

# Alert/Alarm Configuration in FG-110 for Emerson's AMS Suite: Intelligent Device Manager

## Index

1. Introduction.....	2
2. Use Cases .....	2
2.1. Use case I - Emerson AMS workbench setup.....	2
2.2. Use Case II - Emerson AMS together with a FF-H1 control system.....	3
2.3 Use Case III - Emerson AMS together with a control system supporting Modbus/TCP .....	4
3. Use case I – Emerson AMS "workbench setup" .....	5
3.1 Alarm Configuration .....	5
4. Use case II – Emerson AMS together with a FF-H1 control system .....	7
4.1 Visitor Mode .....	7
4.2 Alarm Configuration .....	9
5. Use case III – Emerson AMS together with a control system supporting Modbus/TCP.....	11
5.1 Open an existing or create a new project.....	11
5.2 Configuration of HSE .....	11
5.3 Multicast Addressing .....	12
5.4 Alarm configuration in H1 function blocks .....	14
6. Appendix A - Definitions .....	16
7. Appendix B – List of common alarm parameters .....	17

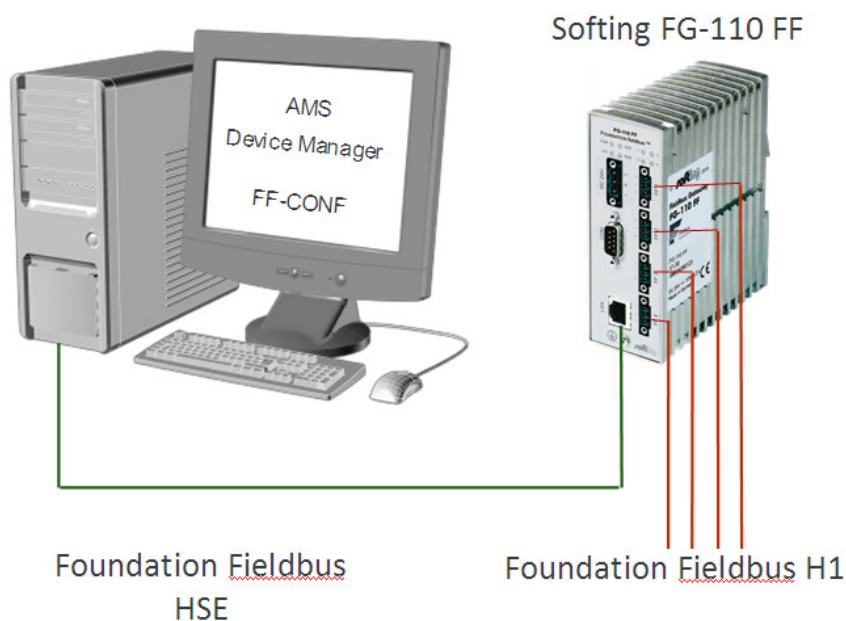
## 1. Introduction

This application note describes how to set up the Softing FG-110 for alarm and alert propagation to Emerson's AMS Suite: Intelligent Device Manager.

The first part of this document describes common use case scenarios that require different approaches when configuring the FG-110. These scenarios are provided as a guideline for integrating of FG-110 into your specific architecture. Please select the scenario that is the closest match to your application and proceed with the corresponding configuration approach.

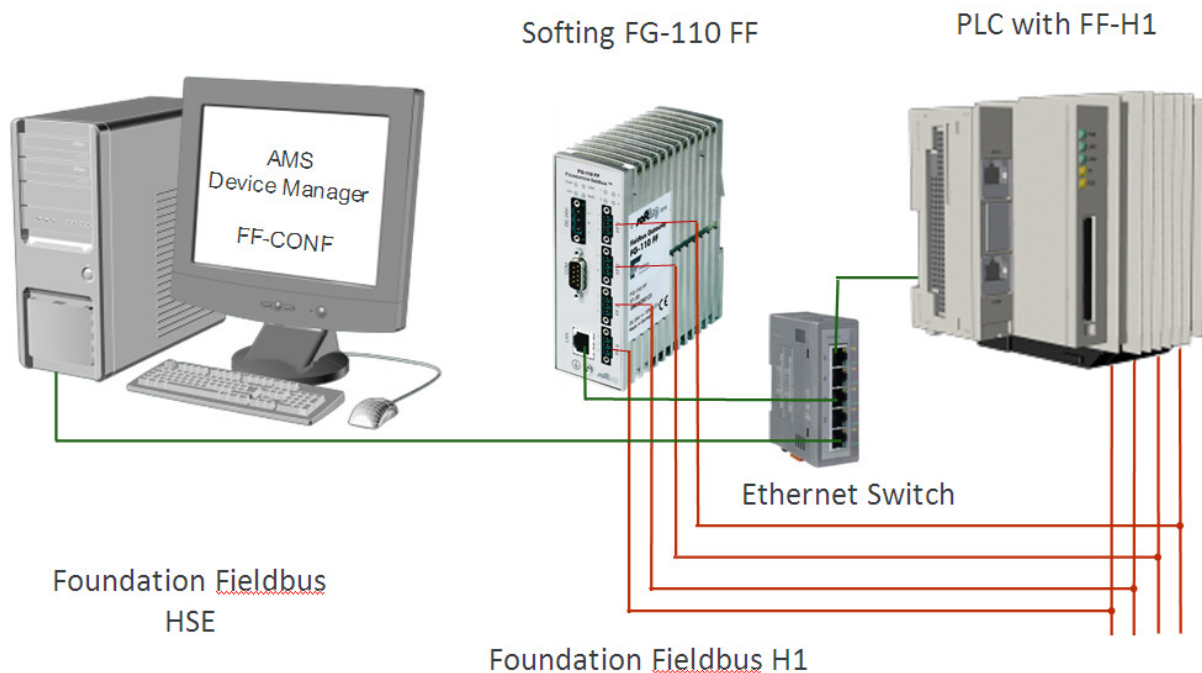
## 2. Use Cases

### 2.1. Use case I – Emerson's AMS Device Manager workbench setup



The stand-alone AMS Device Manager "workbench setup" requires only minimal configuration via the web interface of the FG-110.

## ***2.2. Use Case II – Emerson’s AMS Device Manager together with a FF-H1 control system***



This use case assumes that the FOUNDATION fieldbus H1 host and field devices are already commissioned using a configuration tool provided by the control system manufacturer. The network is assumed to be operational with an active control loop. For this scenario the Linking Device should be configured to operate in "Visitor (Guest)" mode to minimize any impact on the H1 communications of the control system. This scenario requires configuration of the FG-110 via the web interface.

