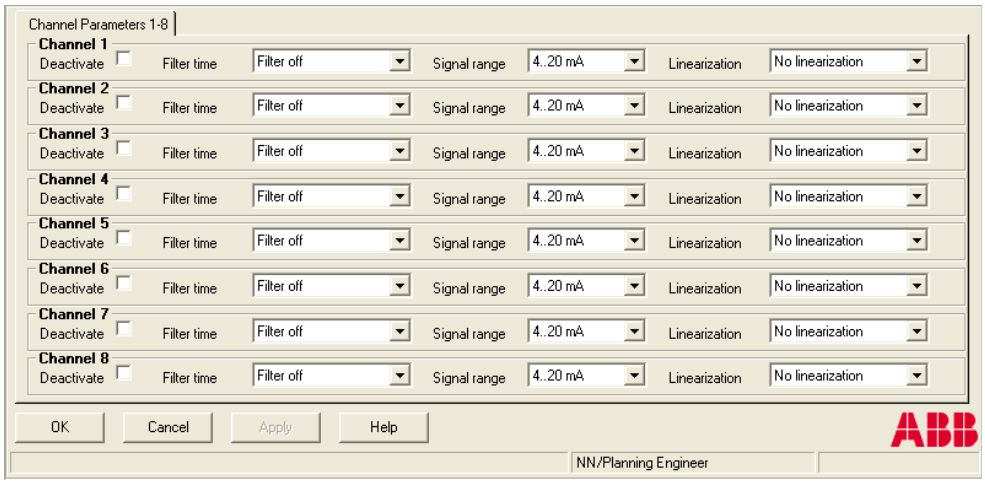


Figure 27. AI801/AI810/AI820/AI825 - Configuration

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Linearization** drop-down menus.

AI815/AI845

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module parameters tab

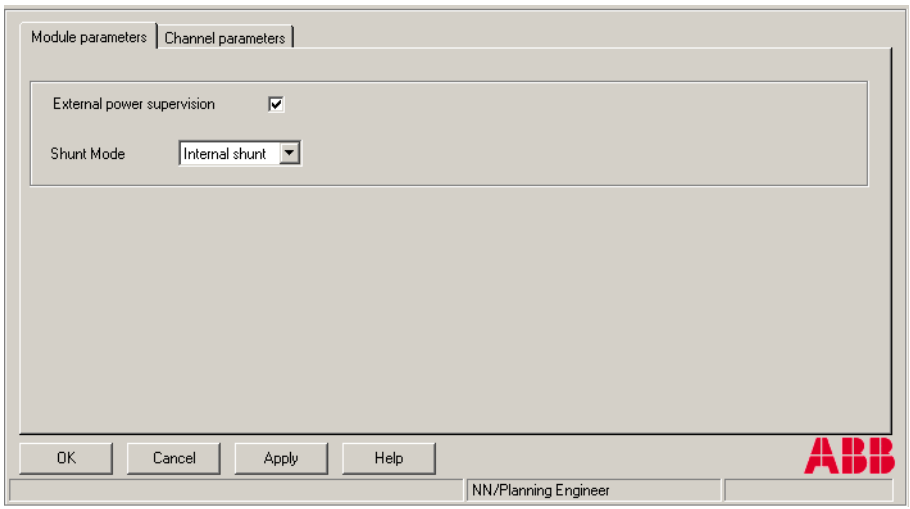


Figure 28. AI815 - Configuration - Module Parameters Tab

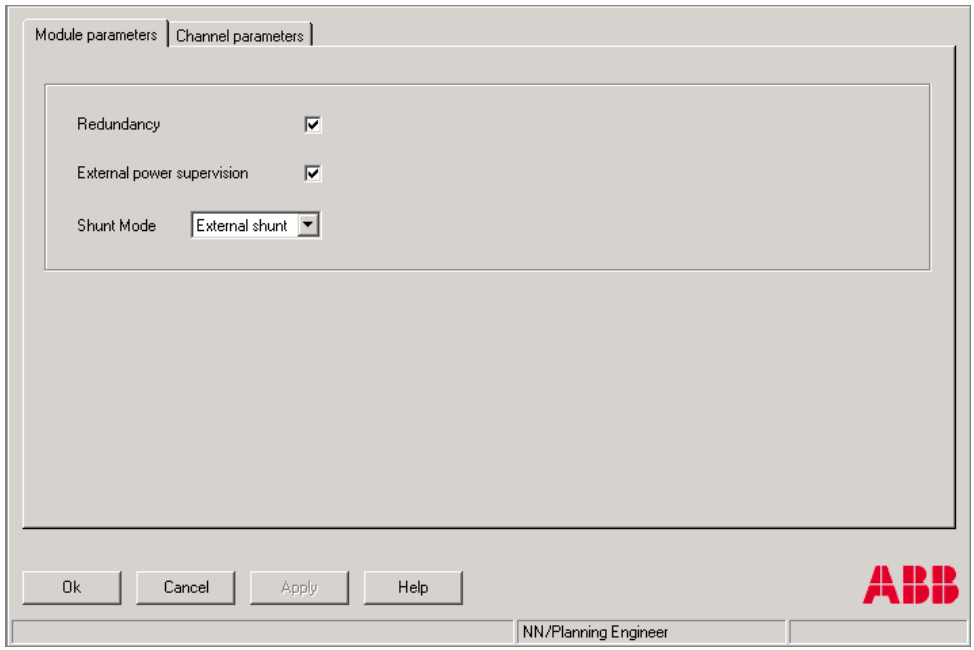


Figure 29. AI845 - Configuration - Module Parameters Tab

Mark the **Redundancy** check box if the unit shall be set for redundant operation. This check box is only applicable for AI845 when configured via CI840.

Mark the **External power supervision** check box if supervision of the power supply to the transducer shall be enabled. If an error occurs the status of the unit is updated and the channel status bits will be set.

In the **Shunt mode** drop-down menu you can choose between ‘Internal shunt’ or ‘External shunt’. External shunt shall always be set together with MTU TU844 or TU845, and at voltage signal together with other MTUs.

Channel parameters tab

The Channel parameters tab shows the user parameters of the module. It shows Filter time, Linearization function and Signal range.

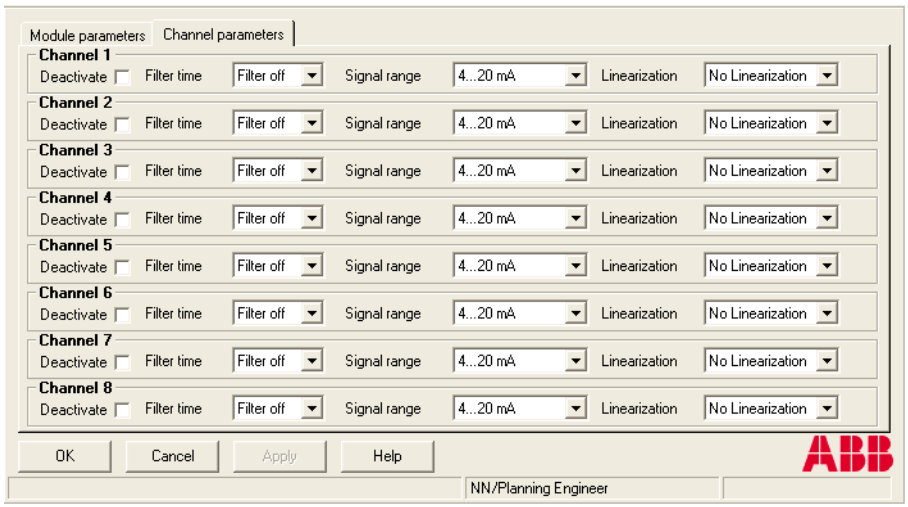


Figure 30. AI815 and AI845 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Linearization** drop-down menus.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840. The service control is only applicable for AI845.

Redundancy Tab

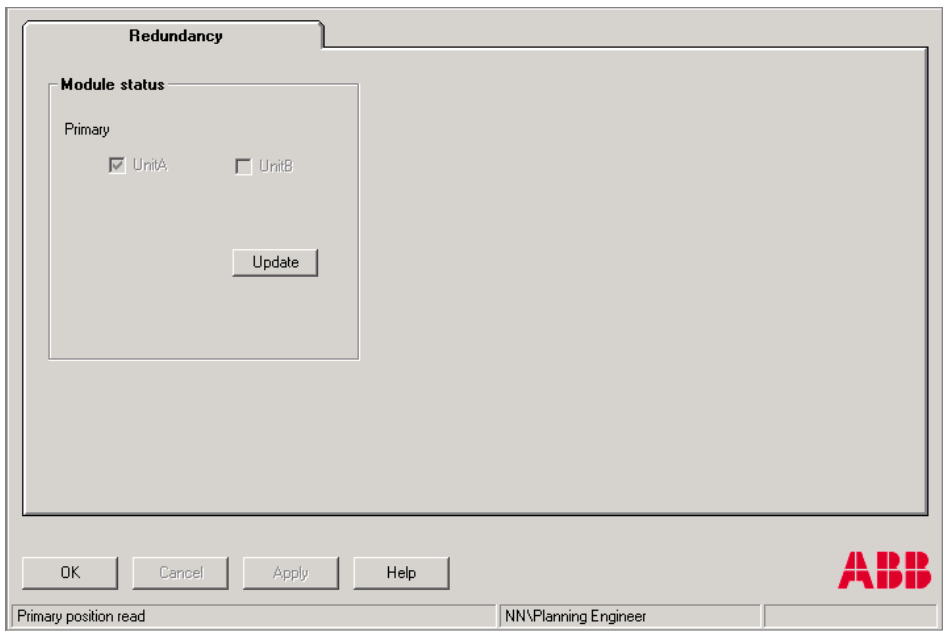


Figure 31. AI845 - Service - Redundancy Tab

The Redundancy Tab is only shown in Commissioning mode.

Module status area

In the **Module status** area you can see which I/O module that is treated as primary by CI840. By clicking the **Update** button you update the status for which of the I/O module that are the primary.

The HART Primary unit does not have to be identical with the Primary unit described in this control. The HART Primary unit is set in the Service Control in Engineering mode.

HART Primary Tab

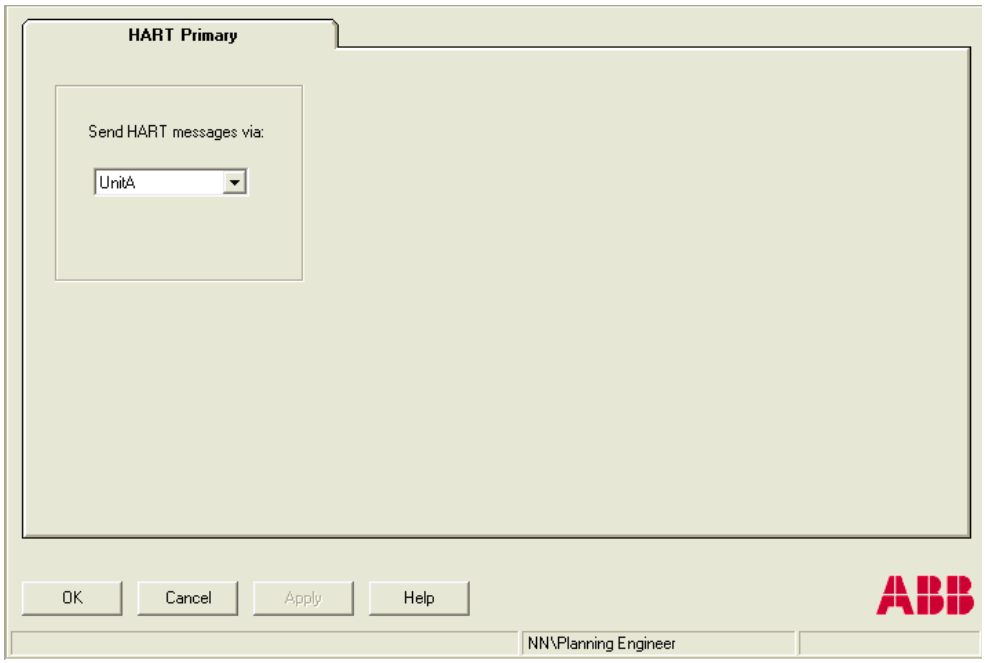


Figure 32. AI845 - Service - HART Primary Tab

The HART Primary Tab is only shown in Engineering mode. Here you select through which unit HART communication should happen.

The HART Primary unit can be, but does not have to be, identical with the unit treated as primary by CI840 seen in Service Control in Commissioning mode. If the HART Primary module fails, HART communication does not switch over automatically to the other unit. The user must manually do the switchover.

AI830

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for the channels, i.e. Filter time and Signal range.

Module parameters tab

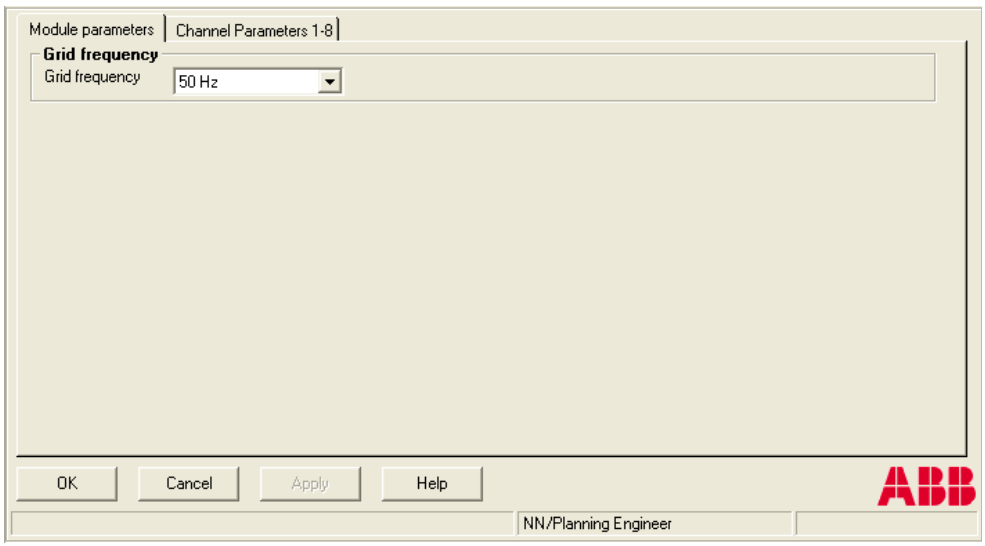


Figure 33. AI830 - Configuration - Module Parameters Tab

Grid frequency area

Make the required choice in the **Grid frequency** drop-down menu.

Channel parameters tab

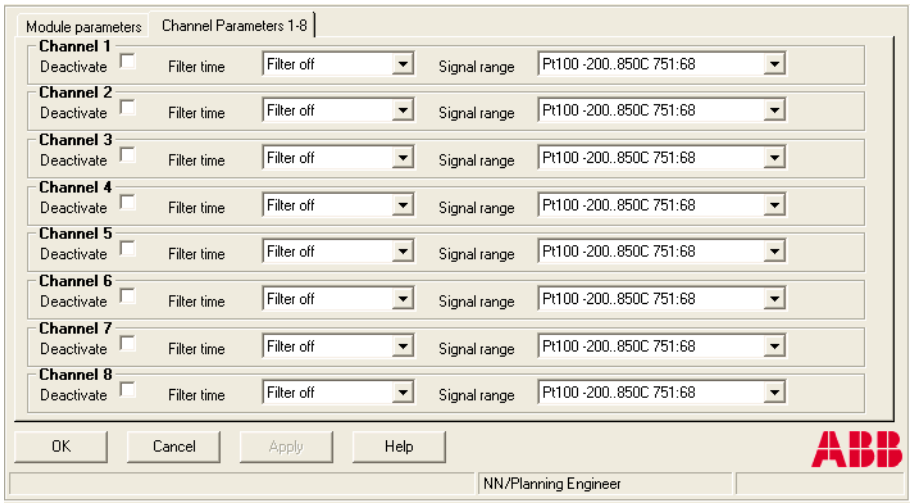


Figure 34. AI830 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time** and **Signal range** drop-down menus.

AI835/AI835A

The difference between the AI835 and AI835A modules is that AI835A has some supplementary features.
AI835A supports the same thermocouple types as AI835 and additionally TC types D, L and U. AI835A has also a possibility to use remote cold junction compensation. It is possible to insert an AI835A in an configuration as replacement for AI835, but not the other way around.

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167, and AI835A Dynamic Values on page 168.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for the channels, i.e. Signal range and Filter time.

Module parameters tab

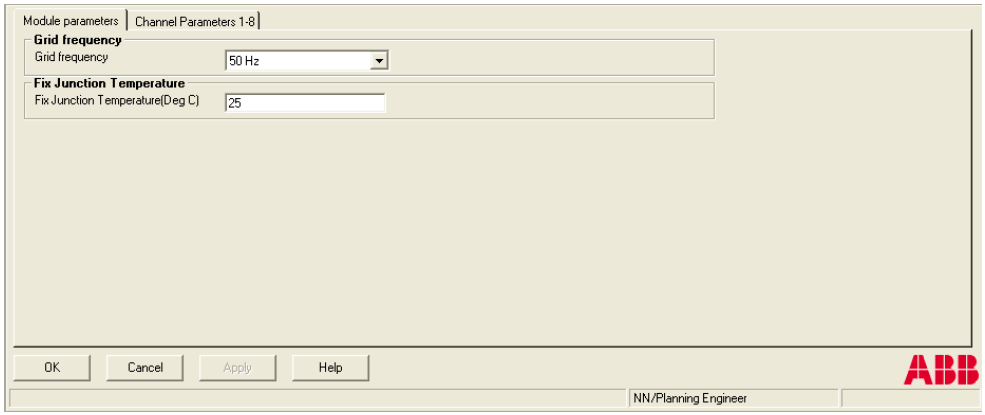


Figure 35. AI835/AI835A - Configuration - Module Parameters Tab

Grid Frequency area

Make the required choice in the **Grid frequency** drop-down menu.

Fix Junction Temperature area

Type the required value in the **Fix junction temperature** text field.

