COM43

Configuration Software
for *MX43* Controller

User Manual

OLDHAM
An Industrial Scientific Company

The Fixed Gas Detection People

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Chapter 1 │ General Information

User Manual

These instructions must be read and understood to ensure correct use of the application, otherwise the safety of the installation could be jeopardized. Studying the User Manual for the *MX43* Controller (P/N *NPM43xx*) is also recommended. This can be downloaded from our website www.oldhamgas.com.

The information and technical data contained in this manual are based on the information that is available at a given time. In case of doubt, contact *Industrial Scientific Oldham* (referred to subsequently as *Oldham*) for additional information.

The aim of this manual is to supply simple and accurate information to the user*. Oldham* cannot be held liable for any misinterpretations in the reading of this manual. In spite of our efforts to produce an error-free manual, it may nonetheless contain some unintentional technical inaccuracies.

In the client's interest, *Oldham* reserves the right to modify the technical characteristics of its equipment to increase their performance without prior notice.

The present instructions and their content are the inalienable property of *Oldham*.

Symbols Used

Icon	Significance
	This symbol indicates useful additional information.

Important Information

The *COM43* application covered by this manual gives the operator total freedom in configuring the *MX43* controller. Coherency checks of the input values and/or related actions **are not** conducted by the application. It is the operator's responsibility to check the configuration file's coherency. The next section *Liability Limits* defines this limitation.

Liability Limits

Neither *Oldham* nor any other associated company may under any circumstances be held liable for any damage, including, without limitation, damage due to loss or interruption of manufacture, loss of information, defect in the *COM43* application and/or *MX43* controller configured using this application, injuries, loss of time, financial or material loss, or any direct or indirect consequence of loss occurring in the context of the use or impossibility of use of the product, even where *Oldham* has been informed of such damage.

Chapter 2 │ General Introduction

Purpose of the *COM43* application

The *COM43* application must be installed on a PC running *Windows XP*, *Windows Vista* or *Windows 7* (32- or 64 bit).

COM43 is the programming interface for the *MX43* controller. *COM43* enables the configuration file of an *MX43* controller to be read or a configuration file to be written to an *MX43*.

The configuration file is transferred via USB.

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Figure 1: The *COM43* application allows *MX43* configuration on a PC as well as bidirectional transfer of the configuration file via USB

Install the *COM43* application

Follow the steps below:

- Insert the CD-ROM in the drive of the PC on which the *COM43* application is to be installed.

- If installation does not start automatically, double-click the *COM43.exe* icon.

- Select the application language and click *OK*.

- In the *Welcome to the wizard* window, click *Next* and follow the steps.

- Once installation is complete, the *COM43 Installation Complete* window is displayed.

- Click *Finish* and the application will start automatically.

Start the *COM43* application

By default, the *COM43* application is started from the *Start* menu > *COM43* or by double-clicking the *COM43* icon on the desktop, if that option was selected during installation of the *COM43* application.

Chapter 3 │ Create a Configuration

Object

The purpose of this chapter is to describe the various modules (detectors, relays, analog inputs, analog outputs, logic inputs) that are part of the detection installation.

At this stage, USB connection between the PC on which the *COM43* application is installed and the *MX43* is not necessary. The configuration file (xxx.cfg) will be saved (PC hard disk, USB key or network drive) to be accessed at a later stage for modification, duplication or transfer to the *MX43* to be set up.

A configuration file can be created in several stages by reloading it (*File > Open*). A configuration file can also be copied and modified so that it can be used with another *MX43* (*File > Open* and *File > Save as*).

Procedure

Program the *MX43* by following the steps described below.

Step	Action to be performed	Page
1	Create a new configuration.	7
	Or reload an existing configuration.	5
2	Add modules:	9
	- Detector.	9
	- 4- or 8-relay module.	14
	- 4-analog-output module.	15
	- 16–logic-input module.	17
	- 8-analog-input module.	18
3	Display, modify, delete, copy/paste a module.	20

Create/Select a Configuration

■ To create a new configuration, go directly to the section *Create a New Configuration* on page 7.

■ To reload a saved configuration, select the configuration file to be used (*cfg* extension) from *File > Open* before moving on to the next paragraph.

Configuration Window

The figure below shows an example of a configuration window.
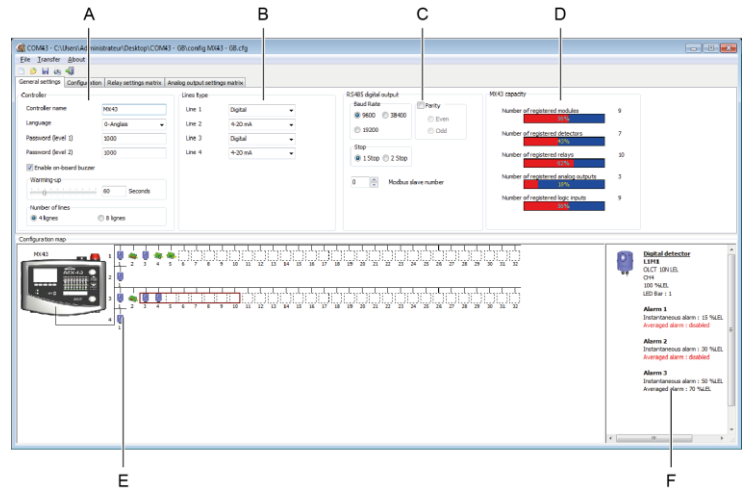
Figure 2: COM43, screenshot of the *General settings* menu

CONF_00

Ref.	Information	Page
A	General settings (Controller name, Number of lines, etc.).	**Erreur ! Signet non défini.** ~~7~~
B	Definition of the lines type (off, digital, 4-20 mA).	7
C	RS485 output settings.	8
D	Resources area showing free slots (modules, detectors, relays, inputs, outputs).	8
E	Module icons:	
	Detector correctly configured.	9
	Detector incorrectly configured, generally not assigned to an LED bar (see page **Erreur ! Signet non défini.**~~10~~).	9
	4- or 8-relay module.	14
	4-analog-output module.	15
	16-logic-input module.	17
	8-analog-input module.	18
F	Information on the module selected.	20

Create a New Configuration

When *COM43* starts, the *General settings* tab is active (Figure 2~~Figure 2~~).

Controller settings

This information concerns the controller (Figure 2~~Figure 2~~, A):

Label	Information
Controller name	Defines the name (15 characters maximum) that will be displayed on the *MX43* start-up and sleep screens as well as in the *System info* sub-menu.
Language	Select the language to be used by the controller.
Password (level 1)	Enter the password for accessing the *Calibration* menu (*1000* by default).
Password (level 2)	Enter the password for accessing the *Settings, Calibration* and *Maintenance* menus (*1000* by default). This also protects against data being deleted from the *Information* menu.
Enable on-board buzzer	Check to enable on-board buzzer when a fault and/or alarm occurs.
Warming-up	Defines the delay (0 to 300 seconds) during which the alarm relays are inhibited after powering up the *MX43*.
Number of lines	Select the controller version (4 or 8 lines option).
	If the *8 lines* option is selected, this cannot be changed to the *4 lines* option. If an error is made, create a new file (*File > New*) without saving the current file.

Lines type settings

This information concerns the activation and definition of the lines type (Figure 3~~Figure 3~~, A).

Label	Information
Line 1	Select the line type. - *OFF*: line not in use. - *Digital*: all line modules will be digital. - *4-20 mA*: the line will be connected to a 4-20 mA analog transmitter.
Lines 2 to 4 (or 8)	Define the other lines in the same way as *Line 1*.

The *Configuration map* graphic area is updated as the line type is defined (Figure 3, D).

Although 32 addresses are represented for each line, the *MX43* supports up to 16 modules in its 4-line version and 32 modules in its 8-line version.

