



## Product Datasheet

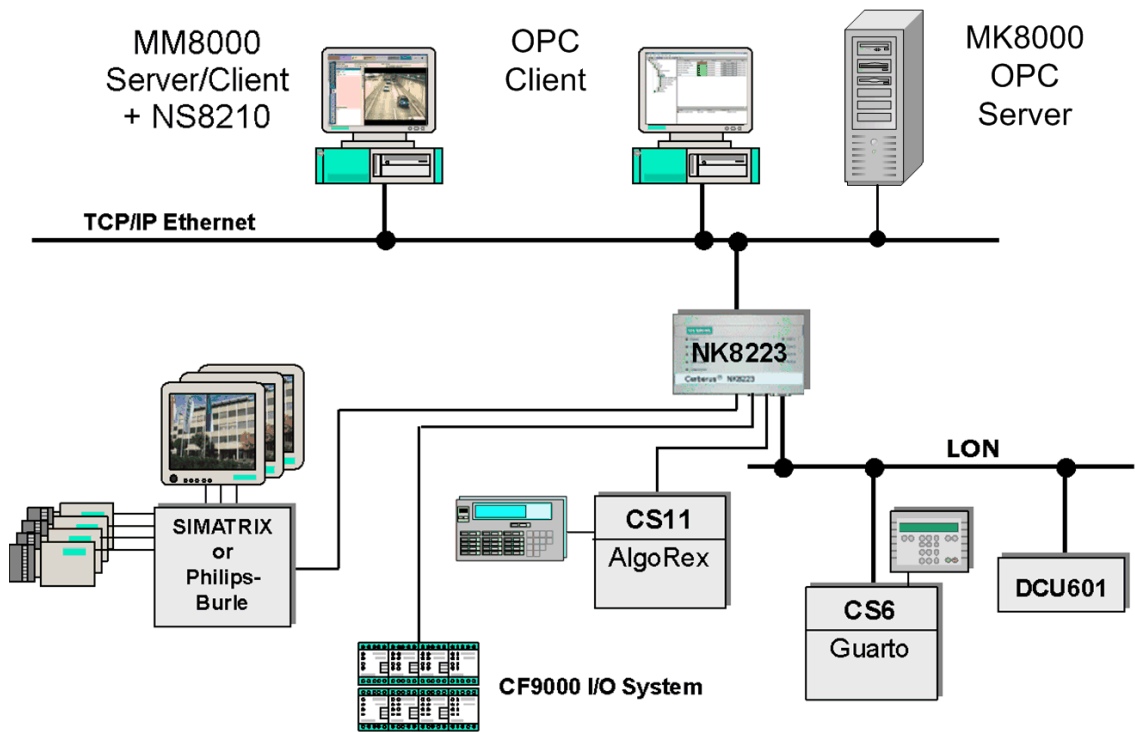
NK8000  
MP3.20

### NK8223 Ethernet Port

The NK8223 Ethernet Port is used to connect local and distributed safety and security devices to the NK8000 network. It provides a first level of centralisation, and acts as a secure communication partner for the NS8210 Network Driver of MM8000 or MK8000, and provides serial connectivity for MM8000, MK8000, or MT8001.

- **The Ethernet Port allows the connection of numerous SBT safety and security subsystems and 3<sup>rd</sup> party systems to NK8000 networks**
- **NK8000 safety / security networks are based on the LAN standards TCP/IP and Ethernet**
- **NK8000 networks are compatible with MM8000 Management Stations, MK8000 OPC Servers, and the MT8001 Management Terminal**
- **Interaction machine supporting logical combinations between locally connected subsystems**
- **NK8223 is based on a flexible, high performance hardware platform, that has been specifically designed for safety and security applications**
- **Supplied in a plastic box, easy to install on DIN-rails**
- **Optional housing solutions with autonomous power supply**