Channel parameters tab

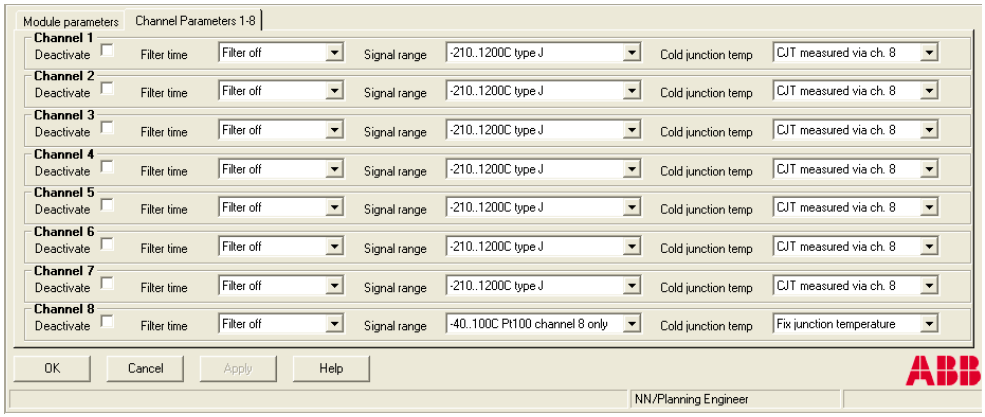


Figure 36. AI835/AI835A - Configuration - Channel parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Cold junction temperature** drop-down menus.

AI843

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI843 Dynamic values on page 169

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module parameters tab

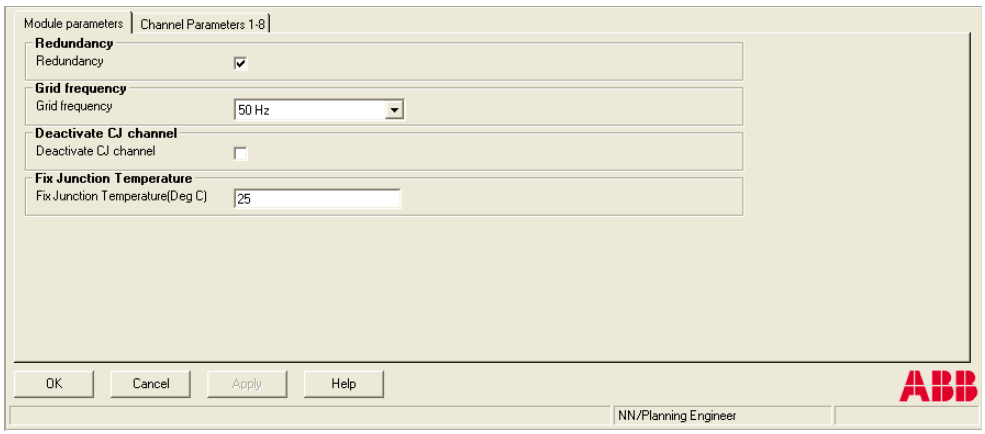


Figure 37. AI843 - Configuration - Module Parameters Tab

Redundancy area

Mark the **Redundancy** check box if the unit shall be set for redundant operation. This check box is only applicable for AI843 when configured via a CI840.

Grid Frequency area

Make the required choice in the **Grid frequency** drop-down menu.

Deactivate CJ channel area

Mark the **Deactivate CJ channel** check box if the Cold Junction channel shall not be used and the supervision disabled.

Fix Junction Temperature area

Type the required value in the **Fix Junction Temperature** text field.

Channel parameters tab

The Channel parameters tab shows the user parameters of the module. It shows Filter time, Signal range and Cold junction temperature.

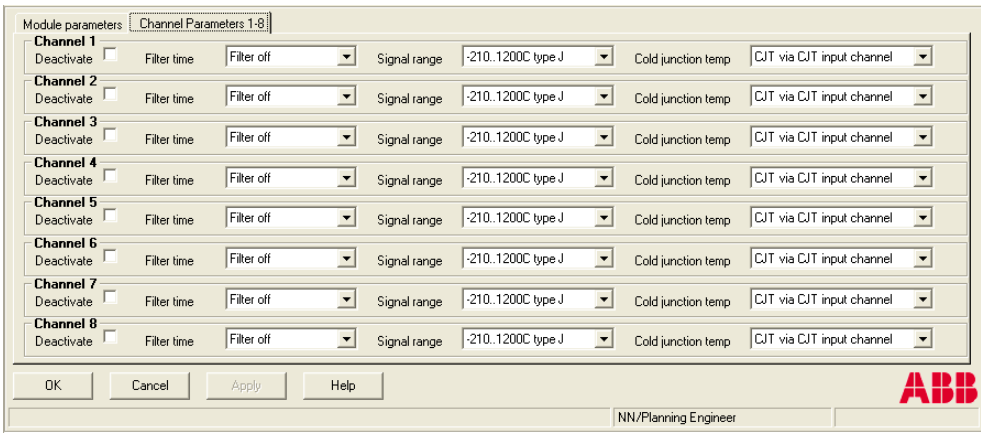


Figure 38. AI843 - Configuration -Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Cold junction temperature** drop-down menus.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840.

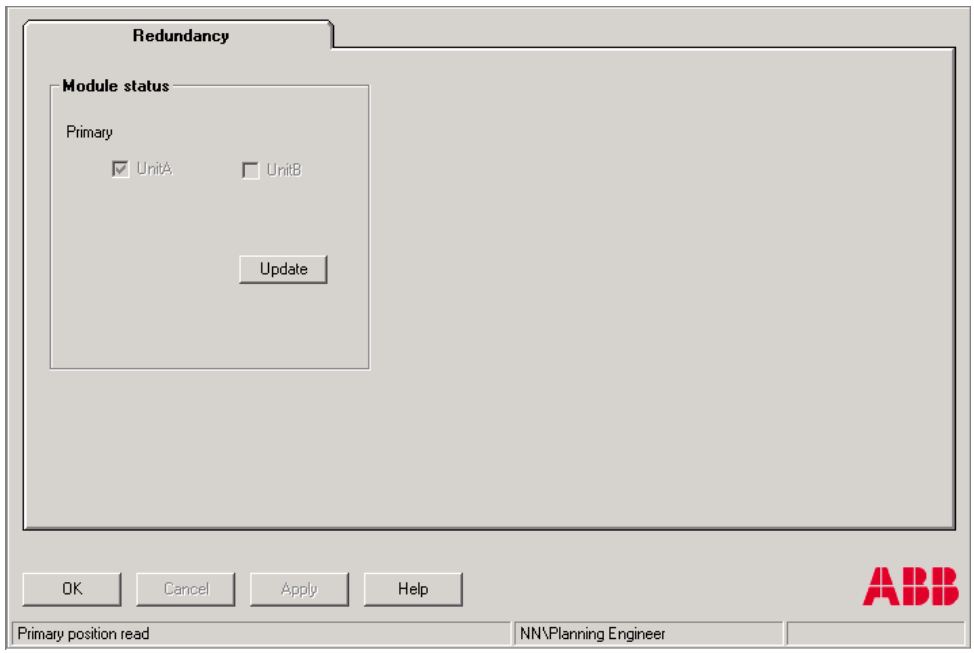


Figure 39. AI843 - Service - Redundancy Tab

Redundancy Tab

The Redundancy Tab is only shown in Commissioning mode.

Module status area

In the **Module status** area you can see which I/O module that is addressed by CI840. By clicking the **Update** button you update the status for which of the I/O module that are the primary. The module has to be configured via a CI840.

AI880

This module is only supported as direct I/O connected to AC800M.

If the AI880A are used in Safety applications there are restrictions on how to access data and the HART parameter are recommended to be set to Read only.

Device specific HART commands are not predefined and can be implemented as both read or write commands. If device specific commands are to be used the parameter has to be set to Full mode.

Note: If the HART routing functionality of AI880A is not restricted by the modules configuration settings (Read only or Disabled), the operation procedures must include restrictions for use of this function.

If a write command is sent when the AI880A is in Read only mode the module will return an error which is reported back to the AI880 DTM. The AI880 DTM will display an error message “No connection” in the FBB view stating which command that has failed. The AI880 DTM will also send an error report back to the HART DTM and it is up to this DTM to decide how to act on the error.

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

AI890

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Channel parameters tab

Channel parameters tab shows the user parameters of the module. It shows Filter time, Linearization and Signal range.

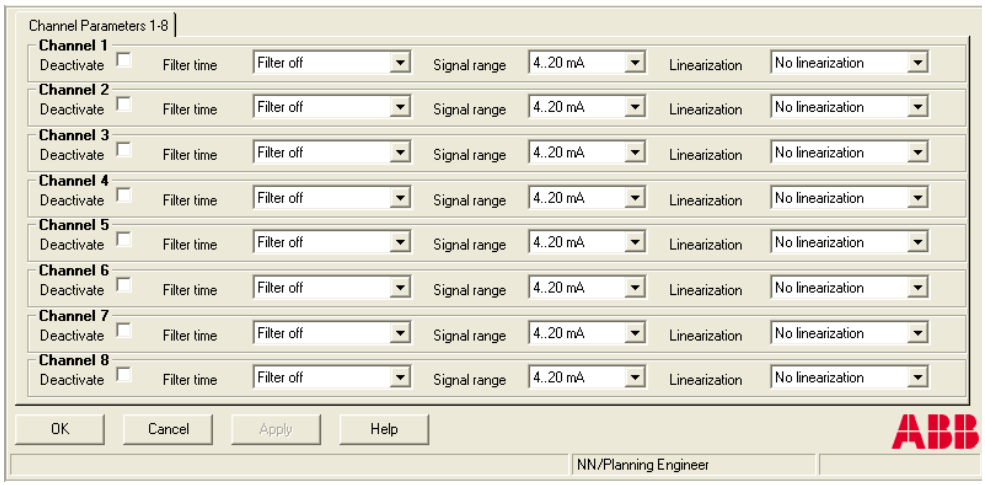


Figure 40. AI890 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Linearization** drop-down menus.

AI893

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

AI893 in RTD mode

Channel parameters tab

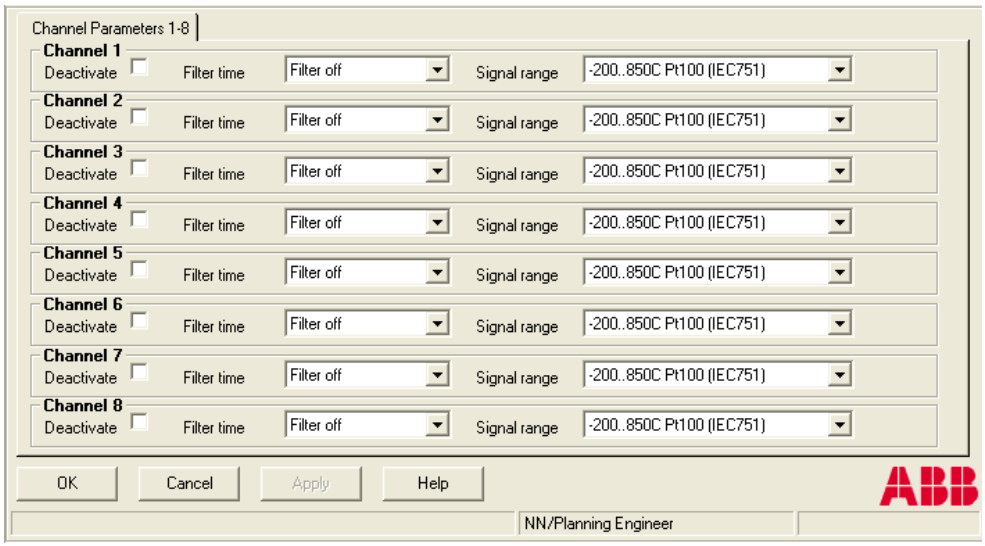


Figure 41. AI893 - Configuration in RTD mode

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time** and **Signal range** drop-down menus.

AI893 in TC mode

Module parameters tab

Figure 42. AI893 - Configuration in TC mode- Module Parameters Tab

- **Fix Junction Temperature area**
  Type the required value in the **Fix Junction Temperature** text field.

Channel parameters tab

Channel parameters tab shows the user parameters of the module. It shows Filter time, Signal range and Cold junction temperature.

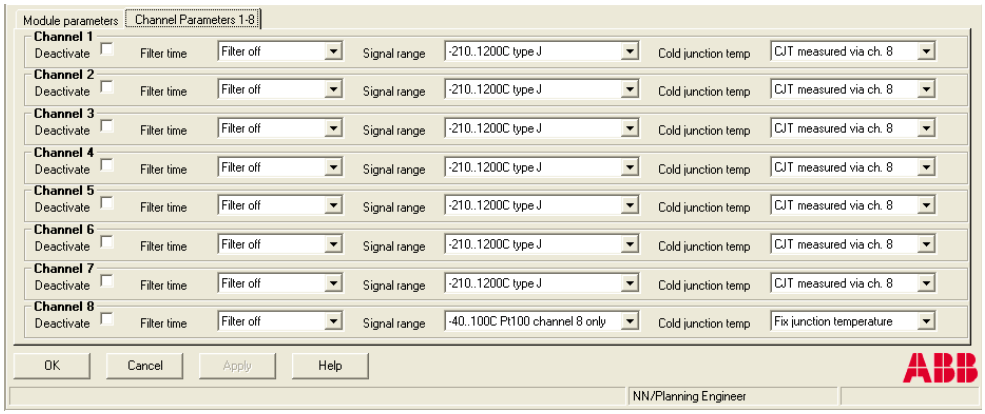


Figure 43. AI893 - Configuration in TC mode - Channel Parameters Tab

- **Channel area**
  Mark the Deactivate check box if the channel shall not be used.

  Make the required choices in the **Filter time, Signal range** and **Cold junction temperature** drop-down menus.

AI895

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values on page 167.

Diagnosis

Module diagnosis tab

The module tab in the diagnosis window is used for reading diagnosis about the module itself. See Diagnosis on page 49.

HART device tab

The HART tab in the Diagnosis window is used for reading diagnosis about the HART part of the module.

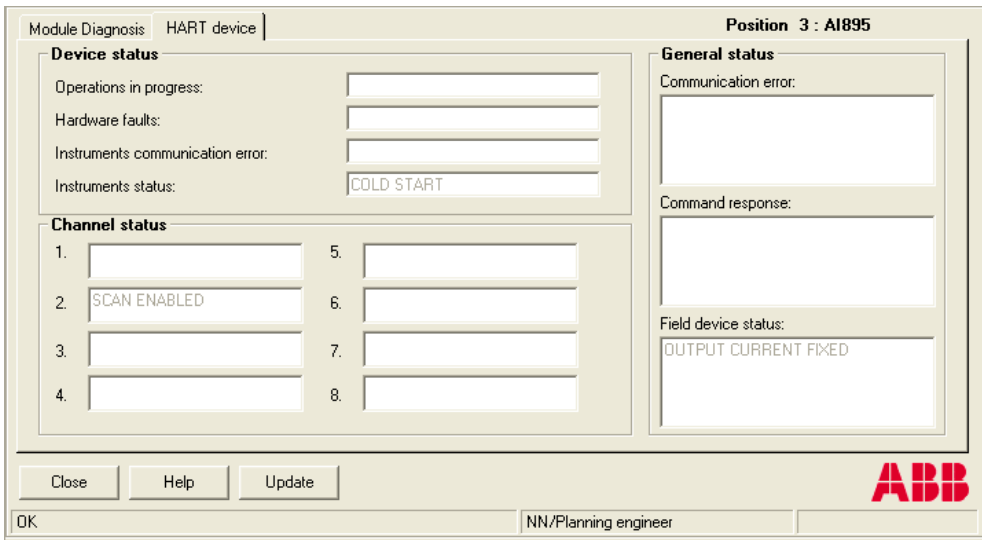


Figure 44. AI895 - Diagnosis - HART device tab

Device Status area

- **Operations in progress**

  Shows an indication if one of the following operations is currently performed:

  – Reset: Reset of the HART functionality.

  – Rebuild: Collecting information about HART instruments (HART command 0 performed).

  – Scan_enabled: Normal operation if scanning is enabled.

  – Self test: A check sum verification on HART non-volatile parameters is performed.

- **Hardware faults**

  Shows one of the following faults for the module:

  – Channel fault (of any HART channels)

  – ROM fault

  – EEPROM fault

- **Instruments communication error**
  Shows the summary of the communication error bits for the instruments. According to the HART protocol specification.

- **Instruments status**
  Shows the summary of the status bits for the instruments. According to the HART protocol specification.

Channel status area

- **Channel 1 - 8**
  Shows the instruments scan faults and status. Following status can be shown, Scan enabled, Searching, Disappeared, Appeared, Mismatched. See Scan enabled for more information on different status.

  An empty box means that no instrument was found and have not been present on this channel before.

General status area

The status can be of three different types, either it is a communication error, command response or field device status. Note that if it is a communication error, the other statuses will then be empty. These status bytes are defined by the HART protocol specification. See appropriate HART documentation for more detailed information.

Communication errors are mostly those which will be detected by a UART, like parity, overrun and framing errors. The field device reports RX (receive buffer for HART messages) overflow and check sum error.

Command response codes are categorized as either errors or warnings, which could have a single meaning or multiple meaning. The codes listed below are those which could be applicable to all transactions. There could also be private defined meanings for some numbers.

Field device status includes both fault conditions and abnormal operation modes or conditions and does not necessarily mean a faulty device.

- **Communication Error**
  Case Communication error can be of the following types:
  - Parity error
  - Overrun error
  - Framing error
  - Check sum error
  - RX buffer overflow
  - Undefined
- **Command response**
  Case Command response can show the following:
  - No command-specific error
  - Invalid selection
  - Passed parameter too large
  - Passed parameter too small
  - Too few data bytes received
  - Device-specific command error
  - In write-protect mode
  - Access restricted
  - Device is busy
  - Command not implemented
- **Field device status**
  Case Field device status can show the following:
  - Field device malfunction
  - Configuration changed
  - Cold start

- More status available
- Analogue output current fixed
- Analogue output saturated
- Non-primary variable out of limits
- Primary variable out of limits

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Channel parameters tab

Channel parameters tab shows the user parameters of the module. It shows Filter time, Signal range and Linearization.

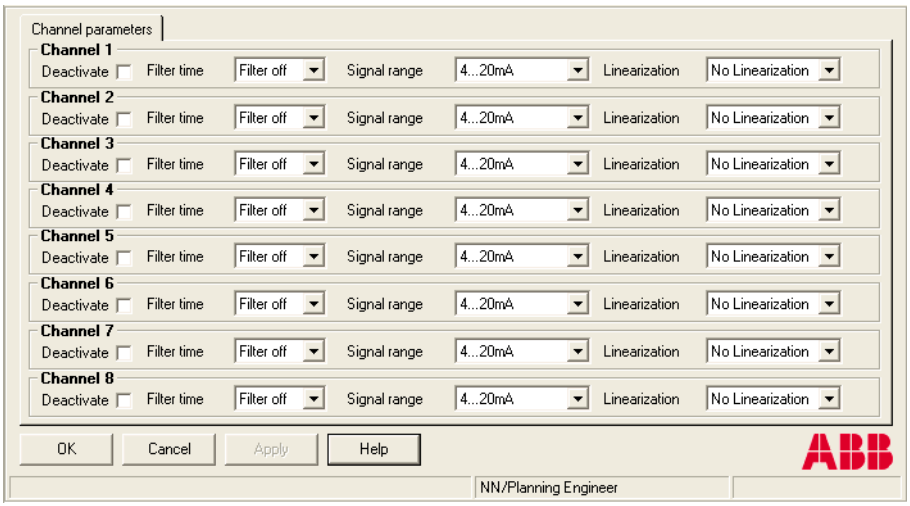


Figure 45. AI895 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Signal range** and **Linearization** drop-down menus.

