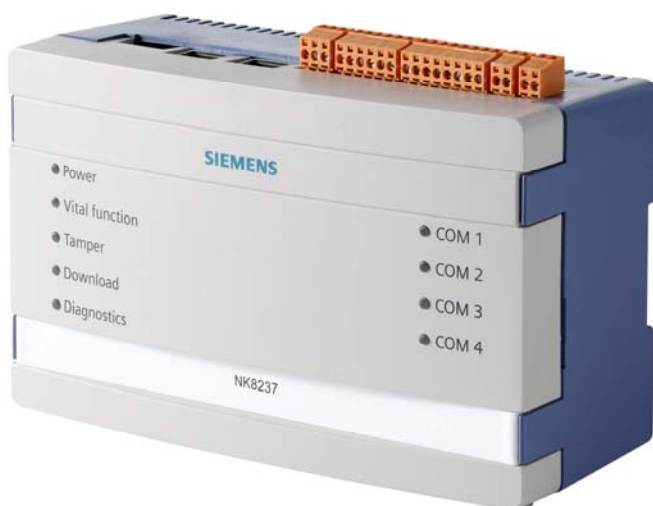


SIEMENS



NK823x MP4.50

Modbus Gateway for STT20 Add-on Module

Installation

Configuration

Commissioning

Table of Contents

About this document	5
1 Safety regulations	8
1.1 Country-specific standards.....	8
1.2 Assembly and installation.....	8
1.3 Commissioning and testing	8
1.4 Disposal and recycling	8
1.5 Modifications to system design and products	8
2 Introduction	10
3 Installation	11
3.1 Add-on distribution package.....	11
3.1.1 Installation checklist.....	11
3.2 Software installation	12
3.2.1 Preliminary checks.....	12
3.2.1.1 Requirements.....	12
3.2.1.2 DMS8000 Compatibility	12
3.2.1.3 Software License	12
3.2.2 Installing hotfixes	13
3.2.3 Installing the Add-on module	13
3.2.4 Multiple add-on's installations.....	14
3.2.5 Removing the Add-on module	14
4 Configuration	15
4.1 Configuring the fire network	15
4.1.1 STT20 fire system.....	15
4.1.2 NK823x BACnet Protocol.....	17
4.1.3 STT20 BACnet connection to NK823x	20
5 Modbus Interface Specifications	21
5.1 Modbus Gateway	21
5.1.1 Modbus Connections	21
5.1.2 Modbus Functions.....	21
5.2 Modbus Data Model	22
5.2.1 Model Configuration Workflow.....	22
5.2.1.1 Customizing Modbus Maps.....	23
5.2.1.2 CSV Export File Structure.....	23
5.2.2 STT20 Register Map.....	25
5.2.2.1 Summary Table.....	27
5.2.2.2 Synchronization Tables.....	28
5.2.2.3 Status Tables	30
5.2.2.4 Compact Status Tables.....	36
5.2.2.5 Bit Status Tables.....	37
5.2.2.6 Command Tables.....	38
5.2.2.7 Example of Register Map.....	39

5.2.3	NK823x Gateway Register Map.....	41
5.2.3.1	Status Tables	41
5.2.3.2	NK823x Objects	42

About this document

Purpose of this document

This manual is intended as a guide for the installation, configuration, and operation of the NK8000 network units that can support the STT20 BACnet connectivity for DMS8000 as well as 3rd party Modbus stations and devices.

It presents the NK8000 add-on module for this type of architectures as well as the application-level information of this interface indicating the fire objects mapping, and describes the corresponding Modbus registry structure and the applicable Modbus functions.

Note that the relevant DMS8000 engineering documentation set also includes the NK8237 Installation, Configuration, and Commissioning manual (A6V10316241) and the guide for DMS8000 Connectivity Network (A6V10359485). Basic information about the Composer configuration tool is given in the Composer Technical Manual (A6V10062401).



Important

It is assumed that readers of this document are familiar with the Modbus protocol and data communication in general.

Scope

This document applies to the **NK8000 MP4.50**.

Target audience

This documentation is intended for the following users:

- Project Managers
- Project Engineers
- Commissioning Personnel

Documentation resource information

The *DMS8000 Documentation Resource Information and Glossary Guide* assembles important information regarding documentation resources. This document contains the following:

- Comprehensive definitions of the target audiences for Siemens FS DMS documents
- Training program information including the Siemens intranet link
- A complete list of all available DMS8000 documents
- Instructions for how to obtain a document via the Siemens intranet using the Siemens Asset Portal
- A map of relevant documents for each target audience group
- Customer Support links & resources
- A glossary containing definitions of all terms and acronyms used in DMS8000 documentation

To access the *DMS8000 Documentation Resource Information and Glossary Guide* (document no. A6V10089056), go to the link and follow the document search instructions below:

<http://assetportal.bt.siemens.com/portal/index.html>

1. In the Search column on the left, set:

- Segment: **04 Fire -3F**
- Document Type: **All**
- Image Type: **All**
- Advanced search criterias: Select **Brochure No.** and enter the document number to search for (*A6V10089056*). Alternatively, select **Title** and enter the product name (*DMS8000*).

2. Click **Search** to start.

3. In the resulting area on the right, click on **Contents** link to show the list of search results.

For more information such as Siemens news and announcements, visit the STEP Web portal at:

<https://workspace.sbt.siemens.com/content/00001123/default.aspx>

Operational and safety regulations



Before groups of persons begin work on the system, they must have read and understood the Safety Regulations [→ 8] section in this manual.

Liability disclaimer for damage or injuries

Before products are delivered, they are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions, or the disregard of danger advisories. This disclaimer applies in particular to personal injuries or damage caused by:

- Improper and/or incorrect use.
- Disregard of safety instructions in the documentation or on the product.
- Poor maintenance or a lack of maintenance.

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections are included in subsequent editions. Suggestions for improvement are welcome.





Copyrights and registered trademarks

Brand or product names mentioned in this document may be names protected by copyright law or registered trademarks of other companies. These are mentioned only for identification purposes and have no recommendatory character in regard to the product or manufacturer, unless otherwise stated.

Documentation Conventions

The following table lists conventions to help you use this document in a quick and efficient manner.

Convention	Examples
Numbered Lists (1, 2, 3...) indicate a procedure with sequential steps.	<ol style="list-style-type: none"> 1. Turn OFF power to the field panel. 2. Disconnect the power cord. 3. Open the cabinet.
One-step procedures are indicated by a bullet point.	<ul style="list-style-type: none"> ● Expand the Event List.

<p>Conditions that you must complete or must be met before beginning a procedure are designated with a ▷.</p> <p>Results, after completing a step or at the end of the entire procedure, are designated with a ⇨.</p>	<p>▷ The report you want to print is open.</p> <p>1. Select the Print icon .</p> <p>⇨ The Print dialog box appears.</p> <p>2. Select the printer and click Print.</p> <p>⇨ The print confirmation appears.</p>
<p>Bold font in a procedure indicates something you should select or type.</p>	<p>Type F for Field panels.</p> <p>Click OK to save changes and close the dialog box.</p>
<p>Menu paths are indicated in bold.</p>	<p>Select File > Text, Copy > Group, which means from the File menu, then select Text, Copy and finally Group.</p>
<p>Error and system messages are displayed in Courier New font.</p>	<p>The message <i>Definition successfully renamed</i> displays in the status bar.</p>
<p><i>Italics</i> are used to emphasize a term.</p>	<p>The Open Processor continuously executes a user-defined set of instructions called the <i>control program</i>.</p>
<p></p>	<p>This symbol signifies a Note. Notes provide additional information or helpful hints.</p>
<p> Caution</p>	<p>This is a Caution message and indicates that minor or moderate injury or property damage may occur if a procedure is not followed.</p>
<p> Warning</p>	<p>This is a Warning message and indicates that a serious injury or a severe equipment and property damage may occur if a procedure is not followed.</p>
<p>Cross references to other information in printed material are indicated with an arrow and the page number, enclosed in brackets: [→92]</p>	<p>For more information on creating flowcharts, see Flowcharts [→92].</p>

Modification index		
Current version	Date	Comments
A6V10374340_a_en	09.2012	Corresponds with MP4.50

1 Safety regulations

This section describes the danger levels and the relevant safety regulations applicable to the use of the products described in this manual. Please read the following work instructions as well as the preceding section *About this document* thoroughly before beginning any work.