The diagram illustrates a networked industrial control system architecture. On the left, a computer system (tower unit and monitor) is labeled "AMS Device Manager" and "FF-CONF". A green line connects the computer to a central "Softing FG-110 FF" device. This device is connected to a "PLC with Modbus" on the right via a network switch. The network switch is labeled "Ethernet Switch". The connection between the Softing device and the Ethernet switch is labeled "Foundation Fieldbus H1". The connection between the Ethernet switch and the PLC is labeled "Foundation Fieldbus HSE".

Softing's FOUNDATION fieldbus H1 configuration tool (FF-CONF) is used to configure the FOUNDATION fieldbus H1 devices and network and create the control loop. In this scenario the alarm configuration for AMS Device Manager needs to be done with FF-CONF as well.

### 3. Use case I – Emerson’s AMS Device Manager "workbench setup"

The AMS Device Manager workbench setup represents a simple network with AMS Device Manager communicating with a single (or a few) H1 field device for configuration, calibration or maintenance purposes.

This chapter describes how to configure FF Alarms for the use with Emerson’s AMS Device Manager with the FG-110 installed as the only host on the H1 network. In this scenario it is **not** recommended to use Softing FF-CONF. The Softing Linking FG-110 FF has a built-in web server that provides an easy way to setup the alarm propagation from the FG-110 to AMS Device Manager.

#### 3.1 Alarm Configuration

Please click on

Configuration > Fieldbus > Advanced > Network Parameters > HSE

to enable or disable HSE Alarms, and display the Alarm Distribution Address and Alarm Distribution Port. Alerts are generated by devices and then alarms are propagated through the Softing FG-110 FF to AMS Device Manager software by a Multicast message.

Therefore the following parameters need to be configured:

Enable HSE Alarms:	<input checked="" type="checkbox"/>
Alarm Distribution Address:	239.255.0.33
Alarm Distribution Port:	45000

The values above are the standards used for AMS Device Manager. Please verify that the Alarm Distribution Address and the port match the setting in your AMS Device Manager installation.

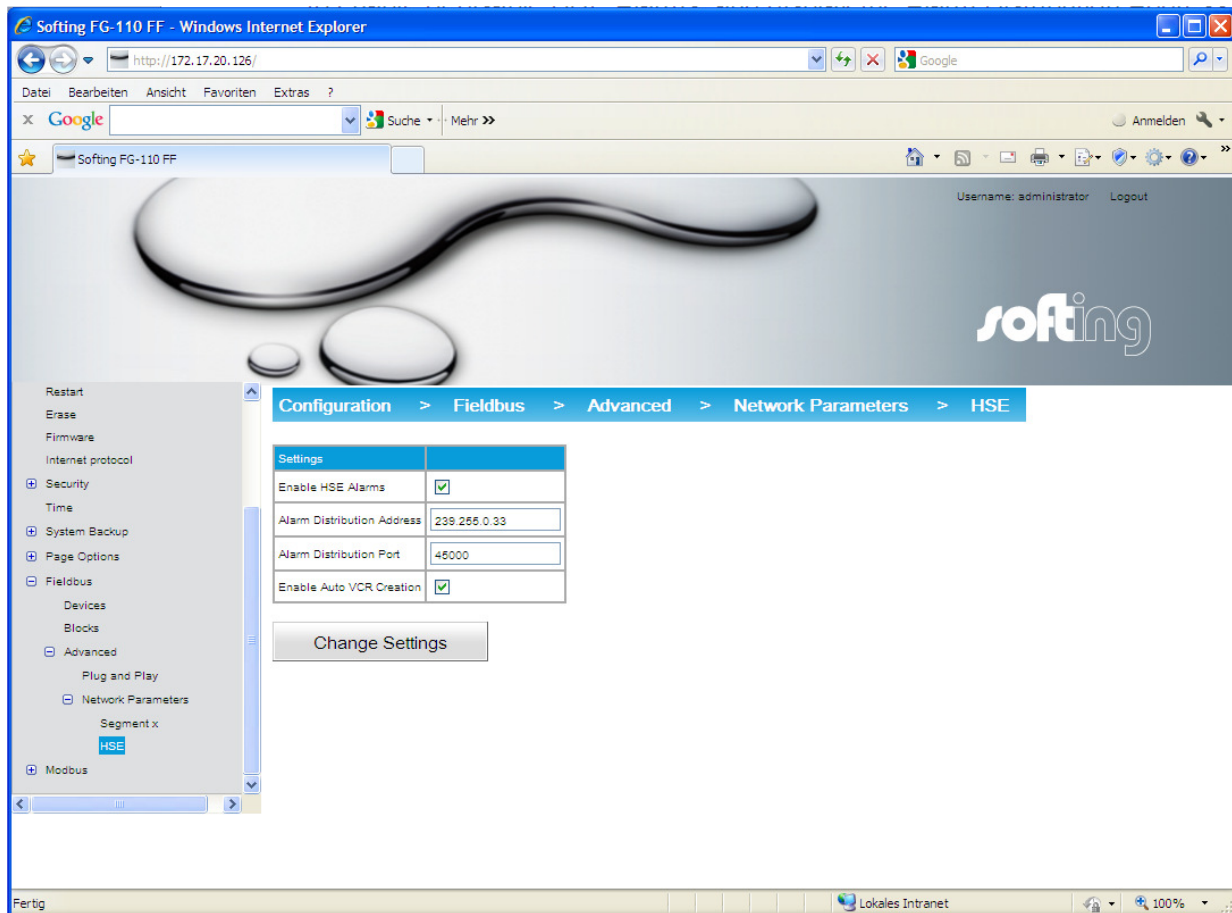


Figure 3.3 Alarm Configuration

## 4. Use case II – Emerson's AMS Device Manager together with a FF-H1 control system

This use case assumes that AMS Device Manager is connected to a H1 network that is controlled by a third party control system. In this scenario the H1 field devices are configured with a configuration package provided by control system vendor. Therefore, it is **not** recommended to use Softing's FF-CONF. Softing's Linking FG-110 has a built-in web-server that provides an easy way to setup the alarm propagation from the FG-110 to AMS Device Manager.