Parameterization

The parameterization control is used for sending parameters to the module. This is for the HART part of the module.

HART parameters tab

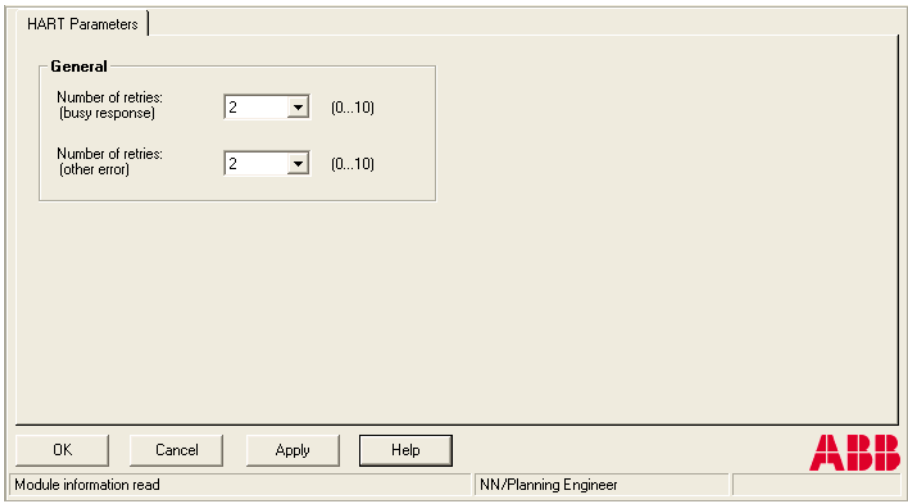


Figure 46. AI895 - Parameterization

General area

- **Number of retries (busy response)**
  Writes the selected number of retries to the module. This affects the communication between the module and the HART instrument. Valid numbers are 0 - 10. This applies for a busy response.

If the communication with the HART instrument fails when the default value is used, increase the value to ensure a better performance.

- **Number of retries (other error)**
  Writes the selected number of retries to the module. This affects the communication between the module and the HART instrument. Valid numbers are 0 - 10. This applies for other error.

Service

The service control is used for sending special functions (commands) to the HART part of the I/O module.

HART

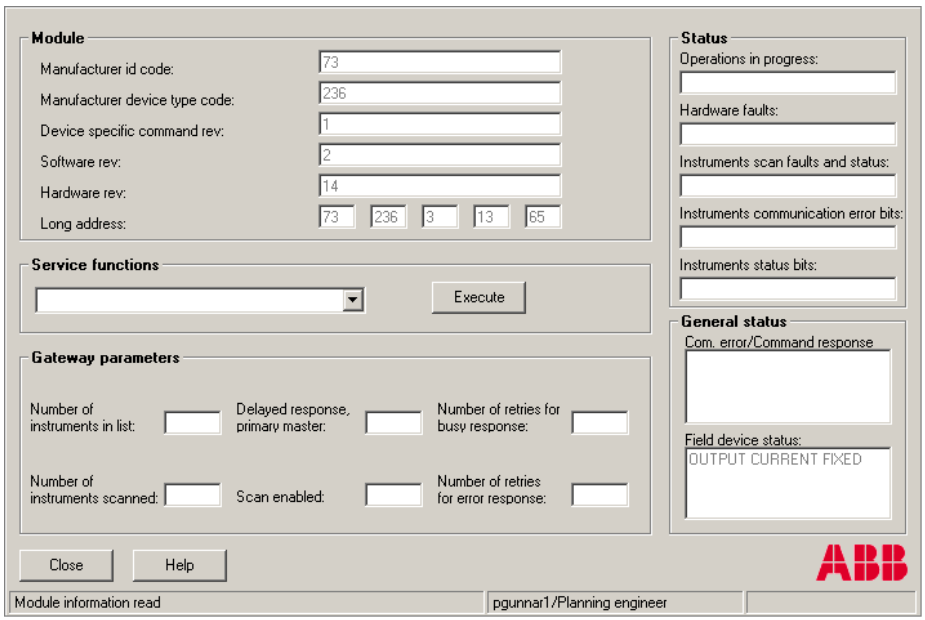


Figure 47. AI895 - Service

Module area

- **Manufacturer ID code**
  Shows the number code for the manufacturer.
- **Manufacturer device type code**
  Shows the number code for the type of module.
- **Device specific command rev**
  Shows the number of the command revision. Each HART instrument implements HART universal commands, HART common practice commands and HART specific commands. This number identifies the revision of this set of commands.
- **Software rev**
  Shows the software revision of the firmware.

- **Hardware rev**
  Shows the hardware revision.
- **Long address**
  These text fields will show the long address, also known as extended address, which is defined by the HART protocol and consists of the "manufacturer identification code", "manufacturer's device type code" and three bytes called identification number.

Service functions area

- **Reset configuration changed identification**
  This function resets this change identification in the module. This configuration changed flag is part of the general status and this status will be read when the function "Read additional device status" and "Read gateway parameters" are executed. This flag is set every time a HART change is made for the configuration parameters.
- **Perform device self-test**
  This self-test is related to the HART part of the module. A check sum verification of the HART non volatile parameters is performed.
- **Perform master reset**
  This function will reset the HART functionality of the module. The HART activity and all HART variables are reset. Then the HART functionality is restarted and a rebuild of its internal HART structure will be done, i.e. it collects information about HART instruments on the channels (HART command 0 performed).

If new devices are connected to an AI895 module, or if the devices are changed at specific channels of the module, executing the **Perform master reset** option ensures that the devices are detected. See Connecting a HART instrument on page 163

- **Read additional device status**
  This function will read additional status for the module. These are:
  - Operations in progress
  - Hardware faults
  - Instruments scan faults and status

- Instruments communication error bits
- Instruments status bits

See I/O Module Status area for more information.

- **Flush completed delayed response**
  This function will delete the response that is stored in the buffer. If the DTM is in a lock situation when the I/O module always response busy then this function can be used to flush the HART response buffer.
- **Read gateway parameters**
  This function will read gateway parameters for the module. These are:
  - Number of instruments in list
  - Number of instruments scanned
  - Delayed response, primary master
  - Scan enabled
  - Number of retries for busy response
  - Number of retries for error response
- **Enable scan status**
  This function turns on the scanning.

  The scanning function is implemented to monitor the presence of field instruments. When the scanning is enabled all instruments of the instruments list are scanned with HART command 1. A different channel every 5s. If an instrument does not reply the DISAPPEARED and SEARCHING bits related to that instrument are set, else the SCAN_ENABLED will be set.

  For the instrument that is not replying the module begins to scan that instrument with HART command 0. If there is a reply to command 0, the module verifies if it comes from the original instrument:
  - If it does, the APPEARED bit is set, the DISAPPEARED and SEARCHING bits are cleared and the module restarts the normal scanning activity.

– If it does not, the MISMATCHED bit is set, the DISAPPEARED bit is cleared and the module keeps on searching the instrument with command 0.

- **Disable scan status**
  This function turns off the scanning.

Gateway parameters

- **Number of instruments in list**
  Shows the number of instruments that the module has found on its channels. If an instrument is added in run-time then the module has to be reset to find the new instrument and add it to its instrument list. This can be done by using the service function "Perform master reset". The maximum of instruments are one per channel which means eight total on the module.
- **Number of instruments scanned**
  If the scan option is enabled the module will try to scan all elements that are in the instrument list. See Enable scan status for more information about the scanning.
- **Delayed response, primary master**
  Shows if there are any responses in use for the primary master. Can be flushed with using the service function "Flush completed delayed response".
- **Number of retries for busy response**
  Shows the configured number of retries for a busy response from the instrument to the module.

  Default number of retries is 2.
- **Number of retries for error response**
  Shows the configured number of retries for an error response between the instrument and the module.

  The following is determined for an error response:

  – Instrument time-out: when the maximum amount of time that an I/O module will wait before deciding that the instrument has failed is elapsed. The value is fixed to 33 character times (305 ms)

  – Outgoing communication error: when bit 7 is set in the reply status first byte

– Incoming communication error:

  - byte count error (received data byte number differs from byte count field)

  - command number error (received command number differs from transmitted one)

  - received address error

  - check sum error

  - character error (parity, overrun, framing error)

Default number of retries is 2.

- **Scan enabled**
  The scanning function is implemented to monitor the presence of field instruments.

  When the scanning is enabled or if diagnosis is read all instruments of the instruments list are scanned (a different channel every 5 s).

  If an instrument does not reply the DISAPPEARED and SEARCHING bits related to that instrument are set. Then the module begins to scan that instrument with HART command 0.

  If there is a reply to command 0, the module verifies if it comes from the original instrument:

  – if it does, the APPEARED bit is set, the DISAPPEARED and SEARCHING bits are cleared and the module restarts the normal scanning activity;

  – if it does not, the MISMATCHED bit is set, the DISAPPEARED bit is cleared and the module keeps on searching the instrument with command 0.

  With a new diagnosis scan, the DISAPPEARED and APPEARED bits are cleared.

AO801/AO810/AO820

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AO801/AO810/AO815/AO845/AO890/AO895 Dynamic values on page 170, and AO820 Dynamic values on page 171.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item. It shows the user parameters of the module, i.e. Signal range, OSP Value.

Channel parameters tab

The control looks the same for all modules but for the number of channels.

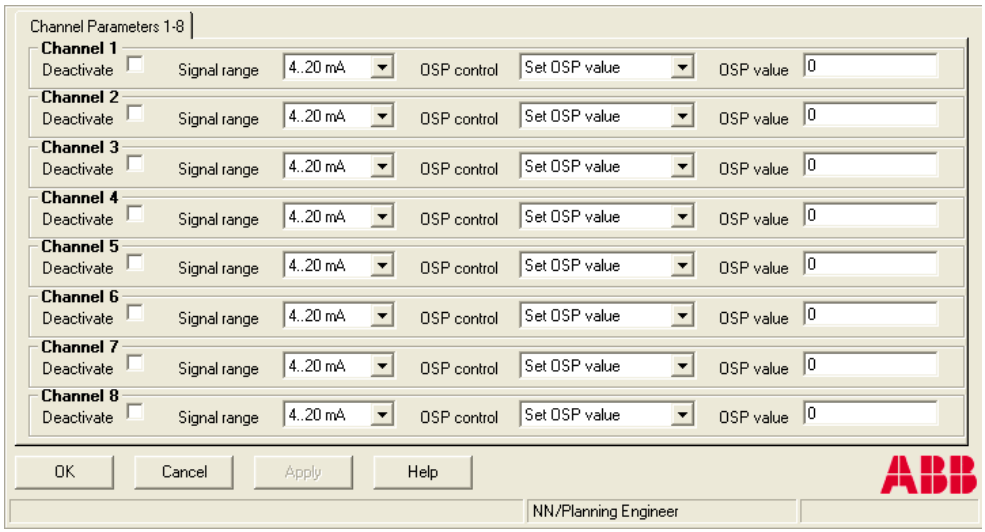


Figure 48. AO801/AO810/AO820 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Signal range** and **OSP control** drop-down menus.

If the alternative “Set OSP value” is chosen, you can type your own value (0-100%) in the **OSP value** text field.

AO815/AO845

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AO801/AO810/AO815/AO845/AO890/AO895 Dynamic values on page 170.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module parameters tab (only applicable for AO845)

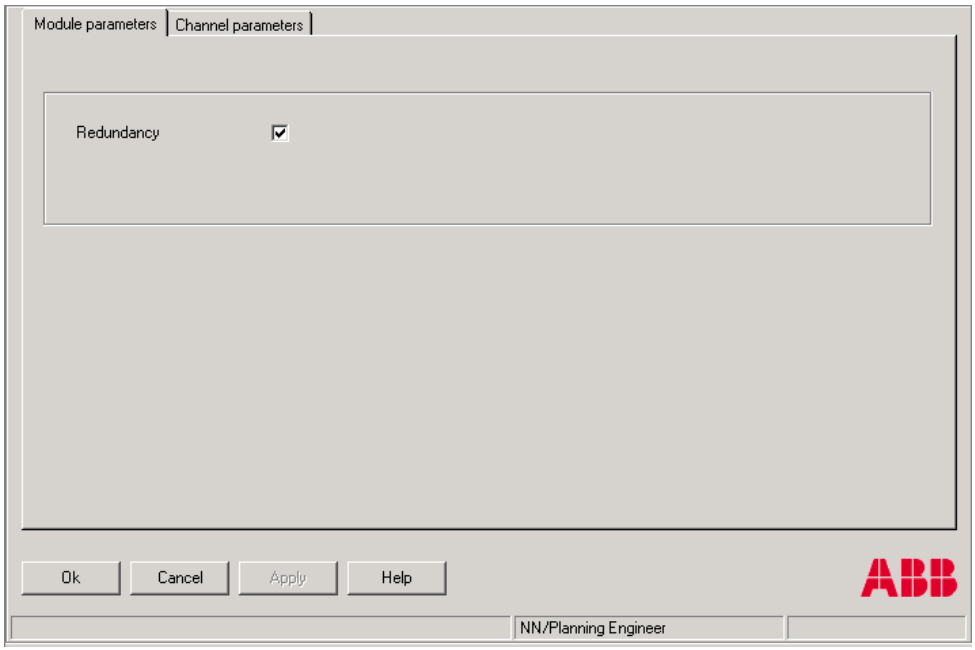


Figure 49. AO845 - Configuration - Module Parameters Tab

- **Redundancy**
  Mark the Redundancy check box if the unit shall be set for redundant operation.

Channel parameters tab

The Channel parameters tab shows the user parameters of the module. It shows Signal range, OSP control, OSP value and Output filter.

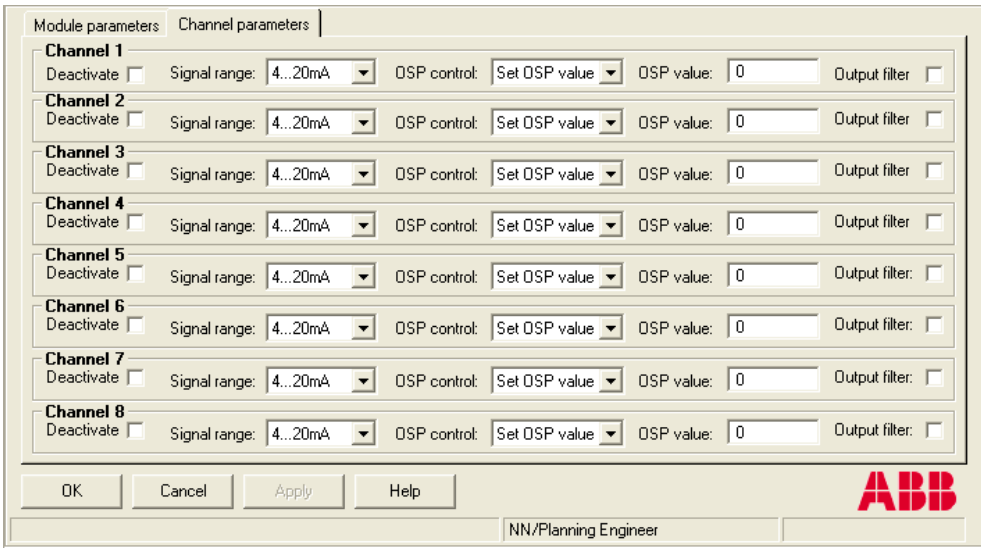


Figure 50. AO815 and AO845 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Signal range** and the **OSP control** drop-down menus.

If the alternative “Set OSP value” is chosen, you can type your own value (0-100%) in the **OSP value** text field.

Mark the **Output filter** check box if it shall be used. Should be set when using HART.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840. The service control is only applicable for AO845.

Redundancy Tab

The Redundancy Tab is only shown in Commissioning mode.

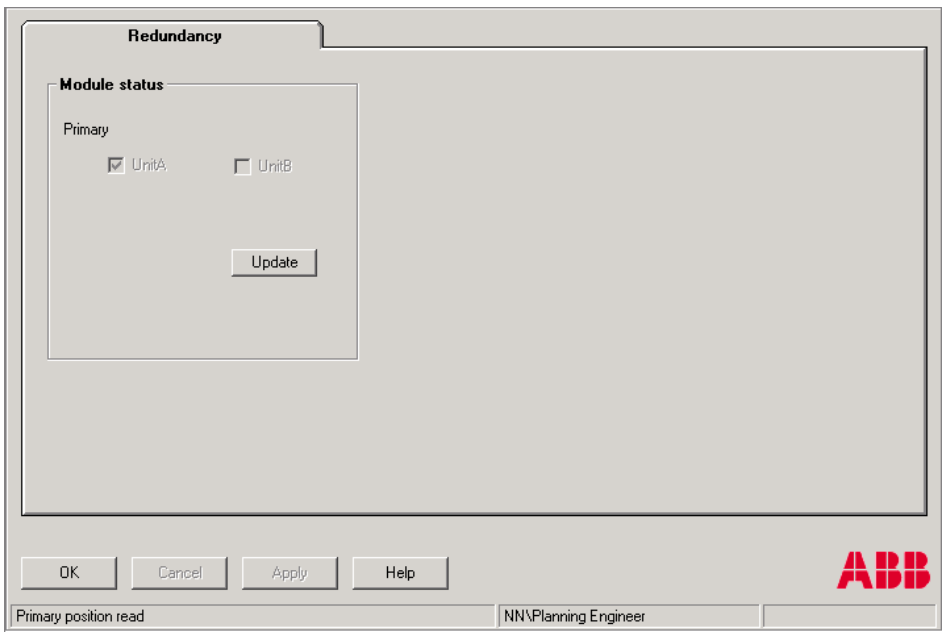


Figure 51. AO845 - Service - Redundancy Tab

Module status area

In the **Module status** area you can see which I/O module that is treated as primary by CI840. By clicking the **Update** button you update the status for which of the I/O module that are the primary.