1.1 Country-specific standards

Siemens products are developed and produced in compliance with the relevant international and European safety standards. Should additional country-specific, and/or local safety standards or regulations concerning project planning, installation, and/or operation of the product(s) apply, then these standards and/or regulations must also be taken into account, in addition to the safety regulations mentioned in the product documentation.

1.2 Assembly and installation

The NK8000 units and NE8000 cabinets should always be installed in a clean and stable environment; see the specific requirements given in the Technical Data section of the specific NK823x datasheets.

In particular, keep units and cabinets away from the following:

- High levels of dust
- High temperature and humidity
- Locations where it might become wet
- Vibration and impact

Also, abide by the safety regulations of the connected devices.

1.3 Commissioning and testing

- Activate security-, fire- and third party systems or devices *only* in the presence of the person responsible.
- Abide by the safety regulations of the connected sub-systems when working on management stations. This especially applies when switching-off system components.
- Inform people before the testing of alarm devices; take the possibility of panic reactions into account.
- Inform the alarm and fault receiving stations connected to the system before carrying out any tests.

1.4 Disposal and recycling

The NK8000 units include electrical and electronic components and must not be disposed of as domestic waste. **Current local legislation must be observed.**

These devices have been manufactured as much as possible from materials that can be recycled or disposed of in a manner that is not environmentally damaging. However, they contain parts (batteries) that require disposal in a controlled waste stream according to local environmental standards and/or regulations.

1.5 Modifications to system design and products



Modifications to a system or to individual products may cause faults or malfunctioning.

Please request written approval from Siemens Building Technologies, FS-DMS, and the relevant authorities concerning intended system modifications and system extensions.

2 Introduction

Addressing the French regulations, STT20 system is designed to perform automatic actions (called “fire actuations”) following the detection of fire alarms by a fire detection system, which can be:

- CS11 AlgoRex system, connected over a Cerloop network.
- FS20 Sinteso system, connected over a SAFEDLINK network providing a BACnet/IP interface.

STT20 is made up of a physical and logical tree. The fire system is logically organised in a 6-level structure: Site, Buildings, Sectors, Zones, Functions and Elements.

The physical and logical configuration for an STT20 is first defined for the hardware unit set-up, and then ported to the Composer environment using an export or meta-file, generated by the STT20 tools.

DMS8000 connectivity is realised via Cerloop/MK7022 for AlgoRex solutions and via BACnet/IP Ethernet for Sinteso SAFEDLINK. In both cases, NK8000 units can be used for higher network flexibility and interactions support.

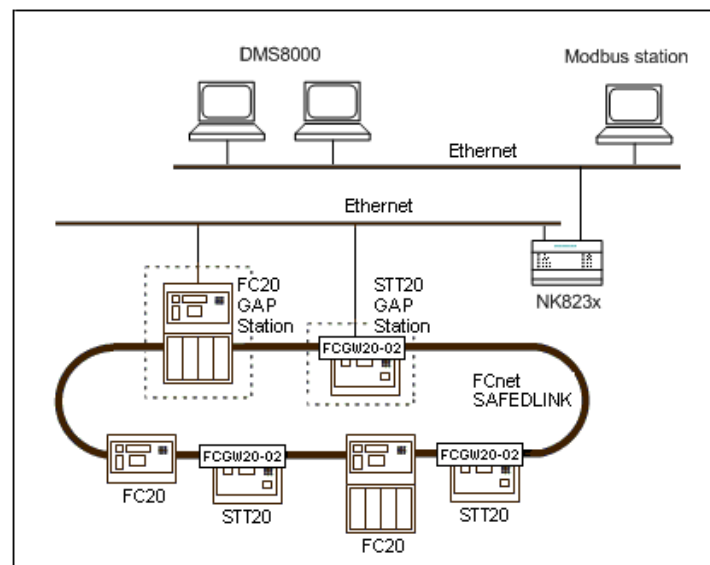


NOTE:

The Cerloop configuration is not supported by the Modbus gateway and therefore not further discussed in this document.

SAFEDLINK Network connection

In SAFEDLINK networks, as for the FC20, the STT20 units are connected to an external Ethernet via a GAP station. The NK8000 units can be applied to separate the fire network and/or to provide a gateway to 3rd-party Modbus stations.



STT20 SAFEDLINK architecture with NK8000

3 Installation

There are basically three major installation steps:

1. Install the DMS8000 software. Referring to the setup menu presented in the DMS8000 installation, use one of the following setup options:
 - **Stand-alone (MM8000)**, to install the complete MM8000 configuration and runtime environment. Use this option if the Modbus gateway is part of a wider MM8000 system.
 - **Composer GW Tool (NK8237)**, to install a light version of Composer with the functionalities required for commissioning of NK823x Modbus gateways.

NOTE: The *Composer GW Tool (NK8237)* setup option does not require any Composer license (HW-key and PAK).

For detailed information, refer to the MM8000 Installation, Configuration & Commissioning guide (A6V10062413) or to the NK8237 Installation, Configuration & Commissioning guide (A6V10316241).

2. Install the NK823x network.

For detailed information, refer to the NK8000 Installation, Configuration & Commissioning guide (A6V10062437) or to the NK8237 Installation, Configuration & Commissioning guide (A6V10316241).

3. Install the STT20 add-on package as described in the following sections.

3.1 Add-on distribution package

The software for the STT20 BACnet connectivity over NK8000 is distributed as an add-on package, to be installed on the stations including the Composer tool (client-only and FEP stations are therefore excluded) after the standard DMS8000 Setup. The package is named: **MM8000 MP4.50 - Addon N.13 (STT20BAC V.1.0)** and is made up by an installation kit of a few files.

Installation kit

The installation kit includes:

- A **Custom Folders** folder, containing special files and utility application.
- The **Help Files**, describing the configuration procedures.
- The Composer Subsystem Tool (**New ST** folder) for the configuration tasks.
- The **NK823x Firmware** folder, including additional DLL module(s) supporting the required protocols.
- The add-on definition text file: **MM8000 - Extension Product Name.txt**.

3.1.1 Installation checklist

Item list

- The DMS8000 Setup CD
- Hotfix #04 for DMS8000 MP4.50 (prerequisite for installing the add-on)
- The add-on installation kit that is named **MM8000 MP4.50 - Addon N.13 (STT20BAC V.1.0)**
- NK8000 Network units MP4.50 installed and active (NK823x)
- If required, the DMS8000 hardware key (dongle) and the MM8000 license PAK code (.REG file).

NOTE: hardware key and PAK code are not required if the setup option *Composer GW tool (NK8237)* is selected.