Commentaire [SC1]: The French translates literally as "This information concerns", which seems strange in view of the phrasing used in subsequent paragraphs. It has therefore been assumed that the French should read "Ces informations concernent la centrale".
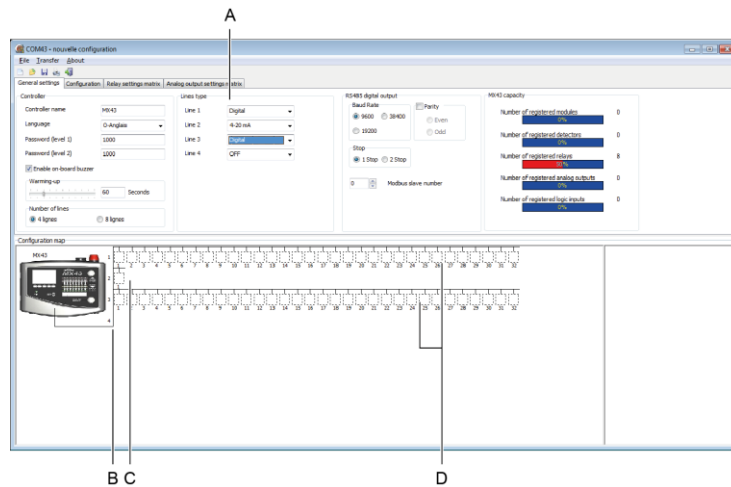
Figure 3: The *Configuration map* area (B) displays the choices made in the *Lines type* area (A)

CONF_02

Ref.	Information
A	Line settings.
B	Graphic display of the current configuration. In this example, line 4 is not declared (OFF).
C	Example of a 4-20 mA analog line. Only an analog transmitter can be assigned to this line.
D	Example of a digital line. Up to 32 digital modules can be connected to this line.

RS485 digital output settings

This information concerns the *MX43* RS485 output (Figure 2~~Figure 2~~, C).

Label	Information
Baud Rate	Select transfer rate. *9600* baud by default.
Even/Odd	Select parity. *No parity* by default.
Stop	Select number of *Stop* bits. *1 Stop* bit by default.
Modbus slave number	Assign slave number (between 1 and 255) of the *MX43*. *0* by default.

MX43 capacity

This area displays the number of registered modules and their representation as a percentage of the maximum capacity. See page 21 for more details.

> It is advisable to save the configuration via *File > Save* or *File > Save as*.

Add Modules

Having configured the lines, modules can now be added to each one.

> The *MX43 capacity* graphic area constantly shows how many modules are available.

Refer to the pages indicated for the type of module to be added.

Type of module to be added	See page
Detector	9
4- or 8-relay module	14
4-analog-output module	15
16-logic-input module	17
8-analog-input module	18
Modify a module	20
Delete a module	20
Copy a module	20

Add a *Detector*

Detectors can be analog (4-20 mA) or digital. Follow the steps below for each detector.

Type of detector selection

1. Right-click the block where a detector is to be added (1 to 32 for a digital line, 1 for an analog line).

2. Select (Figure 4Figure 4) *Add a module > Detector* or *Add a detector* depending on whether the line is digital or analog.

3. Select the detector type.
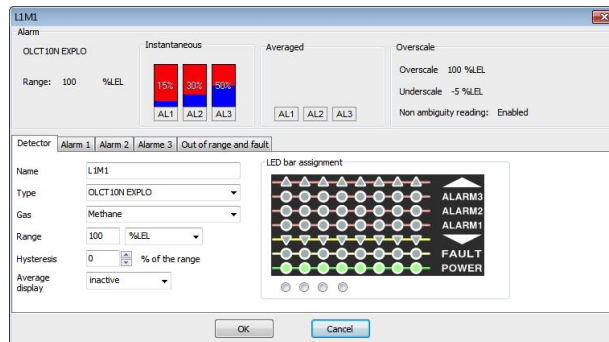
4. Select the gas to be detected.
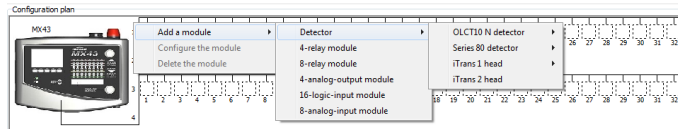
CONF_50_01

Figure 4: *Detector* **selection**

> If the *COM43* application refuses to add a module, check the available capacity in the *MX43 capacity* area (see Figure 2Figure 2, page 6 for details).

Detector settings – *Detector* tab

1. The window displays the *Detector* tab with the detector's general settings.
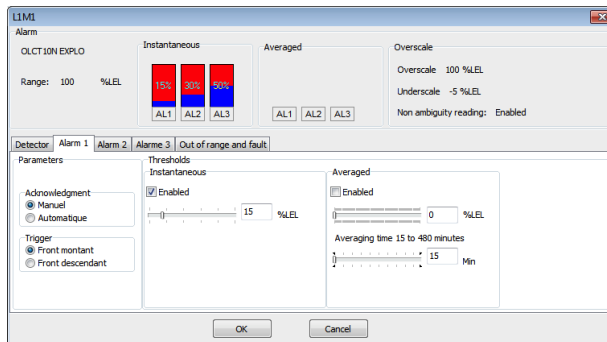

CONF_50_02

Figure 5: *Detector* **tab**

2. Define the settings.

Label	Information
Name	Enter the detector name (15 characters maximum): for example, the detector's location. This information will be displayed on the *MX43* screen.
Type	Select the detector type from the drop-down list.
Gas	Select the gas to be detected from the drop-down list.
Range	Select the measurement scale and display unit.
Hysteresis	Define the alarm hysteresis. This value can be set from 0 to 3% of the measurement range in steps of 1%. A hysteresis prevents the alarm from being repeatedly triggered when the measurement fluctuates around the set point. *Example: a hysteresis of 3% for a range of 100 ppm is equivalent to 3 ppm. If the alarm threshold is set at 50 ppm, acknowledgment will be permitted at a gas concentration less than or equal to 47 ppm.*
Average display	Option to display the average measurement value on the *MX43* screen: - *Inactive*: no average calculation displayed. - *Over 15 min.*: displays average calculation over 15 minutes. - *Over 8 hours*: displays average calculation over 8 hours.
LED bar assignment	Click one of the buttons located under the LED bars to assign the detector to the corresponding area.

Alarm 1 settings – *Alarm 1* tab

1. Click the *Alarm 1* tab to set the first alarm threshold.

CONF_50_03

Figure 6: *Alarm 1* tab

2. Define the settings.

Label	Information
Acknowledgment	Alarm 1 acknowledgment mode. - *Manual*: the alarm is acknowledged manually by the operator; this can only occur once the alarm event has disappeared. - *Automatic*: the alarm is acknowledged automatically as soon as the alarm event disappears.
Trigger	Alarm trigger type: - *Rising edge*: the alarm is triggered as soon as the monitored value rises above the *Instantaneous* or *Averaged* alarm threshold (see following points). - *Falling edge*: the alarm is triggered as soon as the monitored value falls below the *Instantaneous* or *Averaged* alarm threshold (see following points). This option is used to measure oxygen, for example.
Instantaneous	Management of the instantaneous alarm. This becomes active as soon as the *Enabled* box is checked. Then set the alarm threshold using the slider.
Averaged	Management of the averaged alarm. This becomes active as soon as the *Enabled* box is checked. Set the averaged alarm threshold using the first slider and the averaging time using the second slider (duration from 15 to 480 minutes). This value is used only to trigger the relay and has no effect on the average values displayed. The alarm event can follow either an *Instantaneous* alarm or an *Averaged* alarm without distinction.
Other tabs	If necessary, refer to the *Detector settings - Alarm 2 tab* section before closing this window by clicking *OK*. Also refer to the *Parameter display* section on page 14 with regard to the information displayed in the top part of the window.
OK	Close the window and save the changes.
Cancel	Close the window without saving the changes.

At the same time, the barograph (A) displays the alarm threshold (red zone) in relation to the scale range (blue zone) according to the position of the slider (B) setting the alarm threshold.
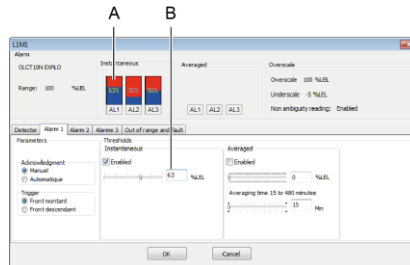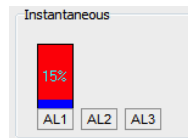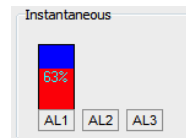

CONF_50_04

Figure 7: Link between slider and barograph

Note that the red and blue zones are reversed when the alarm is said to be increasing or decreasing (see Figure 8).

CONF_50_07

Increasing alarm set at 15% of the measurement range.