## Connectivity



Connectivity example for a local system

### Upstream connectivity:

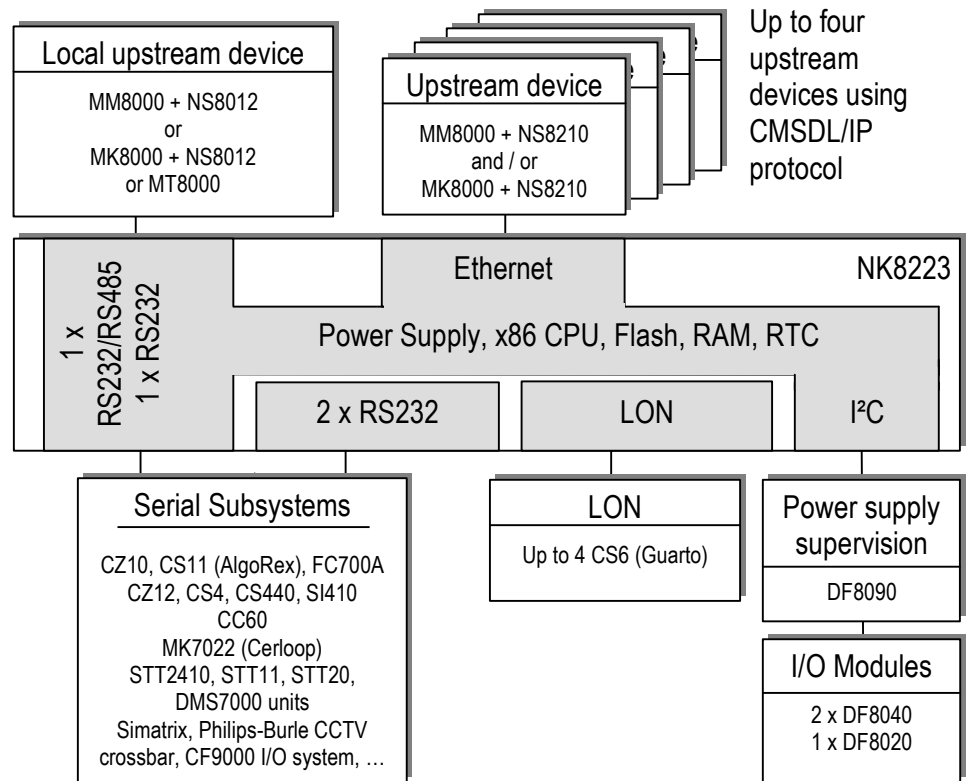
- TCP/IP on Ethernet connectivity for connection to local and remote management stations (MM8000 or MK8000). Transport protocol CMSDL/IP or CEI 79-5 featuring 64-bit encryption (FEAL algorithm) for high security banking applications;
- Simultaneous multiple host connectivity (up to four) using CMSDL/IP protocol (without encryption);
- Upstream serial connectivity to a local management station (MM8000 / MK8000 / MT8001) using an RS232 line via CMSDL serial protocol;
- The upstream devices (MM8000 or MK8000) must be equipped with the NS8210 Network Driver for TCP/IP on Ethernet connectivity or with the NS8012 CDI-Net Driver for serial connectivity.

### Downstream connectivity:

- Up to 4 serial connections supporting fire, gas, and intrusion detection systems, CCTV, and digital I/O's;
- LON adapter for connecting up to 4 CS6 intrusion detection systems;
- Direct support for local digital I/O with up to 16 non-supervised inputs and 8 relay outputs.

➔ For application examples, see the DMS8000 Application & Planning guide.

## Internal structure



The NK8223 employs industry standard x86 CPUs and PC104 extension boards, and is composed of:

- Base board with power supply, CPU, and basic configuration of interfaces;
- Optional add-on board with 2 RS232 ports;
- Optional PC104 LON board.

