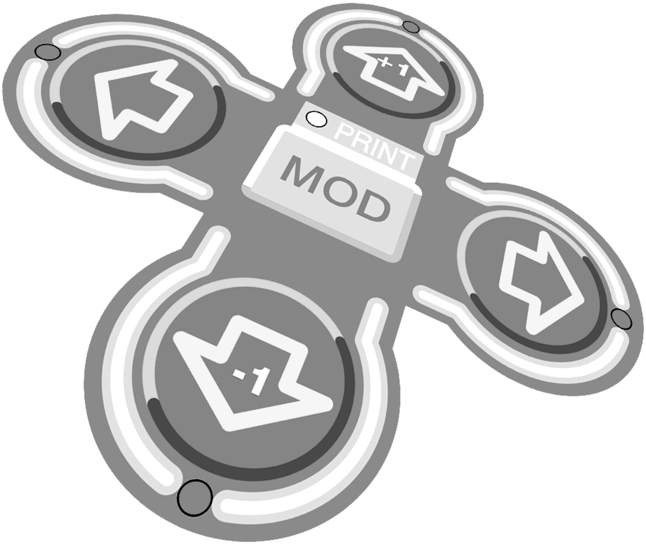
User manual
January

2001

Software
XBT-L1000 ver 3.60

# Magelis range
# Graphic
# XBT-F / TXBT-F
# Tome 2



Merlin Gerin
Modicon
Square D
Telemecanique

Schneider Electric

## ⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter, and apply this product.

XBT-L100x V 3.6 and later software should only be used with hardware dated 98 25 and later.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

# General Contents

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| Application specifications, development with XBT-L1000 software, saving the application, transferring the application to the terminal. | **Application Development With XBT-L1000** | **B** |
| PLC and terminal communications dialog principle, dialog tables, dialog cycle. | **PLC and Terminal Communications Dialog** | **C** |
| Terminal keys and indicator lights, operating principle, page display, entering and modifying fields, alarms, alarm log, process control, key locking, printing, terminal configuration. | **Operating the Terminal** | **D** |
| Application specifications, page template architecture, creating the applications using XBT-L1000, transferring the application to the terminal, running the application. | **Application Development Example** | **E** |
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# Chapter A
# Introduction

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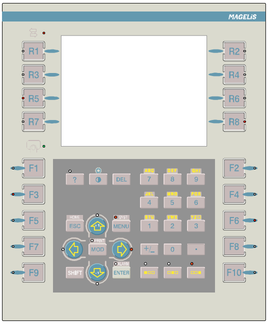
# 1. Man/machine communications dialog using Graphic Magelis terminals

## Terminals with keyboard

The main functions of the terminals are to:
- Display data from the control system
- Modify the control system parameters
- Control the system using discrete commands.

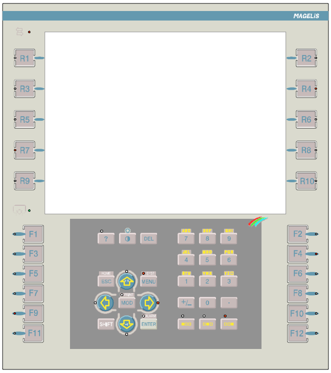
Various terminals are available:

### XBT-F 5"


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
?
DEL
7
8
9
4
5
6
ESC
MENU
1
2
3
MOD
+/-
0
.
SHIFT
ENTER

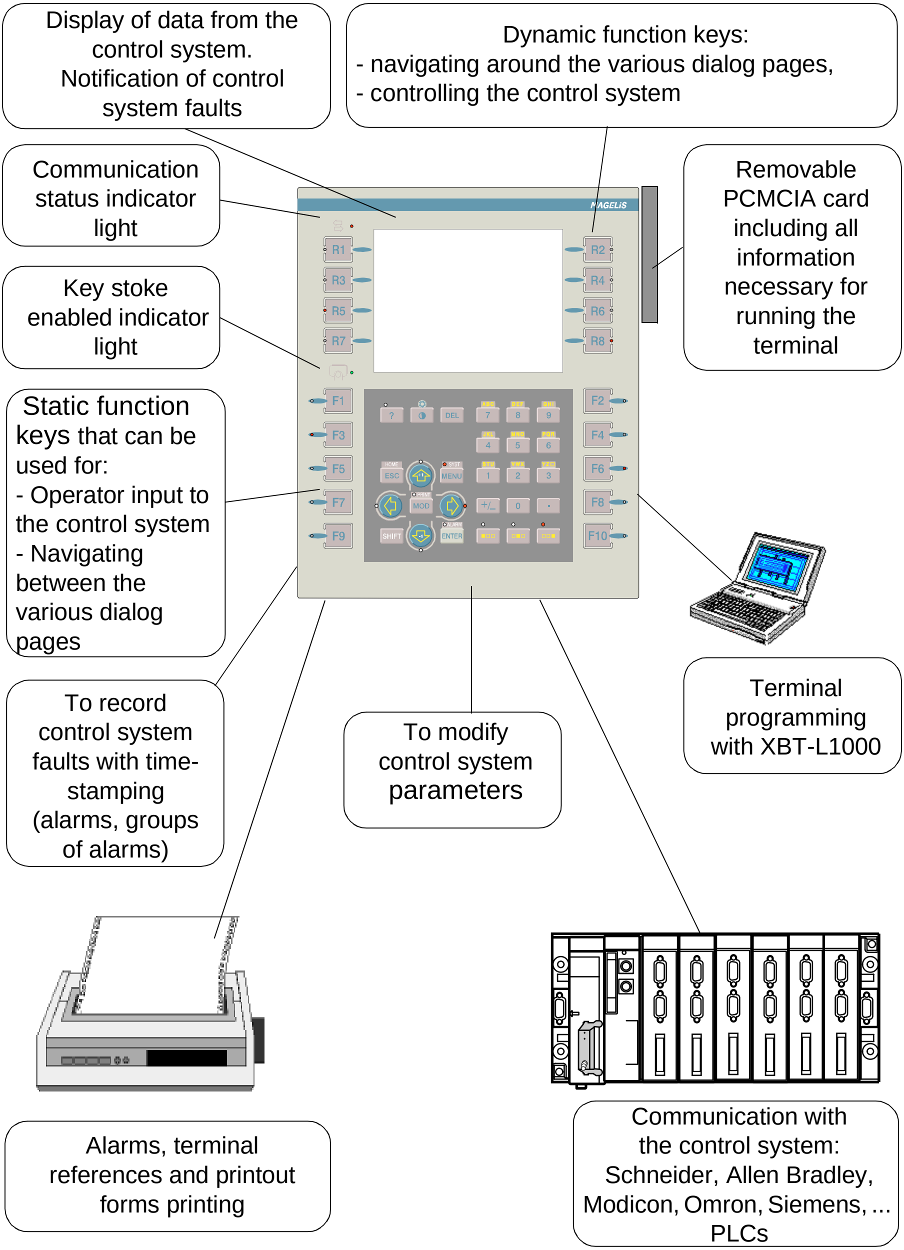
Terminals with LCD screen.
STN Monochrome, 16 gray scale,
320x240 pixels.
10 static function keys.
8 dynamic function keys.
System and
alphanumeric keys.
Downloadable protocols.
Printer output.

### XBT-F 10"


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
?
DEL
7
8
9
4
5
6
ESC
MENU
1
2
3
MOD
+/-
0
.
SHIFT
ENTER

Terminals with LCD screen.
STN Monochrome (9.5") or
TFT color (10.4"), 256 colors.
640x480 pixels.
12 static function keys.
10 dynamic function keys.
System and alphanumeric keys.
Downloadable protocols.
Printer output

# 1. Man/machine communications dialog using Graphic Magelis terminals


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
?
DEL
ABC 7
DEF 8
GHI 9
JKL 4
MNO 5
PQR 6
HOME ESC
SYST MENU
STU 1
VWX 2
YZ 3
MOD
PRINT
+/_
0
.
SHIFT
ALARM ENTER

Display of data from the control system.
Notification of control system faults

Dynamic function keys:
- navigating around the various dialog pages,
- controlling the control system

Communication status indicator light

Removable PCMCIA card including all information necessary for running the terminal

Key stoke enabled indicator light

Static function keys that can be used for:
- Operator input to the control system
- Navigating between the various dialog pages

Terminal programming with XBT-L1000

To record control system faults with time-stamping (alarms, groups of alarms)

To modify control system parameters

Alarms, terminal references and printout forms printing

Communication with the control system: Schneider, Allen Bradley, Modicon, Omron, Siemens, ... PLCs

# 1. Man/machine communications dialog using Graphic Magelis terminals

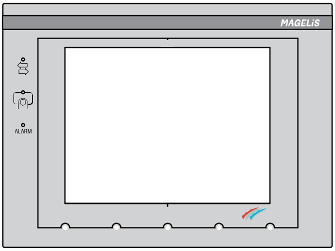
## Touchscreen terminals

The main functions of the touchscreen terminals are to:
- Display data from the control system,
- Modify the control system parameters,
- Control the system using discrete commands.

Various terminals are available:

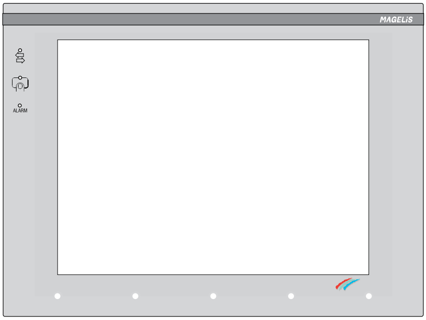
### Touchscreen XBT-F 5"

Resistive matrix touchscreen pad.
6x8 touchscreen zones.
Terminals with LCD screen.
STN color, 256 colors,320x240 pixels.
Downloadable protocols.
Printer output.