CONF_50_08

Decreasing alarm set at 63% of the measurement range (for an oxygen detector with a range of 0-30% vol. and an alarm set at 19% vol.).

Figure 8: Barograph with an increasing alarm (left figure) and decreasing alarm (right figure)

Alarm 2 settings – *Alarm 2* tab

1. Click the *Alarm 2* tab to set the second alarm threshold.

2. Enter or change the preset data as described for Alarm 1 (*Alarm 1 settings – Alarm 1 tab* section on page 11).

Alarm 3 settings – *Alarm 3* tab

1. Click the *Alarm 3* tab to set the third alarm threshold.

2. Enter or change the preset data as described for Alarm 1 (*Alarm 1 settings – Alarm 1 tab* section on page 11).

Out of range alarm settings – *Out of range and fault* tab

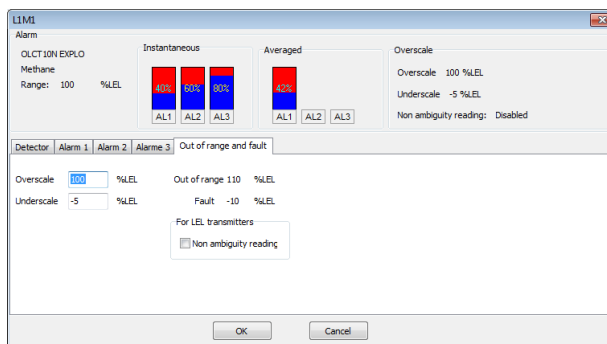1. Click the *Out of range and fault* tab to set and display the overscale and underscale alarm parameters.

CONF_50_05

Figure 9: Tab for setting out of range alarms

2. Define the settings.

Label	Information
Overscale	Set the overscale alarm threshold (value can be set up to 110% of the range). This function can also be regarded as a fourth alarm threshold. Note that acknowledgment is manual and cannot be modified.
Underscale	Set the underscale alarm threshold (value can be set from 0 to -10% of the range). This function is usually used for preventive maintenance to report a negative shift in a detector.
Out of range	Non-configurable value of high fault *(see MX43 manual for fault management).*
Fault	Non-configurable value of low fault *(see MX43 manual for fault management).*
Non ambiguity reading	Managing the *Non ambiguity reading* alarm applies only to explosive gas detectors. On detecting a concentration of gas higher than 100% LEL, the LCD display will indicate *>100%* LEL together with the message *High concentration. Reset by authorized person in maintenance menu* . The *OVS* and *FAULT* indicators are activated. The *Non ambiguity reading* alarm can only be cleared by switching off the detector via the *MX43 Maintenance* menu once the gas level falls below this threshold.
OK	Close the window and save the changes made in all windows.
Cancel	Close the window without saving the changes.

Parameter display

1. This area (A to D) is visible regardless of which tab is active.

CONF_50_06

Figure 10: Parameters display area

Ref.	Information	See page
A	Type of detector and measurement range, defined in the *Detector* tab.	10
B	Barographs of the instantaneous alarms defined in the *Alarm 1, Alarm 2* and *Alarm 3* tabs.	11
C	Barographs of the averaged alarms defined in the *Alarm 1, Alarm 2* and *Alarm 3* tabs.	12
D	Parameters of the various faults defined in the *Out of range and fault* tab.	13

> It is advisable to save the configuration via *File > Save* or *File > Save as*.

Add a *4- or 8-Relay Module*

This digital module manages 4 or 8 relays depending on its version. Follow the steps below for each relay module.

Relay module type selection

1. Right-click on one of the dotted areas of the digital line in question.

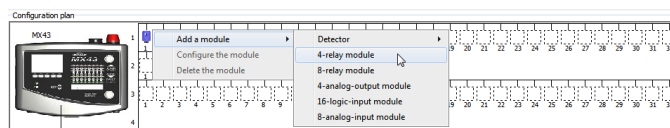2. Select *Add a module > 4-relay module* (or *8-relay module*).

CONF_60_01

Figure 11: Relay module selection

> If the *COM43* application refuses to add a module, check the available capacity in the *MX43 capacity* area (see Figure 2~~Figure 2~~, page 6 for details).
> The address of the module (see *MX43 User Manual*) must be identical to the address defined using the *COM43* application.

Module settings

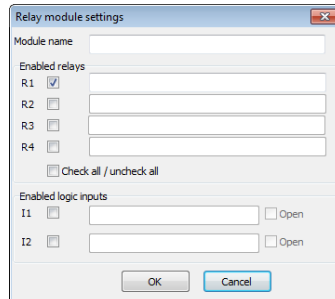1. The relay module settings can be entered in the window that opens.

CONF_60_02

Figure 12: Settings window for a *4-relay module*

2. Define the settings.

Label	Information
Module name	Enter the module name (15 characters maximum): for example, its location.
Enabled relays	Select the relays (*R1* to *R4* or *R1* to *R8*) that will be used in the installation. By default, relay *R1* is enabled. - *Checked*: the relay is enabled and can be programmed (see page **Erreur ! Signet non défini.**23). - *Unchecked*: the relay is not in use. In the area to the right, enter text (15 characters maximum) defining the function of the relay, such as *Rotating light*.
Check all/uncheck all	Enable or disable all relays.
Enabled logic inputs	Enable additional logic inputs (*I1* and *I2*) of the relay module. These inputs will be connected to dry contacts. - *Checked*: the input is enabled. The dry contact connected to this input will be monitored by the *MX43*. - *Unchecked*: the input is disabled and will not be monitored. In the area to the right, enter text (15 characters maximum) defining the function of the input, such as *Emergency stop*. This information will be displayed on the *MX43* screen in the event of an alarm. The *Open* option is used to define the input status under normal operating conditions (no fault): - *Checked*: the dry contact connected to this input is closed during an alarm (NO). - *Unchecked*: the dry contact connected to this input is open during an alarm (NC).
OK	Close the window and save the changes.
Cancel	Close the window without saving the changes.

> It is advisable to save the configuration via *File > Save* or *File > Save as*.

Relay settings

Configuring the relay modules is now complete, but the relay settings are not yet defined. This step comes in the *Relay Configuration* chapter on page

Add a *4-Analog-Output Module*

This digital module provides 1 to 4 programmable 4-20 mA analog outputs. Follow the steps below for each module.

Module selection

1. Right-click one of the dotted areas of the digital line in question.

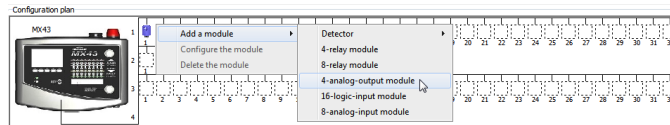2. Select *Add a module > 4-analog-output module.*

CONF_70_01

Figure 13: *4-analog-output module* **selection**

> If the *COM43* application refuses to add a module, check the available capacity in the *MX43 capacity* area (see Figure 2Figure 2, page 6 for details).
>
> The address of the module (see *MX43 User Manual*) must be identical to the address defined using the *COM43* application.

Module settings

1. The module settings can be entered in the window that opens.

CONF_70_02

Figure 14: Settings window for a *4-analog-output module*

2. Define the settings.

Label	Information
Module name	Enter the module name (15 characters maximum): for example, its location.
Enabled outputs	Select the module outputs (*O1* to *O4*) that will be used in the installation. By default, output *O1* is enabled. - *Checked*: the output is enabled and can be set (see page 41). - *Unchecked*: the output is not in use. In the area to the right, enter text (15 characters maximum) defining the function of the output.
Check all/uncheck all	Enable or disable all outputs.
Enabled logic inputs	Enable additional logic inputs (*I1* and *I2*) of the relay module. These inputs will be connected to dry contacts.

Label	Information
	- *Checked*: the input is enabled. The dry contact connected to this input will be monitored by the *MX43*.
	- *Unchecked*: the input is disabled and will not be monitored.
	In the area to the right, enter text (15 characters maximum) defining the function of the input, such as *Emergency stop*. This information will be displayed on the *MX43* screen in the event of an alarm.
	The *Open* option is used to define the input status under normal operating conditions (no fault):
	- *Checked*: The dry contact connected to this input is closed during an alarm (NO).
	- *Unchecked*: the dry contact connected to this input is open during an alarm (NC).
OK	Close the window and save the changes.
Cancel	Close the window without saving the changes.

