

Cerberus® LMSmodular

## Input / Output Multiplexing System CF9000

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- Flexible I/O system designed for easy and cost-effective integration of a large spectrum of devices in a safety / security supervising centre
- DIN rail-mounted modules
- Architectures based on modular units supporting from 4 to 48 input/output points
- Multiple units can be distributed over a RS-485 bus
- Binary (ON/OFF) and supervised (ON/OFF/OPEN/SHORT) inputs
- Relay outputs
- 12-27 VDC power supply, separated between internal and external circuits

## Product summary

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CF9000 is a flexible I/O system designed for easy and cost-effective integration of a large spectrum of devices in a safety / security supervising centre.

Based on an innovative modular approach, it is made up of DIN rail-mounted modules that can be combined in local units so as to concentrate from 4 to 48 I/O points, distributed on a RS-485 line.

Each CF9000 unit is composed of an intelligent module (CPU module) and by up to 6 input or output modules.

The module list includes:

CF9003: CPU module, equipped with a RS-485 interface that can be connected to a Bus and to the supervision centre via IC-2 / GW-xx; it controls the I/O modules on a local I<sup>2</sup>C Bus

DF8040: module for 8 non supervised inputs with galvanic isolation

DF8044: module for 4 supervised, normally closed inputs with optical isolation

DF8045: module for 4 supervised, normally open inputs with optical isolation (only via NK8223 port)

DF8020: module for 8 non supervised outputs with NO/NC relays included (only via NK8223 port)

The units have been designed for easy installation in cabinets equipped with DIN rails. A local DC power supply (12-27 Vdc) is required for each unit (PS21 could be used); input voltage can be separated for internal circuitry and external I/O.

## Features and benefits

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The CF9000 unit detects any input status change, and transmits this information to the supervising host. The individual outputs are controlled according to the commands sent by the supervising station. The communication line to and from the supervisor is fully monitored.

CF9000 can therefore satisfy the requirements of connecting foreign equipment via contacts in any safety / security application at a very competitively price for its product class.

## Applications

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CF9000 can be used to interface technological signals or to interface third party control panels. Typical applications include:

ON/OFF or ON/OFF/OPEN/SHORT alarm acquisition

Technological plants controls: to turn on and off devices or to activate subsystems

Security devices interfacing: to monitor alarm signals coming from security devices without serial interface

Synoptic panels

Controlling horns, flashing light or any other alarm actuating devices

## Modules, units, lines

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CF9000 is organised in *units* made up of:

1 CPU *module*

1 to 6 I/O *modules*

The I/O modules can be arranged in different combinations and distributed over RS-485 *lines*.

This allows various configurations, ranging from 1 to 16 units on a single RS-485 line connection up to 1200 meters long.

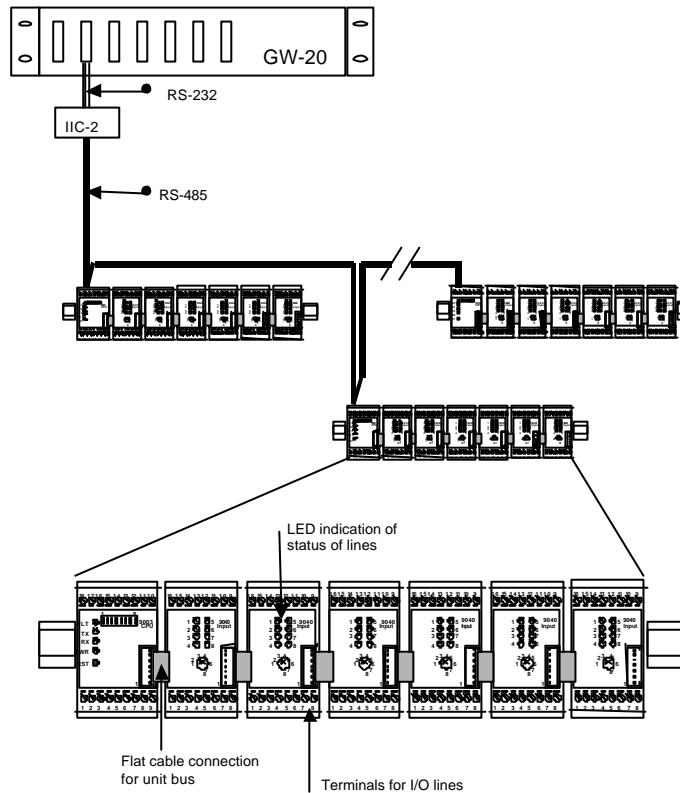
## Communication with gateways

The CF9000 system communicates (using CMX-DL protocol) with a CDI-WAN or CDI-NET Gateway (NK8223, GW-20, or GW-21), through an interface unit (IC-2) for RS-232/RS-485 conversion. The NK8223 also features a RS-485 port that can be used without any converter.

The IC-2 can be powered by the same power supply of the CF9003 nearest to it, or by an independent power supply.