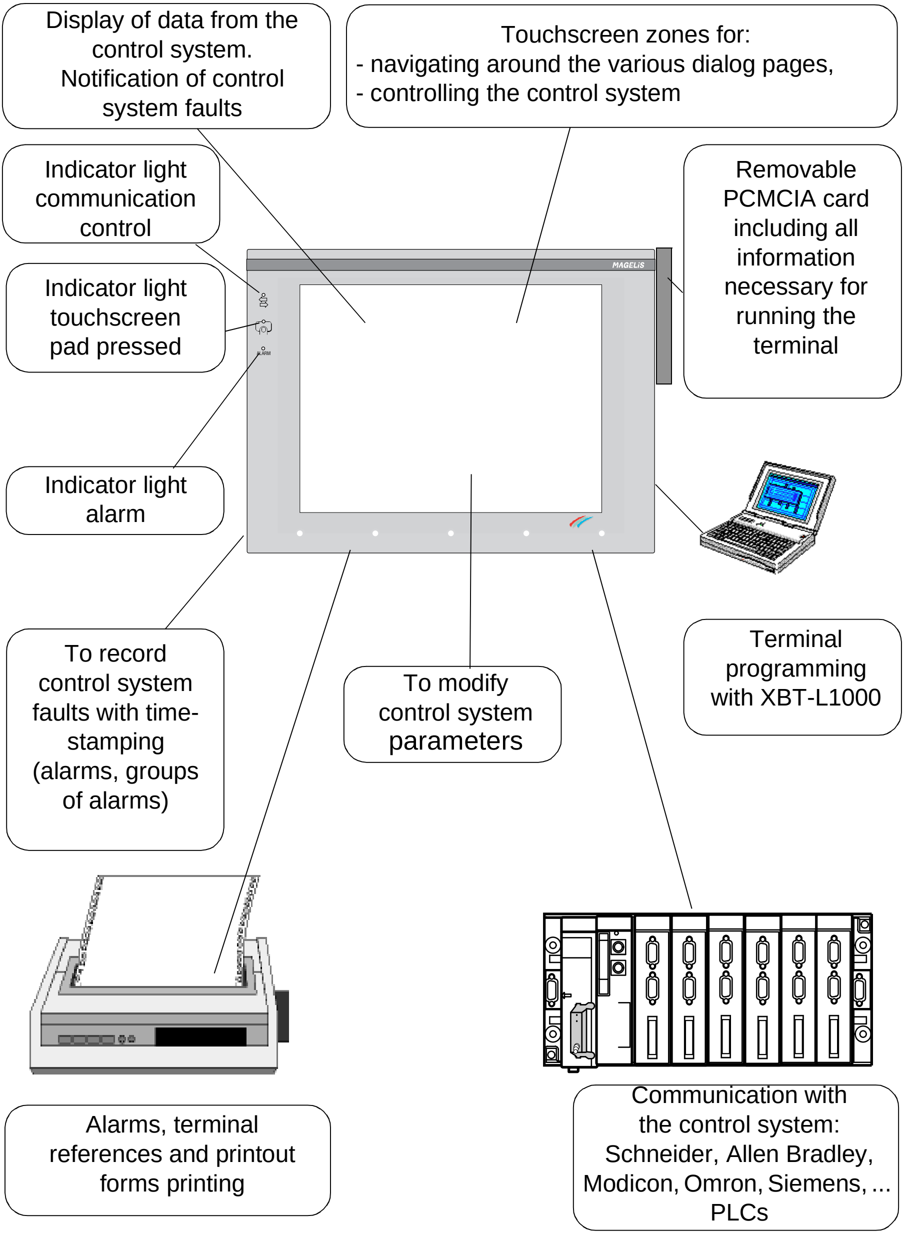


### Touchscreen XBT-F 10"

Resistive matrix touchscreen pad.
10x13 touch screen zones.
Terminals with LCD screen.
TFT color, 256 colors,
(10.4" screen)
640x480 pixels.
Downloadable protocols.
Printer output.



# 1. Man/machine communications dialog using Graphic Magelis terminals



Display of data from the control system. Notification of control system faults

Touchscreen zones for:
- navigating around the various dialog pages,
- controlling the control system

Indicator light communication control

Indicator light touchscreen pad pressed

Indicator light alarm

Removable PCMCIA card including all information necessary for running the terminal

Terminal programming with XBT-L1000

To record control system faults with time-stamping (alarms, groups of alarms)

To modify control system parameters

Alarms, terminal references and printout forms printing

Communication with the control system: Schneider, Allen Bradley, Modicon, Omron, Siemens, ... PLCs

# 1. Man/machine communications dialog using Graphic Magelis terminals

## Terminals with touch keys

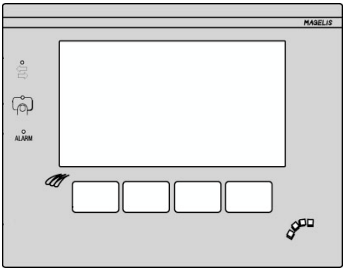
The main functions of the terminals with tactile keys are to:

- Display data from the control system,
- Modify the control system parameters,
- Control the system using discrete commands.

Various terminals are available:

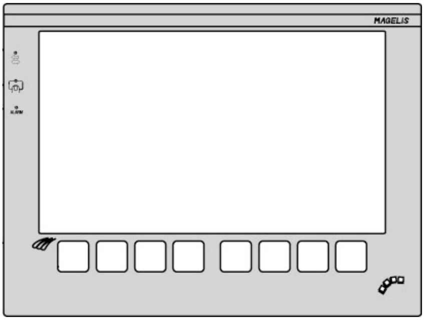
### Tactile XBT-FC 5" 1 keys row

Resistive matrix tactile pad.
4x8 tactile zones.
4 tactile keys on 1 row at the bottom of the screen,
Terminals with LCD screen.
STN color, 256 colors, 320*240 pixels.
Downloadable protocols.
Printer output.



### Tactile XBT-FC 10" 1 keys row

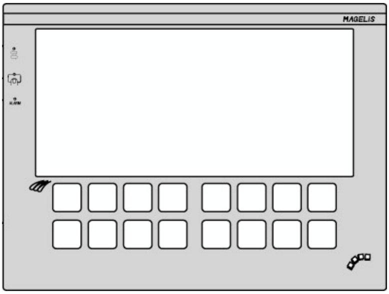
Resistive matrix tactile pad.
8x13 tactile zones.
8 tactile keys on 1 row at the bottom of the screen,
Terminals with LCD screen.
TFT color, 256 colors,
(10.4" screen)
640*480 pixels.
Downloadable protocols.
Printer output.



# 1. Man/machine communications dialog using Graphic Magelis terminals

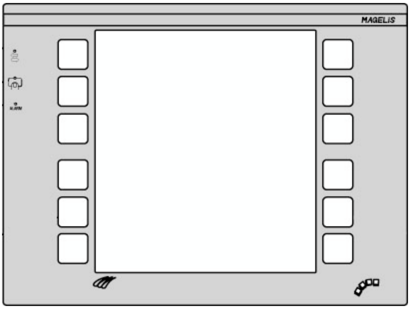
### Tactile XBT-FC 10"
### 2 keys rows

Resistive matrix tactile pad.
6x13 tactile zones.
2x8 tactile keys on 2 rows at the bottom of the screen,
Terminals with LCD screen.
TFT color, 256 colors,
(10.4" screen),
640*480 pixels.
Downloadable protocols.
Printer output.

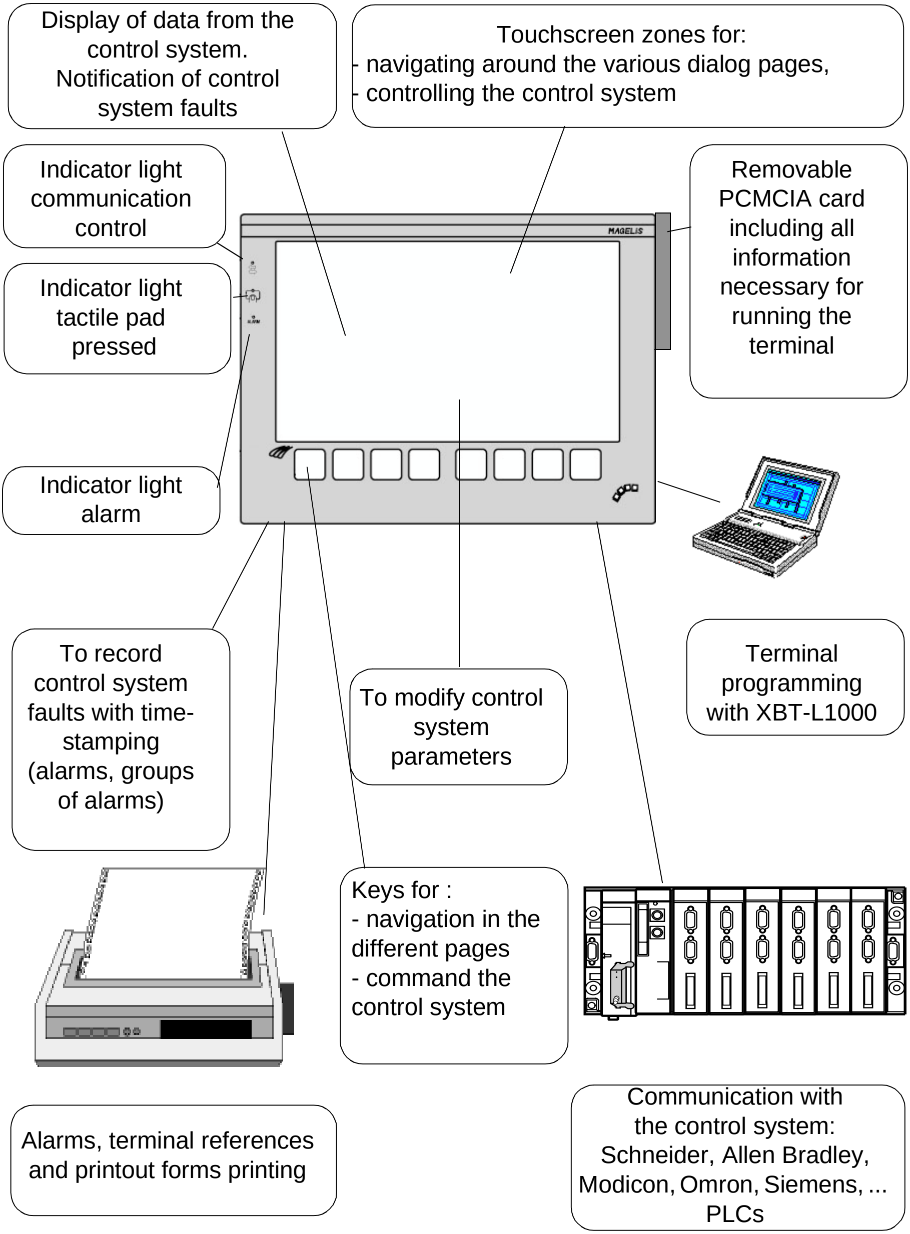


### Tactile XBT-FC 10"
### 2 keys columns

Resistive matrix tactile pad.
10x9 tactile zones.
2x6 tactile keys on 2 columns,
Terminals with LCD screen.
TFT color, 256 colors,
(10.4" screen),
640*480 pixels.
Downloadable protocols.
Printer output.



# 1. Man/machine communications dialog using Graphic Magelis terminals



Display of data from the control system.
Notification of control system faults

Touchscreen zones for:
- navigating around the various dialog pages,
- controlling the control system

Indicator light communication control

Indicator light tactile pad pressed

Removable PCMCIA card including all information necessary for running the terminal

Indicator light alarm

To record control system faults with time-stamping (alarms, groups of alarms)

To modify control system parameters

Terminal programming with XBT-L1000

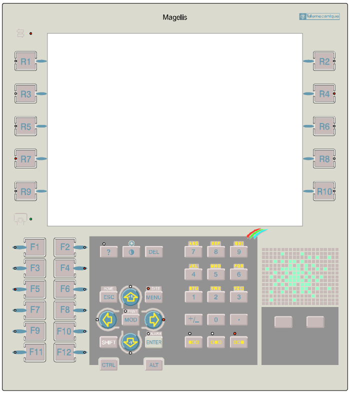
Keys for :
- navigation in the different pages
- command the control system

Alarms, terminal references and printout forms printing

Communication with the control system: Schneider, Allen Bradley, Modicon, Omron, Siemens, ... PLCs

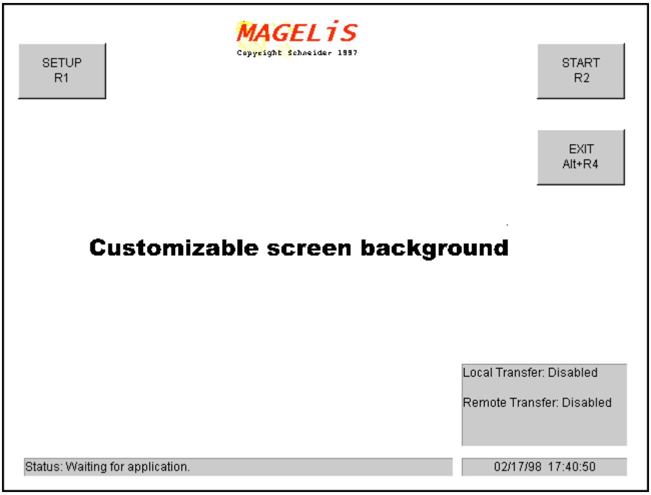
# 1. Man/machine communications dialog using Graphic Magelis terminals

## TXBT Terminals


Magelis
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
?
DEL
7
8
9
4
5
6
ESC
MENU
1
2
3
MOD
+/_
0
.
SHIFT
ENTER
CTRL
ALT