### 4.1 Visitor Mode

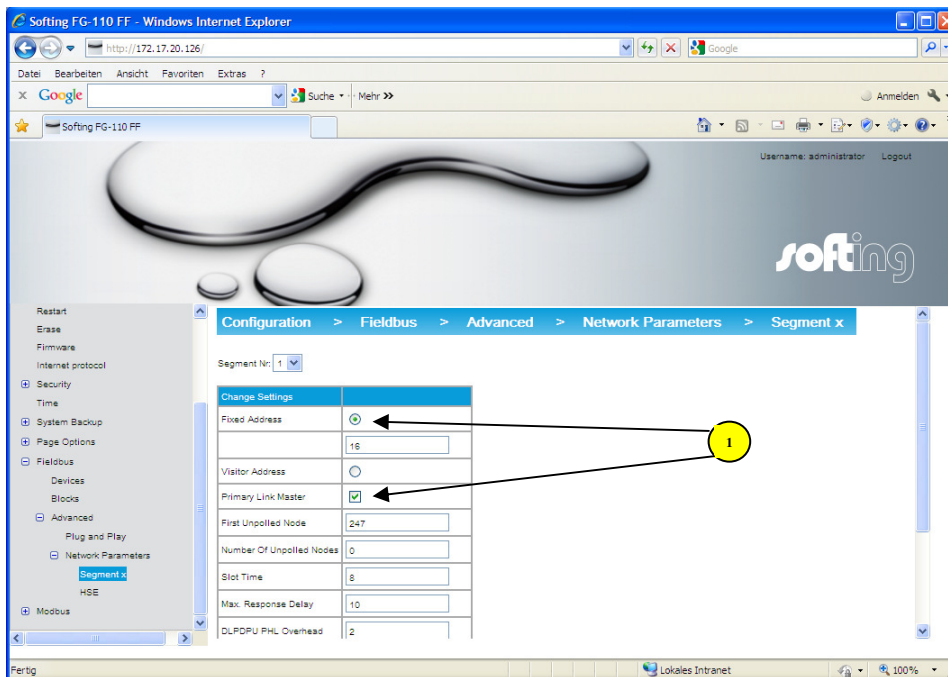
Please confirm that the Linking Device is set to "Visitor" mode before connecting the FG-110 to the FF-H1 network to avoid possible interruptions in the control system communication.

The "Visitor" mode is configured with the web interface of the FG-110. Please open a standard web browser and navigate to the following page:

*Configuration > Fieldbus > Advanced > Network Parameters > Segment x*

This web page allows the configuration of all H1 parameters for one (or all) H1 segments. Under normal conditions these values do not need to be changed except for the node address.

The H1 segments of the Linking Device are set to Visitor mode by selecting the radio button "Visitor Address". (see figure 4.1 )



*Figure 4.1 Set Visitor mode*

In case the Linking Device is attached to a network that is controlled by a third party control system (Host) The FG-100 should not take on the role as primary link master. Therefore please disable the feature “Primary Link Master” (see figure 4.2 2).

To apply the same configuration to all 4 H1 segments please check the box “Apply settings to all 4 segments” (see figure 4.2 3).



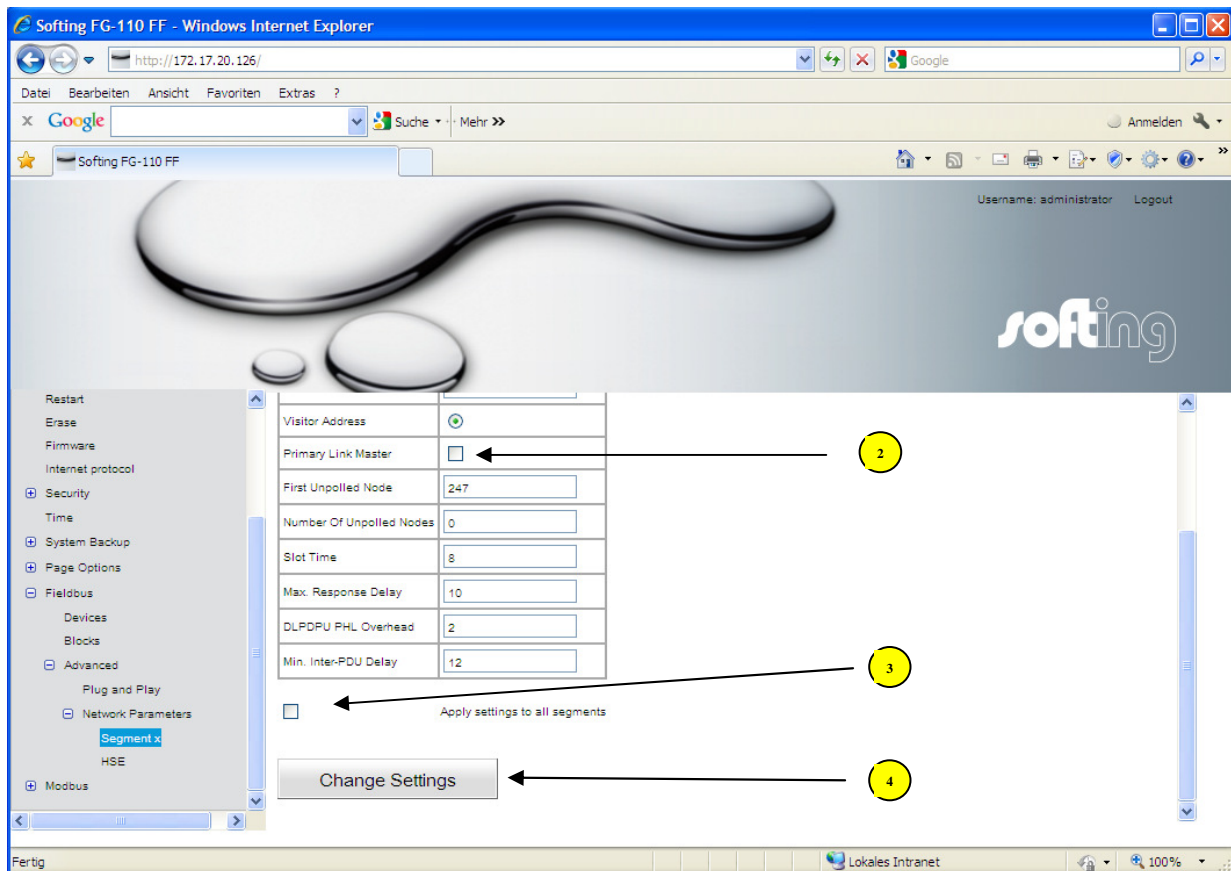


Figure 4.2 Disable Primary Link Master

## 4.2 Alarm Configuration

Please click on

*Configuration > Fieldbus > Advanced > Network Parameters > HSE*

to enable or disable HSE Alarms and to display the Alarm Distribution Address and Alarm Distribution Port. Alerts that are generated by H1 devices are propagated through the Softing FG-110 FF to AMS Device Manager software via a Multicast message.