The HART Primary unit does not have to be identical with the Primary unit described in this control. The HART Primary unit is set in the Service Control in Engineering mode.

HART Primary Tab

The HART Primary Tab is only shown in Engineering mode. Here you select through which unit HART communication should happen.

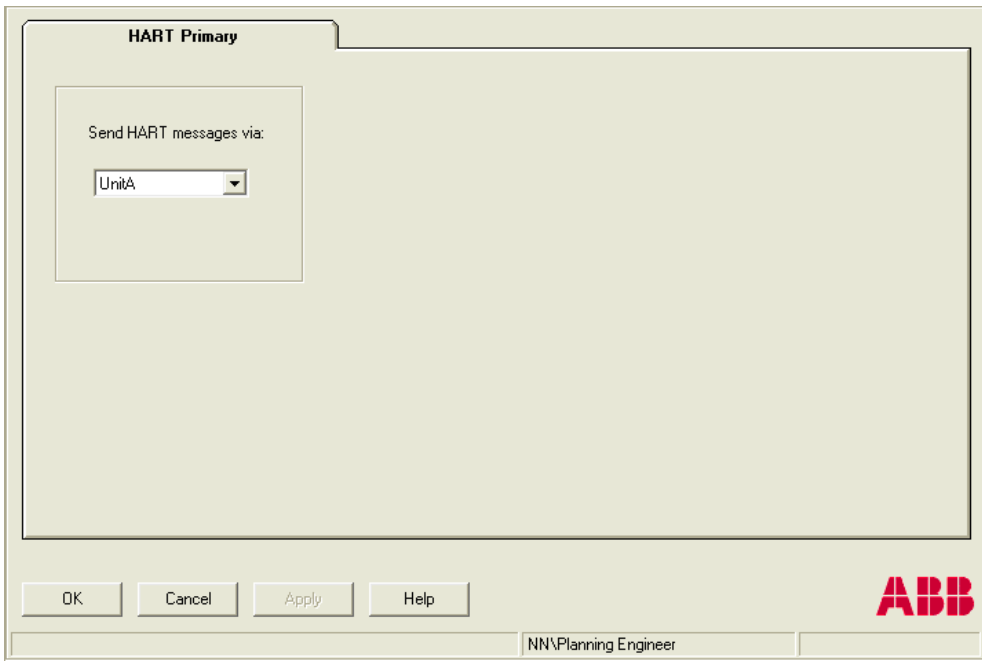


Figure 52. AO845 - Service - HART Primary Tab

The HART Primary unit can be, but does not have to be, identical with the unit treated as primary by CI840 seen in Service Control in Commissioning mode. If the HART Primary module fails, HART communication does not switch over automatically to the other unit. The user must manually do the switchover.

AO890

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AO801/AO810/AO815/AO845/AO890/AO895 Dynamic values on page 170.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Channel parameters tab

The channel parameters tab shows the user parameters of the module. It shows Signal range, OSP control and OSP value.

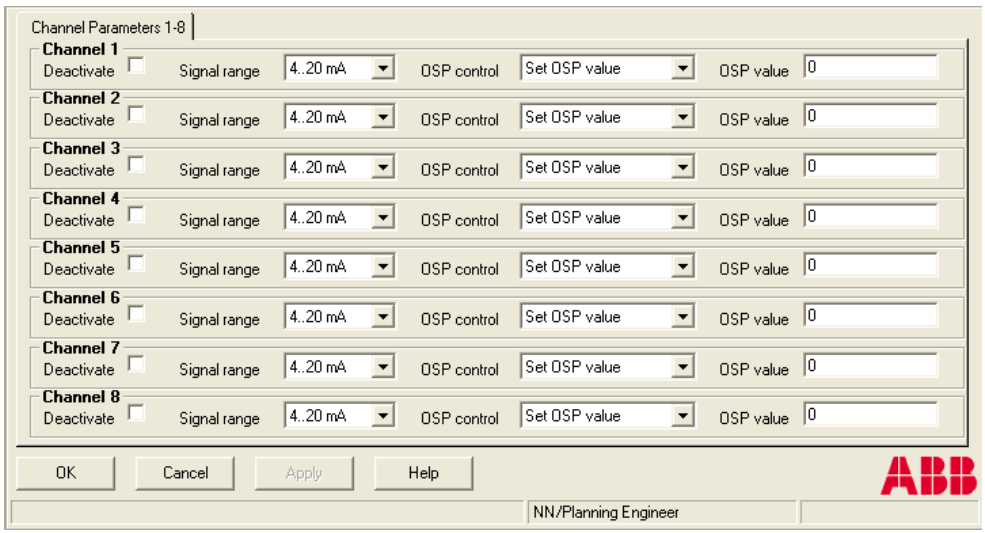


Figure 53. AO890 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Signal range** and the **OSP control** drop-down menus.

If the alternative “Set OSP value” is chosen, you can type your own value (0-100%) in the **OSP value** text field.

AO895

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See AO801/AO810/AO815/AO845/AO890/AO895 Dynamic values on page 170.

Diagnosis

Module diagnosis tab

The module tab in the diagnosis window is used for reading diagnosis about the module itself. See Diagnosis on page 49.

HART device tab

The HART tab in the Diagnosis window is used for reading diagnosis about the HART part of the module.

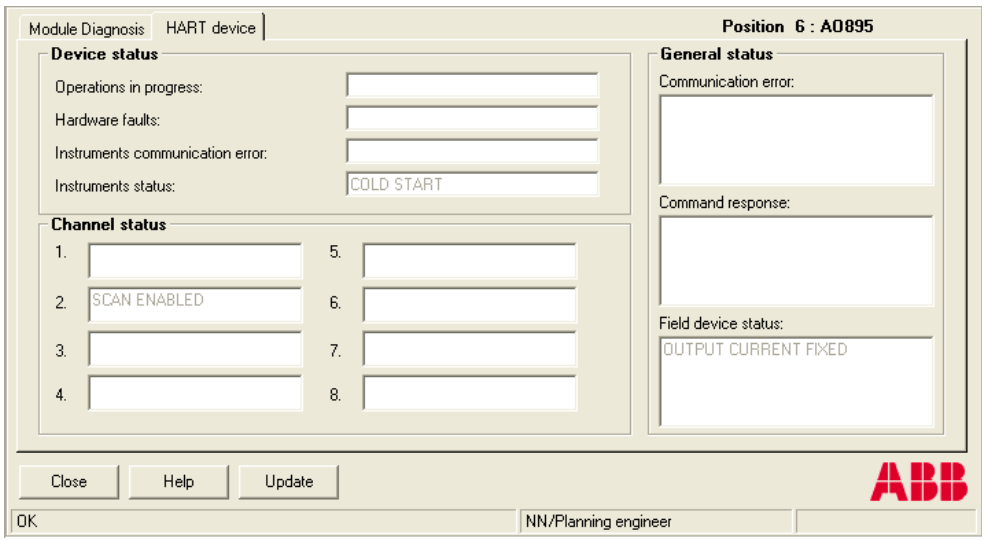


Figure 54. AO895 - Diagnosis

Device Status area

- **Operations in progress**
  Shows an indication if one of the following operations is currently performed:
  - Reset: Reset of the HART functionality.
  - Rebuild: Collecting information about HART instruments (HART command
    0 performed).
  - Scan_enabled: Normal operation if scanning is enabled.
  - Self test: A check sum verification on HART non-volatile parameters is performed.

- **Hardware faults**
  Shows one of the following faults for the module:
  - Channel fault (of any HART channels)
  - ROM fault
  - EEPROM fault
- **Instruments communication error**
  Shows the summary of the communication error bits for the instruments. According to the HART protocol specification.
- **Instruments status**
  Shows the summary of the status bits for the instruments. According to the HART protocol specification.

Channel status area

- **Channel 1 - 8**
  Shows the instruments scan faults and status. Following status can be shown, Scan enabled, Searching, Disappeared, Appeared, Mismatched.
  See Scan enabled for more information on different status.

  An empty box means that no instrument was found and have not been present on this channel before.

General status area

The status can be of three different types, either it is a communication error, command response or field device status. Note that if it is a communication error, the other statuses will then be empty. These status bytes are defined by the HART protocol specification. See appropriate HART documentation for more detailed information.

Communication errors are mostly those which will be detected by a UART, like parity, overrun and framing errors. The field device reports RX (receive buffer for HART messages) overflow and check sum error. Command response codes are categorized as either errors or warnings, which could have a single meaning or multiple meaning. The codes listed below are those which could be applicable to all transactions. There could also be private defined meanings for some numbers.

Field device status includes both fault conditions and abnormal operation modes or conditions and does not necessarily mean a faulty device.

- **Communication Error**
  Case Communication error can be of the following types:
  - Parity error
  - Overrun error
  - Framing error
  - Check sum error
  - RX buffer overflow
  - Undefined
- **Command response**
  Case Command response can show following:
  - No command-specific error
  - Invalid selection
  - Passed parameter too large
  - Passed parameter too small
  - Too few data bytes received
  - Device-specific command error
  - In write-protect mode
  - Access restricted
  - Device is busy
  - Command not implemented

- **Field device status**
  Case Field device status can show following:
  - Field device malfunction
  - Configuration changed
  - Cold start
  - More status available
  - Analogue output current fixed
  - Analogue output saturated
  - Non-primary variable out of limits
  - Primary variable out of limits

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Channel parameters tab

The channel parameters tab shows the user parameters of the module. It shows Signal range, OSP control and OSP value.

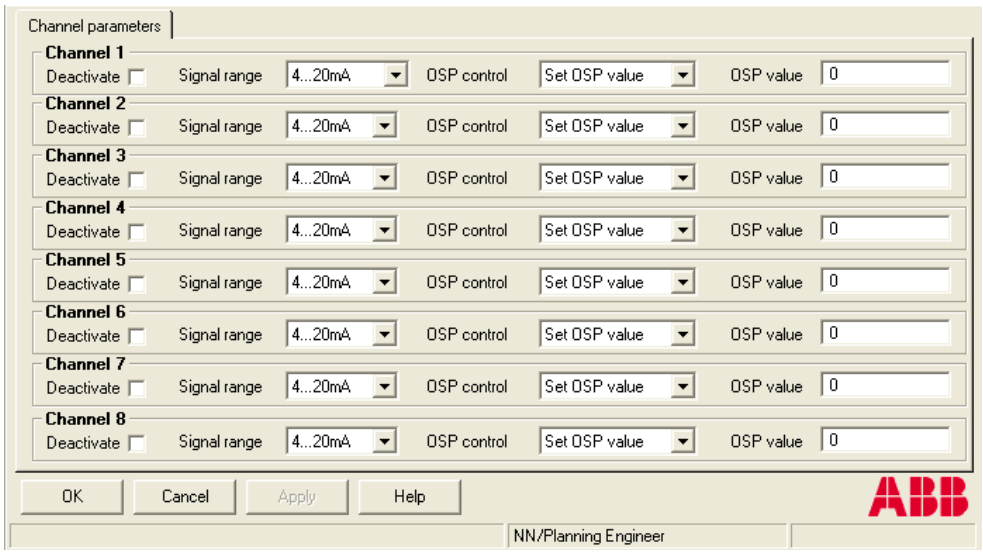


Figure 55. AO895 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Signal range** and the **OSP control** drop-down menus.

If the alternative “Set OSP value” is chosen, you can type your own value (0-100%) in the **OSP value** text field.

Parameterization

The parameterization control is used for sending parameters to the module. This is for the HART part of the module.

HART parameters tab

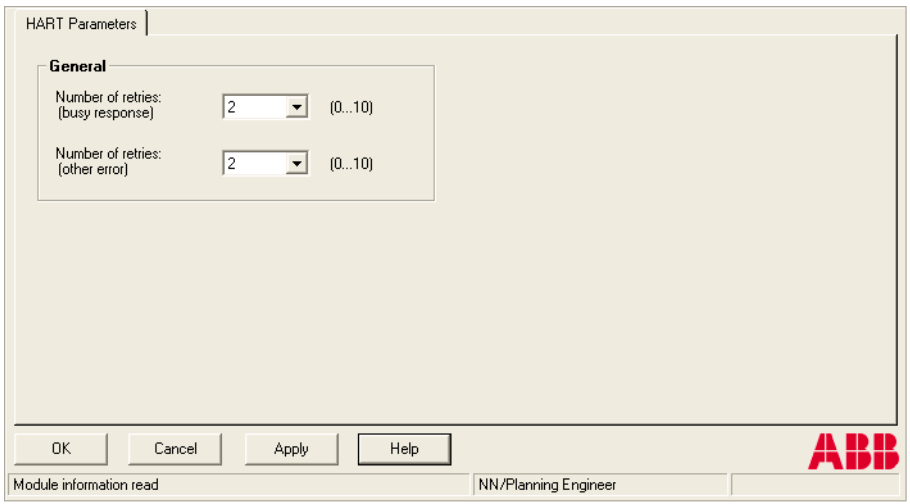


Figure 56. AO895 - Parameterization

General area

- **Number of retries (busy response)**
  Writes the selected number of retries to the module. This affects the communication between the module and the HART instrument. Valid numbers are 0 - 10. This applies for a busy response.

If the communication with the HART instrument fails when the default value is used, increase the value to ensure a better performance.

- **Number of retries (other error)**
  Writes the selected number of retries to the module. This affects the communication between the module and the HART instrument. Valid numbers are 0 - 10. This applies for other error.

Service

The service control is used for sending special functions (commands) to the HART part of the I/O module.

HART

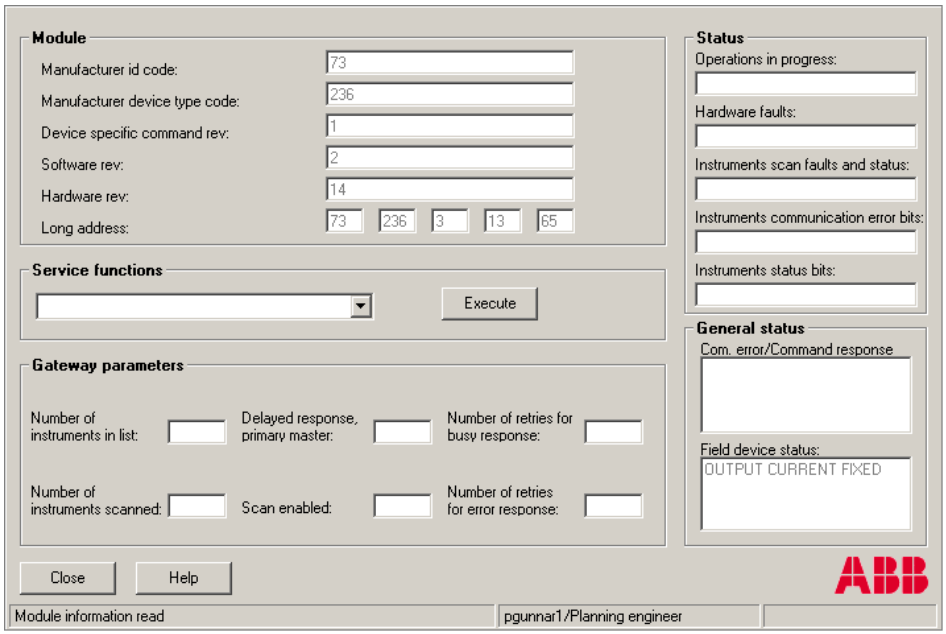


Figure 57. AO895 - Service

Module area

- **Manufacturer ID code**
  Shows the number code for the manufacturer.
- **Manufacturer device type code**
  Shows the number code for the type of module.

- **Device specific command rev**
  Shows the number of the command revision. Each HART instrument implements HART universal commands, HART common practice commands and HART specific commands. This number identifies the revision of this set of commands.
- **Software rev**
  Shows the software revision of the firmware.
- **Hardware rev**
  Shows the hardware revision.
- **Long address**
  These text fields will show the long address, also known as extended address, which is defined by the HART protocol and consists of the "manufacturer identification code", "manufacturer's device type code" and three bytes called identification number.

Service functions area

- **Reset configuration changed identification**
  This function resets this change identification in the module. This configuration changed flag is part of the general status and this status will be read when the function "Read additional device status" and "Read gateway parameters" are executed. This flag is set every time a HART change is made for the configuration parameters.
- **Perform device self-test**
  This self-test is related to the HART part of the module. A check sum verification of the HART non volatile parameters is performed.
- **Perform master reset**
  This function will reset the HART functionality of the module. The HART activity and all HART variables are reset. Then the HART functionality is restarted and a rebuild of its internal HART structure will be done, i.e. it collects information about HART instruments on the channels (HART command 0 performed).

If new devices are connected to an AO895 module, or if the devices are changed at specific channels of the module, executing the **Perform master reset** option ensures that the devices are detected. See Connecting a HART instrument on page 163

- **Read additional device status**
  This function will read additional status for the module. These are:
  - Operations in progress
  - Hardware faults
  - Instruments scan faults and status
  - Instruments communication error bits
  - Instruments status bits

  See I/O Module Status area for more information.
- **Flush completed delayed response**
  This function will delete the response that is stored in the buffer. If the DTM is in a lock situation when the I/O module always response busy then this function can be used to flush the HART response buffer.
- **Read gateway parameters**
  This function will read gateway parameters for the module. These are:
  - Number of instruments in list
  - Number of instruments scanned
  - Delayed response, primary master
  - Scan enabled
  - Number of retries for busy response
  - Number of retries for error response

- **Enable scan status**
  This function turns on the scanning.

  The scanning function is implemented to monitor the presence of field instruments. When the scanning is enabled all instruments of the instruments list are scanned with HART command 1. A different channel every 5s. If an instrument does not reply the DISAPPEARED and SEARCHING bits related to that instrument are set, else the SCAN_ENABLED will be set. For the instrument that is not replying the module begins to scan that instrument with HART command 0. If there is a reply to command 0, the module verifies if it comes from the original instrument:

  – If it does, the APPEARED bit is set, the DISAPPEARED and SEARCHING bits are cleared and the module restarts the normal scanning activity.

  – If it does not, the MISMATCHED bit is set, the DISAPPEARED bit is cleared and the module keeps on searching the instrument with command 0.

- **Disable scan status**
  This function turns off the scanning.

Gateway parameters

- **Number of instruments in list**
  Shows the number of instruments that the module has found on its channels. If an instrument is added in run-time then the module has to be reset to find the new instrument and add it to its instrument list. This can be done by using the service function "Perform master reset". The maximum of instruments are one per channel which means eight total on the module.

- **Number of instruments scanned**
  If the scan option is enabled the module will try to scan all elements that are in the instrument list. See Enable scan status for more information about the scanning.