Terminals with LCD color screen
(640*480 pixels)
(10.4" screen: TXBT-F024)
1.6 Gb hard disk
Windows 95
12 static function keys
10 dynamic function keys
System and alphanumeric keys
Pointing device (except TXBT-F034)
Downloadable protocols
Printer output
External keyboard connection
Slots for 2 ISA bus cards

### Application home screen


MAGELiS
Copyright Schneider 1997
SETUP
R1
START
R2
EXIT
Alt+R4
Customizable screen background

Local Transfer: Disabled

Remote Transfer: Disabled

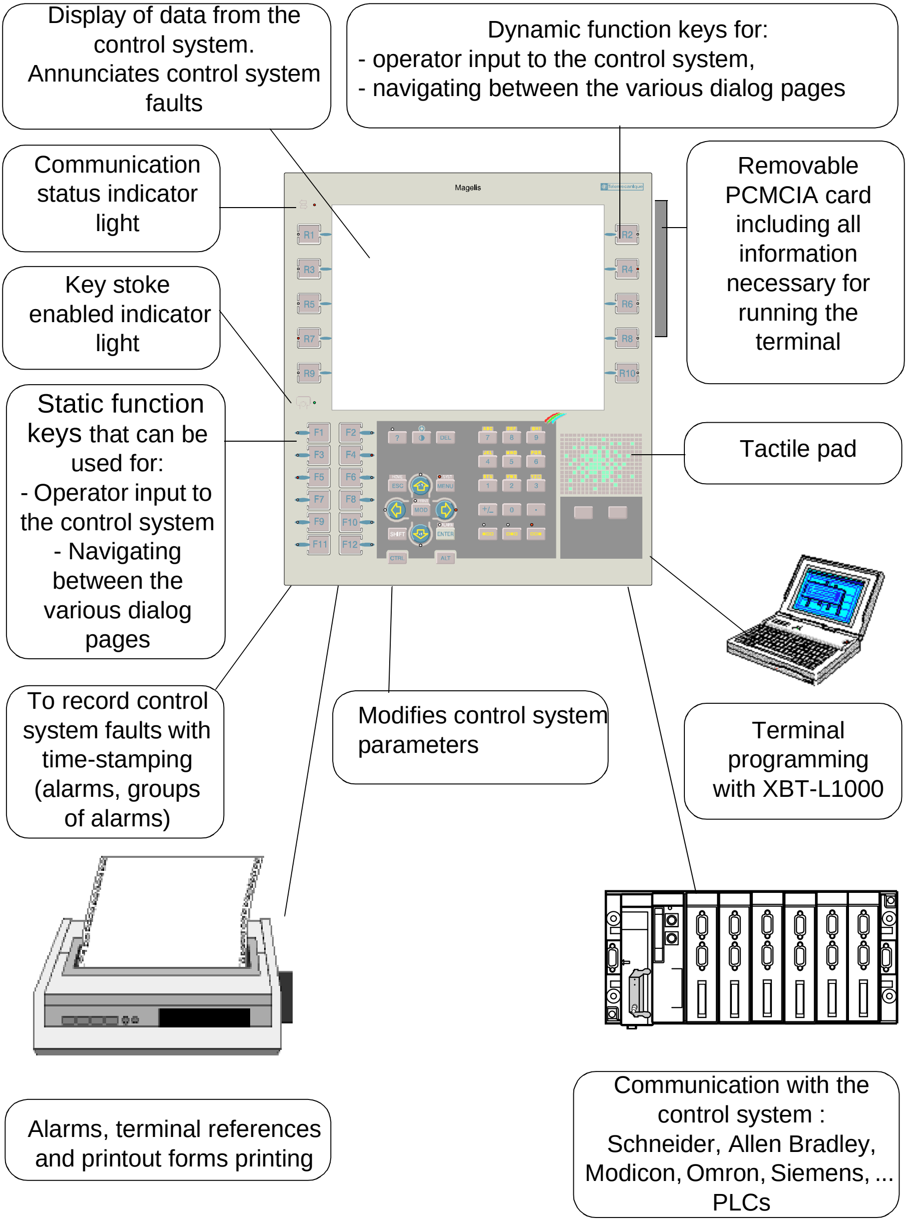
Status: Waiting for application.

02/17/98 17:40:50

The functions possible from the home screen (using the dynamic keys) are:
- Startup of Graphic Magelis applications
- Access to Windows 95
- Closure of home screen
- Setup: terminal parameters setup

For more information refer to the TXBT documentation.

# 1. Man/machine communications dialog using Graphic Magelis terminals


Magelis
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
DEL
ESC
MENU
MOD
SHIFT
ENTER
CTRL
ALT

Display of data from the control system. Annunciates control system faults

Dynamic function keys for:
- operator input to the control system,
- navigating between the various dialog pages

Communication status indicator light

Key stoke enabled indicator light

Removable PCMCIA card including all information necessary for running the terminal

Static function keys that can be used for:
- Operator input to the control system
- Navigating between the various dialog pages

Tactile pad

To record control system faults with time-stamping (alarms, groups of alarms)

Modifies control system parameters

Terminal programming with XBT-L1000

Alarms, terminal references and printout forms printing

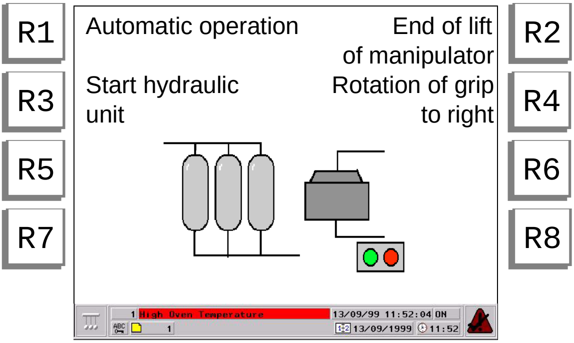
Communication with the control system : Schneider, Allen Bradley, Modicon, Omron, Siemens, ... PLCs

# 1. Man/machine communications dialog using Graphic Magelis terminals

The following application examples may be configured with the Graphic Magelis:

Production monitoring

Ex.


R1
R2
R3
R4
R5
R6
R7
R8

Automatic operation

End of lift of manipulator

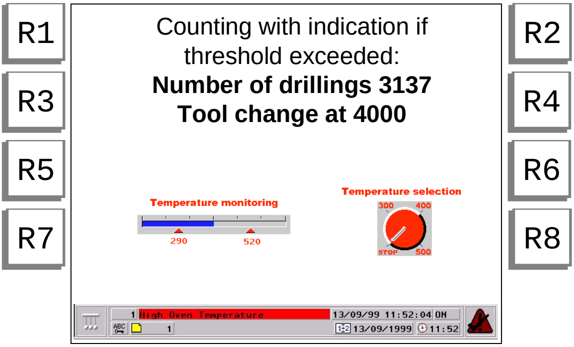
Start hydraulic unit

Rotation of grip to right

1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52

Preventive maintenance

Ex.


R1
R2
R3
R4
R5
R6
R7
R8
Temperature monitoring
290
520
Temperature selection
300
400
STOP
500

Counting with indication if threshold exceeded:

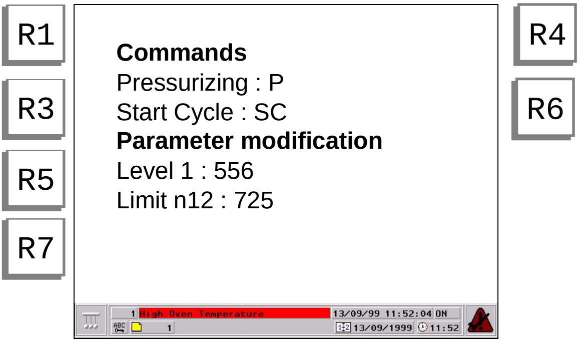
**Number of drillings 3137**

**Tool change at 4000**

1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52

Process control

Ex.


R1
R4
R3
R6
R5
R7

**Commands**
Pressurizing : P
Start Cycle : SC
**Parameter modification**
Level 1 : 556
Limit n12 : 725

1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52

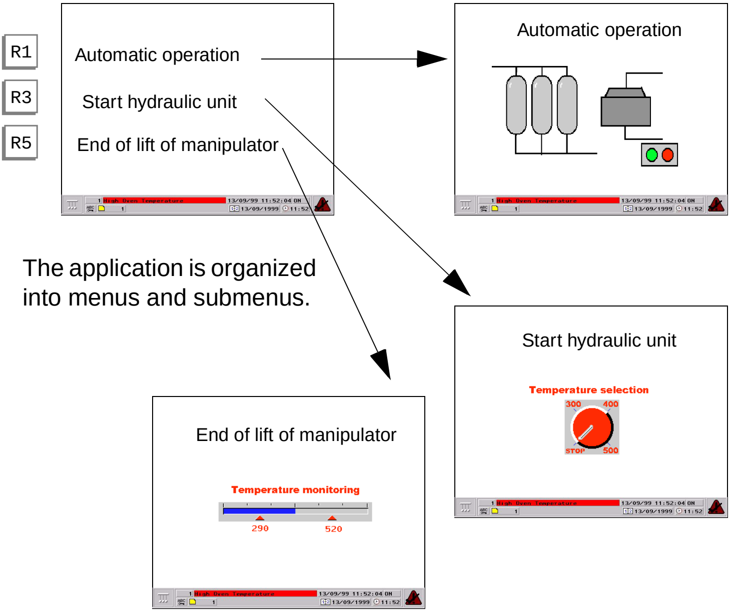
# 2. Structure of the applications

An application represents the entire dialog between the user and the automated process. An application is developed based on the user requirements:

- User Requirement Control System Interface
    - Process control
    - Production monitoring
    - Preventive maintenance
    - ...
- Operator Concerns
    - User interface
    - Level of involvement
    - ...
- Developer Concerns
    - Program structure
    - Data structure
    - Debugging
    - Updating

These characteristics determine that your application must be structured. An application consists of a series of pages, which form a tree structure as shown in the following example:

Ex.


R1
R3
R5
Automatic operation
Start hydraulic unit
End of lift of manipulator
Automatic operation
Start hydraulic unit
Temperature selection
300
400
STOP
500
End of lift of manipulator
Temperature monitoring
290
520
High Oven Temperature
13/09/99 11:52:04 ON
13/09/1999
11:52

The application is organized into menus and submenus.

Each page may include the following:

- **Static / Dynamic alphanumeric text**

- **Variable fields used to:**
  - Display the values indicating control system status (status of a bit, a single or double word, a floating point word, or an ASCII string); or
  - Enter parameters for operating the control system (modification of bits, single or double words, floating point words, or an ASCII string).
    The display format can be binary, decimal, hexadecimal, or alphanumeric.

- **Static dynamic graphic objects**

- **Dynamic function keys objects** allowing the user to display other pages directly, or command the process, or start a Windows 95 application (TXBT).

- A page is identified by **a number, and a name** (optional).

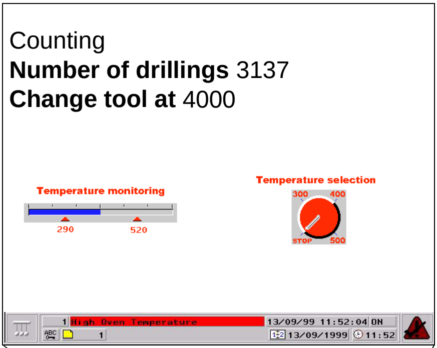
- Pages may be accessed by pressing the keypad function keys or the control system.
  Pages are called up by :
  - pressing a physical function key for terminals with keyboard,
  - pressing a "virtual" function key called tactile zone for terminals with a tactile screen,
  - pressing a "virtual" function key called tactile zone or tactile key for terminals with tactile keys (XBT-FC),

- The arrow keys are used to navigate within a page. Navigation consists of selecting various input fields.

- Access to pages may be password protected.