The following parameters need to be configured to enable the alarm propagation:

Enable HSE Alarms:	<input checked="" type="checkbox"/>
Alarm Distribution Address:	239.255.0.33
Alarm Distribution Port:	45000

The above parameter settings represent the default values used within AMS Device Manager. Please verify that the Alarm Distribution Address and the port match the setting in your AMS Device Manager installation.

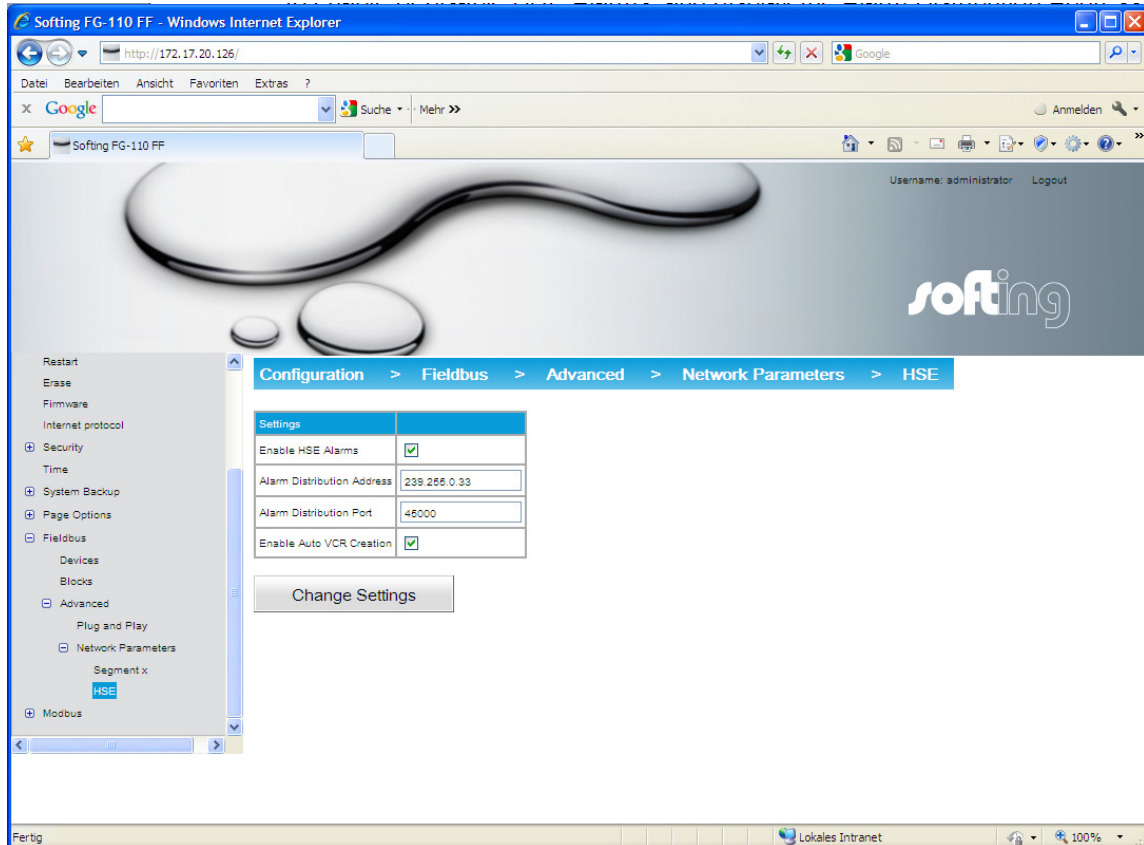


Figure 4.3 Alarm Configuration

## 5. Use case III – Emerson's AMS Device Manager together with a control system supporting Modbus/TCP

This chapter describes how to configure alarms with the Softing FOUNDATION fieldbus configuration tool (FF-CONF).

### 5.1 Open an existing or create a new project

Please follow the instruction in the user manual for FF-CONF section 5.

If your project is open and all devices are assigned you should see a screen similar to the figure below (figure 5.1).

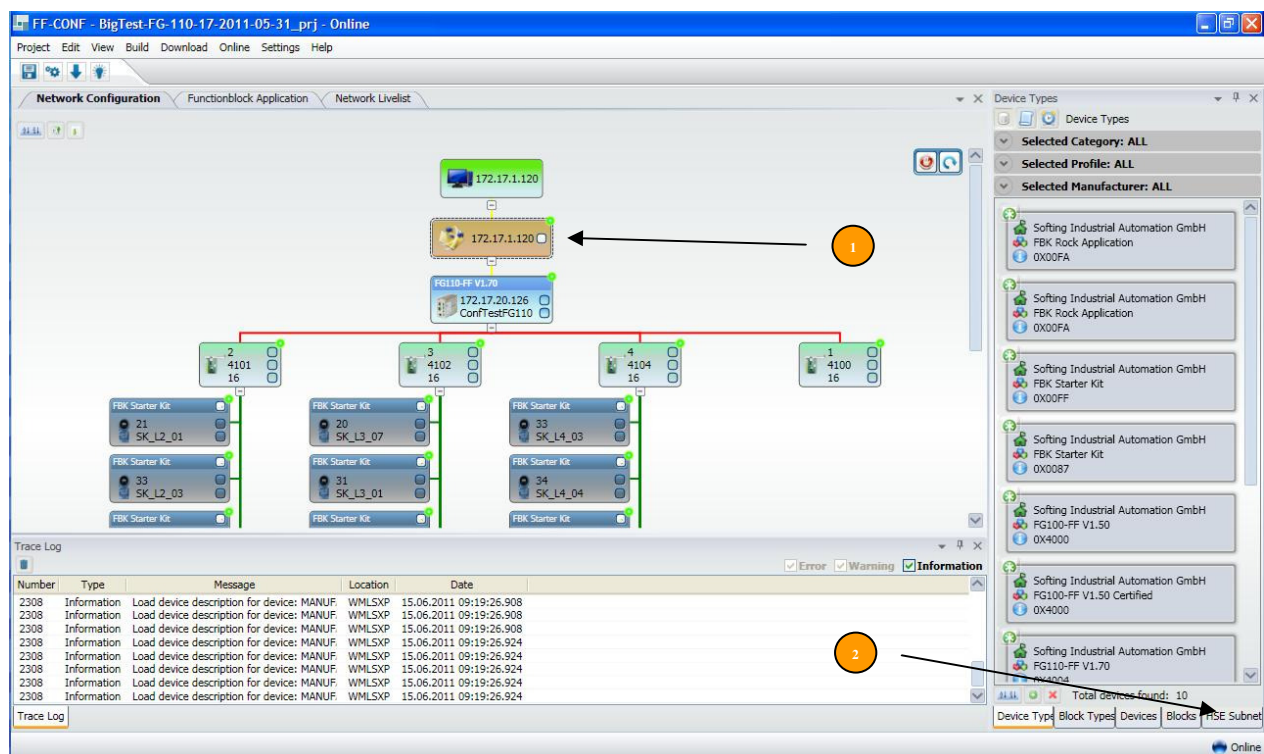


Figure 5.1: FF-CONF project

### 5.2 Configuration of HSE

Please enable the alarm configuration as described in the following steps:

While in the "Network Configuration" view click on the networking card icon (brown icon in figure 1) ① and then select the "HSE Subnet" tab from the property view. ②

Set the "Alarm Configuration" flag to the value "True" and edit the configuration parameters "Confirm Time", "GroupAddress", and "Alarm Multicast Index." (See Figure 5.2) ③

Please find a detailed description of each parameter in Appendix (A).