- **Delayed response, primary master**
  Shows if there are any responses in use for the primary master. Can be flushed with using the service function "Flush completed delayed response".

- **Number of retries for busy response**
  Shows the configured number of retries for a busy response from the instrument to the module.

  Default number of retries is 2.

- **Number of retries for error response**
  Shows the configured number of retries for an error response between the instrument and the module.

  The following is determined for an error response:

  – Instrument time-out: when the maximum amount of time that an I/O module will wait before deciding that the instrument has failed is elapsed. The value is fixed to 33 character times (305 ms)

  – Outgoing communication error: when bit 7 is set in the reply status first byte

  – Incoming communication error:

    - byte count error (received data byte number differs from byte count field)

    - command number error (received command number differs from transmitted one)

    - received address error

    - check sum error

    - character error (parity, overrun, framing error)

  Default number of retries is 2.

- **Scan enabled**
  The scanning function is implemented to monitor the presence of field instruments.

  When the scanning is enabled or if diagnosis is read all instruments of the instruments list are scanned (a different channel every 5 s).

  If an instrument does not reply the DISAPPEARED and SEARCHING bits related to that instrument are set. Then the module begins to scan that instrument with HART command 0.

If there is a reply to command 0, the module verifies if it comes from the original instrument:

– if it does, the APPEARED bit is set, the DISAPPEARED and SEARCHING bits are cleared and the module restarts the normal scanning activity;

– if it does not, the MISMATCHED bit is set, the DISAPPEARED bit is cleared and the module keeps on searching the instrument with command 0.

With a new diagnosis scan, the DISAPPEARED and APPEARED bits are cleared.

DI801/DI802/DI803/DI810/DI811/DI814/DI818*/DI820/DI821/ DI828*/DI890

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DI801/DI810/DI811/DI814/DI828*/DI840 Dynamic values on page 172, DI818 Dynamic values on page 173 and DI802/DI803/DI820/DI821/DI890 Dynamic values on page 175.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for separate channels.

* Feature Pack Functionality

Module parameters tab

The control looks the same for all modules but for the number of channels.

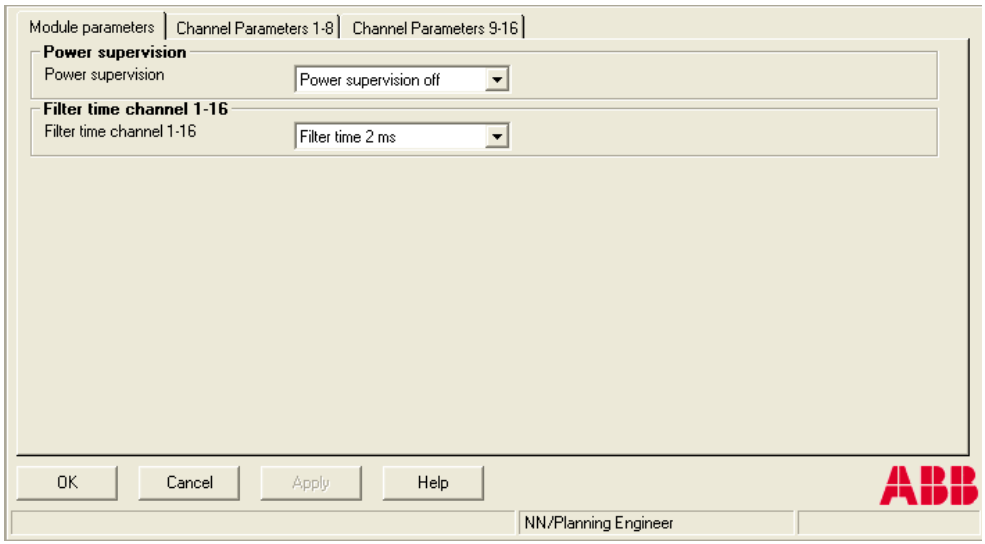


Figure 58. DI801/DI802/DI803/DI810/DI811/DI814/DI818/DI820/DI821/DI828* /DI890 - Configuration - Module Parameters Tab*

* Feature Pack Functionality

Power supervision area

Make the required choice in the **Power supervision** drop-down menu.

Filter time channel area

Make the required choice in the **Filter time channel** drop-down menu.

Channel parameters tab

The control looks the same for all modules but for the number of channels.

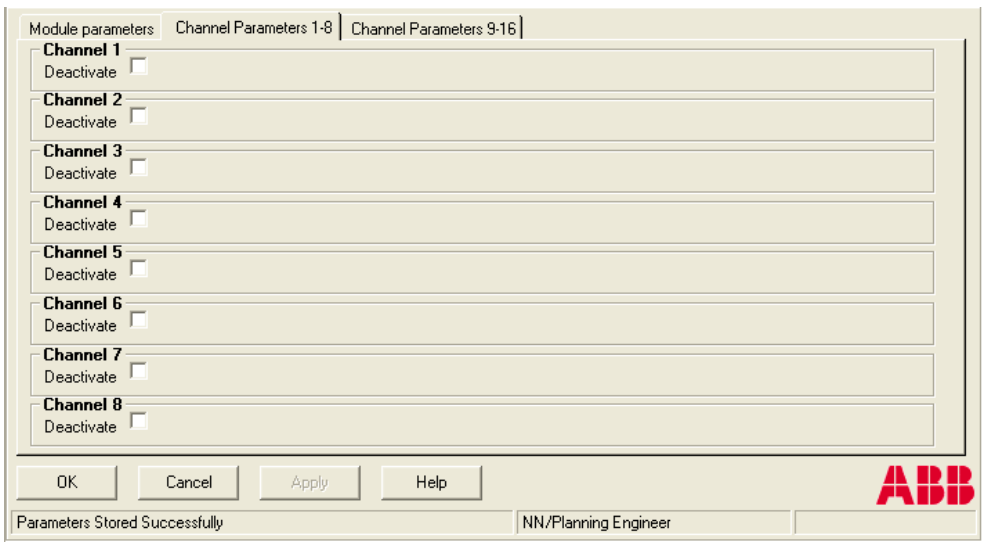


Figure 59. DI801/DI802/DI03/DI810/DI811/DI814/DI818/DI820/DI821/DI828* - Configuration - Channel Parameters Tab*

* Feature Pack Functionality

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

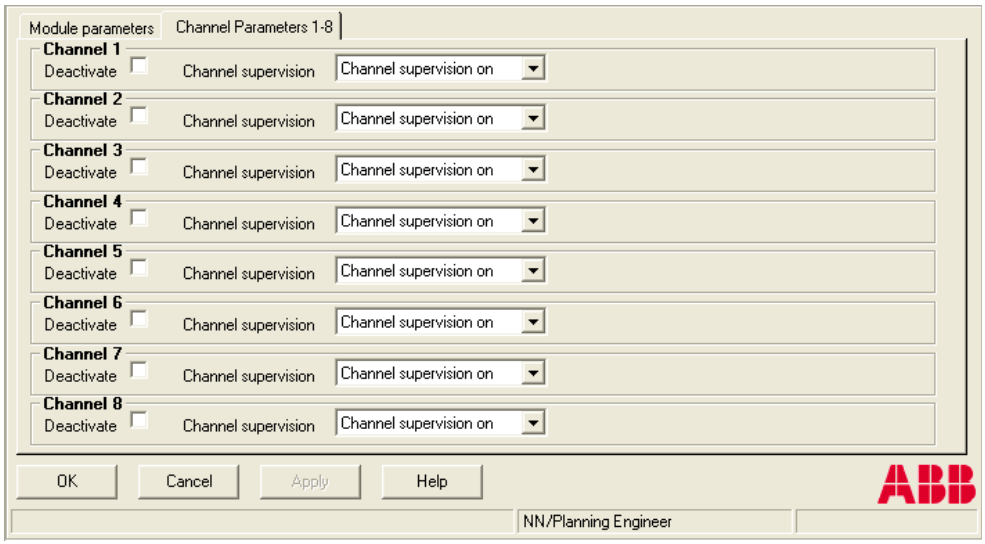


Figure 60. DI890 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choice in the **Channel supervision** drop-down menu.

DI825

This module requires CI840 and supports the SOE feature only with AC870P/Composer. Contact ABB Local Supplier for the Composer version.

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DI825 Dynamic Values on page 176.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module Parameters Tab

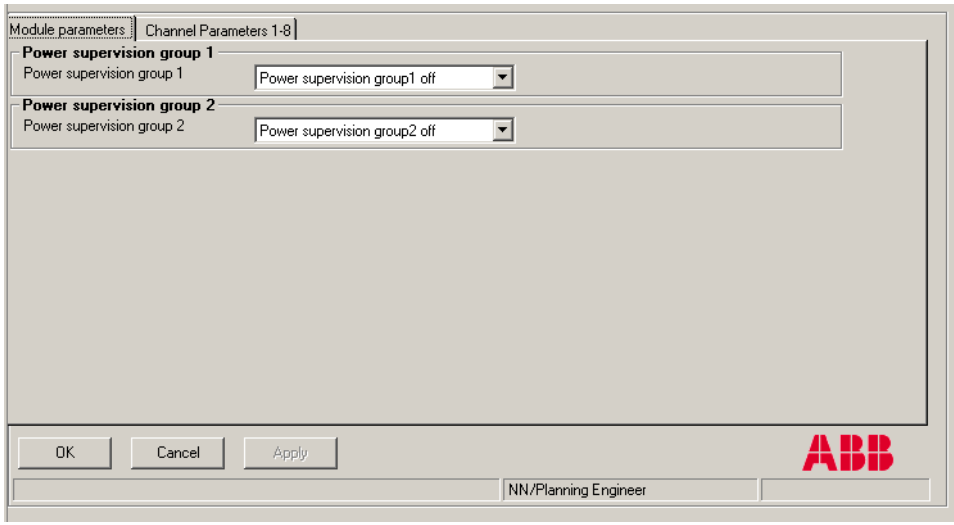


Figure 61. DI825 - Configuration - Module Parameters Tab

Power Supervision group 1 area

Make the required choice in the **Power Supervision group 1** drop-down menu, for supervising channels 2-4.

Power Supervision group 2 area

Make the required choice in the **Power Supervision group 2** drop-down menu, for supervising channels 5-7.

Channel Parameters Tab

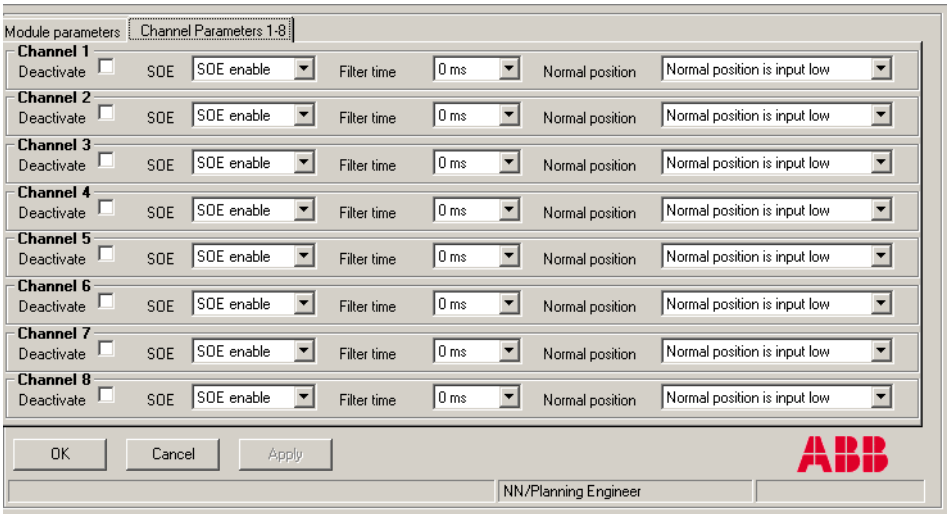


Figure 62. DI825 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choice in the **SOE** drop-down menu. For SOE configuration options when using this module with CI840, see Configuration Control of DI825/DI830/DI831/DI885 with CI840 for SOE on page 63.

Make the required choice in the **Filter time** drop-down menu.

Make the required choice in the **Normal position** drop-down menu.

DI830/DI831

This module requires CI840 and supports the SOE feature only with AC870P/Composer. Contact ABB Local Supplier for the Composer version.

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DI830/DI831 Dynamic Values on page 177.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module Parameters Tab

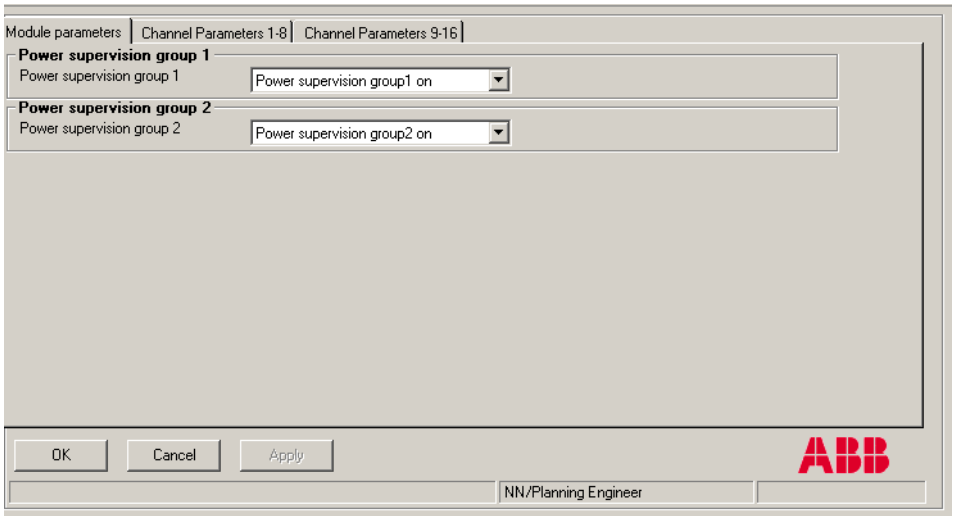


Figure 63. DI830/DI831 - Configuration - Module Parameters Tab

Power Supervision group 1 area

Make the required choice in the **Power Supervision group 1** drop-down menu, for supervising channels 2-4.

Power Supervision group 2 area

Make the required choice in the **Power Supervision group 2** drop-down menu, for supervising channels 5-7.

Channel Parameters Tab

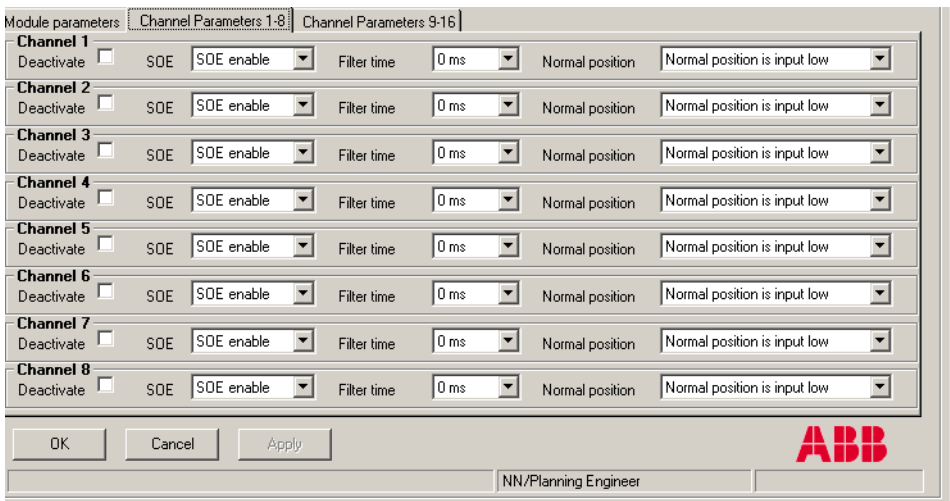


Figure 64. DI830/DI831 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choice in the **SOE** drop-down menu. For SOE configuration options when using this module with CI840, see Configuration Control of DI825/DI830/DI831/DI885 with CI840 for SOE on page 63.

Make the required choice in the **Filter time** drop-down menu.

Make the required choice in the **Normal position** drop-down menu.

DI840

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DI801/DI810/DI811/DI814/DI828*/DI840 Dynamic values on page 172.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module parameters tab

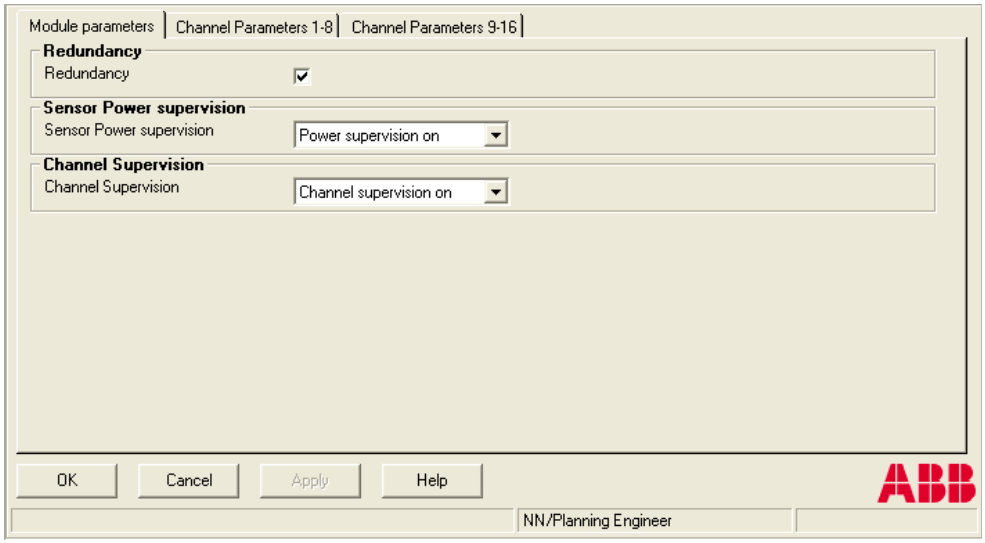


Figure 65. DI840 - Configuration - Module Parameters Tab

Redundancy area

Mark the **Redundancy** check box if the unit shall be set for redundant operation. This check box is only applicable when configured via CI840.

Channel supervision area

Make the required choice the **Sensor power supervision** drop-down menu.

Make the required choice the **Channel supervision** drop-down menu.

Channel parameters tab

It shows the user parameters of the module.