## Creating pages

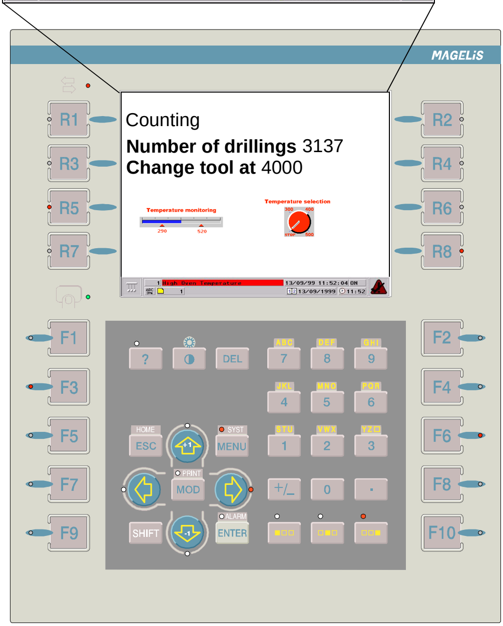
The various elements making up pages are defined using the XBT-L1000 programming software, and then saved in the terminal.
Application pages may be accessed by pressing a configured function key or using the control system variable to initiate a page change.
The development page has the same dimensions as the screen in the graphics display of the configuring software. This means that the appearance of the page being developed is exactly the same as the page being run on the XBT.



Counting
**Number of drillings** 3137
**Change tool at** 4000

Temperature monitoring
290
520
Temperature selection
300
400
STOP
500
1 High Oven Temperature
13/09/99 11:52:04 ON
ABC
1
13/09/1999
11:52

Page displayed by XBT-L1000 on the development PC



MAGELiS
R1
R2
R3
R4
R5
R6
R7
R8
Counting
Number of drillings 3137
Change tool at 4000
Temperature monitoring
Temperature selection
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
?
DEL
ABC 7
DEF 8
GHI 9
JKL 4
MNO 5
PQR 6
HOME ESC
SYST MENU
STU 1
VWX 2
YZ 3
PRINT MOD
+/_
0
.
SHIFT
ALARM ENTER

# 2. Structure of the applications

## Pages Types

In operational phase, the terminal uses the system pages and the pages defined for the application.

### System pages

Pre-configuerd by the terminal manufacturer provide:
- access to the list of pages, alarms, recipes and forms,
- access to alarm history,
- password entry,
- definition of the terminal parameters,
- definition of the protocol parameters,
- definition of the printer parameters,
- stop of printing in progress,
- access to the terminal adjustment function,
- printing of the terminal reference list.

An application can include several types of pages:

### Application pages

Used to monitor system status, control, command, and control system parameter modification (see § 3. Application pages, Page 20).

### Alarm pages

Used to display control system fault and the corrective actions indicating with display priority (see § 4. Alarm pages, Page 26).

### Help pages

Used to display information associated with an application or alarm page (see § 5. Help pages, Page 30).

### Form pages

Used to print out printout forms (see § 6. Form pages, Page 31).

**Note** **Form pages cannot be displayed on the terminal. They are used for printing only.**

### Model pages:

The designer has page models at his disposal. These are background pages containing text and static graphic objects that can be used as a starting point for application page development. Three types of page models can be configured:

- Application and recipe model page
- Alarm model page
- Help model page

From the basic models, the application developer can create new models using the default basic models.
During editing of the application, alarm, or help pages, the objects of the model will appear to be greyed out and cannot be modified.

General rules to follow when configuring an application:

- A model can be used by several pages, thus the application developer will not have to create several times common objects related to those pages.
- One and only one model is associated with each page.
- A dialog application may contain several models.
- Any given model can be associated with several different pages.
- A model type (application/alarm/help model) is associated with a page type (application/alarm/help page).

# 3. Application pages

The application pages represent the basic dialog architecture and are used to:
- Monitor the control system
- Perform operations on the control system
- Maintain the control system

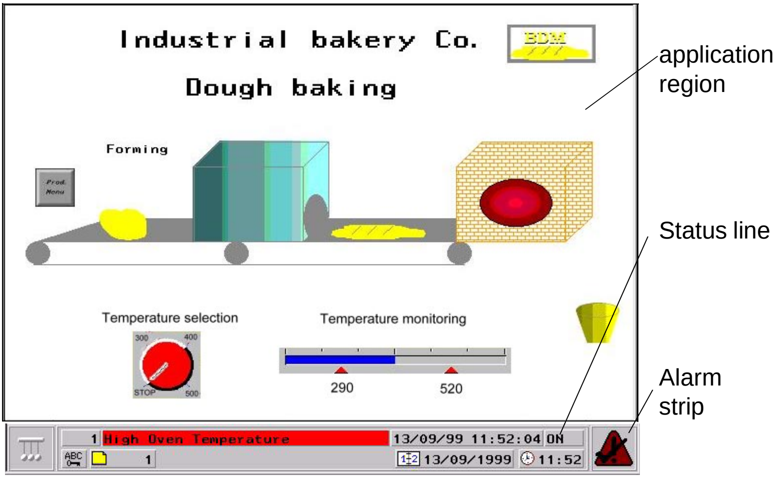
### Structuring the pages

It is advisable to organize the application pages so that they reflect the various stages of the **control process**. The XBT-L1000 software allows you to do this.

## Composition of the application pages

An application page consists of 3 parts:
- Application region,
- Status line,
- Alarm strip.

Ex.


Industrial bakery Co.
BDM
Dough baking
Forming
Prod. Menu
Temperature selection
300
400
STOP
500
Temperature monitoring
290
520
application region
Status line
Alarm strip

1 High Oven Temperature 13/09/99 11:52:04 ON

ABC 1 13/09/1999 11:52

## The application region

It may contain the following :

- Static alphanumeric texts,
- Variable fields,
- Static graphic objects,
- Dynamic graphic objects,
- Dynamic function keys or touchscreen zone according to the terminal type,
- Optional alarm bar showing the last activated alarm.

Details concerning variable fields and dynamic graphic objects.
When creating an application with XBT-L1000, PLC variables are associated with the variable fields and the dynamic graphic objects.

### For XBT-F

The accessible variables are single words, double words, floating words, word bits and ASCII strings.

**Note** **For the MODBUS and MODBUS PLUS protocols, other types of variables are managed, see the service instruction related to the protocols.**

### For TXBT

In the case of XWAY protocols, the accessible variables are:

- Single words, double words, floating words, word bits,
- Local and remote input/output bit,
- double internal words,
- constant words,
- internal words
- internal words bit,
- internal bit,
- System bit,
- Step bit,
- Step macro bit,
- Step input step bit,
- Step macro output step bit,

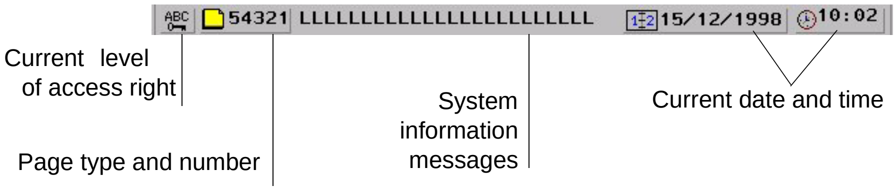
In the case of a protocol other than XWAY, the accessible variables are single words, double words, floating words, and word bits.

# 3. Application pages

---

### Status line

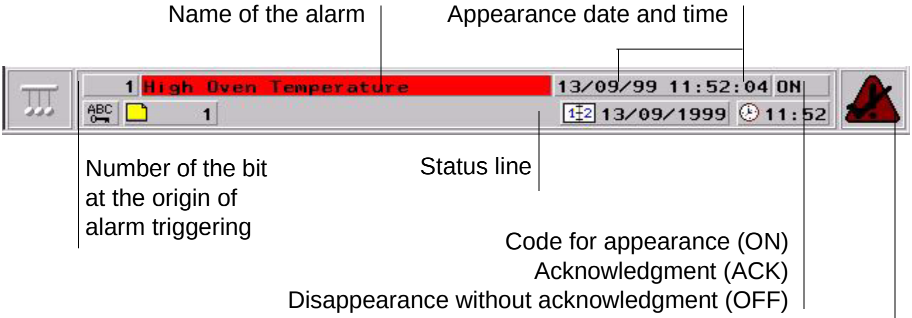
This status line appears by default in the page model and may be optional. When it is present, the status line is always on the last line of the display. It provides the user with contextual information and identifiers.


54321 LLLLLLLLLLLLLLLLLLLLLLLL 15/12/1998 10:02

Current level of access right
Page type and number
System information messages
Current date and time

### Alarm strip

The alarm strip is displayed by default in the page model. It can be moved or deleted. It mainly displays the message of the last alarm displayed not acknowledged by the operator.


1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52

Name of the alarm
Appearance date and time
Number of the bit at the origin of alarm triggering
Status line
Code for appearance (ON)
Acknowledgment (ACK)
Disappearance without acknowledgment (OFF)

**Absent**: no alarm
**Steady yellow** : alarm acknowledged (ACK) - Alarm at state ON
**Steady green**: alarm at state OFF (must be acknowledged if the caracteristic of the alarm is to be acknowledged)
**Flashing red**: alarm at state ON

# 3. Application pages

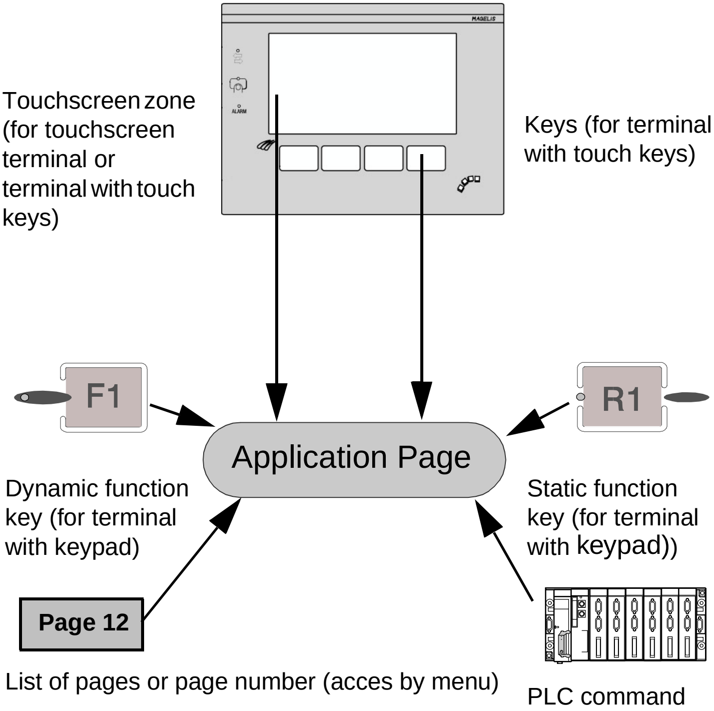
## Accessing the application pages

The application pages can be accessed by :

- Pressing a dynamic function key (when configured),
- Pressing a static function key (when configured),
- Selecting a page from the list of pages,
- Pressing a virtual key shown on a touch terminal screen,
- Pressing a virtual key shown on the screen or pressing a key in the case of a terminal with touch keys,
- Selecting the page number in the list of pages,
- A command from the PLC.

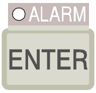
Depending on the selected configuration, certain application pages may only be accessible in a protected mode. Protected mode management is controlled by page access passwords.

Ex.


MAGELIS
ALARM
Touchscreen zone (for touchscreen terminal or terminal with touch keys)
Keys (for terminal with touch keys)
F1
R1
Application Page
Dynamic function key (for terminal with keypad)
Static function key (for terminal with keypad))
Page 12
List of pages or page number (acces by menu)
PLC command

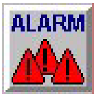
## Displaying the alarm list

A list of active alarms may be accessed from any application page.