Task list

1. Check for requirements, compatibility, and license
2. Install the DMS8000 software and the required license key and PAK
 - See the MM8000 Installation, Configuration and Commissioning manual (A6V10062413)
 - See the MM8000 Release Notes (A6V10062509)
3. Install the mandatory Hotfix #04 for DMS8000 MP4.50
4. Install the NK8000 units (NK823x)
 - See the NK8000 Installation, Configuration and Commissioning manual (A6V10062437)
5. On the station(s) with configuration capability (equipped with Composer), install the add-on
6. Install the new NK8000 firmware

3.2 Software installation

3.2.1 Preliminary checks

3.2.1.1 Requirements

This add-on does not add any special requirements to the standard MM8000 setup. Therefore, software and hardware requirements are described in the MM8000 Installation, Configuration and Commissioning manual (A6V10062413) and in the NK8000 Installation, Configuration and Commissioning manual (A6V10062437).

The MM8000 software must be properly installed before the add-on can be installed. For more information on the MM8000 installation, please refer to the MM8000 Installation, Configuration and Commissioning manual (A6V10062413).

3.2.1.2 DMS8000 Compatibility

This add-on package is designed to work with DMS8000 MP4.50 software and tools.

NK8000 network should also be equipped with MP4.50 Kernel and Firmware.

Kernel version for MP4.50:

- *Linux 2.6.32.41 #40 Tue Apr 17 15:27:30 CEST 2012 ppc* for *NKM8001-A1* mainboard
- *Linux 2.6.32.41 #39 Tue Apr 17 15:25:23 CEST 2012 ppc* for *NKM8001-A2* mainboard

Contact the customer support to verify the compatibility with other versions.

3.2.1.3 Software License

No special license is required to enable the add-on functions. The general license depends on the type of Modbus Gateway that you are installing. The gateway types list includes:

NK8235 Ethernet Port for DMS8000 with Modbus Gateway

A normal MM8000 license is required, including # of panels, # of physical points, driver, and so on. In addition, a Composer license or a Service-key is required for the configuration tasks.

NK8237 Modbus Gateway

No runtime license is required. Composer configuration will need no license either as long as the **Composer GW Tool** setup is used. For other DMS8000 installation types, supporting higher functionality, a Composer license or a Service-key is required.

3.2.2 Installing hotfixes

The hotfix **MM8000 MP 4.50 – Hotfix #04 – STT20Bac** is required as a prerequisite to the add-on installation.

It must be applied to the following types of DMS800 setup:

- Composer
- Composer GW Tool
- NK8000
- Stand-alone station:

Hotfix Installation Procedure

1. Make a local copy of the hotfix files in a new folder of the disk where MM8000 is installed.
2. Launch the **Fix_MM8000 MP4.50.04.exe** procedure to upgrade the software components.
3. Download the firmware to the NK823x device.
 - Refer to the NK8000 Installation, Configuration and Commissioning manual (A6V10062437)
4. Install any other hotfix that may be required (check with customer support).

3.2.3 Installing the Add-on module

A specific application, the **Add-on Manager**, is provided in the DMS8000 installations and allows installing and updating the add-on modules.

The following describes the installation procedure.

1. Start the **Add-on Manager**.
 - From the Windows **Start** menu, select the following:
Start > DMS8000 > Tools > Add-on Manager
 - ⇒ The Add-on Manager window appears.
2. In the list of **MM8000 Add-Ons / Name**, select the name of the module you wish to install
 - OR – (if the name of the add-on is not in the list on the screen):
click the **Browse** button, locate the installation files of the add-on module, and select the text file (**Extension Product Name.txt**) in the root folder.
3. If your installation includes a customized *MM8000 internal account*, then deselect the check box **Use default MM8000 User account** and specify the customized username and password.
4. Click **Install** (or **Update** if a previous version was detected).

3.2.4 Multiple add-on's installations

In general, it is possible to install multiple add-on packages and benefit of their combined functionalities. However, specific incompatibilities might exist. Please check about possible problems in the documentation of all add-on modules that must be installed.

3.2.5 Removing the Add-on module

The add-on module cannot be uninstalled.

4 Configuration

There are basically three major configuration steps:

1. Configure the STT20 units (as well as FC20 detection units) using the specific tools and download the fire system. Then, export the configuration in XML format (SiB-X format for FS20).
 - For detailed information, refer to the STT20 (and FS20) configuration tool manuals.
2. Configure the NK823x and the fire systems in Composer. You need to import the STT20 and FS20 export files. If necessary, the Modbus mapping can be customized. Download the configuration to the NK823x and export the Modbus mapping table in CSV format.
 - The following section discusses the STT20 fire network configuration, including the STT20 units creation and connection to the NK823x. Note that this section complements the general Modbus Gateway engineering documentation provided in the NK8237 Installation, Configuration, and Commissioning manual (A6V10316241).
3. The Modbus station/device needs to be configured by the integrator personnel based on the information provided in the Modbus mapping table (CSV export file).
 - For more information, refer to the Modbus station/device documentation.

4.1 Configuring the fire network


This configuration task is performed in Composer.

The communication between FS20/FS720/STT20 and the NK823x Modbus gateway is based on BACnet/IP. The following rules apply:



- The STT20, FS20 and NK823x units must share the same BACnet Virtual Network (typically =1).
- If the STT20, FS20 and NK823x units do not share the same IP subnet, appropriate IP and BBMD settings must be configured.
- BACnet Device Identifiers must be uniquely defined for each unit including NK823x.
Note: NK823x supports only BACnet ID's in the range from 1 to 65533.
- The Device Identifier set for NK823x must match the client ID expected by the STT20 and FS20 configuration.

4.1.1 STT20 fire system

Configuration Procedure

1. In the left-hand bar, click the **Generic Template** icon .
 - ⇒ A new node is added to the project structure.
2. Select the new folder and name it in the **Description** field of the **Node** tab.

Adding the STT20 fire system node

1. Select the new folder.
2. In the left-hand bar, select the **Fire Folder** icon .
3. In the menu that appears, select the STT20 icon  to add a new STT20 fire system node.

⇒ A new node is added to the project structure.

Importing the STT20 metafile

1. Select the STT20 node.
 2. Select **Tools > Import** in the Composer menu to start the import procedure.
 - ⇒ The software presents a browsing window to search for the file to import (XML file).
 3. Using standard Windows controls, do the following:
 - Locate the file.
 - Select it and click **Open**.
- ⇒ In a few moments, the STT20 structure is imported, and the node is represented in the Composer tree.



NOTE:

After the import procedure, selecting the **Import** tab results in a page report being displayed. This contains the detailed logs of the latest import procedure, including all the added or removed objects.