The Base board is equipped with:

- Power supply;
- 2 serial interfaces (2 RS232 or 1 RS485 and 1 RS232);
- Ethernet 10Base-T interface;
- DIMM-PC / 520-I module with:
  - 32MB RAM
  - 32MB Flash disk
  - Real Time Clock (RTC)
  - Real Time Operating System (RTOS) with integrated IP protocol stack
- Flash EPROM;
- RAM;
- I<sup>2</sup>C bus;
- Diagnostic LEDs.

## Configuration

### Hardware configurations

The NK8223 is available in four hardware configurations:

<b>NK8223.2</b>	<hr/> <ul style="list-style-type: none"><li>- 1 Ethernet line for remote host</li><li>- 2 serial lines for subsystems / local host</li></ul> <hr/>
<b>NK8223.4</b>	<hr/> <ul style="list-style-type: none"><li>- 1 Ethernet line for remote host</li><li>- 4 serial lines for subsystems / local host</li></ul> <hr/>
<b>NK8223.CL2</b>	<hr/> <ul style="list-style-type: none"><li>- 1 Ethernet line for remote host</li><li>- 1 LON line for subsystems</li><li>- 2 serial lines for subsystems / local host</li></ul> <hr/>
<b>NK8223.CL4</b>	<hr/> <ul style="list-style-type: none"><li>- 1 Ethernet line for remote host</li><li>- 1 LON line for subsystems</li><li>- 4 serial lines for subsystems / local host</li></ul> <hr/>

Further options:

<b>DF8040 8-input module on I<sup>2</sup>C bus</b>	<hr/> <ul style="list-style-type: none"><li>- 8 input (non supervised) module for acquiring digital contacts. A max of 2 modules can be directly connected to NK8223. For more connectivity (as well as for supervised inputs), it is necessary to use a CF9003 CPU on one of the serial connections.</li></ul> <hr/>
<b>DF8020 8-output relays module on I<sup>2</sup>C bus</b>	<hr/> <ul style="list-style-type: none"><li>- 8 output (non supervised) relay module for controlling digital contacts. Only one module can be directly connected to NK8223. For more connectivity, it is necessary to use a CF9003 CPU on one of the serial connections.</li></ul> <hr/>
<b>DF8090 power supply supervision module on I<sup>2</sup>C bus</b>	<hr/> <ul style="list-style-type: none"><li>- Optional module for supervising the NK8223 power supply and detecting power failures and battery low conditions. It is not needed when NK8223 is installed in a fire or intrusion control unit, whose power supply is already supervised.</li></ul> <hr/>
<b>NE8001</b>	<hr/> <ul style="list-style-type: none"><li>- Wall-mountable, metallic cabinet with DIN-rail, including power supply unit. Input: 100 – 240 Vac.; Output: 12Vdc 4A.</li></ul> <hr/>
<b>NE8002</b>	<hr/> <ul style="list-style-type: none"><li>- Wall-mountable, metallic cabinet with DIN-rail.</li></ul> <hr/>

### Parameterisation

The NK8000 configuration is part of the Composer tool environment. To perform the SW-configuration for NK8000 market packages MP2.0 and later, a WW8000 Composer license is required.