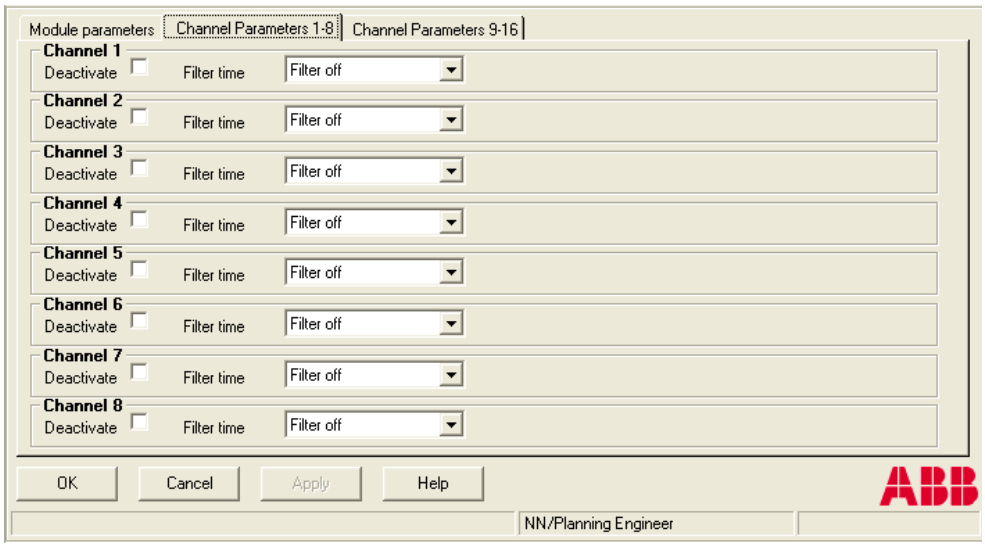


Figure 66. DI840 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box shows if the channel shall not be used.

Make the required choice in the **Filter time** drop-down menu.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840.

Redundancy tab

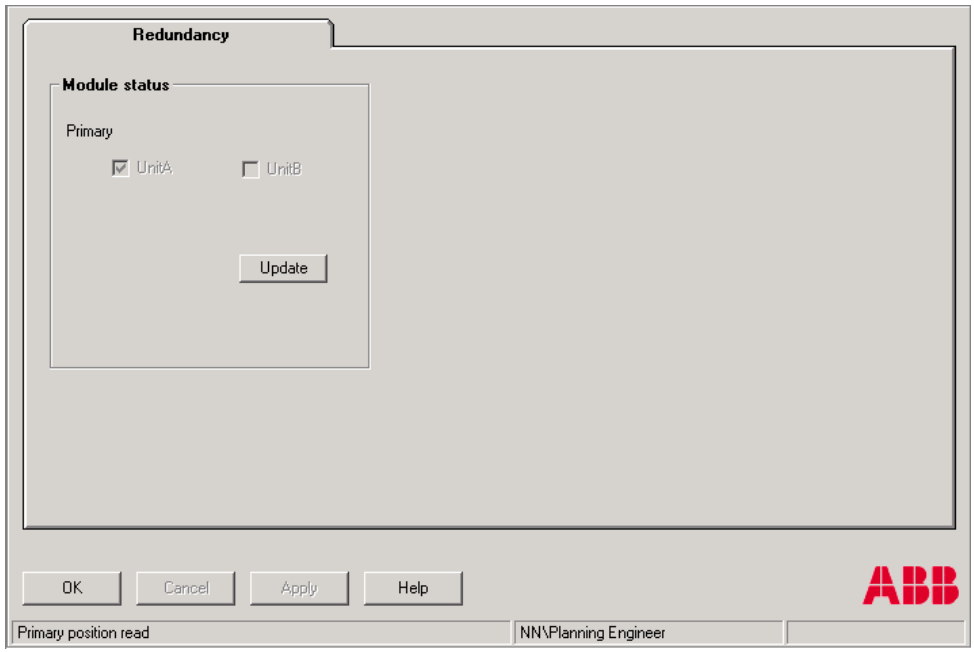


Figure 67. DI840 - Service - Redundancy Tab

Module status area

In the **Module status** area you can see which I/O module that is primary. By clicking the **Update** button you update the status for which of the I/O module that are the primary.

DI885

This module requires CI840 and supports the SOE feature only with AC870P/Composer. Contact ABB Local Supplier for the Composer version.

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DI885 Dynamic Values on page 178.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module Parameters Tab

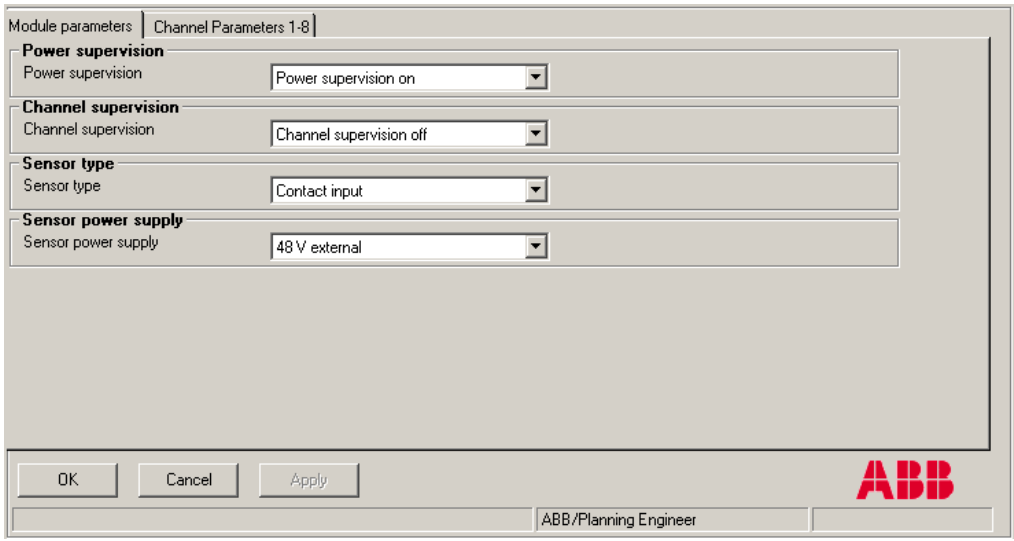


Figure 68. DI885 - Configuration - Module Parameters Tab

Power supervision area

Make the required choice in the **Power supervision** drop-down menu

Channel supervision area

Make the required choice in the **Channel supervision** drop-down menu.

Sensor type area

Make the required choice in the **Sensor type** drop-down menu.

Sensor power supply area

Make the required choice in the **Sensor power supply** drop-down menu.

Channel Parameters Tab

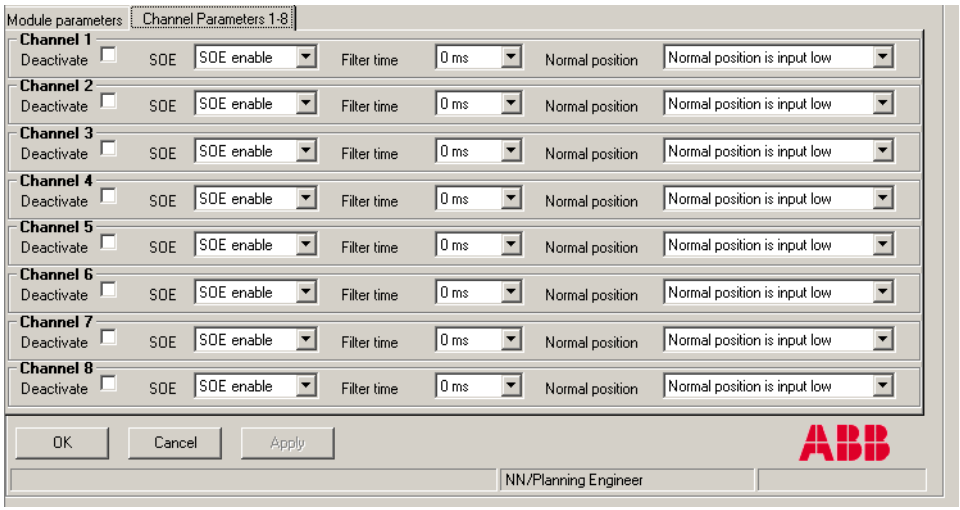


Figure 69. DI885 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choice in the **SOE** drop-down menu. For SOE configuration options when using this module with CI840, see Configuration Control of DI825/DI830/DI831/DI885 with CI840 for SOE on page 63.

Make the required choice in the **Filter time** drop-down menu.

Make the required choice in the **Normal position** drop-down menu.

DO801/DO802/DO810/DO814/DO815/DO818*/DO820/DO821/DO828*

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DO801/DO810/DO814/DO828*/DO840 Dynamic values on page 179, DO818 Dynamic values on page 180 and DO802/DO815/DO820/DO821 Dynamic values on page 182.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for separate channels.

* Feature Pack Functionality

Module parameters tab

The control looks the same for all modules but for the number of channels.

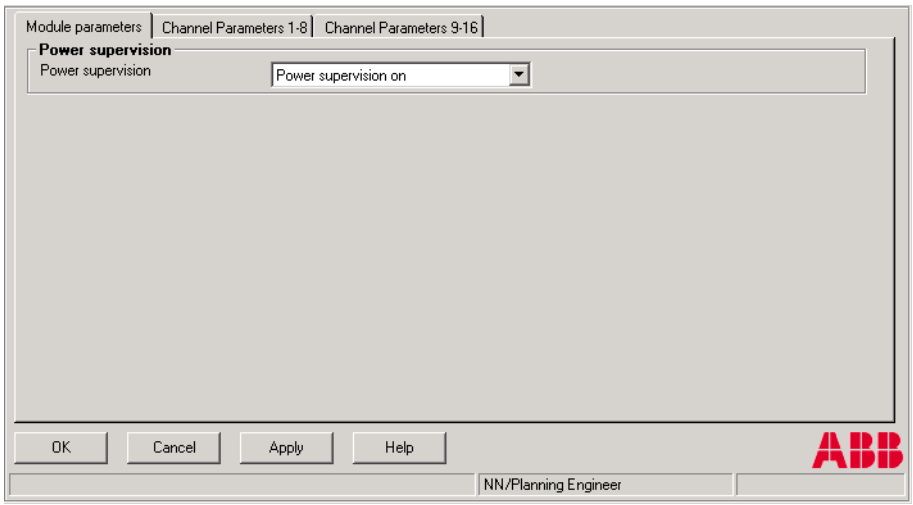


Figure 70. DO802/DO810/DO814/DO815/DO818 /DO820/DO821/DO828* - Configuration - Module Parameters Tab*

* Feature Pack Functionality

Power supervision area

Make the required choice in the **Power supervision** drop-down menu.

The Power supervision is not available for DO801.

Channel parameters tab

The control looks the same for all modules but for the number of channels.

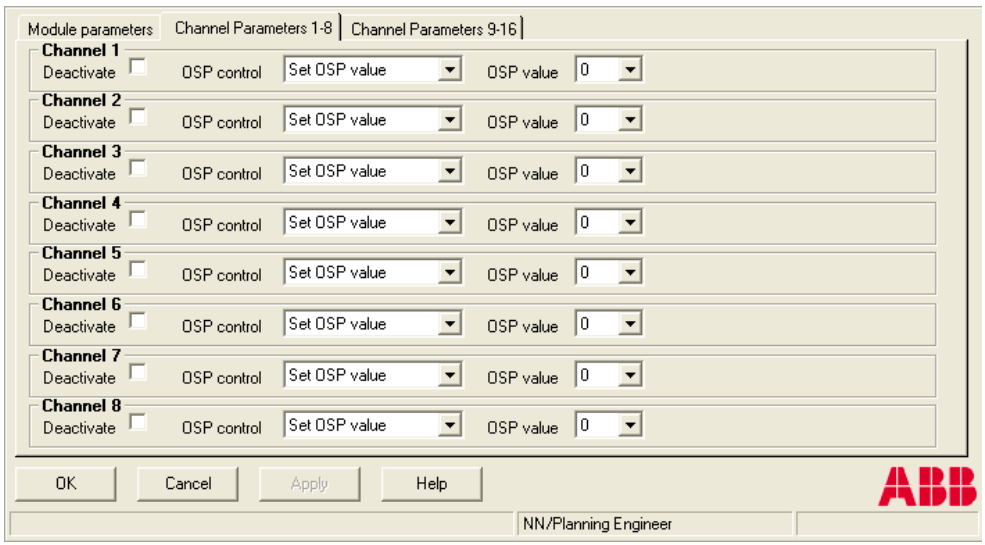


Figure 71. DO801/DO802/DO810/DO814/DO815/DO818 /DO820/DO821/DO828* - Configuration - Channel Parameters Tab*

* Feature Pack Functionality

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **OSP control** and **OSP value** drop-down menus.

DO840

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DO801/DO810/DO814/DO828*/DO840 Dynamic values on page 179.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

For configuration of the module, select the “Configuration” menu item.

Module parameters tab

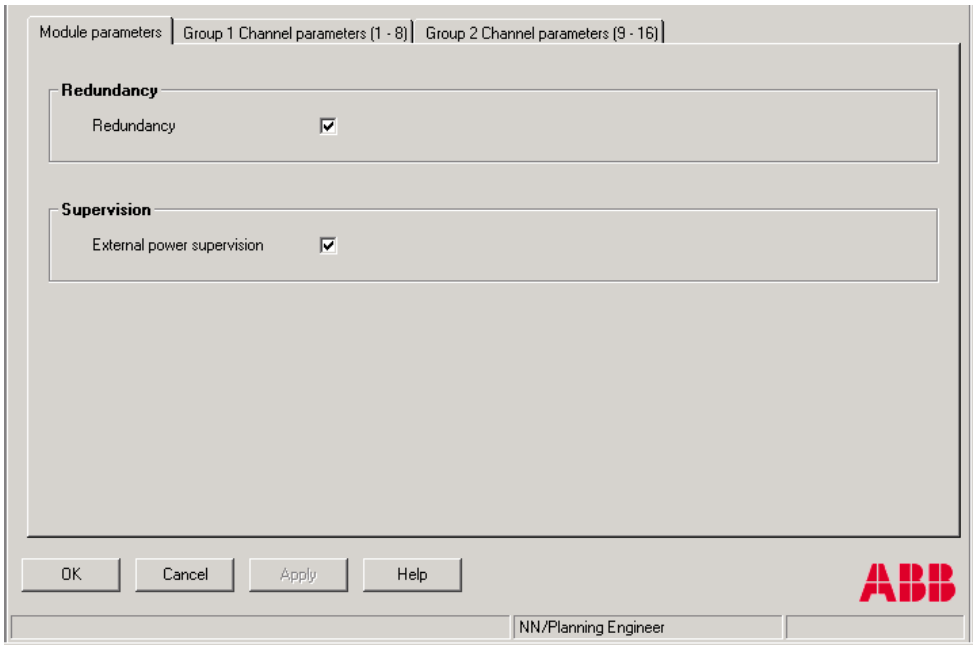


Figure 72. DO840 - Configuration - Module Parameters Tab

Redundancy area

Mark the **Redundancy** check box if the unit shall be set for redundant operation. This check box is only applicable when configured via CI840.

Supervision area

Mark the **External power supervision** check box if supervision of the power supply to the output channels shall be enabled. If an error occurs the status of the unit is updated and the channel status bits will be set.

Channel parameters tab

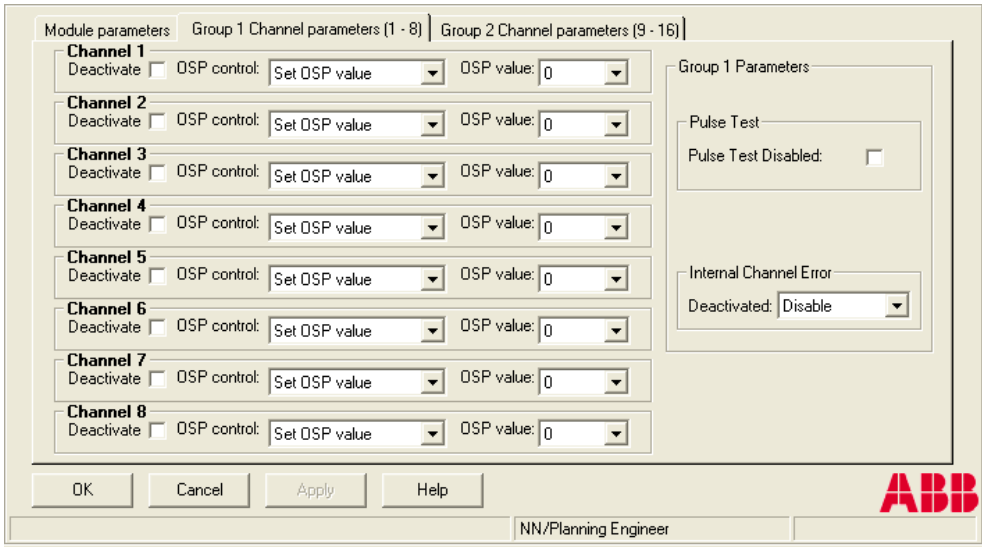


Figure 73. DO840 - Configuration - Channel Parameters Tab

Channel area

Check the **Deactivate** check box shows if the channel shall not be used.

Make the required choices in the **OSP control** and **OSP value** drop-down menus.

Pulse test area

DO840 has two groups (Group 1 = channel 1-8 and Group 2 = channel 9 -16), each with 8 channels. The pulse test checks if the process connection is OK by inverting all output for the group for <1 ms in intervals of 100 ms.

Internal channel error area

Make the required choice, Deactivated enabled or disabled, in the **Deactivated** drop-down menu.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840.

Redundancy tab

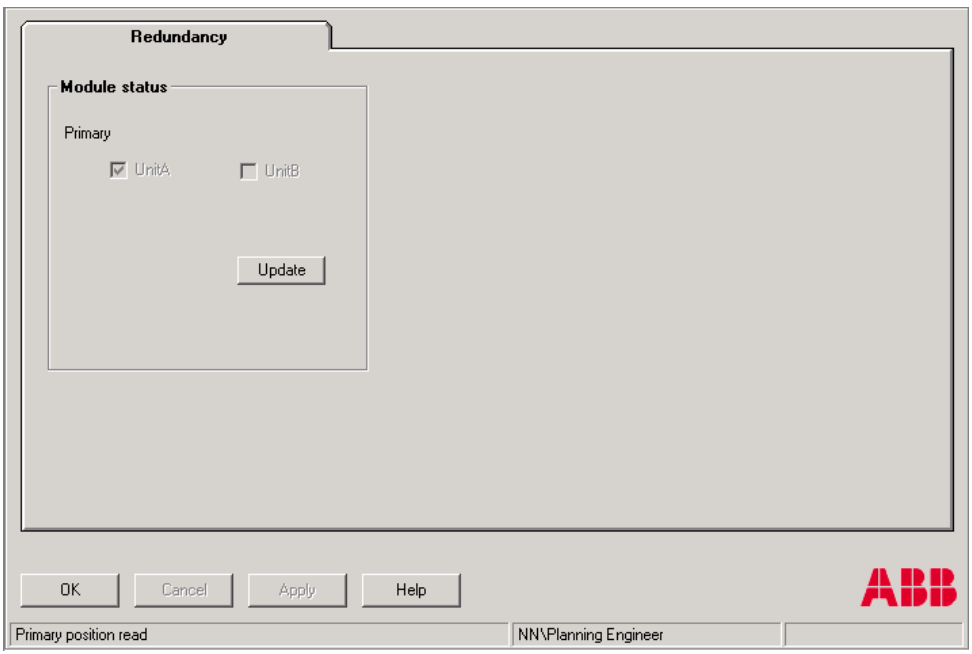


Figure 74. DO840 - Service - Redundancy Tab

Module status area

In the **Module status** area you can see which I/O module that is primary. By clicking the **Update** button you update the status for which of the I/O module that are the primary.