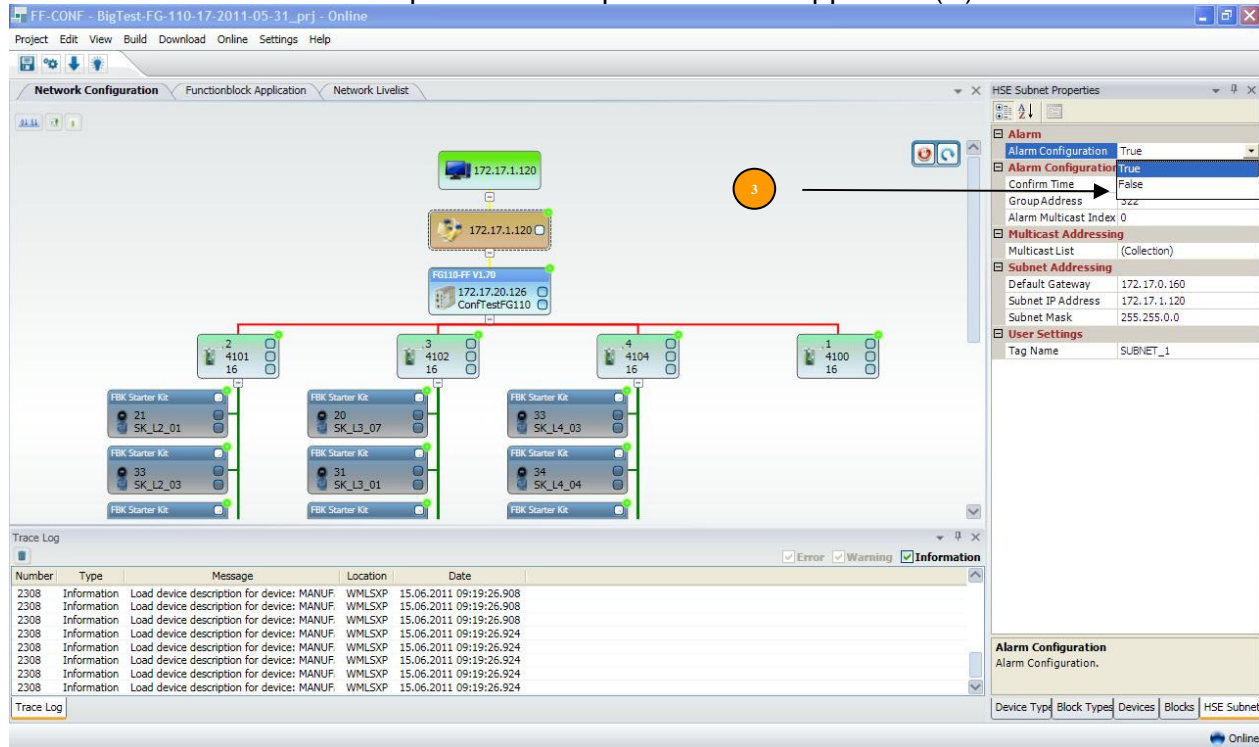


Figure 5.2: HSE alarm configuration

## 5.3 Multicast Addressing

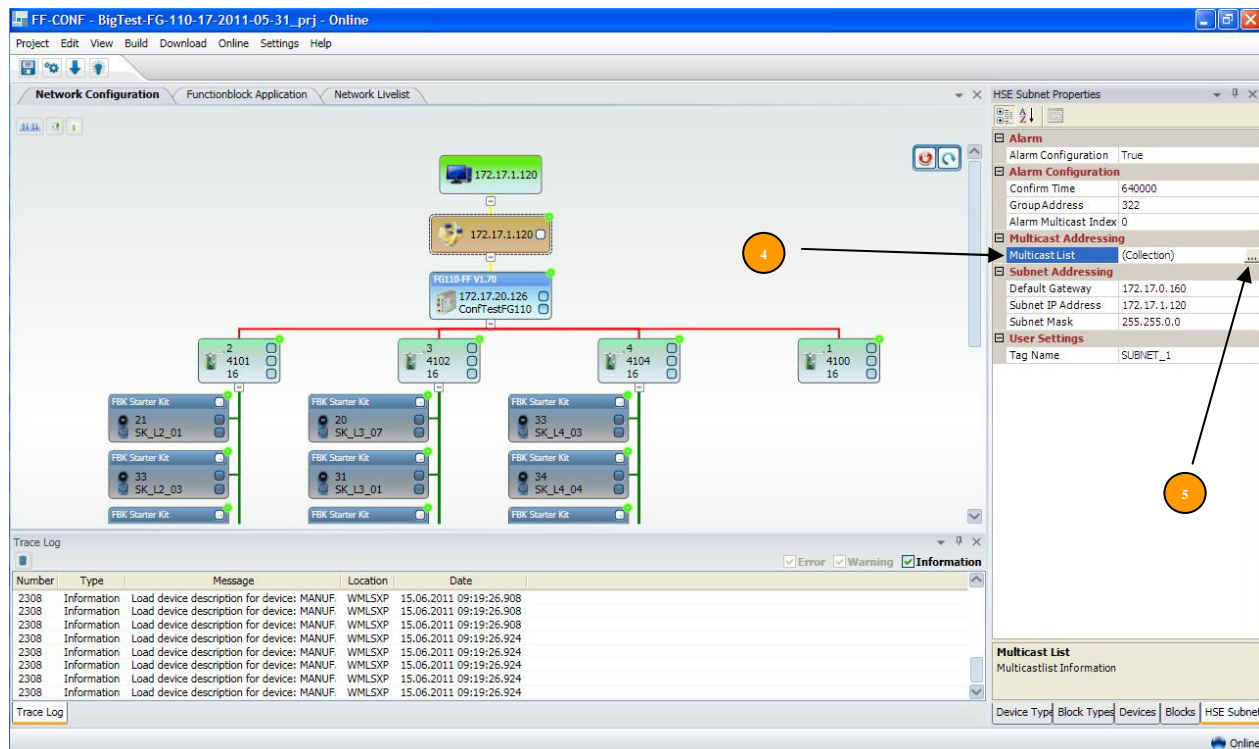


Figure 5.3: Multicast List

Next, configure multicast IP address. <sup>4</sup> In the table, select "Multicast-List" by clicking on it and then click on the small button that appears at the right side of the table cell. <sup>5</sup>