### Access from terminals with keypad

An indicator light and the alarm symbol on the service line indicate that it is possible to access the list of alarms.
The list of alarms can be displayed by pressing the ALARM key (SHIFT+ENTER).

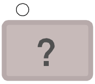


### Access from touchscreen terminals

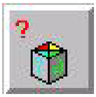
The list of alarms can be displayed by pressing this icon on the status line.

## Getting help

The availability of help is indicated by the " **?**" key indicator light on the keypad. You can display the help page by pressing this key.
Press the ESC key to exit the help page and return to the page from which you asked for help.



Press the **ESC** key (or press the ? key again) or leave a one-minute time-out to exit the help page and return to the page from which you asked for help.



The help page on a touchscreen terminal can be accessed by pressing the help icon to call up the help page.

Help pages can be associated with application pages or alarm pages.

# 3. Application pages

---

## Recipe pages

A recipe page is created from a page model used for a specific application.

It is mainly used to :

- "record" a process status at a given moment,
- manually adjust the setup parameters,
- locally store these values on the terminal,
- re-use the statuses stored,
- transfert to the PLC all the values in one single task.

The main advantage of a recipe page is that it can store up to 5000 variable values :

- in 1 to 125 recordings in the case of XBT-F,
- in a number of recordings limited by the capacity of the PCMCIA card, or the hard disk in the case of TXBT.

The recipe function avoids repetitive entries for the user.

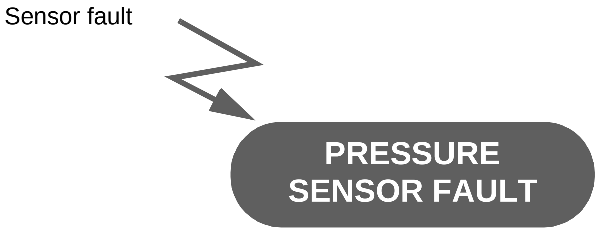
# 4. Alarm pages

The purpose of the alarm pages is to display a control system's fault indications and a list of possible corrective actions. The advantage of an alarm page is to provide an event-related display. Each alarm page is associated with:

- a description of 32 characters maximum,
- one or several control system word bits. If one of the word bit is set to 1, the alarm is displayed. Control system bits can also be associated with the alarm page on a TXBT.

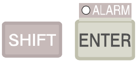
Ex.

A sensor fault occurs. The bit associated with the sensor fault changes to 1 in the control system.



## Alarm indication from an application page

- The status line indicates the last alarm.
- The alarm strip displays the message of the latest alarm activated (see "Composition of the application pages", Page 20).



(keyboard)

●

ALARM
(touchscreen)

- Alarm indicator light: The "Alarm" indicator light indicates the status of the alarm list to the operator at all times:
  - Off: the current list of alarms is empty.
  - On: the list contains alarms that have already been displayed.
  - Flashing: the list of alarms contains new alarms.
  - Flashing: the list of alarms contains the latest alarms since last display of the list of alarms by the operator.

# 4. Alarm pages

## ⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

The XBT does not support any type of processor nor machine control in association with alarms. It is the designer's responsibility to consider programming PLC logic to account for programmed alarms.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

## Composition of the alarm pages

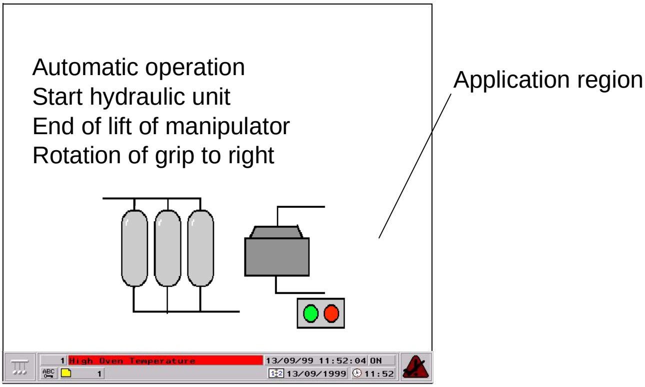
An alarm pages consists of 3 parts:
- Application region,
- An alarm strip,
- Status line.

### Application region

The application region of an Alarm page can contain the same objects as an application page. (You cannot access the applications region of an alarm page using a function key).

Example of an alarm page

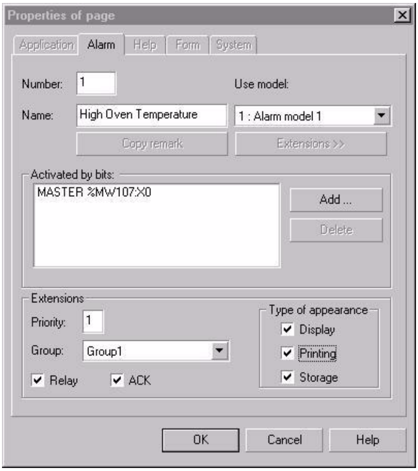
Ex.



Automatic operation
Start hydraulic unit
End of lift of manipulator
Rotation of grip to right

1 High Oven Temperature 13/09/99 11:52:04 ON
ABC 1 13/09/1999 11:52

The XBT-L1000 software allows you to define the properties of the alarm pages



Number: 1

Use model: 1 : Alarm model 1

Name: High Oven Temperature

Activated by bits: MASTER %MW107:X0

Priority: 1

Group: Group1

☑ Relay ☑ ACK

☑ Display

☑ Printing

☑ Storage

### Status line

It is identical to the one displayed on the application pages (see § 3. Application pages, Page 20).

### Alarm indicating

- It is possible to force the operator to acknowledge the alarms so that they can be erased from the list of active alarms; this is useful for transient alarms.
- The terminals have a relay output whose contact is closed when an alarm appears. This function can be configured for each alarm page.

## Advantages of alarm pages

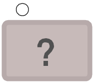
- It is possible to assign a priority to an alarm page (1 to 16, with 1 as the highest priority).
- It is possible to record (log) alarm pages to help control system troubleshooting.
- The alarms are time-stamped.
- Alarms may be configured to require an operator to acknowledge an alarm before continuing process operation; this is useful for transient alarms and troubleshooting.
- The terminals have a relay output whose contact can be closed when an alarm appears. This function can be configured for each alarm page.

**Note** **This relay opens upon a power loss. The relay's contacts are normally open (N.0.).**

## Group of alarms

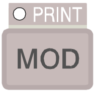
A group of alarms is a set of alarms identified by different color attributes. Each defined group may have its own unique colors that indicate the status of the alarm. The alarm active, alarm cleared, and alarm acknowledged colors make the alarm's status easily recognized by the operator. There are 16 groups of alarms. Each group is identified by an 8-character name enabling rapid identification by the operator.

### Getting help

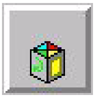


The availability of help is indicated by the " **?**" key indicator light on the keyboard. Press this key to display the help page.
Press the ESC to exit the help page.

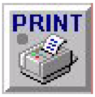
### Printing



On keybaord terminals, accessing to the print function may be performed from the alarms list page or history alarms by means of PRINT key (SHIFT + MOD).



then



The print function from the alarm list page or alarm history page on the touchscreen terminal is accessed by pressing the status icon and then by pressing the print icon.

Whatever the page displayed, a command from the PLC allows the history and list alarms printing (see chapter B, § 4. Configuring the communications dialog table, Page 12).

# 5. Help pages

Help pages can be associated with an application page or with an alarm page. The help page associated with an application page can be used for:
- Information about elements of the page,
- Information about process control.

The help page associated with an application page can be used to provide operator information about control system faults and a list of corrective actions. A help page consists of three parts:
- Application region,
- An alarm strip,
- Status line.

## Application region

It can include the following:
- Static alphanumeric texts,
- Static graphic object.

## Status line

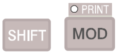
The status line is identical to the one displayed on the application pages (see "Composition of the application pages", Page 20).

## Alarm strip

The alarm strip is identical to the one displayed on the application pages (see "Composition of the application pages", Page 20).

## Screen HardcopiesTXBT

The SHIFT + PRINT keys enable you to print out screen hardcopies.



# 6. Form pages

The form pages are used for printing only.
They are used for creating measurement and production follow-up reports, labels, etc.

A form page can include:

- texts,
- alphanumeric variables,
- frames for designing tables,
- control codes specific to the printer used (bar codes printing, bold printing, etc.).

Printing form pages is performed by :

- operator's initiative from the form page menu,
- PLC command.

# 7. Managing the control system

The control system can be controlled from the terminals using the following functions:

- bit impulse command (see chapter D, "Momentary contact command", Page 50),
- bit toggle command (see chapter D, "Push on/Push off toggle command", Page 51),
- write a numerical value (see chapiter D, "Field entry", Page 33),
- increment/decrement a numerical value (see chapter D, "Field Characteristics", Page 34),

# 8. Static and dynamic function keys

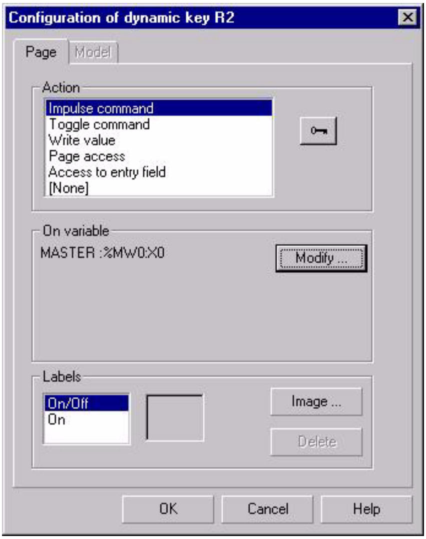
## Static function keys

The static function keys are global and their configuration is defined for the entire application. They may be configured to perform the following functions:
- Access a page,
- bit command (via the dialog table).

## Dynamic function keys

The dynamic function keys are associated with a page. Their configuration and function can therefore change from one page to another. Dynamic function keys may be configured to perform the following functions:
- Access a page,
- Momentary contact command,
- "Push-on/push-off" toggle command,
- Selecting an entry field,
- Direct script of value,
- Startup of a Windows 95 application (TXBT only).

The function key's configuration is defined by means of the XBT-L1000 software, and may not be modified in run mode.



Configuration of dynamic key R2

Action: Impulse command

On variable: MASTER :%MW0:X0

Labels: On/Off

Page
Model
Impulse command
Toggle command
Write value
Page access
Access to entry field
[None]
Modify ...
On
Image ...
Delete
OK
Cancel
Help

# 8. Static and dynamic function keys

---

The function keys for the touchscreen terminal application pages are replaced by touch icons. They are defined in the same manner as the dynamic function keys for the keypad terminals using the XBT-L1000 software and perform the same function:

- access to a page,
- bit control,
- positioning on an entry field.
- direct script of value

An icon is associated with each page access or switch to entry type dynamic key.

# 9. Variable adjustment of the PLC register reference value

## TXBT

The TXBT can be used to adjust the register reference value of the connected PLC. Adjustment is available for the following communication protocols:

- UniTelway
- EthWay
- Modbus
- Fipway
- Fipio
- Modbus+

See chapter D, § 12. Variables adjustment on the TXBT, Page 68, for additional information.