It is advisable to save the configuration via *File > Save* or *File > Save as.*

Output settings

Configuring the *4-analog-output modules* is now complete, but the output settings are not yet defined. This step comes in the *Configure analog outputs* chapter on page 33.

Add a *16-Logic-Input Module*

This digital module monitors 1 to 16 logic inputs.

Module type selection

1. Right-click one of the dotted areas of the digital line in question.

2. Select *Add a module > 16-logic-input module.*

CONF_80_01

Figure 15: *16-logic-input module* **selection**

If the *COM43* application refuses to add a module, check the available capacity in the *MX43 capacity* area (see ~~Figure 2~~Figure 2, page 6 for details).
The address of the module (see *MX43 User Manual*) must be identical to the address defined using the *COM43* application.

Module settings

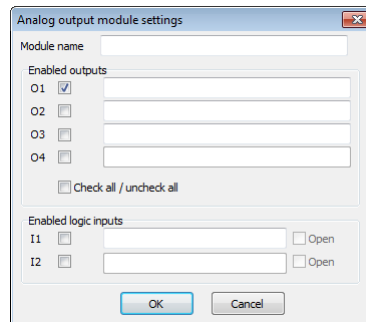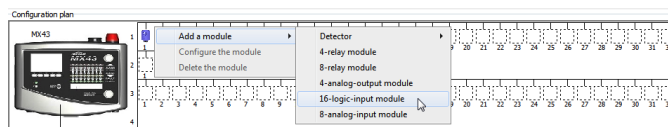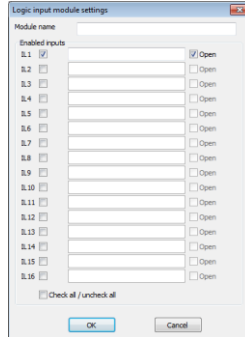1. The module settings can be entered in the window that opens.

CONF_80_02

Figure 16: Settings window for a *16-logic-input module*

2. Define the settings.

| Label	Information
Module name	Enter the module name (15 characters maximum): for example, its location.
Enabled inputs (IL1 to IL16)	Enable module inputs (IL1 to IL16). - *Checked*: the input is enabled. The dry contact connected to this input will be monitored by the *MX43*. - *Unchecked*: the input is disabled and will not be monitored. In the area to the right, enter text (16 characters maximum) defining the function of the input, such as *Emergency stop*. This information will be displayed on the *MX43* screen in the event of an alarm. The *Open* option is used to define the input status under normal operating conditions (no fault): - *Checked*: the dry contact connected to this input is closed during an alarm (NO). - *Unchecked*: the dry contact connected to this input is open during an alarm (NC).
Check all/uncheck all	Enable or disable all logic inputs.
OK	Close the window and save the changes.
Cancel	Close the window without saving the changes.

> It is advisable to save the configuration via *File > Save* or *File > Save as*.

Add an *8-Analog-Input Module*

This digital module retrieves the measurements from 1 to 8 analog inputs (4-20 mA or Wheatstone bridge).

Module type selection

1. Right-click one of the dotted areas of the digital line in question.

2. Select *Add a module > 8-analog-input module.*
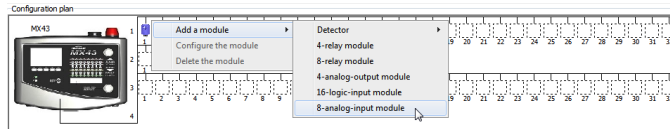
CONF_90_01

Figure 17: *8-analog-input module* selection

If the *COM43* application refuses to add a module, check the available capacity in the *MX43 capacity* area (see Figure 2~~Figure 2~~, page 6 for details).
The address of the module (see *MX43 User Manual*) must be identical to the defined using the *COM43* application.

Module settings

1. The module settings can be entered in the window that opens.
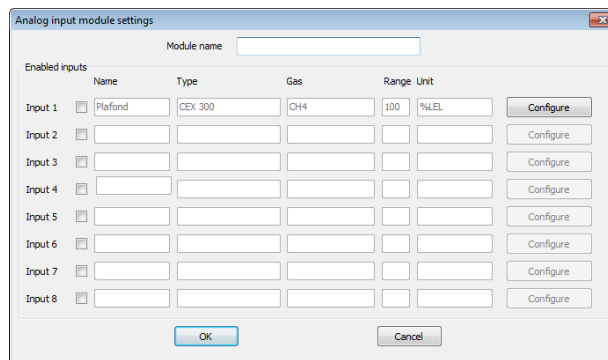
CONF_90_02

Figure 18: Settings window for an *8 analog-input module*

2. Define the settings.

Label	Information
Module name	Enter the module name (15 characters maximum): for example, its location.
Inputs 1 to 8	Enable the inputs that will be used in the installation. - *Checked*: the input is enabled. The analog signal connected to this input will be monitored by the *MX43*. - *Unchecked*: the input is disabled. As soon as the input is enabled, the detector configuration screen is displayed. Refer to the *Detector settings - Detector tab* section on page 10 for details of the configuration.
OK	Close the window and save the changes.
Cancel	Close the window without saving the changes.

Note that adding this module automatically reserves 8 slots in the measurement line, as displayed in the figure below.

CONF_xxxxx

Figure 19: Automatic reservation of 8 slots for an *8-analog-input module*

It is advisable to save the configuration via *File > Save* menu or *File > Save as*.

Module Management

As soon as one or more modules of each type have been defined, each of these modules can be modified, deleted and copied/pasted.

Display the data of a module

Left-click a module to display its settings. Any missing settings are shown in red.

Figure 20: Example of a module's settings

Modify a module

Right-click a module and select *Configure the module.* The settings window (Figure 5Figure 5, page 10) is displayed.

Delete a module

Right-click a module and select *Delete the module.*

Copy/Paste a module

This action retrieves the settings of a module and assigns them to a new module. Follow the steps below:

1. Right-click the module to be copied and select *Copy.*

2. Then right-click an empty block of an active line and select *Paste.*

3. The message *Do not forget to assign your detector to an LED bar* is displayed.

4. Click *OK.*

5. To assign the copied module to an LED bar (see page 10), click the crossed icon ( ), select *Configure the module* and, in the *Assignment of a bar* area, select the corresponding LED bar. Change the *Name* of the detector and any other settings before closing the window.

> It is advisable to save the configuration via *File > Save* or *File > Save as.*

Chapter 4 │ Display the Configuration

This chapter describes the configuration display window, which can be accessed at any time.

Procedure

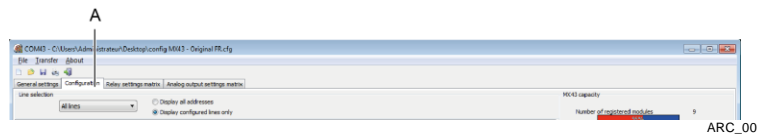1. To display the configuration window (Figure 27), click on the *Configuration* tab (Figure 21Figure 21, A).