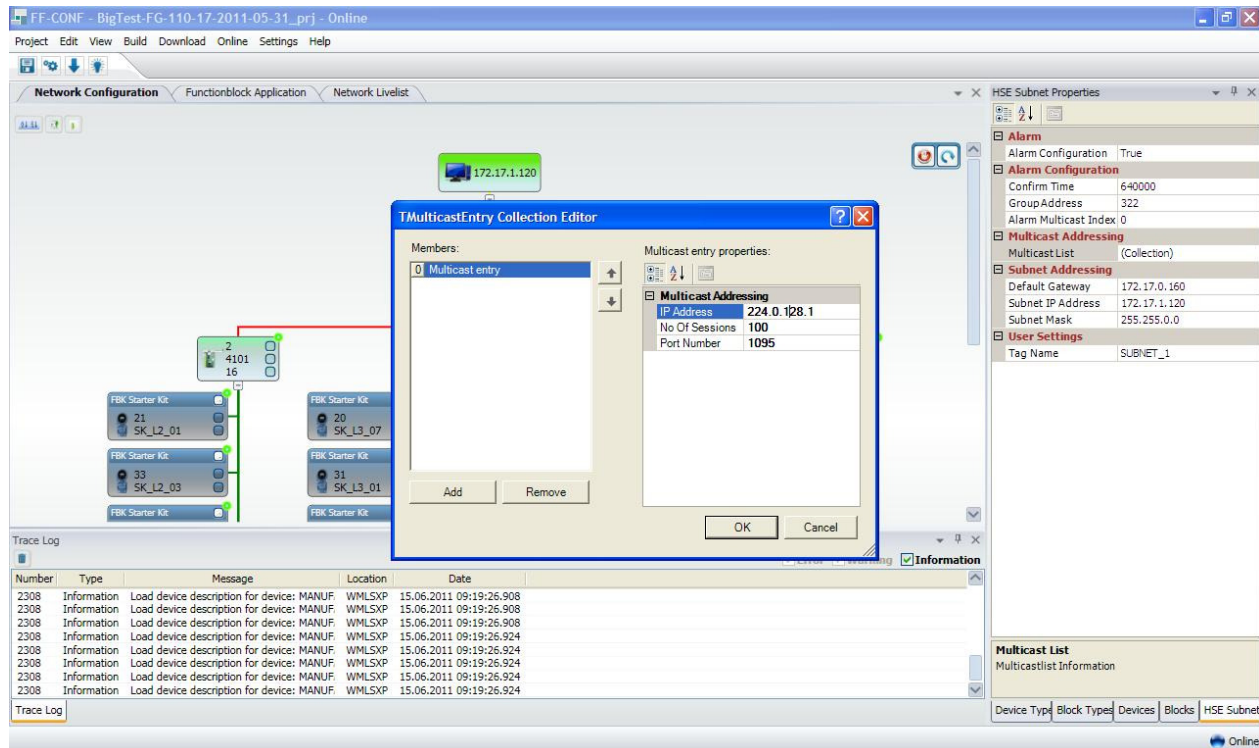


Figure 5.4: Configure multicast entry

The multicast entry properties contain the:

- IP address: Multicast IP-Address. For valid values refer to RFC3171 - IANA Guidelines for IPv4 Multicast Address Assignments.
- No of Sessions: Maximal number of sessions. If it is set to "1" then only one session will be used.
- Port Number: Number of the UDP port for Publish/Subscribe Multicasting on the HSE network. It is recommended not to use well-known ports or registered ports as denoted with <http://www.iana.org/assignments/port-numbers>. It is recommended to use Dynamic and/or Private Ports as denoted with the link above. FF-CONF will not apply any range checks.

After everything is configured correctly close the window by clicking on the "OK" button. Please re-generated the project <sup>6</sup> and download the new configuration <sup>7</sup>. (see figure 5.5)