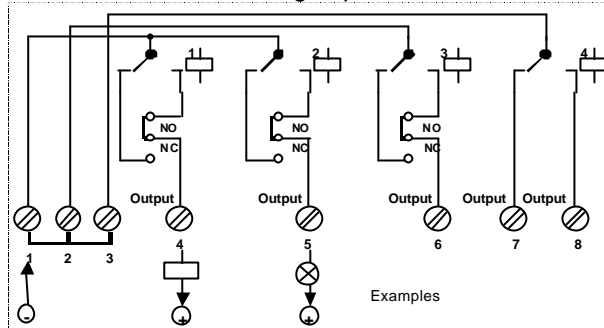
The CF9003s are connected to the communication line of the IC-2 in a multi-drop configuration. Should one of them fail, the others continue to work without problems. DIN rail mounting offers the flexibility required to distribute the systems all over a site, or to group them into a single cabinet, providing customers with an optimised solution for their needs.

The CF9000 system can be powered using any power supply that complies with the specifications. Note that internal circuits are separated from external input/ output and that separate power supplies should therefore be used.

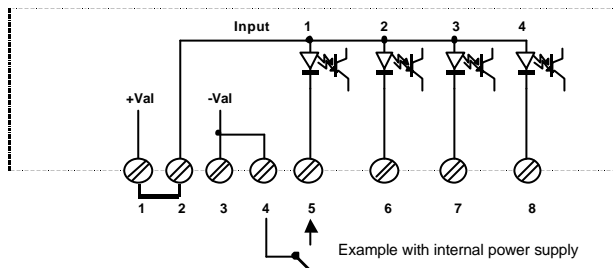


**Key Features of the CF9000 System**

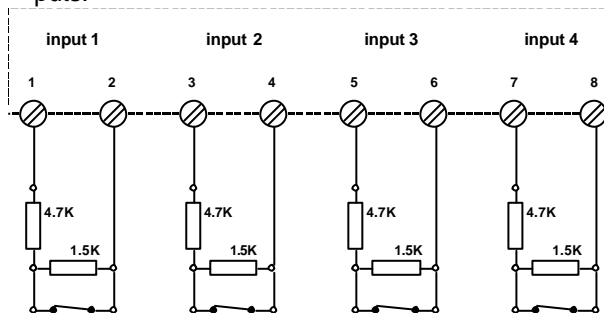
- Modularity: separate modules can be assembled providing a number of unit solutions
- Multi-drop configuration: 2-wire RS-485 connection allows up to 16 units on a single line. Multiple lines can then support even more connectivity.
- 8-output module (DF8020) - Provides 8 relay outputs, organised in two groups of four, see here below a group of 4:



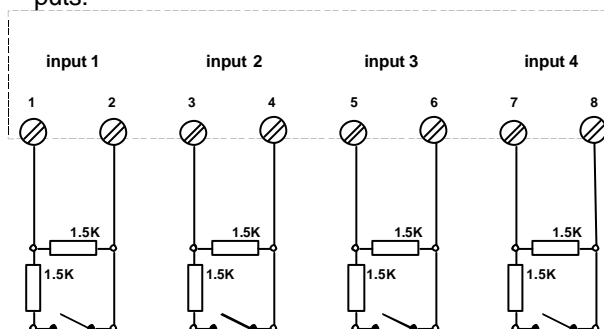
- 8-input module (DF8040) - Provides 8 digital inputs with galvanic isolation, see below a group of 4 inputs



- 4-NC supervised input module (DF8045) - Provides 4 balanced, normally-closed inputs:



- 4-NO supervised input module (DF8046) - Provides 4 balanced, normally-open inputs:



## Configurations, ordering codes and point mapping

The following table illustrates valid configurations for the available I/O models, complete with the number of required units and ordering codes.

At management station level, the CF9000 units are mapped in groups of 24 points, following the CMX-24 mapping. Depending on the number of modules, units is mapped as a single group, from 1 to 3 modules, or as a double group, from 4 to 6 modules. The table below illustrates the valid configurations.