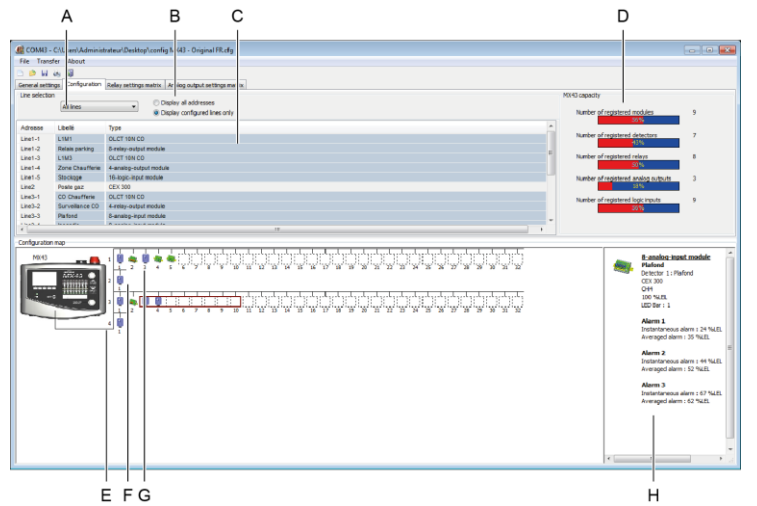

ARC_00

Figure 21: *Configuration* tab

Information Displayed

ARC_01

Figure 22: *Configuration* tab and information displayed

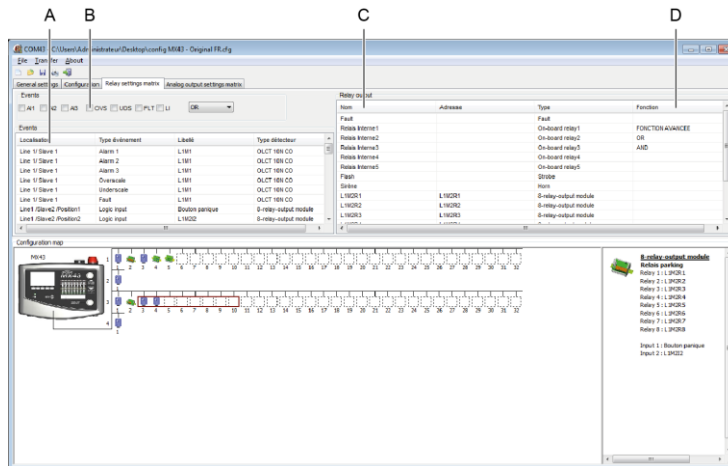| Ref.	Information
A	Drop-down list for selecting the lines to be displayed in (C).
	- *All lines*: displays in area (C) all the lines and associated modules. Additional sorting is possible using the button (B).
	- *Line xx*: displays in area (C) line number xx and associated modules.
B	Additional buttons for the drop-down list (A).
	- *Display all addresses*: displays in area (C) all the lines.
	- *Display configured lines only*: displays in area (C) only the configured lines.
C	Details of the lines based on choices (A) and (B).
	- *Blue lines*: digital modules.
	- *Gray lines*: analog modules.
	The information displayed is:
	- *Address*: module address in the form *Line-Module*.
	- *Label*: module name.
	- *Type*: module type.
D	Barograph showing the free slots (modules, detectors, relays, inputs, outputs).
	Number of registered modules: total number of digital modules connected (up to 16 in the case of a 4-line version *MX43* or up to 32 in the case of the 8-line version).
	Number of registered detectors: total number of detectors (digital or analog) connected (up to 16 in the case of a 4-line version *MX43* or up to 32 in the case of the 8-line version).
	Number of registered relays: total number of registered relays*:* at least 8 internal relays + relay module relays (up to 16 in the case of a 4-line version *MX43* or up to 32 in the case of the 8-line version).
	Number of registered analog outputs: total number of registered analog output (up to 16 in the case of a 4-line version *MX43* or up to 32 in the case of the 8-line version).
	Number of registered logic inputs: total number of registered input inputs for all the modules (up to 16 in the case of a 4-line version *MX43* or up to 32 in the case of the 8-line version).
E	Number of lines. The number of lines displayed depends on the controller version and filter applied (see A).
F	Display of a 4-20 mA analog line with a single block. The dotted area represents the position of an analog module to be defined.
G	Display of a digital line with or without configured modules.
	Detector correctly configured.
	Detector incorrectly configured, generally due to the module not having been assigned to the LED bar (see page **Erreur ! Signet non défini.**10).
	4-or 8-relay module.
	4-analog-output module.
	16-logic-input module.
	8-analog-input module.
H	Display of a module's data by left-clicking on this module. The missing parameters are shown in red.

Chapter 5 | Relay Configuration

Procedure

1. Program the *MX43* relays in accordance with the following table.

Step	Action to be performed	Page
1	Open the relay configuration window.	24
2	Program a simple logic command. Use this method if the command logic uses only a single logic function OR, AND, VOTING, NOR or NAND.	26
	Program an advanced logic command using the function editor. Use this method if the command logic requires multiple logic functions.	27

Overview of the Window

REL_00

Figure 23: Main relay programming window, *Relay settings matrix* tab

Ref.	Information	Page
A	List of configured events	9
B	Selection of events to be displayed in (A).	-
	- *AL1*: displays *Level 1* alarms.	
	- *AL2*: displays *Level 2* alarms.	
	- *AL3*: displays *Level 3* alarms.	
	- *OVS*: displays *Overscale* events.	
	- *UDS*: displays *Underscale* events.	
	- *FLT*: displays fault events.	
	- *LI*: displays *Logic Inputs*.	
	- *Drop-down list*: programming shortcut (D) for the relay output in question (C).	
	First, select an event (A) or several events (A) using the CTRL or Shift keys.	
	Then select the function from this drop-down list and drag everything to the relay output (E) in question.	
C	List of internal outputs (relays 1 to 5 + integrated siren + integrated flash at the *MX43*) and external outputs (relays of relay modules) made available. Double-click a relay output to open the *Relay configuration* window (Figure 25~~Figure 25~~).	24
D	Logic function assigned to each relay (*OR*, *NOR*, *AND*, *NAND*, *Voting* or *Advanced Function* (combination of logic functions that can only be carried out with the function editor; see page 27)).	24

Access *Relay Configuration*

Follow the steps below:

1. In the list of relays, double-click the relay to be programmed (A).
   NB: The *Default* relay is non-configurable and cannot be programmed.
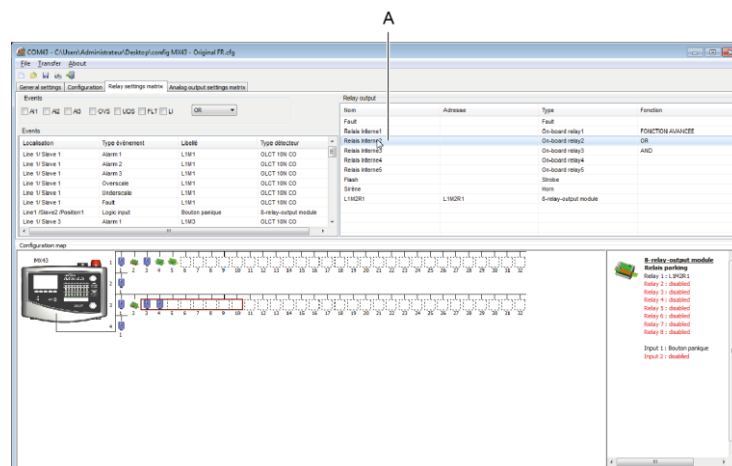

Figure 24: Information displayed in the *Relay settings matrix* tab
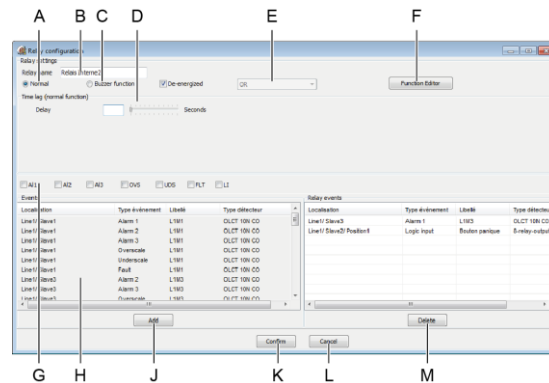
2.   The *Relay configuration* window is displayed.

REL_SE_01

Figure 25: *Relay configuration* **window**

| Ref.	Information	Pages
A	Selection of relay operation in *Normal* mode, as opposed to *Buzzer function* mode (C).	26, 27
B	Relay name.	26, 27
C	Selection of relay operation in *Buzzer function* mode. To be used only if the selected relay controls an audible warning device.	26, 27
D	Time lag definition.	26, 27
	- *Normal function*: setting of the trigger delay.	26, 27
	- *Buzzer function*: setting of the reset inhibit, automatic reset and reactivation time lags. See Figure 26Figure 26.	26, 27
	- De-energized: use of the positive safety function for internal relays only. For relay modules, programming is carried out manually using the relay switch block.	26, 27
E	Optional choice of the logic function to be applied between events (H) to activate the selected relay (B).	26, 27
F	Access the function editor.	27
G	Selection criteria for events to be displayed in (H).	26, 27
H	List of usable events, possibly sorted by (G).	26, 27
J	Add the event selected in (H) to the command list (M) for the relay (B). The drag and drop function also works here.	26, 27
K	Confirm the changes made in this window.	26, 27
L	Cancel the changes made in this window.	26, 27
M	Delete one or more events from the list (M) for the relay in question (B).	26, 27

Program without the Function Editor

Use this method if the relay command logic needs only a single logic function OR, AND, VOTING, NOR or NAND, for example (RL1+RL2+RL3).