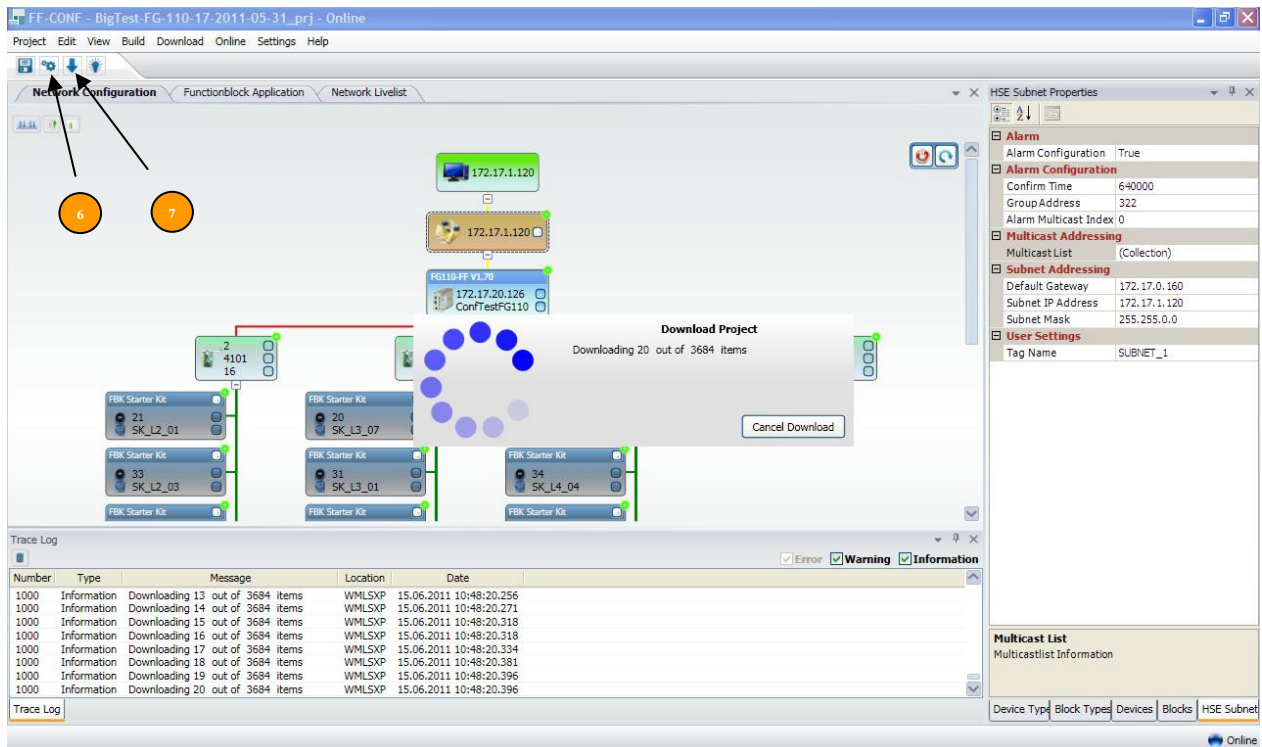


Figure 5.5: Download of Project

## 5.4 Alarm configuration in H1 function blocks

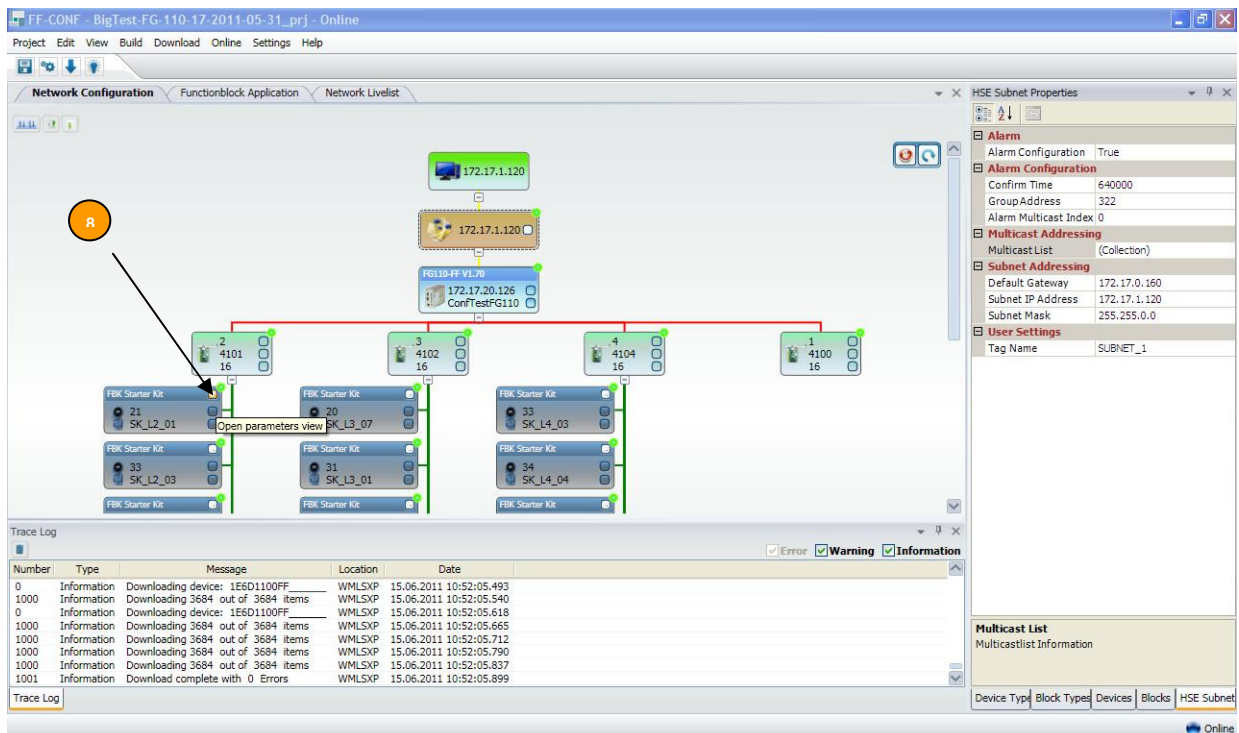


Figure 5.6: Opening the block parameter view

To open the function block parameter view please click on the white field in the right corner of the device icon. 8

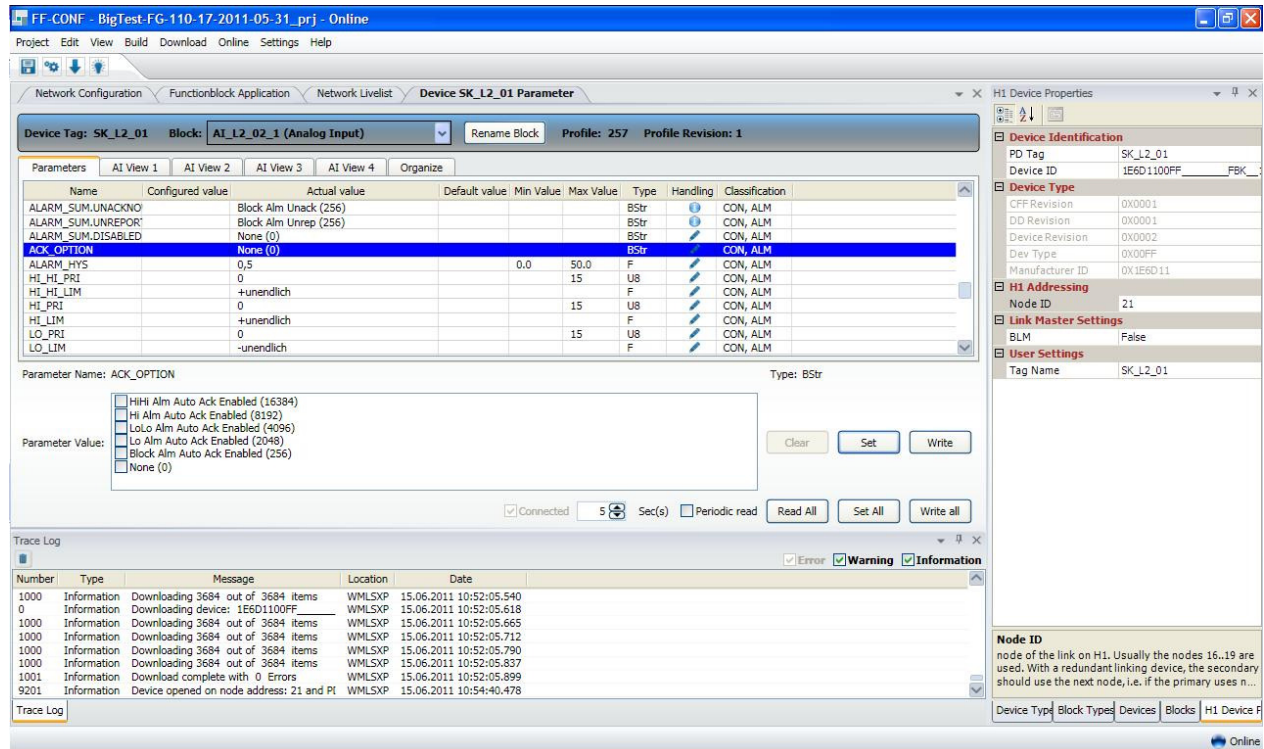


Figure 5.7: Block parameter view

All alarm parameters are configured in the function block parameter view. First, click on the parameter and choose or type the value. Next, click on the “Set” and finally, click on the “Write” button.