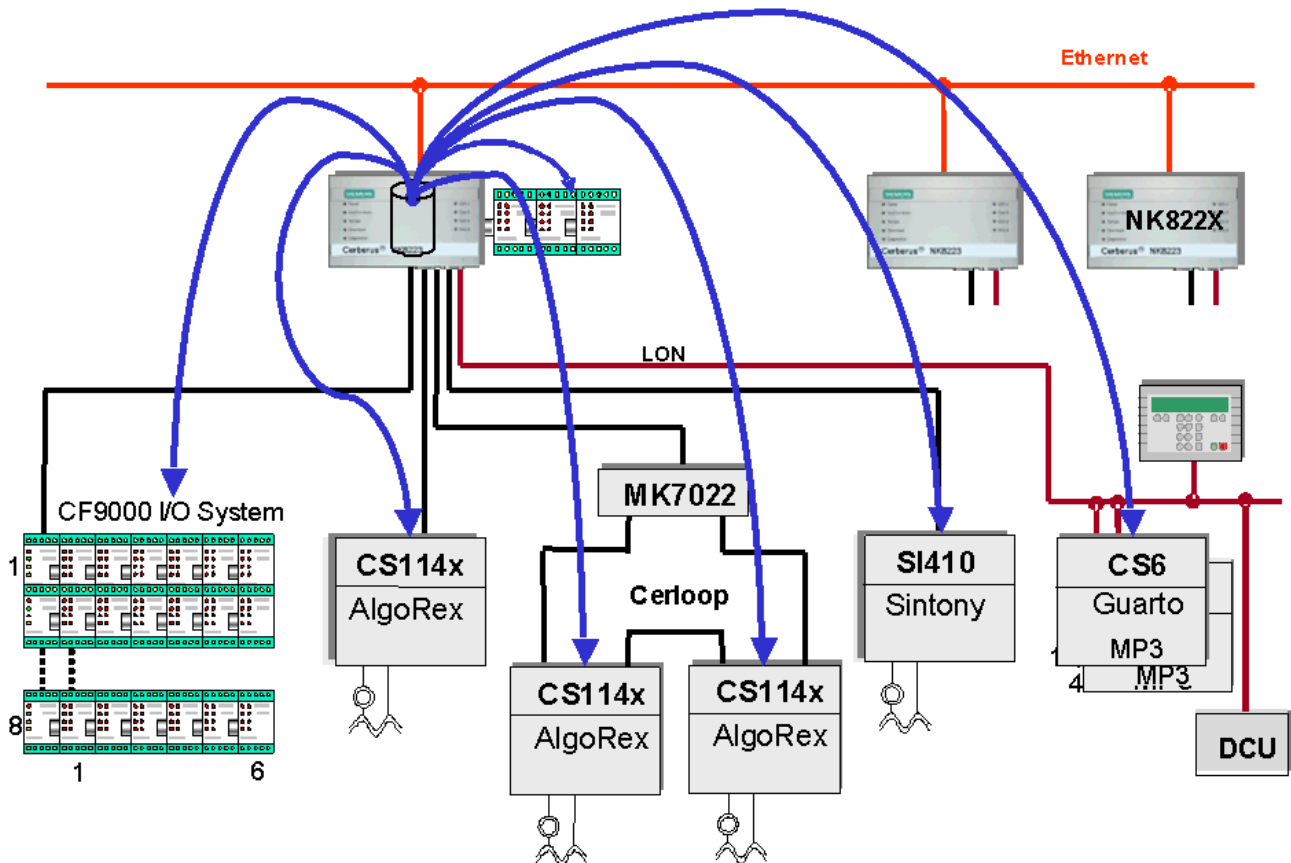
The configuration tool includes connection parameters, as well as interaction parameters (with AND, OR, XOR, and NOT logic combinations).

## Interactions

Interactions are possible between the subsystems connected directly to NK8223 and the locally connected I/O modules. Incoming messages can trigger one or more command messages to other subsystems.

**Note:** Incoming messages can be combined with the logical operators AND, OR, XOR, and NOT.

The configuration is done via an easy to use interactions tool in Composer, and then downloaded to the NK8223.



Local interactions on NK8223

## DF8090 Power supply supervision module

DF8090 is an optional, external module, which can be installed on the I<sup>2</sup>C bus for monitoring the NK8223 power supply. It detects the following conditions, shown on the DF8090 local panel (LEDs), and reported to NK8223 via I<sup>2</sup>C:

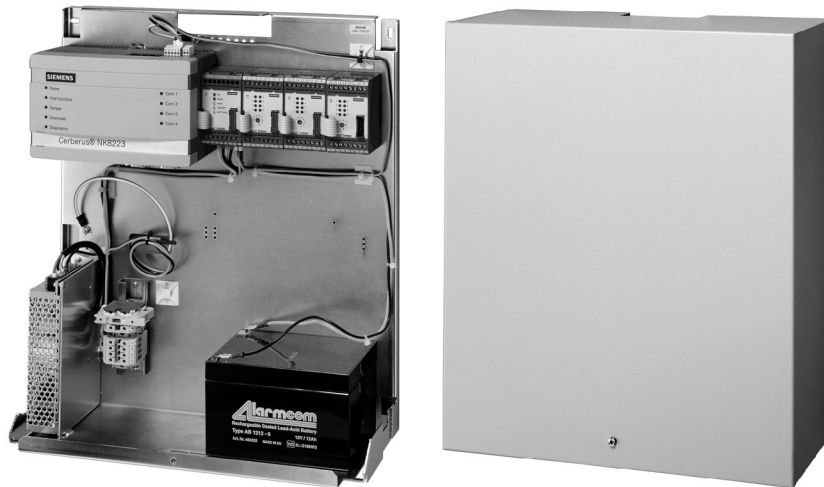
- Mains power failure;
- Battery low;
- Power supply failure;
- Battery protection fuse blown.

DF8090 can be installed on the DIN-rail, next to the NK8223.

## Housing solutions for NK8223

NE8001 and NE8002 are compact and convenient housing solutions for NK8223 units:

- NE8001 - Metallic cabinet for easy wall-mounting, including a DIN rail and a pre-wired power supply for NK8223 and local I/O;
- NE8002 - The sole metallic cabinet.



NE8001 housing equipped with NK8223 and I/O modules

## Connectivity NK8223 Ethernet Port

### Management Systems

RS232 line	- 1 local management station via serial line COM1: MM8000 / MK8000 / MT8001
Ethernet	- 1 remote management station: MM8000 / MK8000 (using CEI 79-5 transport protocol) or - 1-4 remote management stations: MM8000 / MK8000 (using CMSDL/IP transport protocol)

### Subsystems

4 RS232 lines (3 if RS485 line is used)	- 1 subsystem or 1 Cerloop network (via MK7022) per line
1 RS485 line	- Direct connection for 1 CF9000 I/O system
LON line	- Up to 4 CS6 MP3 Guarto units
I <sup>2</sup> C bus	- 1 Power Supply Supervision Module (1 DF8090) - 8 or 16 non supervised digital inputs (1 or 2 DF8040) - 8 non supervised digital relay output (1 DF8020)