Step 1: define the relay operating mode

1. With the *Relay configuration* window open (Figure 25~~Figure 25~~), check that the relay to be programmed is selected (Figure 25~~Figure 25~~, B).

2. If necessary, sort the list of events (Figure 25~~Figure 25~~, H) using the filters (Figure 25~~Figure 25~~, G).

3. Select the relay operating mode:

    -   *Normal:* a *Normal* relay can be reset only when the alarm event disappears. A trigger delay of between 0 and 60 seconds (Figure 30, D) can be set.

    -   *Buzzer function:* a *Buzzer* relay can be reset even while the alarm event is still in progress. This function allows the audible warning devices to be switched off and must be used only for this purpose. Various time lag options are possible after selecting this option (see figure below).

    -   *Positive safety:* this option is available only after selecting an internal relay (see *MX43* manual). For those relays in relay modules, positive safety is programmed manually using the relay switch block.
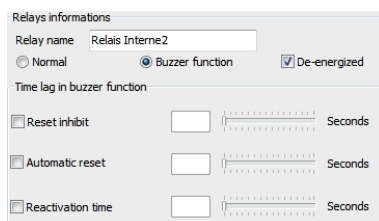
REL_SE_02

Figure 26: The *Time lag in buzzer function* area

    -   *Reset inhibit*: minimum activation time between 0 and 15 minutes (Figure 27~~Figure 27~~, E). No manual reset (Figure 32, B) or automatic reset (Figure 32, C) is authorized during this time. Reset is possible only when the *Reset inhibit* ends.

    -   *Automatic reset*: minimum relay activation time before automatic reset (Figure 27~~Figure 27~~, C). The value of this time (Figure 27~~Figure 27~~, F) must be greater than the *Reset inhibit* value (Figure 27~~Figure 27~~, E).

    -   *Reactivation time*: time (Figure 32, G) after which the relay is reactivated if the alarm event is still present. A new activation cycle is then launched (Figure 27~~Figure 27~~, D).
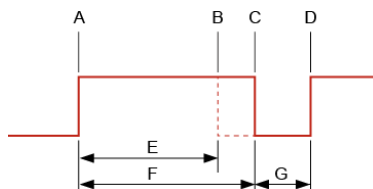

REL_SE_03

Figure 27: Operation of the buzzer relay

Ref.	Information
A	Start of the alarm activation cycle.
B	Manual reset, where applicable.
C	Automatic reset.
D	Start of a new alarm activation cycle triggered if the alarm event is still present.
E	Reset inhibit: minimum activation time between 0 and 15 minutes.
F	Minimum relay activation time before automatic reset must be greater than the *Reset inhibit* value (E).
G	Time after which the relay is reactivated if the alarm event is still present.

Step 2: select the events and logic to be used

1. *For a single event acting on the relay*: select the event (Figure 25~~Figure 25~~, H) and drag it to the *Relay events* list (Figure 25~~Figure 25~~, M) or click the *Add* button (Figure 25~~Figure 25~~, J).

    For several events acting on the relay: first select the logic function (Figure 25~~Figure 25~~, E) and then the events (Figure 25~~Figure 25~~, H) using the CTRL and/or Shift keys. Next drag them to the *Relay events* list (M) or click the *Add* button (Figure 25~~Figure 25~~, J).

2. To delete an event from the list (Figure 25~~Figure 25~~, M), select the event and click *Delete* (Figure 25~~Figure 25~~, N).

3. If necessary, view the function using the *Function Editor* (Figure 25~~Figure 25~~, F). Refer to the *Program with the Function Editor* section on page 27 for more details.

4. Click *Confirm* (Figure 25~~Figure 25~~, K) to confirm the configuration or *Cancel* (Figure 25~~Figure 25~~, L) to discard the changes made.

Step 3: confirm the settings

1. The *Relay output* window in the *Relay settings matrix* tab shows any logic function connected with the relay in question.
    If necessary, double-click this line to open the *Relay configuration* window again.

2. If necessary, continue programming the other relays as described in the *Program without the Function Editor* section on page 26.

Program with the Function Editor

> Use this method if the relay command logic uses multiple logic functions, for example [(RL1 OR RL2) AND (RL3 NOR RL4)].

Step 1: define the relay operating mode

1. With the *Relay configuration* window open (Figure 25~~Figure 25~~), check that the relay to be programmed is selected (Figure 25~~Figure 25~~, B).

2. Select the relay operating mode (see *Normal* or *Buzzer* on page 26).

Step 2: select the events and logic to be used

1. Click the *Function Editor* button (Figure 25~~Figure 25~~, F).

2. If necessary, sort the list of events displayed (Figure 28~~Figure 28~~, B) using the filters (Figure 28~~Figure 28~~, A).

3. Construct the logic function.

   An example is given in the *Function Creation Example* section on page 29.

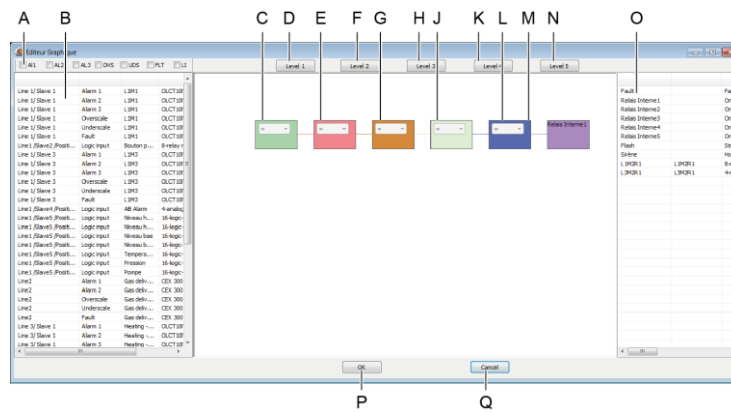4. Click *OK* to close the function editor and save the function created or *Cancel* to discard the changes.

REL_AE_01

Figure 28: Function editor window

Ref.	Information
A	Checkboxes for sorting the events to be displayed in (B).
	- *AL1*: displays *Level 1* alarms.
	- *AL2*: displays *Level 2* alarms.
	- *AL3*: displays *Level 3* alarms.
	- *OVS*: displays *Overscale* events.
	- *UDS*: displays *Underscale* events.
	- *FLT*: displays fault events.
	- *LI*: displays *Logic Inputs*.
B	List of available events, possibly sorted by (A).
C	*Level 1* logic function block.
	NB: A logic function can be selected only if two events are assigned to the function block. The *Voting* function requires at least three events.
	REL_AE_02
	Figure 29: The logic functions available in a block
D	Button for adding a *Level 1* logic block.
E	*Level 2* logic function block usable only if a *Level 1* block has been configured. Other
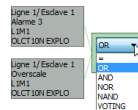
Ref.	Information
	characteristics identical to block 1 (C).
F	Button for adding a *Level 2* logic block.
G	*Level 3* logic function block usable only if a *Level 2* block has been configured. Other characteristics identical to block 1 (C).
H	Button for adding a *Level 3* logic block.
J	*Level 4* logic function block usable only if a *Level 3* block has been configured. Other characteristics identical to block 1 (C).
K	Button for adding a *Level 4* logic block.
L	*Level 5* logic function block usable only if a *Level 4* block has been configured. Other characteristics identical to block 1 (C).
M	Name of relay receiving the logic of blocks 1 to 5.
N	Button for adding a *Level 5* logic block.
O	List of available relays.
P	Confirms the configuration of the relay in question (M).
Q	Cancels any changes made and closes the window.

Comment on the limitations of the function editor

- The function editor can manage 512 *Level 1* logic blocks, 256 *Level 2* logic blocks, 128 *Level 3* logic blocks, 64 *Level 4* logic blocks and 32 *Level 5* logic blocks.

- Each of the 6 alarms of each detector can intervene only 16 times in all the *Level 1* logic blocks.

- Each of the 32 logic inputs can intervene only 16 times in all the *Level 1* logic blocks.

- Each *Level 1*, *2*, *3* or *4* logic block can intervene only once in the higher level logic blocks.