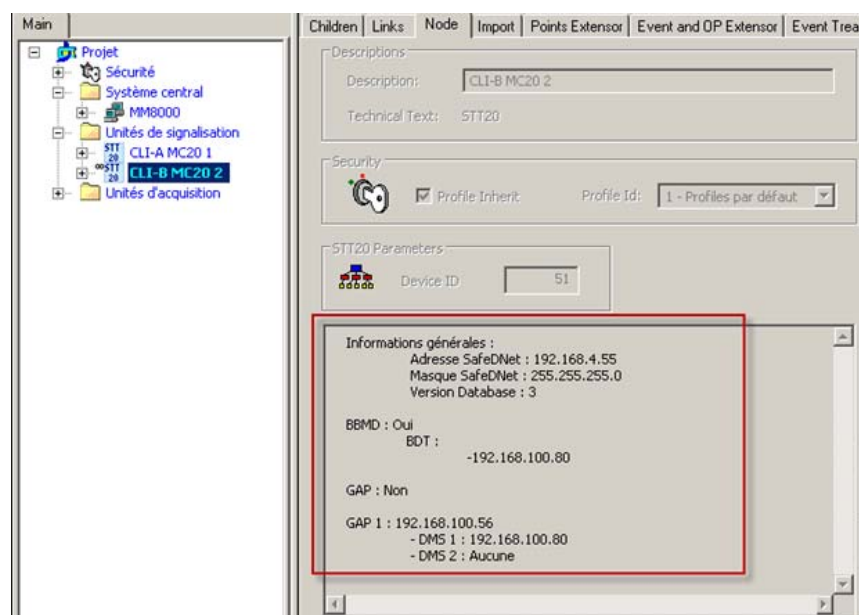
Checking STT20 BACnet settings

Specific STT20 networking information display in the *Information Box* provided after the import procedure. The information list includes the IP addressing, the BACnet BBMD configuration, and the valid BACnet clients (DMS 1 and DMS 2) managed by the GAP station.

Note that the BACnet clients are identified in the STT20 by both a BACnet Device Identifier and an IP address.

To read the Information Box:

1. Select the **STT20** node.
2. Select the **Node** tab.




Information Box populated after the XML import

4.1.2 NK823x BACnet Protocol

The fire system connection to the NK823x Modbus Gateway makes use of the BACnet protocol over IP. In the BACnet/IP communication with the fire units, the NK823x Modbus Gateway acts as a BACnet client. The NK823x configuration in Composer include the definition of the IP addressing and the BACnet/IP connectivity. In both cases, the NK823x configuration must match what is expected by the fire system.

Configuring the NK823x IP addressing

1. If this connection requires a separate LAN port, add a second **Ethernet** node:
 - a. Select the **NK823x** node.
 - b. In the toolbar on the left, select the **Ethernet #2** icon .
⇒ A new Ethernet node is created under the NK823x node.
2. Select the **NK823x** node and expand the subtree.
3. Select the **Ethernet** node to be used for the BACnet connection.
4. Select the **Node** tab.
5. In the form on the right pane, you must enter:
 - **IP address** of the NK823x.
 - **Subnet mask**, typically related to the fire network access. See also the following Routing Tables section.
 - **Default gateway**, typically the GAP station IP address, it may be left = "0.0.0.0" if not used. See also the following Routing Tables section.
 - If **NAT** (Network Address Translation) is used on the network, enable it and enter the external IP address (**NAT address**) of the NK823x.



NOTE:

You can ignore the step above if the Ethernet port is shared with Modbus configuration and the IP settings was already defined for Modbus.



Routing Tables:

NK823x can handle a static routing table to address multiple subnets via IP routers (e.g. SAFEDLINK GAP stations). Accesses to subnets that are not handled by the NK323x *Default gateway* must be defined as routing table.

Note that, if a SAFEDLINK network includes both FS20 and STT20 units, two separate GAPs must be addressed and specific routing tables for two separate subnets must be defined accordingly.

For example, assuming a SAFEDLINK including 14 addresses available for fire detection units from 192.168.10.1 to 192.168.10.14 and 14 addresses available for fire actuation from 192.168.10.17 to 192.168.10.30, two routes can be created, as illustrated in the following table:

Destination	Netmask	Gateway (GAP)
192.168.10.0	255.255.255.240	192.168.5.11
192.168.10.16	255.255.255.240	192.168.5.12

Another example, including 126 addresses per subnet (192.168.10.1 to 192.168.10.127 and 192.168.10.129 to 192.168.10.254) is shown in the following table:

Destination	Netmask	Gateway (GAP)
192.168.10.0	255.255.255.128	192.168.5.100
192.168.10.128	255.255.255.128	192.168.5.200

In both examples, note the *external* address of the GAP units (IP addresses on the NK8000 subnet), which are specified in the routing table as gateways to the fire subnets.

For more information, refer to the guide for DMS8000 Connectivity Network (A6V10359485).

Configuring the Routing Tables

To configure the routing table, do the following:


1. Select the **NK823x** node and then the **Routing** tab.
2. Click the **Add** button to add a new route.
3. Configure the following parameters:
 - **Destination** and **Netmask**, addressing a subnet (recommended) or a single address according to IP addressing rules. For example, Destination = 192.168.2.0 and Netmask = 255.255.255.0 define any address in the range 192.168.2.1 to 254. Instead, Destination = 192.168.2.10 and Netmask = 255.255.255.0 define the single IP address 192.168.2.10.

- IP address of the **Gateway (GAP)** that can provide connectivity to the destination subnet.
TIP: Use the **Ping** button in the **Tools** tab to check that the IP connectivity is properly established between the NK823x and the routing gateway.
- If multiple routes are available for the same destination, use the **Metric** field to indicate the cost (e.g. the number of devices along the network path) of each route: the higher the number (cost), the lower the corresponding priority.

4. Repeat steps above to add as many routes as necessary.

Use the **Routing between ETH1 and ETH2** checkbox (available when both Ethernet ports are used) to enable a general routing across the two NK823x lines. Note that ETH1/ETH2 routing is not required for supporting the NK823x communications across the two Ethernet lines, e.g. between a management station network on ETH1 and a subsystem network on ETH2. Instead, the NK823x-controlled routing is required to enable the IP connectivity for other units operating on the two separated subnets. Be also informed that enabling the **NK823x firewall** function results in this field being handled automatically.

Configuring the NK823x BACnet/IP connectivity

1. Select the **Protocols** node.
2. In the toolbar on the left, select the **BACnet Client Protocol** icon  (violet).
⇒ The BACnet client protocol node is created under the Protocols folder. By default, the new node is named "BACnet Client Protocol".
3. Select the new **BACnet Client Protocol** node.
4. Drag and drop the selection to the appropriate **Ethernet** node.
⇒ A link node is created under the Ethernet node.
5. Select the **BACnet Client Protocol** link under the **Ethernet** node.
6. Select the **Node** tab.
7. In the form on the right pane, configure the **BACnet parameters**:
 - **UDP Port** (must match the UDP port configuration configured in the fire GAP unit; default value is 47808 or BAC0 hex).
 - **Device Identifier** (must match one of the valid client identifiers configured in the fire system; note that NK823x units do not support BACnet IDs greater than 65533).
 - **Virtual Network Number** (the default value 1 may need to be changed if there is already a foreign BACnet network with virtual network number 1 in place. In all cases, remember to keep the NK823x and FS20/FS720/STT20 configuration consistent.).
 - **Process Id** (the default value 1 normally should not be changed).
8. If the NK823x acts as BACnet Foreign Device (*do not use this option for STT20 systems*), enable the Foreign Device checkbox and configure the BBMD router settings:
 - **Remote BBMD IP address**.
 - **Remote BBMD Port Number** (must match the UDP port configuration configured in the unit acting as BBMD; default value is 47808 or BAC0 hex).
 - **Time-To-Live** (default is 1800, 0 means permanent; it normally should not be changed).

9. If the NK823x acts as BBMD, you have to configure the BBMD settings in the **NS8011 BACnet Driver** node:
 - Press the **BBMD Configuration** button. The BBMD window that appears is organised in two tables.
 - In the upper table, set the required BBMD role of the NK823x components (max one per subnet): enable the checkbox on the right.
 - In the lower part, add the corresponding routing partner(s) in the other subnet(s).