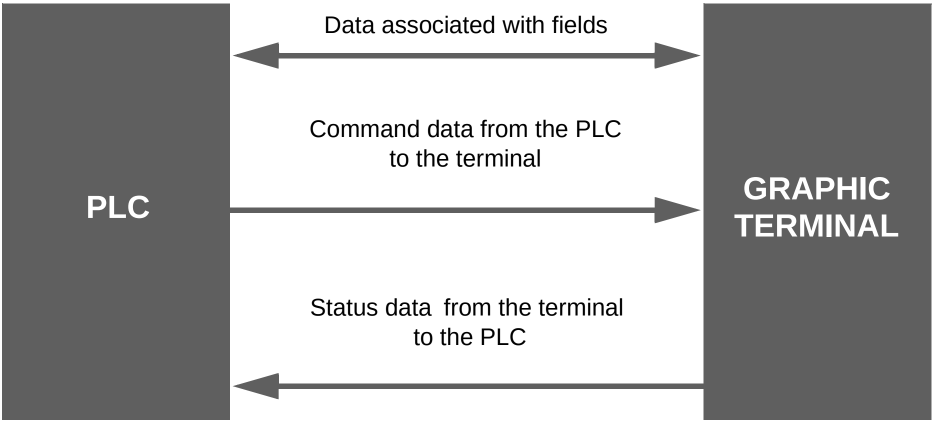
## XBT

The adjustment page is used to display and modify the register reference values of the connected PLC. The page is directly created on the terminal by selecting the requested variables. Once created, the page is refreshed on a cyclic basis.
The page is locally stored on a PCMCIA card and can thus be re-used even if the terminal has been switched off.
Adjustment of the register reference value is available for all communication protocols.

For more informations, see chapter D, § 13. Variables adjustment on the XBT, Page 72.

# 10. PLC/terminal communication dialog

The man/machine communication dialog between the terminal and the PLC consists of an exchange of data between the two devices. Various types of data can be exchanged.


Data associated with fields
Command data from the PLC to the terminal
Status data from the terminal to the PLC
PLC
GRAPHIC TERMINAL

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

If communications between the XBT and PLC are lost, the operator's control over the machine may be lost partially or completely. It is the designer's responsibility to consider programming the PLC logic to account for this situation. One good technique is to monitor Wn+3 of the dialog table from the PLC table.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

## Data associated with the fields

The exchange principle for the data associated with the fields depends on the protocol chosen as a function of the type of PLC. The variables read or written are the single words, double words and word bits.

# 10. PLC/terminal communication dialog

## Master or client terminal

The terminal controls the following transfer exchange regardless of whether or not the terminal is defined as a master or slave:

- Updating of the fields (reading the values in the PLC),
- Entry and modification of fields (writing the values to the PLC).

No PLC communication program needs to be written.

## Server or slave terminal

The PLC application is responsible for updating the displayed variables by constantly writing the values of the variables that have changed to the terminal.

## Principle of terminal "command and status" exchanges

To simplify the communication dialog, the data is grouped together in a memory zone: **the dialog table located in the PLC.**

- Commands from the PLC to the terminal,
- Status data from the terminal to the PLC.

Consisting of "n" consecutive words (16-bit words), this table is divided into two parts.

**Status table**
**Status data from the terminal to the PLC**

**Command table**
**Commands from the PLC to the terminal**

The number of words in the table depends on the status data and the commands you choose to process during the dialog. The XBT-L1000 software allows you to make this choice.

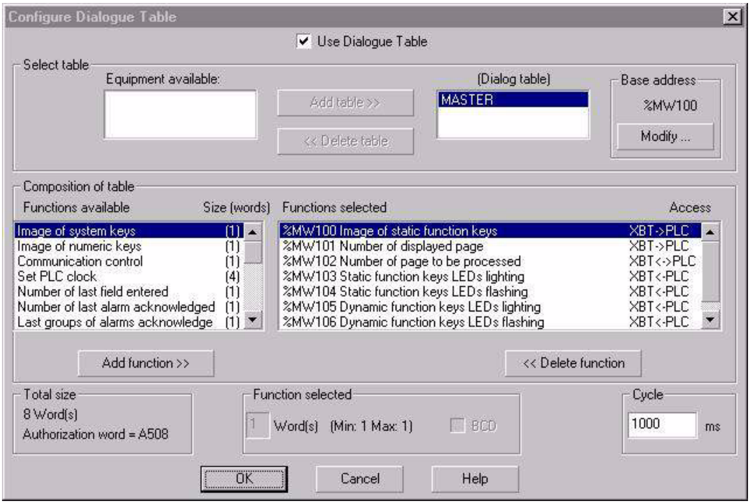
**⚠ WARNING**

**UNINTENTIONAL EQUIPMENT OPERATION**

The PLC memory zone allocated for the XBT dialog table must NOT be used for anything else. It is the designer's responsibility to properly program the PLC logic.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

.



Configure Dialogue Table

☑ Use Dialogue Table

Select table

Equipment available:

(Dialog table): MASTER

Base address: %MW100

Composition of table

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size
8 Word(s)
Authorization word = A508

Function selected
1 Word(s) (Min: 1 Max: 1) ☐ BCD

Cycle
1000 ms

# 11. Loading of extension tasks when transferring the application

On a TXBT terminal, you can add functions on top of the basic XBT-F functions. These extra functions are called **extension tasks**.

The extension tasks supplied as standard for configuring a TXBT are as follows:
- The OLE Automation server (see TXBT manual),
- The Variables setting module,
- The Program diagnostic and dynamic display module.

# 12. Starter kit for the Graphic Magelis application

## Development hardware kit

- 1 XBT-F 5", 9.5", or 10.4", TXBT 10.4".
- 1 serial port operating at 19200 baus (speed required when transferring)
- 1 XBT-Z915 cable and 1 adaptor XBT-Z962 for XBT/PC exchanges and printing
- 1 printer, if necessary.

For the PC configuration, see release notes for XBT-L1000 V3.x software (document with XBT-L1000 software).

## Development software kit

- XBT-L1000 V3.40 (graphic Magelis application development software)

The downloadable protocols depending on the type of PLC :

- For Télémécanique, April, Modicon, AEG PLCs, protocols are included in CD-ROM XBT-L1003 V3.x.
- For the others PLCs, protocols are included in the XBT-L1004 configuration kits or can be ordered separately.

Consult our catalogue.

For the required system, see release notes for XBT-L1000 V3.x software (document with XBT-L1000 software).

## Operating hardware kit

- 1 Magelis/PLC cable (refer to the service instructions for the corresponding protocol),
- 1 XBT-Z915 cable for printing,
- 1 printer, if necessary,
- 1 TCCX CB 20002 cable supplied with the TXBTs.

# Chapter B

# Applications Development With XBT-L1000

# Contents

*The purpose of this chapter is to present a method for implementing an application. It provides information on how to use the XBT-L1000 software. The XBT-L1000 software's menu, submenu, and tool palette structure gives you every latitude when developing your application. The software's on-line help and the instruction manual provides detailed information to assist you in using the XBT-L1000 software.*

*This chapter includes the following sections:*

1. Application requirements specification ________ 5

2. Development method ________ 6

    Phase 0: Control system structure ________ 6
    Phase 1: Commands from the terminal to the control system ________ 6
    Phase 2: Commands from the control system to the terminal ________ 6
    Phase 3: Design of pages ________ 6
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    Phase 9: Translations ________ 8

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# 1. Application requirements specification

The requirement specification is the starting point for developing the man/machine dialog application.

It must include all the user's requirements. To achieve this, it is recommended that the requirements be broken down according to certain criteria:

- **the criteria linked to the users**
    - profile,
    - Man/machine interface,
    - Intervention level,
    - ...

- **the criteria linked to the control system**
    - Production monitoring,
    - Controlling the control system,
    - Preventive maintenance,
    - Corrective maintenance,
    - ...

- **the criteria relative to developing the dialog application itself**
    - Program structure,
    - Data structure,
    - Debugging,
    - Updating.

The specification requirements must indicate:

- Dialog architecture as seen by the end user (navigation, etc.),
- Volume of data to be exchanged between the PLC and the terminal,
- Type of data,
- Terminal/PLCs network architecture.

Use the specification requirements to validate the development.

# 2. Development method

## Phase 0: Control system structure

From the control system structure, define:
- the communication protocol used by the terminal,
- the list of equipment items accessible to the terminal.

## Phase 1: Commands from the terminal to the control system

For each command from the terminal to the control system, define the operator’s action mode:
- static function key,
- dynamic function key (define the associated application page).

## Phase 2: Commands from the control system to the terminal

Define all the actions performed from the control system to the terminal:
- page call-up by the PLC,
- display of LEDs,
- key locking,
- triggering of curve plotting, etc.

## Phase 3: Design of pages

Based on the requirements, design all the pages mentioning for each of them:
- the purpose,
- the type (application, recipe, alarm, help, printout forms),
- the data to be processed.

## Phase 4: Dialog table

Phases 0 to 3 are used to determine all the words - exclusive of any other words - which are necessary for the dialog table.

It is recommended to perform this operation before initiating the PLC program as any addition or cancellation of a word in the dialog table modifies its structure.

## Phase 5: Model pages

Identify the data which are identical on each type of pages: application, help, alarm.

This data can be:
- text, frames, logos, drawings, etc.,
- variables (alphanumeric and/or graphic),
- the status line and/or the alarm strip (displayed by default).

It is recommended to use the model pages for:
- simplifying and clarifying the development,
- providing an easy-to-use man/machine interface by the creation of similar “environments”,
- structuring the space available in the terminal memory.

## Phase 6: Definition of application pages

Create the application pages and then define navigation. It can be performed via:
- dynamic function keys: for a navigation organized in menus,
- static function keys: for direct access to a page of the structure.

Provide the necessary controls for access to the pages and variables available for entry (see chapter D, "Confidential mode, password management", Page 18, for all details). The zones protected by a password can be configured in specific menus.

**NOTE** **System pages linked with XBT-L1000 can be protected by a password, as the application pages.**

## Phase 7: Definition of alarm pages

- Define the equipment items of the control system structure which can be at the origin of alarm triggering.
- Define the size of the alarm tables for all these equipment items. A table includes 1 16-bit word minimum, i.e. 16 alarms maximum per word. Define as many words as necessary.
- Divide the alarms pages into groups according to the control system structure, technologies involved, etc. see chapter D, "Alarm group", Page 41, for all details.
- Classify the alarms and assign a priority to each of the (1 to 16).

- For each alarm, define whether it must:
  - be printed (to keep a hard copy of the faults as soon as they are detected),
  - be recorded in the history (for sequential analysis of the faults: occurrence, cancellation, acknowledgement),
  - be displayed (some pages may not be displayed to the operator),
  - be necessarily acknowledged by the operator (ACK), before going on with the application operating,
  - trigger energizing of a relay associated with a horn, a lighting column, etc.

## Phase 8: Definition of help

- Define the help pages. If necessary, the same help page can be associated with several application or alarm pages.
- Define the help windows for variables requiring a comment, an advice, an explanation, etc.

## Phase 9: Translations

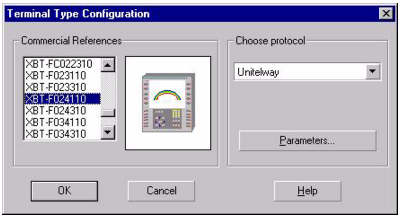
State the application languages (3 maximum) and translate the text objects. (see § 6. Translation of the application, Page 51, and see § 7. Import/Export, Page 53.)

# 3. Application development with the XBT-L1000 software

## Creating the application

Select the **File/New** menu:

**Terminal Type Configuration**, Indicate the **type of terminal :**



Terminal Type Configuration

Commercial References

XBT-FC022310
XBT-F023110
XBT-F023310
XBT-F024110
XBT-F024310
XBT-F034110
XBT-F034310

Choose protocol: Unitelway

Select and configure the **protocol (baud rate, format, etc.).** This is the terminal to PLC communications protocol.

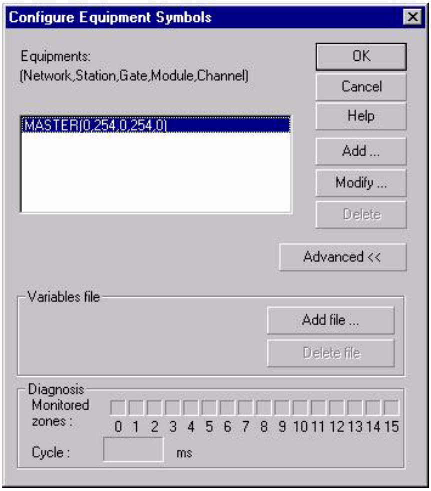
When creating an application, it includes by default:
- an empty application page (1: Application page 1),
- an application page model by default (1: Application Model 1),
- a recipe page model (2: Recipe model 2),
- an alarm page model by default (1: Alarm Model 1),
- a list of system pages in the language in which XBT-L1000 is installed.