Function Creation Example

The example shows how the following logic function is created:

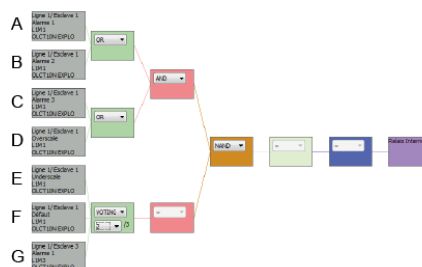[(A OR B) AND (B OR C)] NAND [(E, F, G) (Voting 2/3)]

REL_AE_00A

Figure 30: The logic blocks after programming

Start the function editor

1. Open the function editor by clicking the *Function Editor* button (Figure 25Figure 25, F).

2. Each block represents a logic level from *Level 1* to *Level 5* (from left to right). The last block corresponds to the relay to which the function is assigned. Each logic block carries out a logic function (OR, NOR, AND, NAND, VOTING). As the = symbol indicates a level without a logic function, the output is therefore equal to its input.

REL_AE_00B

Figure 31: The initial logic blocks

Create the block (A + B)

1. Select an event (Figure 28Figure 28, B) (in the example, the event referenced as A) and drag it to the first logic block (Figure 28Figure 28, C). As soon as the mouse button is released, the event is displayed to the left of the block.
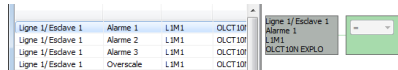
REL_AE_04

Figure 32: The event is assigned to the first block

2. Select a new event (Figure 28Figure 28, B) (in the example, the event referenced as B) and drag it in the same way to the first logic block (Figure 28Figure 28, C).
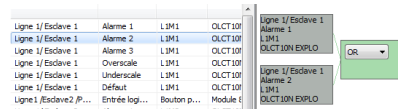
REL_AE_05

Figure 33: New event added to the input of the first block

3. In the block drop-down list, select the logic function to be applied.
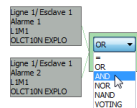
REL_AE_06

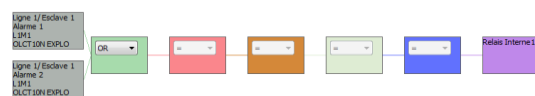**Figure 34: Selection of the logic function to be applied to the input of the first block**

REL_AE_07

Figure 35: The first block has been created

> To delete an event assigned to a block, right-click the event and select *Delete*. Likewise, to delete a logic block, right-click the block and select *Delete*.

Create the block (C + D)

1. Click the *Level 1* button to add a block.

2. Drag each of the two events to this second block and select the OR function. The procedure is identical to that explained for block (A + B).
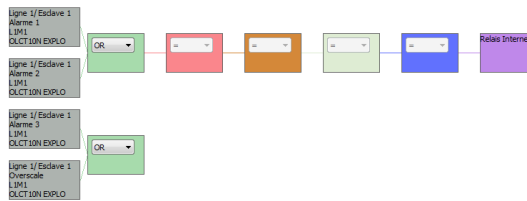
3. Everything looks as follows.

REL_AE_08

Figure 36: The two groups have been created

Create the AND function

1. To create the AND function between (A + B) and (C + D), drag the *Level 1* block (C + D) to the red Level 2 block.

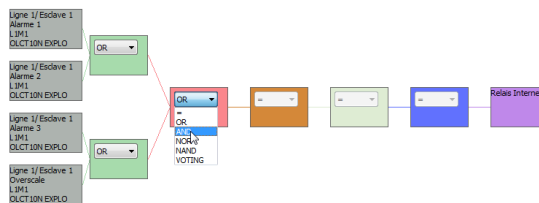2. In the *Level 2* block, select the AND function (see figure below).

REL_AE_09

Figure 37: The two groups are linked by the AND function

Create the *Voting* function

1. To create the [(E, F, G) (Voting 2/3)] function, click the *Level 1* button to add a block.

2. Drag at least three events to this block and select the *Voting* function and the number of inputs that must be present (here 2 out of 3).
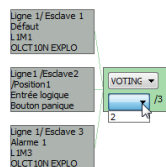
REL_AE_10

Figure 38: Selection of the *Voting* function and its levels
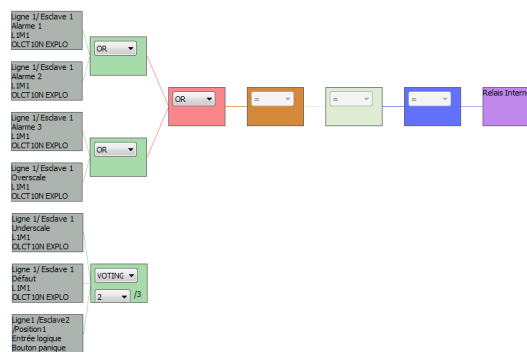
3. Everything now looks as follows.

REL_AE_11

Figure 39: Creation of the *Voting* function (2 out of 3).

Create the *NAND* function

The function editor only allows a block to be linked to a block of an **immediately higher** level. This means that it is impossible to link the *Level 1 Voting* block to the *Level 3* block (brown block). To overcome this restriction, you can simply add a *Level 2* block and use the logic function "=" (passing block).

Follow the steps below.
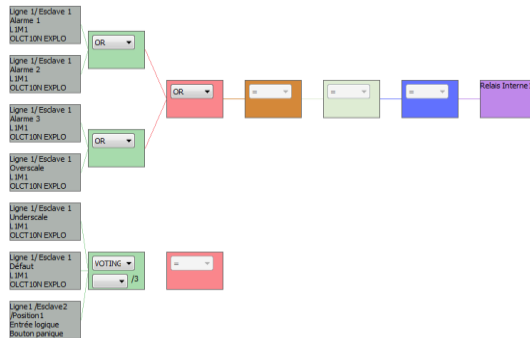
1. Click the *Level 2* button to add a new block.

REL_AE_12

Figure 40: The *Level 2* block attaches itself to the free *Level 1* block.

2. Drag the *Level 1* block to the *Level 2* block to create the link.

3. Then drag the *Level 2* block to the *Level 3* block (brown block) to create the link and then select the *NAND* function.
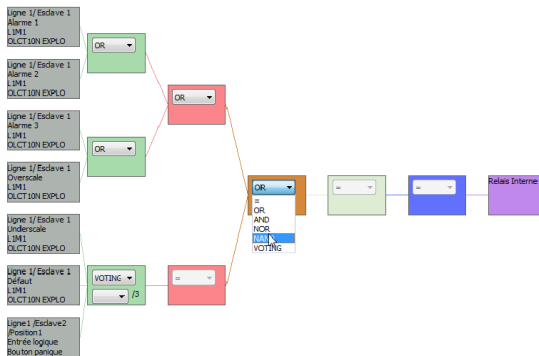
REL_AE_13

Figure 41: The two *Level 2* blocks are linked to the *Level 3* block by the *NAND* function

Completion

The required function [(A + B) x (B + C)] NAND [(E, F, G) (Voting 2/3)] has been created. Click the *OK* button to confirm and close the window.

Chapter 6 │ Configure Analog Outputs

Object

Program the 4-20 mA outputs of the *4-20 mA output modules* on the digital lines.

Overview of the Window

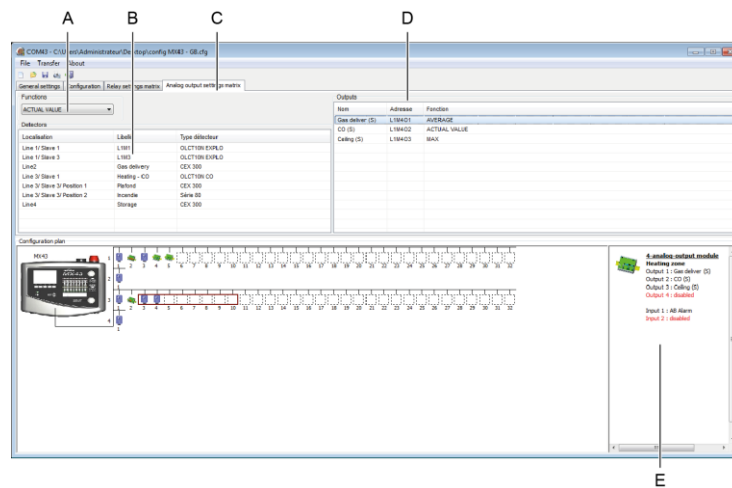The example below shows the configuration window for the analog outputs.