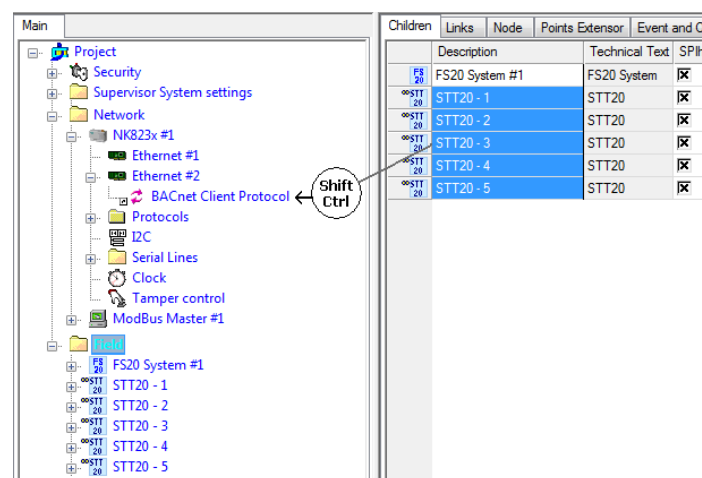
4.1.3 STT20 BACnet connection to NK823x

All STT20 fire panels must be linked to the NK823x Modbus Gateway. Proceed as follows:

1. Select and expand the NK823x **Ethernet** node to display the **BACnet Client Protocol**.
2. Select the node of the first STT20 panel.
3. Drag and drop the selection to the **BACnet Client Protocol** node.
 - ⇒ A new node appears in the tree under the protocol representing the link.
4. Repeat the last two steps for all the panels of the fire system.

If several stations have to be linked to the network driver, you can profit of the Composer grid mode and link all stations in one shot. Just proceed as follows:

1. Expand the NK823x **Ethernet** node to display the **BACnet Client Protocol**.
2. Select the STT20 folder node.
3. Select the **Children** tab.
 - ⇒ The list of stations appears.
4. Select all stations: click the first STT20 icon (in the first column, see image below), then press the **SHIFT** key and click the last icon in the list. Alternatively, you can also select one icon after the other keeping the **CTRL** key pressed.
5. Keeping the **SHIFT** or **CTRL** key pressed, drag and drop the selected list to the Network Driver. Note that you may wait a little while before a link icon shows up on the destination node.



5 Modbus Interface Specifications

The NK823x Modbus gateway enables Modbus master/client stations to access the STT20 units for acquiring the status information.

The gateway also allows for control commands to be transmitted from the Modbus master/client stations to the fire system. A specific agreement with Siemens is required for this type of functions.

This section deals with the application-level communication with the STT20 and illustrates the register maps used for implementing it.

For information about the Modbus register maps for FS20 fire detection units, please refer to the NK8237 Interface Specification MP4.50 (A6V10316242).

For information about the physical protocols involved and the related configuration procedures, please refer to the NK8237 Installation, Configuration, and Commissioning manual (A6V10316241).

5.1 Modbus Gateway

5.1.1 Modbus Connections

Up to four Modbus protocols can be handled, via serial and/or TCP/IP connection:

- Serial connection: two links as Modbus slave in RTU mode over an RS232 or RS485 line.
- TCP/IP connection: Modbus server for four TCP/IP client connections. Separate Ethernet ports can be used for BACnet/IP and Modbus TCP/IP for maximum protection of the safety network.

Modbus hosts and system limits.	
Modbus hosts	Detectors and units
1 Modbus host	<ul style="list-style-type: none"> ● Max. 10,000 detectors. ● 22 units in FCnet/SAFEDLINK topology (12 FS20/FS720 and 10 STT20) or 4 FS20/FS720 units in FCnet/Ethernet topology (not supported by STT20)
2 Modbus hosts	<ul style="list-style-type: none"> ● Max. 5,000 detectors. ● 11 units in FCnet/SAFEDLINK topology (6 FS20/FS720 and 5 STT20) or 4 FS20/FS720 units in FCnet/Ethernet topology (not supported by STT20)
3 Modbus hosts	<ul style="list-style-type: none"> ● Max. 3,500 detectors. ● 8 units in FCnet/SAFEDLINK topology (5 FS20/FS720 and 3 STT20) or 4 FS20/FS720 units in FCnet/Ethernet topology (not supported by STT20)
4 Modbus hosts	<ul style="list-style-type: none"> ● Max. 2,500 detectors. ● 5 units in FCnet/SAFEDLINK topology (3 FS20/FS720 and 2 STT20) or 4 FS20/FS720 units in FCnet/Ethernet topology (not supported by STT20)

5.1.2 Modbus Functions

The gateway supports the following Modbus functions:

Function code	Function	Applicable table types	Notes
0x02	Read Discrete Input	Bit Status	
0x03	Read Holding Registers	Command, Date and Time	Use it for reading date & time registers

Function code	Function	Applicable table types	Notes
0x04	Read Input Registers	Summary; Status; Compact Status	Use it for reading status information
0x06	Write Single Register	Command; Synchronization	Use it for writing command registers, to perform control actions, and date & time registers, thus synchronizing the NK8237 clock.
0x07	Read Exception Status	-	Serial Line only
0x08	Diagnostics	-	Serial Line only
0x0B	Get Comm Event Counter	-	Serial Line only
0x11	Report Slave ID	-	Serial Line only
0x2B / 0x0E	Read Device ID	-	General NK8237 info.

Gateway Modbus functions

5.2 Modbus Data Model

According to the Modbus protocol specifications, the application-level communication between *Modbus devices* occurs via memory tables representing the Modbus *Registers*. In fact, Modbus functions operate on registers to provide both monitor and control I/O.

The gateway is capable of supporting an *Input Register Map* providing a process image of the fire system status for the Modbus master/client stations, which periodically read the input registers and acquire the related conditions. Control actions can also be initiated by the Modbus master/client stations by writing appropriate values in specific *Holding Registers*. This results then in command messages being transmitted to the fire system.

5.2.1 Model Configuration Workflow

The detailed definition of the register map implementing the Modbus data model occurs at configuration time. The Composer tool can import the *FS20/FS720/STT20 metafile* (the object list) and create the register map that represents the fire objects in a simplified set of types as described in the Register Map section.

The register map can be directly applied or further customized to adapt the addressing scheme to your specific application. Some modifications to the map can be done in the Composer configuration tool, including the tables' base addresses and individual offsets. In addition, all information of the map can be exported into a *CSV file*, then customized externally, and finally re-imported into the Composer environment.



TIP:

Although various customizations are possible in the Composer tool, detailed modifications to the offset addresses can be better performed using a spreadsheet application (e.g. MS-Office Excel™) on the exported CSV file.

Once finalized, the CSV file can be used for integrating the model information in the Modbus master/client station, and the corresponding register map downloaded into the NK823x unit.

**NOTE:**

All addressing starts with offset 0.

5.2.1.1 Customizing Modbus Maps

▷ The following illustrates the overall map customization procedure.

1. Start the Composer tool and open the Modbus gateway project.
 - ⇒ The project tree displays in the Composer environment.
2. In the **Modbus station** node, select the **Host** tab and modify the **Modbus Base Address** values as needed. Make sure to define a consistent address scheme and avoid any conflicts.
3. In the **Modbus station** node, launch the **Node Commands > Export in CSV** command and follow the instructions.
 - ⇒ A CSV file is created.
4. Using e.g. MS-Office Excel, edit the CSV file.
 - You can modify the **ModbusAddress** of any object.
5. When the CSV is ready, launch the import procedure on the same node used above for exporting.
 - ⇒ The new map is available in Composer.
6. Download the configuration into the NK823x gateway unit.