DO890

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DO890 Dynamic values on page 183.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for separate channels.

Module parameters tab

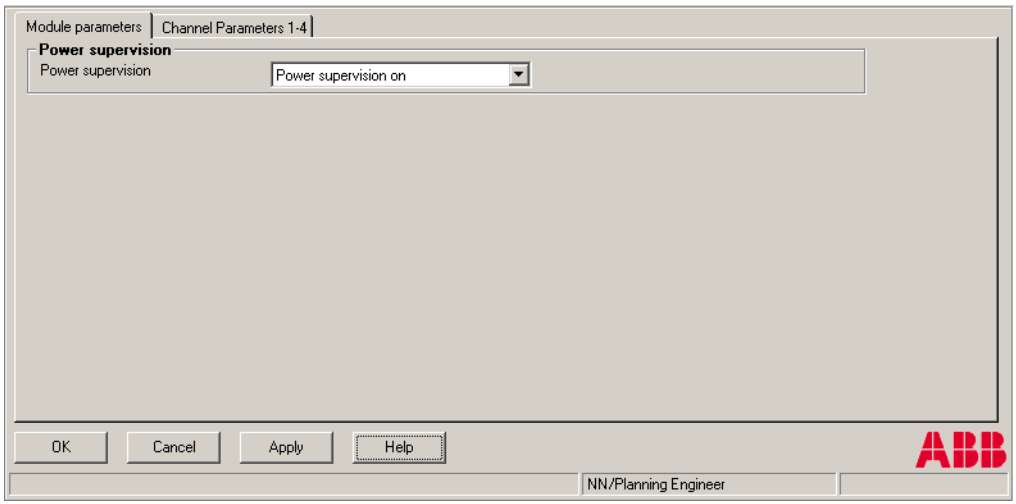


Figure 75. DO890 - Configuration - Module Parameters Tab

Power supervision area

Make the required choice in the **Power supervision** drop-down menu.

Channel parameters tab

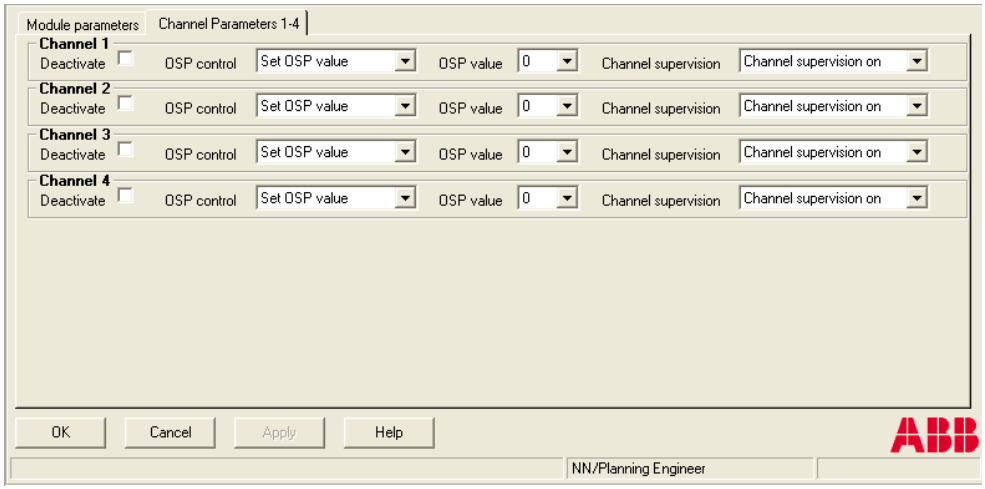


Figure 76. DO890 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **OSP control**, **OSP value** and **Channel supervision** drop-down menus.

DP820

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DP820 Dynamic values on page 183.

Diagnosis

See Diagnosis on page 49.

Observe

The Observe control displays the dynamic for a module in online mode. It is possible to update the value once or to read it cyclic with an interval of 30 s by checking the corresponding check box. To stop the cyclic reading, press the **Cancel** button.

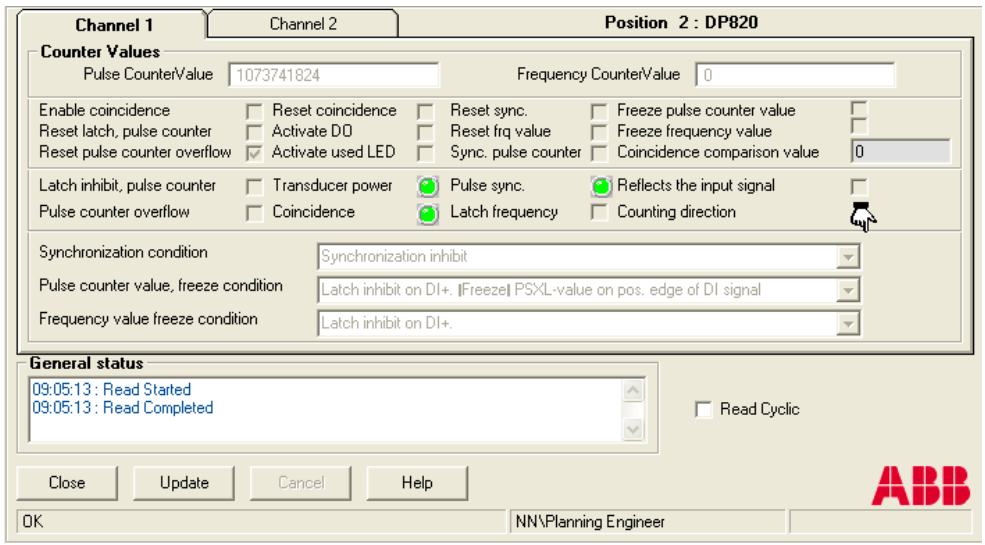


Figure 77. DP820 - Observe

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for separate channels.

Channel parameters tab

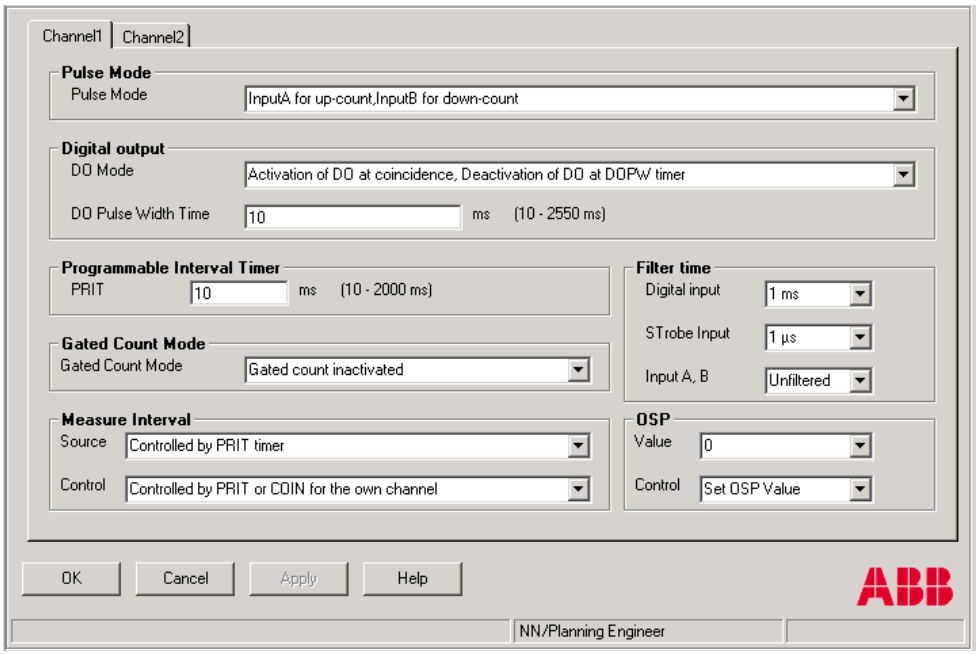


Figure 78. DP820 - Configuration - Channel Parameters Tabs

Make the required choices in the channel parameter drop-down menus.

DP840

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See DP840 Dynamic values on page 188.

Diagnosis

See Diagnosis on page 49.

Observe

See Observe on page 51.

Configuration

This control is not available if the unit is used towards AC 800M. The configuration data is then set via Control Builder Professional.

Configuration consists of two tabs. The Module parameters tab shows the user parameters for the module and the Channel parameters tab shows parameters for separate channels.

Module parameters tab

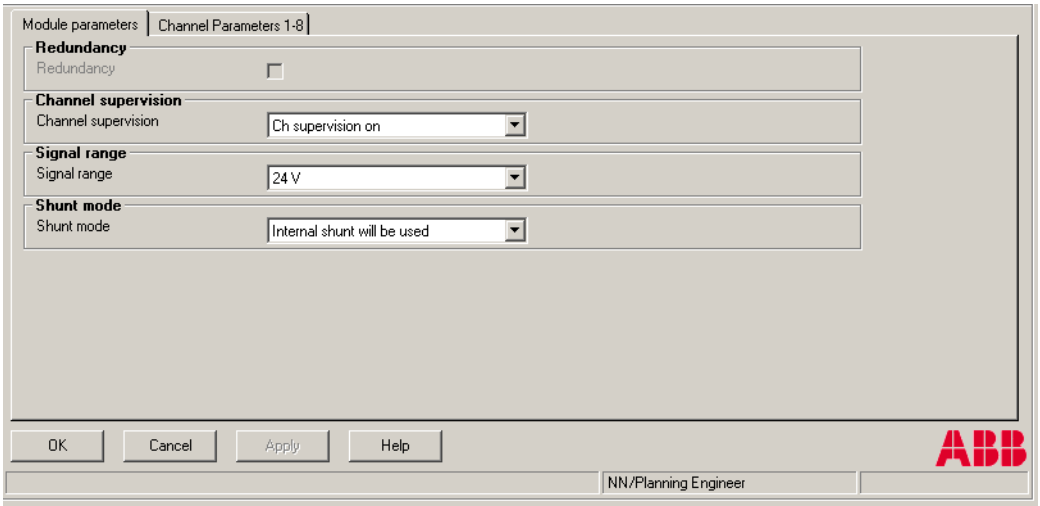


Figure 79. DP840 - Configuration - Module Parameters Tab

Redundancy area

Mark the **Redundancy** check box if the unit shall be set for redundant operation. This check box is only applicable when configured via CI840.

Channel supervision area

Make the required choice in the **Channel supervision** drop-down menu.

Signal range area

Make the required choice in the **Signal range** drop-down menu.

Shunt mode area

Make the required choice in the **Shunt mode** drop-down menu.

Channel parameters tab

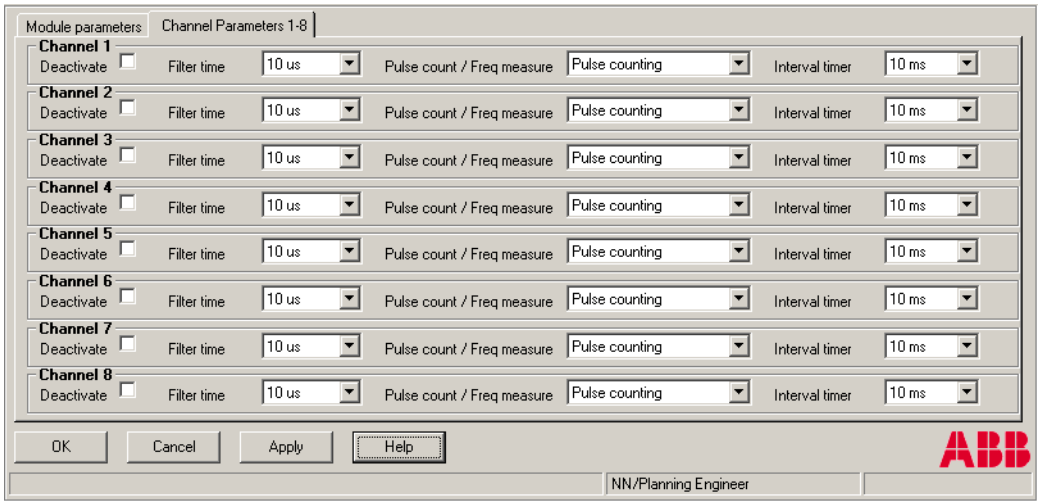


Figure 80. DP840 - Configuration - Channel Parameters Tab

Channel area

Mark the **Deactivate** check box if the channel shall not be used.

Make the required choices in the **Filter time**, **Pulse count/Freq measure** and **Interval Timer** drop-down menus.

Service

The service control is used for reading acyclic data and is only visible if the module is configured via a CI840.

Redundancy tab

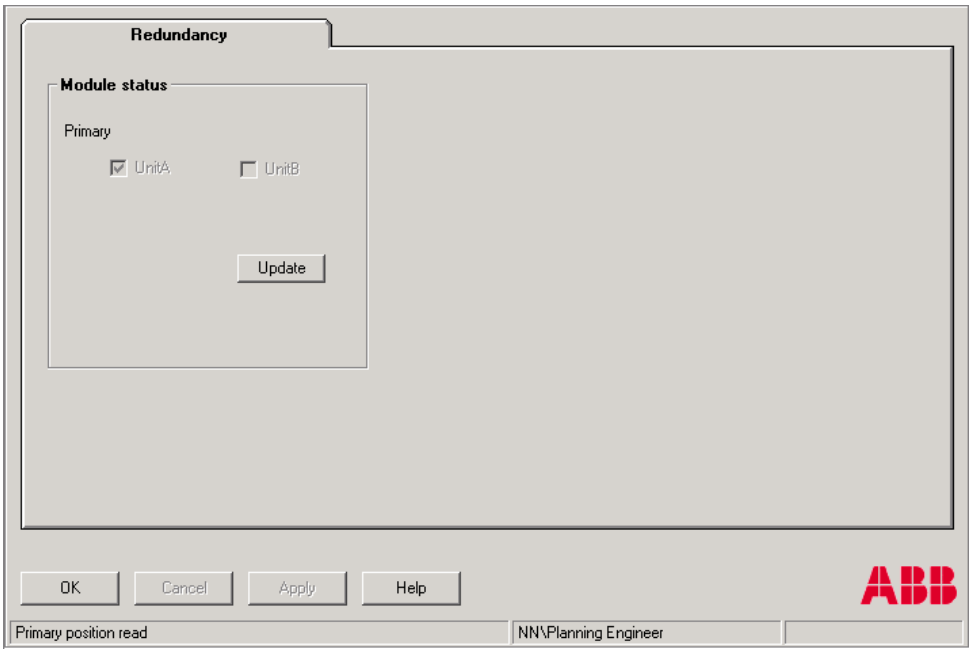


Figure 81. DP840 - Service - Redundancy Tab

Module status area

In the **Module status** area you can see which I/O module that is primary. By clicking the **Update** button you update the status for which of the I/O module that are the primary.

ABB Standard Drive

About DTM

See About DTM on page 46.

Identification

See Identification on page 47.

Dynamic Data

See Appendix B, Dynamic Data.

Diagnosis

See Diagnosis on page 49.

Appendix A Operating with HART DTMs

Introduction

The AI815/AO815, AI845/AO845, AI880 and the AI895/AO895 DTMs support to have HART DTMs connected to their channels. All seven DTMs have 8 channels reflecting their hardware channels. It is possible to connect one HART DTM to any of the channels of the parent AI815/AO815 DTM, AI845/AO845 DTM, AI880 DTM or AI895/AO895 DTM.

The AI815/AO815 DTM, AI845/AO845 DTM, AI880 DTM or AI895/AO895 DTM will only support HART DTMs and no DTMs operating with other protocols. It is only possible to connect **one** HART DTM on each channel. That means the total amount of HART DTMs on a AI815 DTM, AO815 DTM, AI845 DTM, AO845 DTM, AI880 DTM, AI895 DTM or AO895 DTM is 8.

For information about HART DTMs see, for example, 800xA HART DTM Builder - Configuration (3BDD011787Rxxxx).

Connecting a HART instrument

A HART instrument can be connected on any of the channels of an AI815, AO815, AI845, AO845, AI880, AI895 or AO895, module. If the instrument is connected at run-time to an AI895 or AO895, for example when the module is operational, then the module will not discover the new HART instrument automatically.

The DTM for the AI895 and AO895 have a Service application with different functions for the module (For AI895, see Service on page 98; and for AO895, see Service on page 120). The service function *"Perform master reset"* will reset the HART functionality in the module and a new scan for HART instruments on every channel will be done.

Supervision of HART instrument

The AI895 or AO895 module has an supervision option (see Scan enabled). This option can be turned on or off from the DTM, Service application with the service functions *"Enable scan"* and *"Disable scan"*.

This option only applies for HART instrument that already has been confirmed by the module. This option will **not** discover any newly added HART instruments. It only supervises the ones in an internal list.

Appendix B Dynamic Data

The dynamic data is predefined for all units in S800 I/O DTM. Each connection, or variable, is specified and explained in the tables below.

This appendix is not applicable when using S800I/O DTM towards AC800M.

CI801 Dynamic values

	Signal type	Data type	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Connection 1	Input	Byte	SW	0	0	0	RPB	RPA	0	0

Abbreviation	Description
SW	Station warning. Set if any error exists in the FCI station including modules.
RPB	Redundant power B failure (opto extension).
RPA	Redundant power A failure (opto extension).