SA_01

Figure 42: The information displayed in the *Analog output settings matrix* tab

Ref.	Information	Page
A	Selection of function to be applied.	

- *Min*: the value of the output current is equal to the lowest measurement of a group of detectors (B).
- *Max*: the value of the output current is equal to the highest measurement of a group of detectors (B).
- *Average*: the value of the output current is equal to the average measurement of a group of detectors (B).
- *Actual value*: the value of the output current is identical to the signal from a single detector (B).

NB: when using the *Min*, *Max* and *Average* functions, it is essential that the detectors selected within a group are identical (same gas, same measurement range, etc.).

Ref.	Information	Page
B	List of available detectors.	
C	Tab for configuring the 4-20 mA outputs covered by this chapter.	
D	List of the 4-20 mA outputs and their associated function. If no function is shown, this indicates that the output has not been configured. Double-click an output line to display the configuration details. See Figure 43Figure 43.	
E	Displays the characteristics of the *4-20 mA 4-analog-output module* selected by the user (E).	

> To delete a function, right-click the corresponding output and select *Delete*. To modify a function, you must first delete it and then recreate it.

Output Configuration

Follow the steps below:

1. Having selected the *Analog output settings matrix* tab (Figure 42Figure 42, C), choose from the drop-down list (Figure 42Figure 42, A) the mathematical function to be used (*Min*, *Max*, *Average* or *Actual value*).

2. Using the mouse, and the CTRL or Shift keys if required, select one or more detectors (Figure 42Figure 42, B) and then drag them to the target 4-20 mA output (Figure 42Figure 42, D). The mathematical function used is updated (Figure 42Figure 42, D, *Function* column).

3. To access the configuration of an analog output, double-click the corresponding output (Figure 42Figure 42, D).

   The *Add* and *Delete* buttons allow you to add or delete detectors in the list of *Selected detectors* (D). Note that it is not possible to modify the function (C) from this screen.
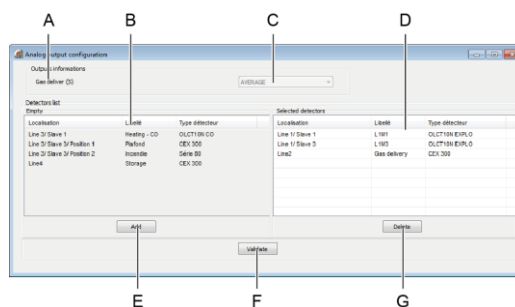

SA_03

Figure 43: Detailed information on an output

4. Click *Confirm* (F) to close the window and save any changes made.

5. The outputs of the *4-20 mA output module(s)* have been configured.

> It is advisable to save the configuration via *File > Save* or *File > Save as*.

Mis en forme : Vérifier l'orthographe et la grammaire

Chapter 7 │ Data Transfer

This chapter discusses the transfer of configuration data between the MX43 and the PC on which the COM43 application is installed.

Object

By the end of this chapter, the user will know how to transfer the configuration file created in the previous chapters to an *MX43* and also how to transfer the configuration data from an *MX43* to a PC so that it can be saved or modified.

PC to *MX43* Data Transfer

Configuration check

1. Start the *COM43* application and display the corresponding configuration file (*.cfg* extension) via *File > Open.*

2. In the menu bar, select *File > Configuration check*.

3. The message *Configuration Check OK* in the *Configuration check* window indicates that the configuration is correct and that it can be transferred to the *MX43*. If one or more notifications appear, correct the missing or incomplete elements before continuing.

Connect the *MX43*

1. Connect the PC to the programming port of the *MX43* ([Figure 44](#)Figure 44, A) using a USB cable.

2. Move the programming selector ([Figure 44](#)Figure 44, B) to position "1".

3. Press the *Reset* button ([Figure 44](#)Figure 44, C) on the microcontroller. The *MX43* switches to standby. The configuration file can now be transferred to the *MX43*.

> During the transfer phases, the *MX43* controller is not operational. Detection is no longer assured.

Transfer the configuration file

1. In the menu of the *COM43* application, select *Transfer > PC to MX43*.

2. In the window that opens, click *Transfer*.

3. At the end of the transfer, the *COM43* application displays *Transfer successful*.

Disconnect the *MX43*

1. Return the selector (Figure 44Figure 44, B) to position "0".

2. Remove the USB cable between the PC and the *MX43* (Figure 44Figure 44, A).

3. The *MX43* screen displays *Configuration update accepted*, and then the *MX43* restarts normally and launches an initialization cycle.
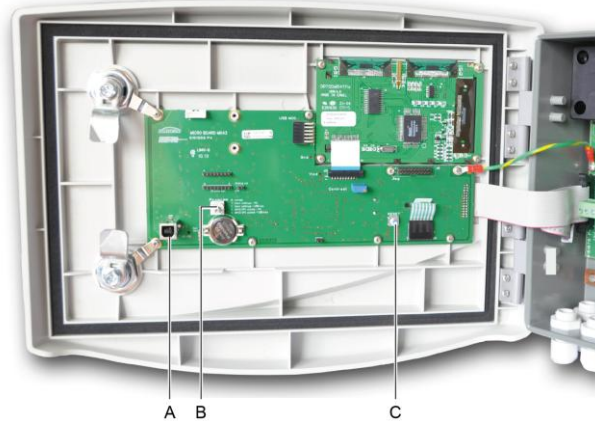

Figure 44: The elements used to connect an *MX43* and a PC

MX43 to PC Data Transfer

Connect the *MX43*

1. Connect the PC to the programming port of the *MX43* (Figure 44Figure 44, A) using a USB cable.

2. Move the *MX43* selector to position "1" (Figure 44Figure 44, B).

3. Press the *Reset* button (Figure 44Figure 44, C) on the microcontroller. The *MX43* switches to standby. The configuration file can now be transferred to the PC.

Transfer the configuration file

1. In the menu of the *COM43* application, select *Transfer > MX43 to PC*.

2. In the window that opens, select the destination folder for the configuration file, and then click *Transfer*. By default, the filename is in the following format: YYYYMMDDHHMMSS.cfg (year, month, day, hours, minutes and seconds).

3. At the end of the transfer, the *COM43* application displays *Transfer successful*. Click *OK*. The data from the configuration file transferred are displayed on the PC screen.

Disconnect the *MX43*

1. Return the selector to position "0" (Figure 44Figure 44, B).

2. Remove the USB cable between the PC and the *MX43* (Figure 44Figure 44, A).

3. The *MX43* restarts normally and launches an initialization cycle.

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We guarantee:

1 **Plus Points**

Through our customer service department, to respond quickly and efficiently to your needs for advice or order tracking anywhere in the world.
To respond as quickly as possible to all technical questions.

2 **Quality**

To ensure the highest quality products and services in accordance with the applicable international standards and instructions.

3 **Inspection and Reliability**

To provide you with reliable equipment. The quality of our production is an essential condition for this reliability. This is guaranteed by very stringent checks that are carried out from the arrival of raw materials, all the way through manufacture and at the end of manufacture (all equipment dispatched is configured to your individual requirements).

4 **Commissioning**

On request, to commission your equipment using our Ism-ATEX qualified engineers. An extra safety guarantee.

5 **Training**

To provide targeted training.

6 **Project department**

Our team will study all your gas and flame detection projects through on-site inspections or based on drawings. We can even offer preliminary design, design, installation and maintenance services for safety systems in ATEX or non-ATEX areas in accordance with the applicable standards.

7 **Maintenance contract**

To offer rolling maintenance contracts that are tailored to your needs in order to guarantee perfect safety:
- One or more inspections per year, including consumables.
- Renewable by tacit agreement.
- Including setting of fixed or portable gas detectors, and inspection of control systems.

8 **On-site repair**

To quickly send out our **After Sales Service** engineers. This is possible due to our local hubs in France and abroad.

9 **Factory repair**

To deal with any problems that cannot be solved on site by returning the equipment to the factory.
Teams of **specialist engineers** will be sent out to repair your equipment as quickly as possible, thereby minimizing the downtime.

For all After Sales Service in France, contact us by email at servicecenter@oldhamgas.com or by telephone on 0800-OLDHAM (0800 653 426).

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OUR MISSION

To protect people at work.

To provide the highest quality and best customer service

at every opportunity.

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OLDHAM
An Industrial Scientific Company

The Fixed Gas Detection People

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