**NOTE:**

When modifying the address values, make sure to define a consistent mapping, avoiding any address conflict.

**NOTE:**

The export command also generates a TXT file containing information about supported Modbus functions.

For a detailed description of the configuration process, please refer to the NK8237 Installation, Configuration, and Commissioning Guide (document no. A6V10316241).

5.2.1.2 CSV Export File Structure

The CSV export file can be created in Composer using the node command for the Modbus master/client node. It contains the entire set of objects mapped in Modbus registers to represent the fire system.

The CSV file can be used for:

- Modifying the registers address and (re)organize the data memory to optimize the Modbus master/client treatment.
- Feeding the fire system configuration into the Modbus master/client configuration tool.

The following fields (columns) are present in the CSV file:

SubsystemId

Identifier of the subsystem in the Composer project, and used during file re-import. It cannot be modified.

NodeId

Identifier of the node in the Composer project, and used during file re-import. It cannot be modified.



⚠ WARNING

Composer subsystem and node IDs are used during the re-import to identify the object positions. Any modification to those fields in the imported file are likely to cause the system to fail.

FieldDevice

Description text of the control unit. Modifications to this field are ignored in the re-import.

ModbusSlaveAddress

Address of the Modbus slave (range: 1... 247). Modifications to this field are ignored in the re-import.

ParentDescription

Description text of the parent object. Modifications to this field are ignored in the re-import.

Description

Description text of the object. Modifications to this field are ignored in the re-import.

TechnicalText

Technical text of the object in the Composer project. Modifications to this field are ignored in the re-import.

ObjectName

Unique technical tag of the object. It cannot be modified.

ModbusTable

Name of the table in the Modbus data representation (see Register Map). It cannot be modified.

Modbus BaseAddress

Starting address of the set of Modbus registers associated to the object. Modifications to this field are ignored in the re-import. Note however that the base addresses can be modified in the Composer configuration.



For each object, the actual Modbus register address is determined by summing the **Modbus BaseAddress** and the **ModbusAddress**.

CommandRange

Starting address of the set of Modbus Holding Registers associated to the command objects. Modifications to this field are ignored in the re-import. Note however that the base addresses for the command tables can be modified in the Composer configuration.



For each object, the actual Modbus register address is determined by summing the **Modbus BaseAddress** and the **ModbusAddress**.

ModbusAddress

Object offset address. This value can be changed in the CSV file and re-imported into Composer.

CompactAddress

Starting address of the set of Modbus registers associated to the compact tables. Modifications to this field are ignored in the re-import. Note however that the base addresses for the compact tables can be modified in the Composer configuration.



For each object, the actual Modbus register address is determined by summing the **Modbus BaseAddress** and the **ModbusAddress**.

Base address for Bit Status Tables

The CSV file contains also the starting addresses of the Bit Status Tables (see Bit Status Tables).

Modifications to these fields are ignored in the re-import. Note however that the base addresses for the compact tables can be modified in the Composer configuration.

5.2.2 STT20 Register Map

Data Representation

The NK823x Modbus gateway can support multiple fire detection panels or terminals (STT20, FC2xxx and FT2xxx). Each STT20 panel, terminal and gateway is represented as a virtual Modbus device with its own Modbus Slave Address and a complete register map. The map includes a number of sub-maps that represent the fire units, and a general table for the gateway itself.

Fire Control Unit Representation

In the Modbus data representation, *each panel is mapped as a separate Modbus device with an individual address*. The device address is defined at configuration time.

A dedicated register sub-map is used for each panel, including six types of tables. Namely:

- **Summary tables**

These are a set of word input registers including:

- The overall panel conditions (1 word register).

- The vitality counter (1 word register).
- As many as 525 data change flags (33 word registers) reporting any modifications in the register area (the complete range of 65536 registers is monitored).
- **Status tables**

These are word input registers reporting the conditions of all the mapped objects. Each word corresponds with one object and is organized in two bytes: bits 0-7 are used to represent the object operating modes, for example the on/off (inclusion/exclusion) conditions, whereas bits 8-15 contain the event conditions, such as alarms, fault, and so on.

Status tables cover the entire set of supported objects. The status tables list includes:

 - Panel
 - Activation Mode
 - Buzzer
 - Communication Link
 - Hardware Link
 - MEA
 - MDHW
 - Mains
 - Battery
 - MCIO
 - MDIO
 - Functions
 - Extinguishing Functions
 - UGA
 - BOP Evacuation Mode
 - Horn
 - Element
 - Extinguishing Element
- **Compact status tables**

These are available for a limited set of detection objects. The compact status tables are word input registers containing a simplified status representation. In fact, each representation is made up of 4-bit status for functions or 2-bit status for elements. This results in 4 or even 8 objects being packet in a single word register, thus allowing a faster acquisition whenever communication performances have priority than status details.

The compact tables list includes:

 - Functions
 - Elements
- **Bit status tables**

For extremely simple applications, a set of bit input registers is also provided for specific objects and events that are combined in very basic 1-bit (on/off) status report. The list of bit input registers includes:

 - Panel Fault
 - Activation Mode Fault
 - Activation Mode Abnormal
 - Communication Link Fault
 - Mains Fault

- Battery Fault
- Function Safety Position Failed
- Function In Command
- Function Wait Position Failed
- Function Fault
- UGA Alarm
- UGA Activated Evacuation
- UGA Fault
- BOP Evacuation Mode On Manual
- **Command tables**
The output command tables (read/write holding registers) enables Modbus master/client stations to initiate control commands to the fire control panels. Note that, depending on a configuration setting, certain commands may not be available.
The command tables list includes:
 - Panel acknowledgement
 - Panel reset
 - Buzzer acknowledgement
 - Buzzer reset
 - Function activation command
 - Evacuation command
- **Date and Time**
See Summary and Synchronization Tables.

Gateway Unit Representation

A dedicated register sub-map is used for the NK823x unit, including one status table.

- **Status table**
This is a word input register reporting the conditions of the gateway. Each word corresponds with one object and is organized in two bytes: bits 0-7 are used to represent the object operating modes, for example the on/off (inclusion/exclusion) conditions, whereas bits 8-15 contain the abnormal event conditions, such as alarms, fault, and so on.
The gateway table includes the following:
 - NK823x Points
 - Power Supply

5.2.2.1 Summary Table

The Summary table includes one register.

STT20 synthesis

One input (read-only) word register reporting 16 general on/off panel conditions in the 16 bits. The following relationship applies:

Bit	Information	Notes about affected objects and conditions corresponding to the "1" state (bit active)
0 (lsb)	Evacuation manual mode	BOP Alarm function or HLB Alarm function. Legal information for a repeater terminal.
1	Evacuation fault	BOP Alarm function or HLB Alarm function.