## 6. Appendix A - Definitions

### **Confirm Time:**

The value for CONFIRM\_TIME is specified in 1/32 ms. Setting the value is optional. If not specified a default value for CONFIRM\_TIME (640000 = 20 s) is assumed.

### **Group Address:**

This defines the group address for the configuration of communication relationships. Setting the value is optional. If not specified the group address 0x142 is used. Value range for the group address is 0x140 - 0x3ff.

### **Alarm Multicast Index:**

The index identifies a MulticastEntry element within the multicast address file. The attribute is required. If missing an Index = 0 is assumed. The value shall be unique within the multicast list.

### **Definition of alarm priority**

Some alarms have an associated priority parameter. A priority of zero disables an alarm completely. A priority of one will allow an alarm to function, but it will not send its state to a host. A Block Alarm has a fixed priority of 2; process alarms may also have priorities of 3 - 7 for an Advisory level, or priorities of 8 - 15 for a critical level.



## 7. Appendix B – List of common alarm parameters

Parameter Name	Block found in	Used by/for
FEATURES / Reports Bit	Resource Block	Device supports alert reports external to the device. Read Only
FEATURE_SEL / Reports Bit	Resource Block	Enables transmission of alert reports if VCR and Link objects exist. Should be set by Host Software.
FEATURES / Multi-bit- Alarm bit	Resource Block	Device supports Bit Enumerated alarms to have independent operation. Read Only
FEATURE_SEL / Multi-bit - Alarm bit	Resource Block	Enables Bit Enumerated alarms to have independent operation. Appropriate values will be configured by FF-CONF. No user configuration action necessary.
CONFIRM_TIME	Resource Block	Time before an alarm is rebroadcast if the Host confirmation reply is not sent.
MAX_NOTIFY	Resource Block	Maximum number of alarms broadcast and awaiting confirmation. Read Only
LIM_NOTIFY	Resource Block	User set limit of maximum number of alarms broadcast and awaiting confirmation. Must be less than or equal to MAX_NOTIFY. Appropriate values will be configured by FF-CONF. No user configuration action necessary.
BLOCK_ALM	All Blocks	Alarm parameter showing status of BLOCK_ERR bit being processed.
BLOCK_ERR	All Blocks	Common conditions represented by individual bits
UPDATE_EVT	All Blocks	Event parameter showing status of ST_REV condition being processed
ALARM_SUM	Most Function Blocks	Structure showing a summary of all alarms in a given block
ACK_OPTION	Most Function Blocks	Bit definitions allow for auto Acknowledging alarms in a given block
WRITE_ALM	Resource Block	Alarm parameter showing status of the Write Lock software or hardware jumper
DESC_ALM	DI Block	Process alarm parameter for discrete output parameter
HI_ALM	Multiple Function Blocks	Process alarm parameter for analog OUT or PV parameter depending on block
HI_LIM	Blocks with	Value that triggers alarm condition. Set by

	HI_ALM	Process Engineer
HI_PRI	Blocks with HI_ALM	Priority of HI_ALM. Set by Process Engineer or Host Software
HI_HI_ALM	Multiple Function Blocks	Process alarm parameter for analog out or PV parameter depending on block
HI_HI_LIM	Blocks with HI_HI_ALM	Value that triggers alarm condition. Set by Process Engineer
HI_HI_PRI	Blocks with HI_HI_ALM	Priority of HI_HI_ALM. Set by Process Engineer or Host Software
LO_ALM	Multiple Function Blocks	Process alarm parameter for analog out or PV parameter depending on block
LO_LIM	Blocks with LO_ALM	Value that triggers alarm condition. Set by Process Engineer
LO_PRI	Blocks with LO_ALM	Priority of LO_ALM. Set by Process Engineer or Host Software
LO_LO_ALM	Multiple Function Blocks	Process alarm parameter for analog out or PV parameter depending on block
LO_LO_LIM	Blocks with LO_LO_ALM	Value that triggers alarm condition. Set by Process Engineer
LO_LO_PRI	Blocks with LO_LO_ALM	Priority of LO_LO_ALM. Set by Process Engineer or Host Software
DV_HI_ALM	Multiple Control Blocks	Process alarm parameter for PV parameter depending on block
DV_HI_LIM	Blocks with DV_HI_ALM	Value that triggers alarm condition. Set by Process Engineer
DV_HI_PRI	Blocks with DV_HI_ALM	Priority of DV_HI_ALM. Set by Process Engineer or Host Software
DV_LO_ALM	Multiple Control Blocks	Process alarm parameter for PV parameter depending on block
DV_LO_LIM	Blocks with DV_LO_ALM	Value that triggers alarm condition. Set by Process Engineer
DV_LO_PRI	Blocks with DV_LO_ALM	Priority of DV_LO_ALM. Set by Process Engineer or Host Software
FAIL_ALM	Resource Block	Field Diagnostic alarm parameter. See FF-912
MAINT_ALM	Resource Block	Field Diagnostic alarm parameter. See FF-912
OFFSPEC_ALM	Resource Block	Field Diagnostic alarm parameter. See FF-912
CHECK_ALM	Resource Block	Field Diagnostic alarm parameter. See FF-912

© 2011 SOFTING Industrial Automation GmbH

No part of this document may be reproduced (printed material, photocopies, microfilm or other method) or processed, copied or distributed using electronic systems in any form whatsoever without prior written permission of SOFTING Industrial Automation GmbH.

The manufacturer reserves the right to make changes to the scope of supply as well as changes to technical data, even without prior notice. A great deal of attention was given to the quality and functional integrity in designing, manufacturing and testing the system. However, no liability can be assumed for potential errors that might exist or for their effects. Should you find errors, please inform your distributor of the nature of these errors and the circumstances under which they occur. We will be responsive to all reasonable ideas and will follow them up, taking measures to improve the product if necessary.

We call your attention to the fact that the company name and trademark as well as product names are, as a rule, protected by trademark, patent and product brand laws.

All rights reserved.