## Technical data NK8223 Ethernet Port

<b>Lines to local host</b>	<p>1 RS232 line</p> <ul style="list-style-type: none"> <li>- Transport protocol: CMSDL</li> <li>- Host (single host only): <ul style="list-style-type: none"> <li>- MM8000 or MK8000 equipped with NS8012 CDI-Net Driver</li> <li>- MT8001</li> </ul> </li> </ul>	Up to 9600 baud
<b>Lines to remote host(s)</b>	<p>1 Ethernet IEEE 802.3, 10Base-T</p> <ul style="list-style-type: none"> <li>- Transport protocol: CEI 79-5B</li> <li>- Host (single host only): <ul style="list-style-type: none"> <li>- MM8000 or MK8000, equipped with NS8210 Network Driver (supporting up to 100 NK822x)</li> </ul> </li> <li>- FEAL 64-bit encryption</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>- Transport protocol: CMSDL/IP</li> <li>- Hosts (up to four): <ul style="list-style-type: none"> <li>- MM8000 and/or MK8000, equipped with NS8210 Network Driver (supporting up to 100 NK822x)</li> </ul> </li> </ul>	10Mbit/sec
<b>Switched lines to remote host (as backup line)</b>	Not yet available	
<b>Lines to subsystems</b>	<p>LON line and 2/4 RS232 lines, protocol and baud rate options configured by NK8000- configuration tool (Composer):</p> <ul style="list-style-type: none"> <li>- CNAP protocol (CS6 MP3) LON: 78Kbit/sec</li> <li>- Cerban protocol (CS114x EP5 and EP7F, CZ10, CZ12, CS4, CS440, CC60) RS232: 300 or 600 baud</li> <li>- Sintony serial link protocol (SI410) RS232: 9600 baud</li> <li>- ISO1745 protocol (Connection to Cerloop via MK7022: CS114x EP5 and EP7F, CZ10, CZ12, CS4, CS440, CC60, STT2410, STT11, STT20, DMS7000 units) RS232: 1200 or 2400 baud</li> <li>- ISO1745 direct protocol (CS114x, FC700A) RS232: 1200 or 2400 baud</li> <li>- CMXDL protocol (CF9003) RS485: 9600 baud</li> <li>- Burle protocol (Philips-Burle) RS232: up to 9600 baud</li> <li>- CDDL/CDSF (Siemens Simatrix) RS232: 2400 baud</li> <li>- CDDL/CDSF (other control units) RS232: up to 9600 baud</li> <li>- VBF (D100, SIGMASYS) RS232 4800, 9600 baud</li> </ul>	
<b>Interactions</b>	<p>Programmable interaction programs including single or multiple triggers (incoming events) and single or multiple effects (outgoing control actions). Interactions are possible between locally connected subsystems.</p> <ul style="list-style-type: none"> <li>- Subsystems supported: CS11 AlgoRex, CS6 MP3, SI410 Sintony, CF9000, Philips-Burle, SIGMASYS, D100</li> <li>- Logical combinations: AND, OR, XOR, NOT</li> <li>- Delay of effects (wait): configurable 0...6500 sec.</li> <li>- Max. # of interactions: 1000</li> <li>- Total # of field points used in triggers/effects: 5000</li> <li>- Max. # of field points/interactions that can be combined in a trigger expression: 255</li> </ul>	
<b>Ethernet data traffic</b>	<p>Very low network load:</p> <ul style="list-style-type: none"> <li>- Keep-alive message: 1 empty TCP/IP packet</li> <li>- Periodic authentication: exchange of three CEI packets with max. 30 bytes</li> <li>- Single alarm event: from 20 to 60 bytes</li> </ul>	<p>Configurable, default every 30 s</p> <p>Configurable, default 10 min.</p>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>- D-Sub 9 pin, female type (for serial and modem lines)</li> <li>- RJ-45 connector for Ethernet</li> <li>- Wieland 5-pin connector for power supply and LON</li> </ul>	
<b>Cables</b>	<ul style="list-style-type: none"> <li>- RS232 lines: two unshielded twisted pairs</li> <li>- LON line: one unshielded twisted pair</li> </ul>	<p>Cat.3 UTP, max. 15 m</p> <p>Cat.4 UTP, 22AWG</p> <p>Max 500 m (free topology)</p> <p>Max 1400 m (doubly terminated bus topology)</p>

Detailed specifications for LON network:  
<http://www.echelon.com/support/documentation/Manuals/078-0156-01G.pdf>  
 Section: System Performance and Cable Selection

<b>Power supply requirements</b>	- Input voltage (DC power supply to NK8223 board)	10-33 Vdc
	- Power (NK8223 processor board)	6,34 W
	- Power (fully equipped NK8223)	8,34 W
	- NE8001	100-240 Vac, 50/60Hz,
<b>Operating conditions</b>	- Temperature range	0 to 50 °C
	- Humidity	10 to 95 % non condensing
<b>Dimensions</b>	- NK8223 boards	W x H [mm] 160 x 100 (Euro-size PCB)
	- NK8223 plastic cabinet for DIN-rail	W x H x D [mm] 180 x 108* x 80
	- NK8223 in NE8001 / wall-mounted	W x H x D [mm] 385 x 450 x 150
		*Excluding connectors
<b>Weight</b>	- NK8223 boards	0,35 kg
	- NK8223 plastic cabinet for DIN-rail	0,7 kg (fully equipped)
	- NK8223 in NE8001	8,5 kg (fully equipped)
<b>Digital Input</b>	DF8040 8xInput Module (max 2 modules)	Optical coupler Inputs Max 30Vdc
<b>Digital Output</b>	DF8020 8xOutput Module (1 module)	Relay contacts (NO or NC) Max 1A at 30 Vdc Relay lifetime: 100'000 cycles
<b>Power Supply Supervision Module</b>	DF8090 Power Supply Supervision Module	Supervision of power supply and battery backup
<b>Regulatory Approvals</b> (CE conformity)	EN 55022	EMC emission
	EN 50130-4	EMC immunity
	EN 60950-1	LVD (NK8223 installed in NE8001)