CI840 Dynamic values

	Signal type	Data type	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Connection 1	Input	Byte	SW	RW	0	FPR	RPB	RPA	FEB	FEA

Abbreviation	Description
SW	Station warning. Set if any error exists in the FCI station including modules.
RW	Redundancy warning.
FPR	If = 0, FCI in position A is Primary or only FCI If = 1, FCI in position B is Primary or only FCI
RPB	Redundant power B failure (opto extension).
RPA	Redundant power A failure (opto extension).
FEB	FCI error on FCI B (to the right).
FEA	FCI error on FCI A (to the left).

AI801/AI810/AI815/AI830/AI835/AI845/AI890/AI893/AI895 Dynamic values

	Signal type	Data type	Description							
Connection 1	Input	Integer	Analog value channel 1							
Connection 2	Input	Integer	Analog value channel 2							
Connection 3	Input	Integer	Analog value channel 3							
Connection 4	Input	Integer	Analog value channel 4							
Connection 5	Input	Integer	Analog value channel 5							
Connection 6	Input	Integer	Analog value channel 6							
Connection 7	Input	Integer	Analog value channel 7							
Connection 8	Input	Integer	Analog value channel 8							
Connection 9	Input	Byte	Bit 7 S8	Bit 6 S7	Bit 5 S6	Bit 4 S5	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

Abbreviation	Name	Values
S#	Channel status #	0 = channel OK 1 = channel error

AI820/AI825 Dynamic values

	Signal type	Data type	Description				
Connection 1	Input	Integer	Analog value channel 1				
Connection 2	Input	Integer	Analog value channel 2				
Connection 3	Input	Integer	Analog value channel 3				
Connection 4	Input	Integer	Analog value channel 4				
Connection 5	Input	Byte	Not used	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

Abbreviation	Name	Values
S#	Channel status #	0 = channel OK 1 = channel error

AI835A Dynamic Values

	Signal type	Data type	Description
Connection 1	Input	Integer	Analog value channel 1
Connection 2	Input	Integer	Analog value channel 2
Connection 3	Input	Integer	Analog value channel 3
Connection 4	Input	Integer	Analog value channel 4
Connection 5	Input	Integer	Analog value channel 5
Connection 6	Input	Integer	Analog value channel 6

	Signal type	Data type	Description							
Connection 7	Input	Integer	Analog value channel 7							
Connection 8	Input	Integer	Analog value channel 8							
Connection 9	Input	Byte	Bit 7 S8	Bit 6 S7	Bit 5 S6	Bit 4 S5	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1
Connection 10	Output	Integer	Application controlled CJT							

AI843 Dynamic values

	Signal type	Data type	Description							
Connection 1	Input	Integer	Analog value channel 1							
Connection 2	Input	Integer	Analog value channel 2							
Connection 3	Input	Integer	Analog value channel 3							
Connection 4	Input	Integer	Analog value channel 4							
Connection 5	Input	Integer	Analog value channel 5							
Connection 6	Input	Integer	Analog value channel 6							
Connection 7	Input	Integer	Analog value channel 7							
Connection 8	Input	Integer	Analog value channel 8							
Connection 9	Input	Integer	Analog value CJT input							
Connection 10	Input	Byte	Bit 7 S8	Bit 6 S7	Bit 5 S6	Bit 4 S5	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

	Signal type	Data type	Description	
Connection 11	Input	Byte	Not used	Bit 0 CJ ch
Connection 12	Input	Integer	Application controlled CJT	

Abbreviation	Name	Values
S#	Channel status #	0 = channel OK 1 = channel error
CJ ch	Channel status for CJT channel	0 = channel OK 1 = channel error

AO801/AO810/AO815/AO845/AO890/AO895 Dynamic values

	Signal type	Data type	Description
Connection 1	Output	Integer	Analog value channel 1
Connection 2	Output	Integer	Analog value channel 2
Connection 3	Output	Integer	Analog value channel 3
Connection 4	Output	Integer	Analog value channel 4
Connection 5	Output	Integer	Analog value channel 5
Connection 6	Output	Integer	Analog value channel 6
Connection 7	Output	Integer	Analog value channel 7

	Signal type	Data type	Description							
Connection 8	Output	Integer	Analog value channel 8							
Connection 9	Input	Byte	Bit 7 S8	Bit 6 S7	Bit 5 S6	Bit 4 S5	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

Abbreviation	Name	Values
S#	Channel status #	0 = channel OK 1 = channel error

AO820 Dynamic values

	Signal type	Data type	Description				
Connection 1	Output	Integer	Analog value channel 1				
Connection 2	Output	Integer	Analog value channel 2				
Connection 3	Output	Integer	Analog value channel 3				
Connection 4	Output	Integer	Analog value channel 4				
Connection 5	Input	Byte	Not used	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

Abbreviation	Name	Values
S#	Channel status #	0 = channel OK 1 = channel error

DI801/DI810/DI811/DI814/DI828*/DI840 Dynamic values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Bool	Digital value channel 9
Connection 10	Input	Bool	Digital value channel 10
Connection 11	Input	Bool	Digital value channel 11
Connection 12	Input	Bool	Digital value channel 12
Connection 13	Input	Bool	Digital value channel 13
Connection 14	Input	Bool	Digital value channel 14
Connection 15	Input	Bool	Digital value channel 15
Connection 16	Input	Bool	Digital value channel 16
Connection 17	Input	Integer	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit15=ch 16	0 = channel OK 1 = channel error

* Feature Pack Functionality

Feature Pack Functionality

DI818 Dynamic values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Bool	Digital value channel 9
Connection 10	Input	Bool	Digital value channel 10
Connection 11	Input	Bool	Digital value channel 11
Connection 12	Input	Bool	Digital value channel 12
Connection 13	Input	Bool	Digital value channel 13
Connection 14	Input	Bool	Digital value channel 14
Connection 15	Input	Bool	Digital value channel 15
Connection 16	Input	Bool	Digital value channel 16
Connection 17	Input	Bool	Digital value channel 17
Connection 18	Input	Bool	Digital value channel 18
Connection 19	Input	Bool	Digital value channel 19

	Signal type	Data type	Description
Connection 20	Input	Bool	Digital value channel 20
Connection 21	Input	Bool	Digital value channel 21
Connection 22	Input	Bool	Digital value channel 22
Connection 23	Input	Bool	Digital value channel 23
Connection 24	Input	Bool	Digital value channel 24
Connection 25	Input	Bool	Digital value channel 25
Connection 26	Input	Bool	Digital value channel 26
Connection 27	Input	Bool	Digital value channel 27
Connection 28	Input	Bool	Digital value channel 28
Connection 29	Input	Bool	Digital value channel 29
Connection 30	Input	Bool	Digital value channel 30
Connection 31	Input	Bool	Digital value channel 31
Connection 32	Input	Bool	Digital value channel 32
Connection 33	Input	Integer	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit31=ch 32	0 = channel OK 1 = channel error

DI802/DI803/DI820/DI821/DI890 Dynamic values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Byte	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit7=ch 8	0 = channel OK 1 = channel error

DI825 Dynamic Values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Byte	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit7=ch 8	0 = channel OK 1 = channel error

DI830/DI831 Dynamic Values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Bool	Digital value channel 9
Connection 10	Input	Bool	Digital value channel 10
Connection 11	Input	Bool	Digital value channel 11
Connection 12	Input	Bool	Digital value channel 12
Connection 13	Input	Bool	Digital value channel 13
Connection 14	Input	Bool	Digital value channel 14
Connection 15	Input	Bool	Digital value channel 15
Connection 16	Input	Bool	Digital value channel 16
Connection 17	Input	Integer	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 9…. Bit7=ch 16 Bit8=ch 1.....Bit15=ch 8	0 = channel OK 1 = channel error

DI885 Dynamic Values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Input	Byte	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit7=ch 8	0 = channel OK 1 = channel error

DO801/DO810/DO814/DO828*/DO840 Dynamic values

	Signal type	Data type	Description
Connection 1	Output	Bool	Digital value channel 1
Connection 2	Output	Bool	Digital value channel 2
Connection 3	Output	Bool	Digital value channel 3
Connection 4	Output	Bool	Digital value channel 4
Connection 5	Output	Bool	Digital value channel 5
Connection 6	Output	Bool	Digital value channel 6
Connection 7	Output	Bool	Digital value channel 7
Connection 8	Output	Bool	Digital value channel 8
Connection 9	Output	Bool	Digital value channel 9
Connection 10	Output	Bool	Digital value channel 10
Connection 11	Output	Bool	Digital value channel 11
Connection 12	Output	Bool	Digital value channel 12
Connection 13	Output	Bool	Digital value channel 13
Connection 14	Output	Bool	Digital value channel 14
Connection 15	Output	Bool	Digital value channel 15
Connection 16	Output	Bool	Digital value channel 16
Connection 17	Input	Integer	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit15=ch 16	0 = channel OK 1 = channel error

* Feature Pack Functionality

Feature Pack Functionality

DO818 Dynamic values

	Signal type	Data type	Description
Connection 1	Output	Bool	Digital value channel 1
Connection 2	Output	Bool	Digital value channel 2
Connection 3	Output	Bool	Digital value channel 3
Connection 4	Output	Bool	Digital value channel 4
Connection 5	Output	Bool	Digital value channel 5
Connection 6	Output	Bool	Digital value channel 6
Connection 7	Output	Bool	Digital value channel 7
Connection 8	Output	Bool	Digital value channel 8
Connection 9	Output	Bool	Digital value channel 9
Connection 10	Output	Bool	Digital value channel 10
Connection 11	Output	Bool	Digital value channel 11
Connection 12	Output	Bool	Digital value channel 12
Connection 13	Output	Bool	Digital value channel 13
Connection 14	Output	Bool	Digital value channel 14
Connection 15	Output	Bool	Digital value channel 15
Connection 16	Output	Bool	Digital value channel 16
Connection 17	Output	Bool	Digital value channel 16
Connection 18	Output	Bool	Digital value channel 18
Connection 19	Output	Bool	Digital value channel 19

	Signal type	Data type	Description
Connection 20	Output	Bool	Digital value channel 20
Connection 21	Output	Bool	Digital value channel 21
Connection 22	Output	Bool	Digital value channel 22
Connection 23	Output	Bool	Digital value channel 23
Connection 24	Output	Bool	Digital value channel 24
Connection 25	Output	Bool	Digital value channel 25
Connection 26	Output	Bool	Digital value channel 26
Connection 27	Output	Bool	Digital value channel 27
Connection 28	Output	Bool	Digital value channel 28
Connection 29	Output	Bool	Digital value channel 29
Connection 30	Output	Bool	Digital value channel 30
Connection 31	Output	Bool	Digital value channel 31
Connection 32	Output	Bool	Digital value channel 32
Connection 33	Input	Integer	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit31=ch 32	0 = channel OK 1 = channel error

DO802/DO815/DO820/DO821 Dynamic values

	Signal type	Data type	Description
Connection 1	Input	Bool	Digital value channel 1
Connection 2	Input	Bool	Digital value channel 2
Connection 3	Input	Bool	Digital value channel 3
Connection 4	Input	Bool	Digital value channel 4
Connection 5	Input	Bool	Digital value channel 5
Connection 6	Input	Bool	Digital value channel 6
Connection 7	Input	Bool	Digital value channel 7
Connection 8	Input	Bool	Digital value channel 8
Connection 9	Output	Byte	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit7=ch 8	0 = channel OK 1 = channel error

DO890 Dynamic values

	Signal type	Data type	Description				
Connection 1	Output	Bool	Digital value channel 1				
Connection 2	Output	Bool	Digital value channel 2				
Connection 3	Output	Bool	Digital value channel 3				
Connection 4	Output	Bool	Digital value channel 4				
Connection 5	Input	Byte	Not used	Bit 3 S4	Bit 2 S3	Bit 1 S2	Bit 0 S1

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit3=ch 4	0 = channel OK 1 = channel error

DP820 Dynamic values

	Signal type	Data type	Description							
Connection 1	Input	Integer	Pulse counter value 1							
Connection 2	Input	Byte	Bit 7 li_sp1	Bit 6 tp1	Bit 5 coin1	Bit 4 sync1	Bit 3 li_ps1	Bit 2 owf1	Bit 1 up1	Bit 0 DI1
Connection 3	Input	Real	Measured frequency value 1							
Connection 4	Input	Integer	Pulse counter value 2							

	Signal type	Data type	Description							
Connection 5	Input	Byte	Bit 7 li_sp2	Bit 6 tp2	Bit 5 coin2	Bit 4 sync2	Bit 3 li_ps2	Bit 2 owf2	Bit 1 up2	Bit 0 DI2
Connection 6	Input	Real	Measured frequency value 2							
Connection 7	Output	Integer	Coincidence comparison value1							
Connection 8	Output	Byte	Bit 7 r_lip1	Bit 6 r_of1	Bit 5 r_sy1	Bit 4 r_co1	Bit 3 coen1	Bit 2 DO1	Bit 1 r_lis1	Bit 0 LED1
Connection 9	Output	Byte	Bit 7 pcsy1	Bit 3..6 Sync condition1				Bit 0..2 pxlc1		
Connection 10	Output	Byte	Bit 6..7 splc2		Bit 4..5 splc1		Bit 3 frzps2	Bit 2 frzsp2	Bit 1 frzps1	Bit 0 frzsp1
Connection 11	Output	Integer	Coincidence comparison value2							
Connection 12	Output	Byte	Bit 7 r_lip2	Bit 6 r_of2	Bit 5 r_sy2	Bit 4 r_co2	Bit 3 coen2	Bit 2 DO2	Bit 1 r_lis2	Bit 0 LED2
Connection 13	Output	Byte	Bit 7 pcsy2	Bit 3..6 Sync condition2				Bit 0..2 pxlc2		

Abbreviation	Name	Values
li_ps#	Latch inhibit, pulse counter	0 = Latch not inhibit 1 = Latch inhibit
owf#	Pulse counter overflow	0 = No overflow 1 = Overflow
up#	Counting direction	0 = Counting direction is down 1 = Counting direction is up
li_sp#	Latch inhibit, frequency	0 = Latch not inhibit 1 = Latch inhibit

Abbreviation	Name	Values
tp#	Transducer power OK	0 = False 1 = True
coin#	Coincidence has occurred	0 = False 1 = True
sync#	Pulse counter has been synchronized	0 = False 1 = True
DI#	Reflects the input signal	0 or 1
coen#	Enable coincidence	0 = Disable 1 = Enable
r_lip#	Reset latch inhibit, pulse counter	
r_of#	Reset pulse counter overflow	
r_sy#	Reset sync.	
r_co#	Reset coincidence	
DO#	Activate DO	
LED#	Activate used LED	
pcsy#	Sync. (i.e. reset) of pulse counter	

Abbreviation	Name	Values
Sync condition#	Synchronization condition	0 = Synchronization inhibit 1 = Sync. if pcsy=1 2 = Sync. if count.dir=up and input ST=active 3 = Sync. if count.dir=down and input ST=active 4 = Sync. if count.dir=up and input DI=pos. edge 5 = Sync. if count.dir=down and input DI=pos. edge 6 = Sync. if count.dir=up and input DI=neg. edge 7 = Sync. if count.dir=down and input DI=neg. edge 8 = Sync. if count.dir=up and input ST=active and DI=pos. edge 9 = Sync. if count.dir=down and input ST=active and DI=pos. edge 10 =Sync. if count.dir=up and input ST=active and DI=neg. edge 11 = Sync. if count.dir=down and input ST=active and DI=neg. edge 12 =Sync. if coincidence on "own" channel 13 =Sync. if coincidence on "other" channel 14 and 15 = Not used

Abbreviation	Name	Values
pxlc#	Pulse counter value, freeze condition	0 = Latch inhibit on DI+. "Freeze" PSXL-value on pos. edge of DI signal. 1 = Latch inhibit on DI-. "Freeze" PSXL-value on neg. edge of DI signal. 2 = Latch inhibit on coincidence. 3 = Latch inhibit on sw freeze, bit frzps x in the Dynamic values. 4 = Latch inhibit on coincidence on the "other" channel.
r_lis	Reset frequency value	1 = Reset of bit lisp # 0 = -
splc#	Frequency value freeze condition (Speed Latch Inhibit Condition)	0 = Latch inhibit on DI+. 1 = Latch inhibit on DI-. 2 = Latch inhibit on coin on "own" channel. 3 = Latch inhibit on sw freeze, bit frzsp x in the Dynamic values.
frzps#	Freeze pulse counter value channel #	0 = - 1 = freeze
frzsp#	Freeze frequency value channel #	0 = - 1 = freeze

DP840 Dynamic values

	Signal type	Data type	Description
Connection 1	Input	UINT16 / Real	Pulse counter value / Frequency value ch 1
Connection 2	Input	UINT16 / Real	Pulse counter value / Frequency value ch 2
Connection 3	Input	UINT16 / Real	Pulse counter value / Frequency value ch 3
Connection 4	Input	UINT16 / Real	Pulse counter value / Frequency value ch 4
Connection 5	Input	UINT16 / Real	Pulse counter value / Frequency value ch 5
Connection 6	Input	UINT16 / Real	Pulse counter value / Frequency value ch 6
Connection 7	Input	UINT16 / Real	Pulse counter value / Frequency value ch 7
Connection 8	Input	UINT16 / Real	Pulse counter value / Frequency value ch 8
Connection 9	Input	Bool	Digital value channel 1
Connection 10	Input	Bool	Digital value channel 2
Connection 11	Input	Bool	Digital value channel 3
Connection 12	Input	Bool	Digital value channel 4
Connection 13	Input	Bool	Digital value channel 5
Connection 14	Input	Bool	Digital value channel 6
Connection 15	Input	Bool	Digital value channel 7
Connection 16	Input	Bool	Digital value channel 8
Connection 17	Input	Byte	Channel status #

Abbreviation	Name	Values
Channel status #	Bit0=ch 1 …. Bit7=ch 8	0 = channel OK 1 = channel error

Revision History

This section provides information on the revision history of this User Manual.

The revision index of this User Manual is not related to the 800xA 5.1 System Revision.

The following table lists the revision history of this User Manual.

Revision Index	Description	Date
-	First version published for S800 IO DTM 5.3 supported on 64-bit operating systems.	November 2011
A	Second version published for 800xA 5.1 Feature Pack 3.	June 2012

Updates in Revision Index -

The following table shows the updates made in this User Manual for S800 IO DTM 5.3.

Updated Section/Sub-section	Description of Update
Front Cover, Back Cover to comply with 800xA User Manual standard.	First version published for S800 IO DTM 5.3 supported on 64-bit operating systems.

Updates in Revision Index A

The following table shows the updates made in this User Manual for 800xA 5.1 Feature Pack 3.

Updated Section/Sub-section	Description of Update
Multiple updates as applicable.	Information about new modules DI818,DI828,DO818 and DO828 added for SV 5.1 Feature Pack 3.

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