**NOTE** **After the initial selection of the terminal, only compatible terminal and compatible protocol will be displayed in the Commercial References list.**

# 3. Application development with the XBT-L1000 software

## Creating the equipment list

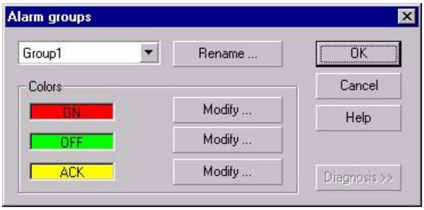
Select the **Configuration/Equipment symbols** menu.


Configure Equipment Symbols
Equipments:
(Network,Station,Gate,Module,Channel)
MASTER(0,254,0,254,0)
OK
Cancel
Help
Add ...
Modify ...
Delete
Advanced <<
Variables file
Add file ...
Delete file
Diagnosis
Monitored zones :
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Cycle :
ms

The network address given to each piece of equipment depends on the **PLC protocol selected** ,
Define the list and adresses of equipment items addressed by the terminal.

## Configuration of alarms displays

Select menu **Configuration/Alarms Groups**.


Alarm groups
Group1
Rename ...
OK
Cancel
Help
Colors
ON
OFF
ACK
Modify ...
Modify ...
Modify ...
Diagnosis >>

**NOTE** **Each of the 16 groups can be reassigned.**

# 3. Application development with the XBT-L1000 software

## Loading the PL7 or Concept symbols file

(special case of Modicon TSX Micro, Premium and Quantum PLCs):

### To create a symbols file in PL7

1. Open the variables editor.
2. Select the **File/Export** command.
3. Select the disk and/or directory in which the file is to be stored.
4. Enter a filename: for example Appli.**SCY**.
5. Select the "all types" export mode and validate.

### To create a symbols file in Concept

1. Select the **File/Export** command.
2. Choose the target file format. Variables: Text delimited.
3. Choose the separator (by default: “,”).
4. Click on **Ok**.
5. Select the **Drive** and/or **Folder** where the file will be stored.
6. Enter a filename: for example Appli.**TXT** and click on **Ok**.

### Use the PL7 or Concept symbols file under XBT-L1000

1. Select the **Configuration/Equipment Symbols** command.
2. Choose the device corresponding to the variables file.
3. Click on “Advanced >>”.
4. Click on "Add file...".
5. Select the directory in which the symbols are stored, then click on **Open**.

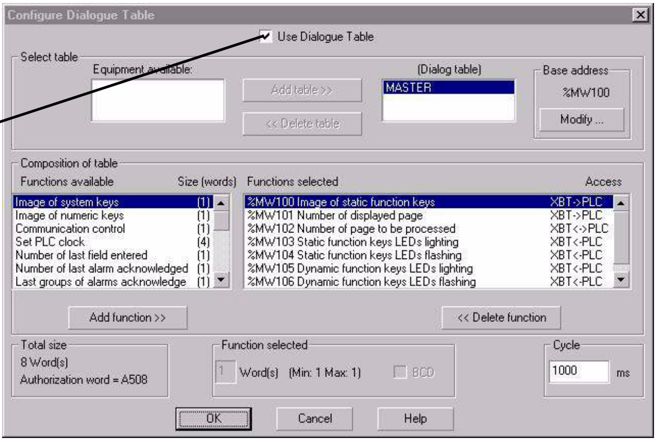
For a PL7 or Concept file, choose the same extension as that defined in concept software.

**NOTE** **The dialog application under XBT-L1000 must be updated each time the symbols file to be used is updated.**
**To do this, repeat operations 1 to 3, select the Variables file/Modify file command and then repeat operation 5.**
**Installation of XBT-L1003+ enables to update automatically PL7 or Concept symbols of variables, in case of evolution of the file of symbols.**

# 4. Configuring the communications dialog table

When you have defined the various pages, you willl have to define the content of the communications dialog table. chapter C provides the information on the various bits and words in the dialog table.

Select the **Configure/Dialog table** menu.



Click the zone "use dialog table"

☑ Use Dialogue Table

(Dialog table): MASTER

Base address: %MW100

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size: 8 Word(s)
Authorization word = A508

Function selected: 1 Word(s) (Min: 1 Max: 1) ☐ BCD

Cycle: 1000 ms

## Base address

Indicate the address of the beginning of the table (address of the first word in the dialog table).

## Composition of table

Add or delete the various elements to/from the table as needed. Use of the dialog table is optional in applications that do not use alarm pages. Alarm pages require the creation of an alarm table that is defined by the dialog table. For further information on the various dialog table components, consult the XBT-L1000 software on-line help or chapter C of this manual.

## Cycle

The terminal's read/write period for the dialog table is used to optimize the terminal/PLC exchanges (see chapter C, § 3. PLC/terminal communication dialog cycle, Page 30).

## Dialog table security

A word is used in the table for security purposes: the "Authorization" word. Using this word ensures PLC/terminal dialog security. When this word is not at the correct value, the terminal cannot write any word in the PLC and cannot execute any command.

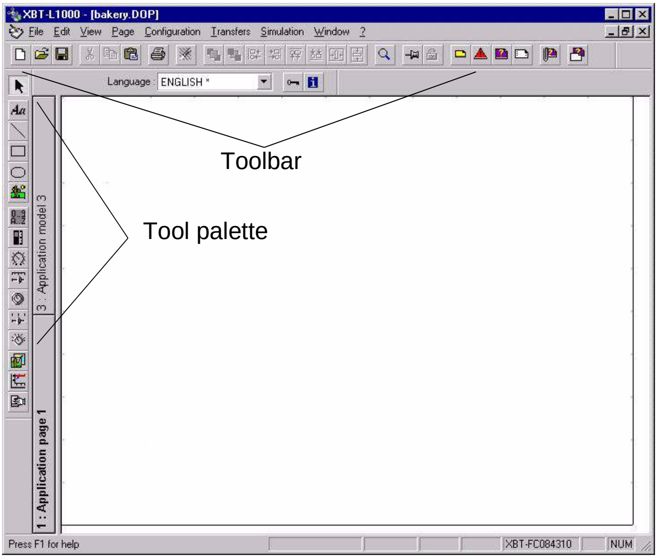
## Alarm table

See chapter D, § 5. Alarms, Page 38.

# 5. Creation of pages

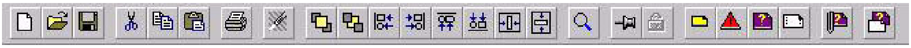
## The main window

The main window that you use to make up the various pages has the following structure.


XBT-L1000 - [bakery.DOP]
File Edit View Page Configuration Transfers Simulation Window ?
Language : ENGLISH *
Toolbar
Tool palette
3 : Application model 3
1 : Application page 1
Press F1 for help
XBT-FC084310
NUM

### Toolbar

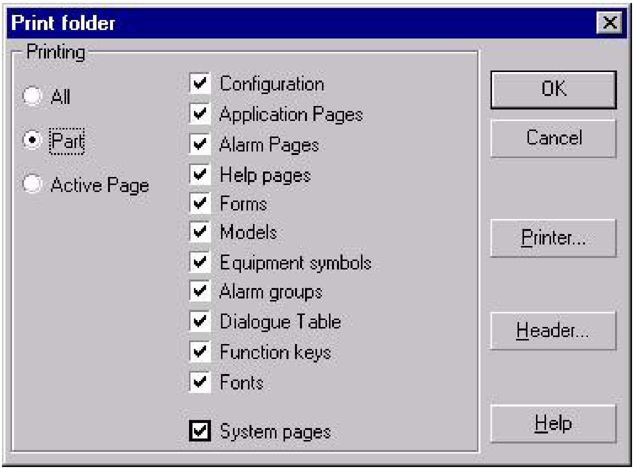
The toolbar allows you to perform various software functions



Example : create pages, cut/copy/paste objects or print.

## File printing

Select File/Print



Print folder

Printing

○ All

● Part

○ Active Page

☑ Configuration
☑ Application Pages
☑ Alarm Pages
☑ Help pages
☑ Forms
☑ Models
☑ Equipment symbols
☑ Alarm groups
☑ Dialogue Table
☑ Function keys
☑ Fonts

☑ System pages

This window to:

- print the full or partial file,
- print the active page.

## Position, alignment and grid

### Drawing pin function

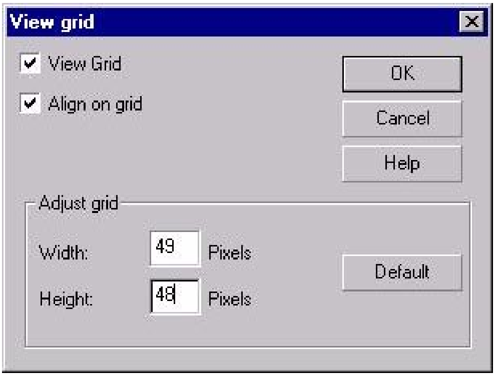
This function allows to lock the object position in the windows while allowing access to the object's properties.

### Alignment

Objects can be aligned
- at the left, at the right,
- at the top and at the bottom
with reference to the first object selected.

### Grid

To easily place objects on the screen, a grid can be actived by "View/ Grid" menu. On its configuration window the grid can be masked and disabled.
The default grid dimensions are the size of the tactile zones of touch screen terminals.



View grid

☑ View Grid

☑ Align on grid

Adjust grid

Width: 49 Pixels

Height: 48 Pixels

### Short cut keys

Arrows : move objects by using magnetic grid,
ALT + arrows : move object without magnetic grid,
SHIFT + arrows : dimension object by using magnetic grid,
ALT + SHIFT + arrows : dimension object without magnetic grid.

## Animating objects

Certain static objects (i.e., text, etc.) can be animated. Animation consists of making an object's color attributes change as a function of the value of an associated PLC variable. This variable must be declared when configuring the object (i.e., 40100). The basic principle consists of drawing up a list of possible values and, for each value, assigning a color to the animated object.

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

Terminals with tactile keys : only one object must be placed under each tactile key to be sure that the object is selected.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

**NOTE** **Case of terminals with tactile keys :**
**- do not move the gray zone representing the tactile keys (loss of the reference),**
**- place only one object under each gray zone representing the tactile keys position,**
**- for positioning an object under a tactile key, put off the magnetic grid (select grid in the menu view).**

## Tool palette

To configure a tool onto a page, select the tool on the tool palette and drag the cursor to the desired application page location. Click on the mouse button, drag and highlight the desired object window size, and release the mouse button. To define an tool's properties, double click the object.
The next page presents the different objects:

- Static object: S
- Animated object: A
- Dynamic object: D (this object shows the change in a variable in alphanumeric form or a graph)
- Dynamic object M (this object allows the modification of a variable from an alphanumeric or graphic form.)

## Text

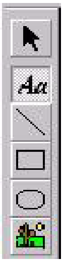
Text (S, A) To provide qualitative information. A symbols library is available by using font XBTSYM1.

Ex.

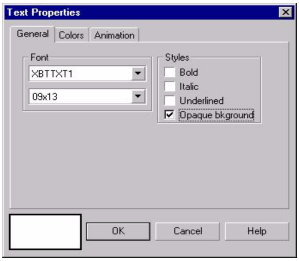
MAINTENANCE

1. Select the Text tool button.
2. Using the mouse, select the required location using the right mouse button.
3. Enter the text.
4. Confirm with ENTER.
5. Select the Edit/Text Properties menu (or click the right mouse button or press ALT ENTER).