## Disposal



This device includes electrical and electronic components and must not be disposed of as domestic waste.

**Current local legislation must be observed.**

## Technical data DF8090 Power Supply Supervision Module

<b>DF8090</b>	Power Supply Supervision Module	
	- Mains failure: 220 Vac missing	Battery fuse is internal to DF8090 plastic box
	- Battery low	Micro-fuse type: MSF 3.15A/250V
	- Power supply failure: trouble in AC/DC converter	
	- Battery protection fuse blown	
	- Battery: 12V, max 27 Ah	



## Technical data housings

<b>NE8001</b>	Wall-mountable, metallic cabinet with DIN-rail support and power supply for NK8223 units	<p>The unit includes the following pre-wired units:</p> <ul style="list-style-type: none"> <li>● Power supply: <ul style="list-style-type: none"> <li>– Input: 100 – 240 Vac / 50-60 Hz 2A / fuse F3.15AL / 250V / 3-pole screw connector</li> <li>– Output: 12Vdc 4A / two 2-pole screw connectors</li> </ul> </li> <li>● Power supply supervision: 1x DF8090 module</li> </ul> <p>NE8001 can provide support for the following units (not included):</p> <ul style="list-style-type: none"> <li>● 1x NK8223</li> <li>● 2x DF8040 modules (connected via I<sup>2</sup>C)</li> <li>● 1x DF8020 module (connected via I<sup>2</sup>C)</li> <li>● Battery: Max 27 Ah Recommended: FIAMM-65 mod. FG22703 (www.fiamm-gs.com)</li> <li>● B3P020 392653 Mains filter 250 Vac 6A</li> <li>● Z31041 496290 surge protector set 230 Vac</li> </ul>
<b>NE8002</b>	Wall-mountable, metallic cabinet with DIN-rail support	<p>NE8002 can provide support for the following units (not included):</p> <ul style="list-style-type: none"> <li>● AC/DC Power supply unit</li> <li>● 1x NK8223</li> <li>● 1x DF8090 module</li> <li>● 2x DF8040 modules (connected via I<sup>2</sup>C)</li> <li>● 1x DF8020 module (connected via I<sup>2</sup>C)</li> <li>● Battery: Max. 27 Ah Recommended: FIAMM-65 mod. FG22703 (www.fiamm-gs.com)</li> <li>● B3P020 392653 Mains filter 250 Vac 6A</li> <li>● Z31041 496290 surge protector set 230 Vac</li> </ul>
<b>Dimensions</b>	NE8001/NE8002	W x H x D [mm] 390 x 450 x 150
<b>Colour</b>	NE8001/NE8002	RAL7035 light grey
<b>Enclosure, degree of protection</b>	NE8001/NE8002	Standard IP-42 (as S3G300 standard Quarto housing).
<b>Environmental limits</b>	NE8001/NE8002	Transportation/storage: -40 to +55 °C Use: 10 to +50 °C Humidity 10 to 95%, non condensing
<b>Weight</b>	NE8002 cabinet only NE8001 cabinet with power supply NE8001 + with NK8223 (fully equipped)	6,2 Kg 7,3 Kg 8,5 Kg