Bit	Information	Notes about affected objects and conditions corresponding to the "1" state (bit active)
		Legal information for a repeater terminal.
2	Evacuation active	BOP Alarm function or HLB Alarm function. Legal information for a repeater terminal.
3	Alarm received	BOP Alarm function. Legal information for a repeater terminal.
4	Reset command required	A reset command is expected by the STT20 panel.
5	Ack command required	An acknowledgment command is expected by the STT20 panel.
6	Function fault	Standard Function, Stop Fan function, Technical CMSI function, Technical SDI function, or Rearming function. Legal summary information for a repeater terminal.
7	Wait position failed	Standard Function, Stop Fan function, Technical CMSI function, Technical SDI function, or Rearming function. Legal summary information for a repeater terminal.
8	Security position failed	Standard Function, Stop Fan function, Technical CMSI function, Technical SDI function, or Rearming function. Legal summary information for a repeater terminal.
9	Safety position failed	Standard Function, Stop Fan function, Technical CMSI function, Technical SDI function, or Rearming function. Legal summary information for a repeater terminal.
10	Battery fault	MC20, MCO, MD20, or battery element.
11	Mains fault	MC20, MCO, MD20, or mains element.
12	Network fault	SAFEDLINK or Fire Links.
13	Activation Mode Mixed	
14	Activation Mode Manual	
15	STT20 Panel fault	

WT_STT20 Syn (Input register, default base address: 1000)

5.2.2.2 Synchronization Tables

The Synchronization tables include a fixed number of registers. Namely:

Life Check

One input (read-only) word register that is constantly incremented as long as the NK823x gateway software works properly and the communication with the fire panel and with the Modbus unit is active.

The counter stops being incremented if any of these events occurs:

- The communication between the NK823x gateway and the Modbus unit goes down (this event can be detected and treated by other Modbus units).
- The communication between the NK823x gateway and the fire panel goes down.

Bit	Information	Notes
0-15	Panel Vitality Counter	Incremented every 250 msec as long as operating properly

LifeCheck (Input register, default base address: 1010)

Data Change

A set of 33 input word registers (525 bits are used) reporting any modifications in the register area. The complete range of 65536 Modbus registers is covered, with each flag representing changes in one or more registers in a corresponding group of 125 word registers.

The first flag, i.e. the least significant bit of the first change word register, corresponds with the registers 0 to 124, the second flag corresponds with the registers 125 to 249, and so on.

Active flags are automatically reset upon reading the registers that changed and caused the flags activation.

Word / Bit	Information	Notes
0 / 0	Registry 0-124 (00h-7Ch)	Flag 0
0 / 1	Registry 125-249 (7Dh-F9h)	Flag 1
...		Flags 2 to 14 (Word register 0)
0 / 15	Registry 1875-1999 (0753h-07CFh)	Flag 15
...		Flags 16 to 522 (Word registers 1 to 32)
32 / 11	Registry 65375-65499 (FF5F-FFDBh)	Flag 523
32 / 12	Registry 65500-65535 (FFDC-FFFFh)	Flag 524

DataChange (Input registers, default base address: 1020)

Date and Time

Three holding (read/write) word registers used for reading or synchronizing the NK823x date and time.

The synchronization must be enabled in the configuration settings and results, in turn, in the synchronization of the fire system (FS20 and then STT20 via FS20).

Alternatively, if the synchronization on these registers is not enabled, the NK823x gateway gets the date and time periodically from the fire system (FS20). In this case, writing to the registers is disabled, and a Modbus error code 0x04 is returned upon trying a write command.

When synchronization occurs, all registers should be written in sequence to prevent any possible data interpretation error. The NK823x gateway acquires the new time stamp when the last of the 3 values gets written.

The three 16-bit registers are organized in 6 byte containing 6 hexadecimal values corresponding with day, month, year, hour, minute, and second, respectively.

Word / Bit	Information	Notes
0 / 0-7	Day	1-31 code in hexadecimal, e.g. 1B hex for day 27.
0 / 8-15	Month	1-12 code in hexadecimal
1 / 0-7	Year	10-99 code in hexadecimal
1 / 8-15	Hour	0-23 code in hexadecimal
2 / 0-7	Minute	0-59 code in hexadecimal
2 / 8-15	Second	0-59 code in hexadecimal

DateTime (Holding registers, default base address: 1060)

**NOTE:**

For detailed information about the time synchronization options on the Modbus host interface, refer to the Modbus interface configuration section of the NK8237 Installation, Configuration, and Commissioning manual (A6V10316241).

5.2.2.3 Status Tables

The status tables include an input word register per object. The number of tables depends on the specific systems whose object list is defined at configuration time. For example, there may be 8 function registers corresponding with 8 functions of a given fire system.

The list of object types includes:

Panel

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition such as states resulting in a reduced safety
9-12	-	Not used
13	Fault	
14	-	Not used
15	Alarm	

WT_Panel (Input registers, default base address: 1100)

Activation Mode

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-11	-	Not used
12	Anomaly	STT20 in mixed mode
13	Fault	STT20 in manual mode
14-15	-	Not used

WT_ActivationMode (Input registers, default base address: 1300)

Buzzer

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-14	-	Not used
15	Active	

WT_Buzzer (Input registers, default base address: 1400)

Communication Link (SafeDlink, Cerloop)

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	Communication faulty on local network (SafeDlink/Cerloop)
14-15	-	Not used

WT_CommunicationLink (Input registers, default base address: 1500)

Hardware Link

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	Communication faulty with STT20 user interfaces (TAE, US, MCO)
14-15	-	Not used

WT_HWLlink (Input registers, default base address: 1600)

MEA – Module Electronique Adressable (addressable field control module)

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	
14-15	-	Not used

WT_MEA (Input registers, default base address: 1700)

MDHW – Matériel Déporté (Remote Module Hardware)

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	MD20 fault or Internal bus fault (BBUS, GBUS, PBUS)
14-15	-	Not used

WT_MDHW (Input registers, default base address: 1800)

Mains Power Supply

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	Mains power supply is not available (on MC20, MCO, or MD20 modules) or mains element is faulty.
14-15	-	Not used

WT_Mains (Input registers, default base address: 1900)

Battery

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	Battery fault (on MC20, MCO, or MD20 modules) or battery element faulty
14-15	-	Not used

WT_Battery (Input registers, default base address: 2500)

MCIO – MC20 Input/Output

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-14	-	Not used
15	Active	Input or Output is active

WT_MCIO (Input registers, default base address: 3500)

MDIO – MD20 Input/Output

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-12	-	Not used
13	Fault	Input is faulty
14	-	Not used
15	Active	Input or Output is active

WT_MDIO (Input registers, default base address: 4000)

Function – Standard / Stop fan / Fire technical / Technical / Rearming functions

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-6	-	Not used
7	Locked	Function locked
8	Non-default value	Function locked without fault
9-11	-	Not used
12	Wait position failed	Wait position fault
13	Fault	
14	In command or Safety position	
15	Safety position failed	Safety position fault

WT_Function (Input registers, default base address: 5000)

Extinguishing Function

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-11	-	Not used
12	System fault	Extinguishing fault report
13	Fault	
14-15	-	Not used

WT_ExtFunction (Input registers, default base address: 6000)

UGA – Unité de Gestion d'Alarme (evacuation control unit)

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-5	-	Not used
6	Evacuation activated	
7	-	Not used
8	Non-default value	Evacuation activated without fault
9-12	-	Not used
13	Fault	
14	-	Not used
15	Alarm	Alarm received

WT_UGA (Input register, default base address: 7000)

BOP Evacuation Mode

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-4	-	Not used
5	Manual (OnManual)	Manual mode
6-7	-	Not used
8	Non-default value	Manual mode
9-15	-	Not used

WT_BOPEvacuationMode (Input registers, default base address: 7500)

Horn

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-6	-	Not used
7	Disabled	
8	Non-default value	Disabled
9-15	-	Not used

WT_Horn (Input registers, default base address: 7700)

Element – Standard / Power supply elements

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-11	-	Not used
12	Wait position failed	Wait position fault
13	Fault	
14	In command or Safety position	
15	Safety position failed	Safety position fault

WT_Element (Input registers, default base address: 8200)

Extinguishing Element

Bit	Information	Notes
0 (lsb)	Non-default mode	Abnormal mode status resulting in a reduced safety
1-7	-	Not used
8	Non-default value	Abnormal condition resulting in a reduced safety
9-13	-	Not used
14	Extinguishing released	
15	-	Not used

WT_ExtElement (Input registers, default base address: 9200)

5.2.2.4 Compact Status Tables

The compact tables provide a summarized representation for the following objects:

- Functions: 4-bit status representation
- Elements: 2-bit status representation

The corresponding data structures, illustrated here below, are packed in the register areas defined at configuration time. The word input registers contain 4 zones and 8 elements each.