I/O configurations	Number of modules and Order Codes	Emulated CMX (LMS database)
<b>Input only:</b>	<b>1xCF9003 plus:</b>	
48 in (double)	6xDF8040	2xCMX 24in
40 in (double)	5xDF8040	2xCMX 24in
32 in (double)	4xDF8040	2xCMX 24in
24 in (single)	3xDF8040	1xCMX 24in
16 in (single)	2xDF8040	1xCMX 24in
8 in (single)	1xDF8040	1xCMX 24in
<b>Input and output:</b>	<b>1xCF9003 plus:</b>	
40 in / 8 out (double)	5xDF8040 + 1xDF8020	1xCMX 24in + 1xCMX 16/8
32 in / 8 out (double)	4xDF8040 + 1xDF8020	1xCMX 24in + 1xCMX 16/8
24 in / 8 out (double)	3xDF8040 + 1xDF8020	1xCMX 24in + 1xCMX 16/8
16 in / 8 out (single)	2xDF8040 + 1xDF8020	1xCMX 16/8
8 in / 8 out (single)	1xDF8040 + 1xDF8020	1xCMX 16/8
32 in/16 out (double)	4xDF8040 + 2xDF8020	2xCMX 16/8
24 in/16 out (double)	3xDF8040 + 2xDF8020	2xCMX 16/8
16 in/16 out (double)	2xDF8040 + 2xDF8020	2xCMX 16/8
8 in / 16 out (double)	1xDF8040 + 2xDF8020	2xCMX 16/8
24 in/24 out (double)	3xDF8040 + 3xDF8020	1xCMX 24in + 1xCMX 24out
16 in/24 out (double)	2xDF8040 + 3xDF8020	1xCMX 24in + 1xCMX 24out
8 in/24 out (double)	1xDF8040 + 3xDF8020	1xCMX 24in + 1xCMX 24out
16 in/32 out (double)	2xDF8040 + 4xDF8020	1xCMX 16/8 + 1xCMX 24out
8 in/32 out (double)	1xDF8040 + 4xDF8020	1xCMX 16/8 + 1xCMX 24out
8 in/40 out (double)	1xDF8040 + 5xDF8020	Not valid!
<b>Output only:</b>	<b>1xCF9003 plus:</b>	
48 out (double)	6xDF8020	2xCMX 24out
40 out (double)	5xDF8020	2xCMX 24out
32 out (double)	4xDF8020	2xCMX 24out
24 out (single)	3xDF8020	1xCMX 24out
16 out (single)	2xDF8020	1xCMX 24out
8 out (single)	1xDF8020	1xCMX 24out
<b>Supervised input (require NK8223):</b>	<b>1xCF9003 plus:</b>	<b>Only 12 points used out of 24</b>
24 in (double)	6xDF8045 or DF8046	2xCMX 24in
20 in (double)	5xDF8045 or DF8046	2xCMX 24in
16 in (double)	4xDF8045 or DF8046	2xCMX 24in
12 in (single)	3xDF8045 or DF8046	1xCMX 24in
8 in (single)	2xDF8045 or DF8046	1xCMX 24in
4 in (single)	1xDF8045 or DF8046	1xCMX 24in

## Technical data

CPU module I/O modules	<b>CF90030</b>	
	<b>DF8020</b>	<b>8 outputs (non supervised) module</b>
	Digital outputs	relay contacts (NO or NC); max 1A at 30 Vdc relay lifetime: 10 <sup>5</sup> cycles
	<b>DF8040</b>	<b>8 inputs (non supervised) module</b>
Digital inputs	normally open or normally closed dry contacts or open collector signals. max forward current: 6,5 mA at 27 Vdc max cable resistance: 500 Ohm	
<b>DF8045</b>	<b>4 NC inputs (supervised) module</b>	
Balanced NC inputs	normally closed dry contacts max cable resistance: 500 Ohm	
<b>DF8046</b>	<b>4 NO inputs (supervised) module</b>	
Balanced NO inputs	normally open dry contacts max cable resistance: 500 Ohm	
<b>Power supply</b>	Input voltage (internal circuits)	12-27 V
	Input voltage (external I/O circuits)	12-27 V
	Max. current absorption for 6 mod. (int. @ 13,8V)	220 mA (all I/O active); 75 mA (no I/O active)
	Max. current absorption for 6 mod. (int. @ 27V)	140 mA (all I/O active); 60 mA (no I/O active)
	Max. current absorption for 6 mod. (ext. @ 13,8V)	400 mA (all I/O active); 25 mA (no I/O active)
	Max. current absorption for 6 mod. (ext. @ 27V)	450 mA (all I/O active); 30 mA (no I/O active)
<b>Communications</b>	Connections	3-wires RS232 from Gateway GW-20 or GW-21 to IC-2 (up to 15 meters). Up to 16 single or 8 double CF-9003 units can be connected to one IC-2 using a 2-wire RS485 line in multi-drop configuration.
	Cable	Shielded cable, with twisted pairs (minimum section 0.50 mm <sup>2</sup> ).
	Max distance	Between the IC-2 and the last CF-9003: 1200 meters (100 Ohm resistors at both ends).
<b>Operating conditions</b>	Temperature range	0 to 50° C
	Humidity	10 to 90% non condensing
<b>Weight</b>	CF-9003 module	140 g
	DF8020/8040/8045/8046 module	110 g
	IC-2	150 g
<b>Dimensions</b>	CF-9003 CPU module	75 H x 50 W x 48 D mm
	DF8020/8040/8045/8046 module	75 H x 45 W x 48 D mm
	IC-2	64 H x 120 W x 40 D mm

## Details for ordering

Type	Designation	Weight
CF9003	CPU module	190 gr
DF8020	8-relay output module	160 gr
DF8040	8-input module	160 gr
DF8045	4-supervised NC input module	160 gr
DF8046	4-supervised NO input module	160 gr

The minimum acceptable order for a new system must include one IC-2 (not needed if RS-485 interface of NK8223 is used), one CF-9003 CPU, and one I/O module (DF8020, DF8040, DF8045, or DF8046). Please see table above for valid configurations.