## Related Products

**Note:** See Sales and Technical documentation for product-specific details.

<b>NK8222</b>	Ethernet Port for a single subsystem
<b>NK8225</b>	Ethernet Port with BACnet Gateway
<b>NS8210</b>	Network Driver (MM8000, MK8000)
<b>NS8012</b>	CDI-Net Driver (MM8000, MK8000, MT8001)
<b>MM8000</b>	Management Station
<b>MK8000</b>	OPC Server
<b>MT8001</b>	Management Terminal
<b>WW8000</b>	Composer
<b>CF9000 I/O System</b>	Input/Output Multiplexing System (for I/O modules DF8020, DF8040, DF8045, DF8046)

## Details for ordering

<b>NK8223</b>		<b>Ethernet Ports MP3.15</b>	
A6E600005	NK8223.2	Base module	– 1 Ethernet line for remote host – 2 serial lines for subsystems / local host
A6E600006	NK8223.4	Base module + 2-serial line extension	– 1 Ethernet line for remote host – 4 serial lines for subsystems / local host
A6E600007	NK8223.CL2	Base module + LON extension	– 1 Ethernet line for remote host – 1 LON line for subsystems – 2 serial lines for subsystems / local host
A6E600008	NK8223.CL4	Base module + LON extension + 2-serial line extension	– 1 Ethernet line for remote host – 1 LON line for subsystems – 4 serial lines for subsystems / local host
		<b>NK8223 Demo offer</b>	
A6E600131	NK8223/DSC	NK8223 Demo suitcase for demonstration	
		<b>NK822x HW Accessories</b>	
A6E600066	NE8001	Wall-mountable, metallic cabinet with DIN-rail	The unit includes a pre-wired power supply unit Input: 220Vac; output: 12Vdc 3A
A6E600067	NE8002	Wall-mountable, metallic cabinet with DIN-rail	Cabinet only: 385(W) x 450(H) x 140(D) mm; RAL7035 light grey; IP-42 (as S3G300 standard Quarto housing)
A6E600010	DF8090	Power supply supervision module	Supervision of power supply and battery backup
A6E600013	NH8002	2 serial port add-on board	
A6E600014	NH8010	NK822x/MT8001 PC 104 LON board	
A6E600185	NZ8201	NK822x Mounting kit for CS11	
A6E600186	NZ8202	NK822x Mounting kit for CS6	
A6E600187	NZ8203	NK822x Mounting kit for SI410	Cable for connecting SI410 to NK822x must be ordered separately from the intrusion product range (8006410001 SAQ18 Cable link X25 SAQ18).
A6E600188	NZ8204	NK822x power supply cable set	
A6E600189	NZ8205	NK822x serial link cable (DB9/m)	
		<b>NK80xx HW Accessories</b>	
5428430001	NK8020	LON repeater	
		<b>DF8000 – I/O Products</b>	
A6E600195	DF8020	8-output module	
A6E600194	DF8040	8-input module	

**Note:** WW8000 Composer and all necessary NK8000 configuration tools are included in the DMS8000 MP3.20 product CD.

## Sales and Technical documentation

<b>Type</b>	<b>Doc. no</b>	<b>Designation</b>
Product Datasheet <i>(Sales)</i>		
– NK8222	007780	Ethernet port for a single subsystem
– NK8225	009249	Ethernet port with BACnet gateway
– NK8225 PICS	009417	Protocol Implementation Conformance Statement
– MM8000	006882	Management Station
– MK8000	004968	OPC Server
– MT8001	006952	Management Terminal
– WW8000	003331	Composer
– CF9000 I/O System	001761, 001762	Input/Output Multiplexing System (for I/O modules DF8020, DF8040, DF8045, DF8046)
Application & Planning <i>(Sales)</i>	008084	DMS8000 Application & Planning Guide
Installation, Configuration & Commissioning <i>(Technical)</i>	007798	NK8000 Installation, Configuration & Commissioning Guide
Connectivity Configuration <i>(Technical)</i>	007083	DMS8000 Network, Fire & Intrusion Configuration Guide
	009424	DMS8000 Access Control Configuration Guide
	009425	DMS8000 Video Configuration Guide

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