Functions (compact)

Bit	Information	Notes
0 (lsb)	-	Not used
1	Locked	
2	Fault or Wait position failed or Safety position failed	
3	In command or Safety position or Safety position failed	

CT_Function (Input registers, default base address: 8100)

Element (compact)

Bit	Information	Notes
0 (lsb)	Fault or Wait position failed or Safety position failed	
1	In command or Safety position or Safety position failed	

CT_Element (Input registers, default base address: 9000)

5.2.2.5 Bit Status Tables

The bit status tables presents single on/off event conditions for specific types of object (Panel, Faults, Functions, and so on) and related conditions, for example *function in command*. In all tables, the value 1 indicates that the condition is present for at least one of the objects considered. The list of objects is defined at configuration time.

The table below collects the list of bit status tables.

Table	Information	Related object type	Default base address
BT_Panel_Fault		Panel	10000
BT_Activation_Mode_Fault		Activation mode	11000
BT_Activation_Mode_Abnormal		Activation mode	12000
BT_Communication Link Fault		Communication Link	13000
BT_Mains Fault		Mains	14000
BT_Battery Fault		Battery	15000
BT_Function Safety Position Failed		Function	16000
BT_Function In Command		Function	17000
BT_Function Wait Position Failed		Function	18000
BT_Function Fault		Function	19000
BT_UGA Alarm		Evacuation Control Unit	20000
BT_UGA Activated Evacuation		Evacuation Control Unit	21000
BT_UGA Fault		Evacuation Control Unit	22000
BT_BOP Evacuation Mode On Manual		Evacuation Mode	23000

Bit Status Tables (Input registers)

5.2.2.6 Command Tables

The command tables enable the Modbus master/client to issue control commands to the fire units.

A read/write holding register is foreseen for each of the objects listed below. Given an initial object state, a data value corresponding to a control action can be written in the register to trigger the command that is then expected to modify the object state and therefore cause a corresponding change in the object input registers. Note that the holding registers store the code of the latest command after its execution.

The list of command tables includes:

Global panel: acknowledgement and reset

State	Command (dec)	New state after a successful command execution
Ack required	12	Panel acknowledged
Reset required	14	Panel reset

STT20 (Holding register, default base address 25000)

Function

State	Command (dec)	New state after a successful command execution
Quiet	1	Function activated

Function Active (Holding register, default base address 27000)

BOP/HLB Alarm Function

State	Command (dec)	New state after a successful command execution
Not activated	33	Evacuation activated

Alarm Function Activate Evac (Holding register, default base address 28000)

5.2.2.7 Example of Register Map

The following illustrates an example of a register map as it is presented in the Composer configuration tool. In the case of the panel map, the default addresses are listed, which can be customized in the Composer configuration.

Field Device	Modbus slave address
NK8237	4
FC20 Panel	5
STT20 Panel	6

Field Devices: example including one FC20 and one STT20 fire panel

Modbus Table	Modbus Base Address	Offset	Register
WT_STT20 Syn	1000	0	Input register
LifeCheck	1010	0	Input register
DataChange	1020	0	Input register
DateTime (Month/Day)	1060	0	Holding register
DateTime (Hour/Year)	1060	1	Holding register
DateTime (Second/Minute)	1060	2	Holding register
WT_Panel	1100	0	Input register
WT_ActivationMode	1300	0	Input register
WT_Buzzer	1400	0	Input register
WT_CommunicationLink	1500	0	Input register
WT_CommunicationLink	1500	1	Input register
WT_HWLink	1600	0	Input register
WT_Mea	1700	0	Input register
WT_Mea	1700	1	Input register
WT_MDHW	1800	0	Input register
WT_MDHW	1800	1	Input register
WT_MDHW	1800	2	Input register
WT_Mains	1900	0	Input register
WT_Mains	1900	1	Input register

Modbus Table	Modbus Base Address	Offset	Register
WT_Battery	2500	0	Input register
WT_Battery	2500	1	Input register
WT_MCIO	3500	0	Input register
WT_MCIO	3500	1	Input register
WT_MCIO	3500	2	Input register
WT_MDIO	4000	0	Input register
WT_MDIO	4000	1	Input register
WT_Function	5000	0	Input register
WT_Function	5000	1	Input register
WT_Function	5000	2	Input register
WT_Function	5000	3	Input register
WT_Function	5000	4	Input register
WT_ExtFunction	6000	0	Input register
WT_ExtFunction	6000	1	Input register
WT_UGA	7000	0	Input register
WT_UGA	7000	1	Input register
WT_BOPEvacuationMode	7500	0	Input register
WT_Horn	7700	0	Input register
WT_Horn	7700	1	Input register
WT_Element	8200	0	Input register
WT_Element	8200	1	Input register
WT_Element	8200	2	Input register
WT_ExtElement	9200	0	Input register

STT20 map: default base address of the available tables, organized by object type



NOTE:

The default base addresses listed above may not exactly match the addressed of your system. Before using them for any related configuration, please check the actual settings of the Modbus master station in the Composer tool.

For more information on the Composer configuration, refer to the NK8237 Installation, Configuration, and Commissioning Guide (document no. A6V10316241).



⚠ WARNING

The convention of Modbus base addresses frequently found, namely 3xxxx for input registers, 4xxxx for holding registers and so on, is not followed by NK823x. Note that some tools strictly based on this convention will not work properly with NK823x.

5.2.3 NK823x Gateway Register Map

5.2.3.1 Status Tables

The gateway status tables include two types of input word registers applied to a number of objects.

NK823x Gateway Points

This table is applied to six objects:

- NK823x Status
- NK823x Tamper
- Generic Inputs (up to 3 optional signals, which may be used for reporting the power supply supervision)
- Relay Output (optional, reporting a Modbus communication fault)

Therefore, up to six registers are provided, each one corresponding with one object.

Bit	Information	Notes
0 (lsb)	Non-default mode	Currently note used (foreseen for future extensions)
1-6	-	Not used
7	Tamper disabled	Tamper detection disabled Note: this information is only available on the tamper register.
8	Non-default value	Currently note used (foreseen for future extensions)
9	Abnormal	Configuration mismatch between gateway and fire system Note: this information is only available on the NK823x status register.
10-14		
15	Alarm	Activated / Alarmed / Tamper Note: this information is available on the Tamper, Input and Output registers.

WT_NK8237Point (Input registers, default base address: 8000)

5.2.3.2 NK823x Objects

This section lists the gateway objects and the corresponding types in the NK823x Modbus data model (refer to the Register Map section).

WT_NK823xPoint

- Application node (NK823x status)
- NK823x unit tamper
- Digital Input Onboard (power supply supervision or generic inputs)
- Digital Output Onboard (Modbus communication fault)

Issued by
Siemens Switzerland Ltd
Infrastructure & Cities Sector
Building Technologies Division
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41-724 24 24
www.siemens.com/buildingtechnologies

© 2012 Copyright Siemens Switzerland Ltd
Technical specifications and availability subject to change without notice.