,

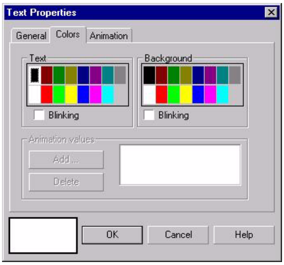


6. Define the text properties (large character font, bold, color) and click OK to confirm


Text Properties
General
Colors
Animation
Font
Styles
OK
Cancel
Help

Font: XBTTXT1, 09x13

Styles:
☐ Bold
☐ Italic
☐ Underlined
☑ Opaque bkground


Text Properties
General
Colors
Animation
Text
Background
Animation values
Add...
Delete
OK
Cancel
Help

Text: ☐ Blinking

Background: ☐ Blinking

**NOTE** **A click on the Opaque background box allows configuration of the background color.**

## Create graphics

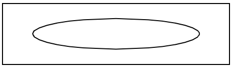
Line (S, A)

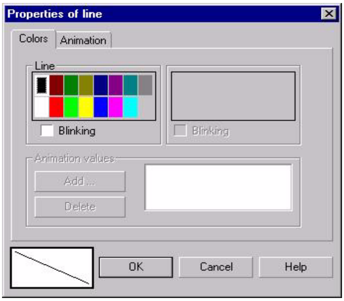
Rectangle (S, A)

Ellipse (S, A)

Graphical representation of an application.

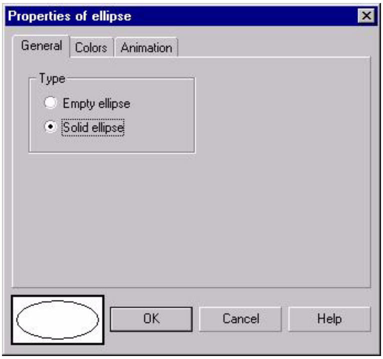
Ex.



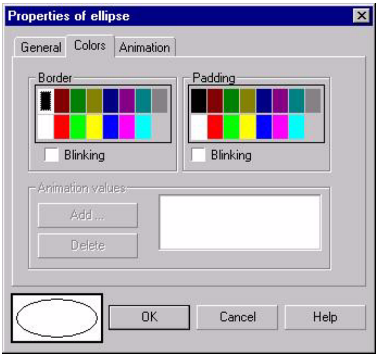

Properties of line
Colors
Animation
Line
☐ Blinking
☐ Blinking
Animation values
Add ...
Delete
OK
Cancel
Help

1. Select the tool button.
2. Using the mouse, define the object size.
3. Select the Edit/graphics Properties menu (or click the right mouse button or press ALT ENTER).

General properties of Ellipse


Properties of ellipse
General
Colors
Animation
Type
○ Empty ellipse
● Solid ellipse
OK
Cancel
Help

Colors properties of Ellipse

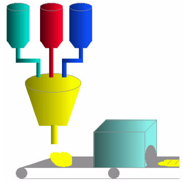

Properties of ellipse
General
Colors
Animation
Border
Padding
☐ Blinking
☐ Blinking
Animation values
Add ...
Delete
OK
Cancel
Help

## Import images

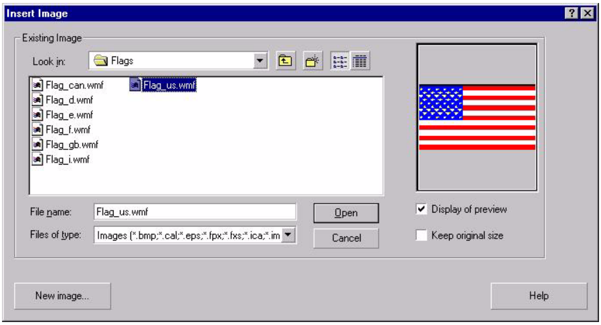
Bitmap
(S)

To insert file images for graphical representation of an application (BMP, WMF, PCX) (a symbols library is available in directory \XBT-L1000\SYMBOLS)

Ex.



1. Select the BITMAP tool button.
2. Using the mouse, click and drag the mouse to create an image area. The Insert Image dialog box is displayed.
3. Select an existing image from the **Symbols** folder. Select **Open**, press **Enter**, or double-click to import an existing image.



Insert Image

Existing Image

Look in: Flags

Flag_can.wmf
Flag_d.wmf
Flag_e.wmf
Flag_f.wmf
Flag_gb.wmf
Flag_i.wmf
Flag_us.wmf

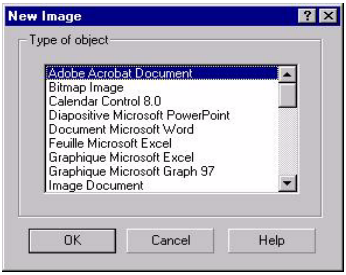
File name: Flag_us.wmf

Files of type: Images (*.bmp;*.cal;*.eps;*.fpx;*.fxs;*.ica;*.im

☑ Display of preview

☐ Keep original size

4. Select the **New Image** button to open an application to import a new image. The list of applications are the programs loaded on the computer.
5. Select the program to create the image.
6. Under XBT L1000, the program selected is executed. Click out of the image window to end the program execution.



New Image

Type of object

Adobe Acrobat Document
Bitmap Image
Calendar Control 8.0
Diapositive Microsoft PowerPoint
Document Microsoft Word
Feuille Microsoft Excel
Graphique Microsoft Excel
Graphique Microsoft Graph 97
Image Document

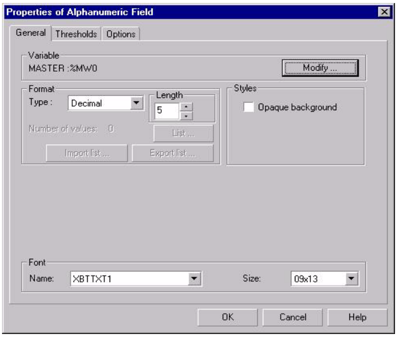
## Alphanumeric variable field

**Alphanumeric variable field (D,M)**

To display values reflecting the control system status. To enter values defining parameters for managing the the control system. Four limits with the possibility to filter the values entered by the operator (Min and Max thresholds only) and to display process overshoots (by changing color).

Ex.

TEMP: 455 °C


Properties of Alphanumeric Field

Variable: MASTER :%MW0

Format: Type : Decimal; Length: 5; Number of values: 0

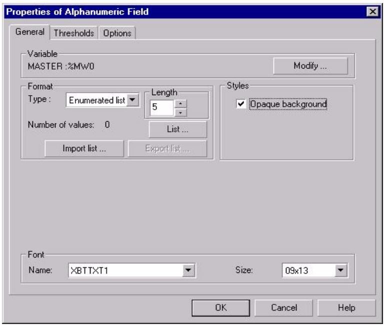
Styles: ☐ Opaque background

Font: Name: XBTTXT1; Size: 09x13
General
Thresholds
Options
Modify ...
List ...
Import list ...
Export list ...
OK
Cancel
Help

### Numbered list

To display strings of text reflecting the control system status.
To enter a select strings of text defining the parameters for managing the control system. Then each string is assigned to a value of the variable field.

1. Select the length of the string (number of characters) and click on "LIST" button.


Properties of Alphanumeric Field

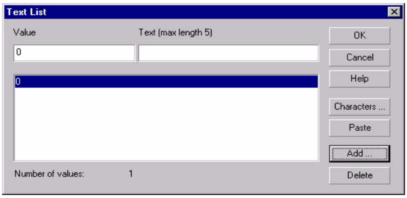
Variable: MASTER :%MW0

Format: Type : Enumerated list; Length: 5; Number of values: 0

Styles: ☑ Opaque background

Font: Name: XBTTXT1; Size: 09x13
General
Thresholds
Options
Modify ...
List ...
Import list ...
Export list ...
OK
Cancel
Help

2. Introduce each string and its value associated. A maximum of 255 strings can be associated to the variable field.


Text List

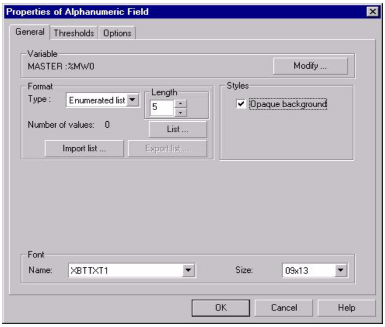
Value: 0

Text (max length 5):

0

Number of values: 1
OK
Cancel
Help
Characters ...
Paste
Add ...
Delete

To modify colors of alphanumeric field:
In the window Ahphanumeric Field Properties, click the Opaque background box.


Properties of Alphanumeric Field

Variable: MASTER :%MW0

Format Type : Enumerated list

Length: 5

Number of values: 0

Styles: ☑ Opaque background

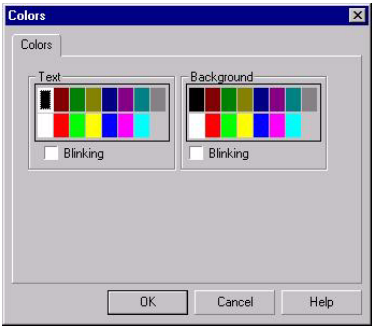
Font Name: XBTTXT1

Size: 09x13
General
Thresholds
Options
Modify ...
List ...
Import list ...
Export list ...
OK
Cancel
Help

Select index threshold.

For each threshold interval defined, click on button "colors".

In the window "colors", select the text and background colors of the alphanumeric field.


Colors

Text: ☐ Blinking

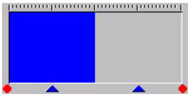
Background: ☐ Blinking
Colors
OK
Cancel
Help

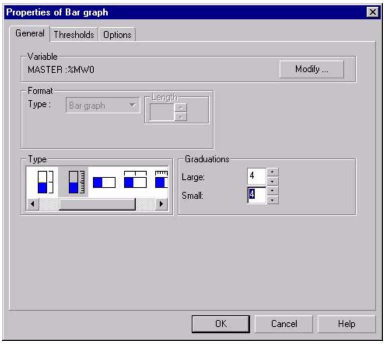
It’s possible to change the color of the text and the background by a right click on the field then by selecting "Colors".

## Bar-graph

| | |
|---|---|
| Bar-graph<br>(D) | To represent the control system data in a graphical form (i.e.,: tank level).<br>Characteristics:<br>- Vertical,<br>- Horizontal,<br>- Minimum, maximum, high and low limits. |

Ex.




Properties of Bar graph
General
Thresholds
Options
Length
Type
OK
Cancel
Help

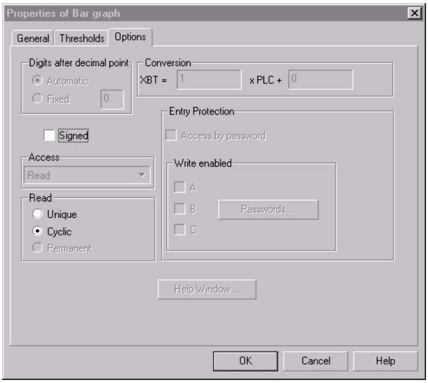
Variable: MASTER :%MW0 — Modify ...

Format — Type : Bar graph

Graduations — Large: 4 — Small: 4

1. Select the Bar Graph tool button.
2. Using the mouse, define the object size.
3. Select the **Edit/Bar Graph Properties** menu (or right mouse click or double click).

Select the type of bar graph (for example: horizontal, large graduation). Assign the word %MW35 to the object using the **Modify** button. This word will contain the oven temperature value. Click **Ok**.


Properties of Bar graph
General
Thresholds
Options
Passwords ...
Help Window ...
OK
Cancel
Help

Digits after decimal point: ● Automatic ○ Fixed: 0

Conversion: XBT = 1 x PLC + 0

☐ Signed

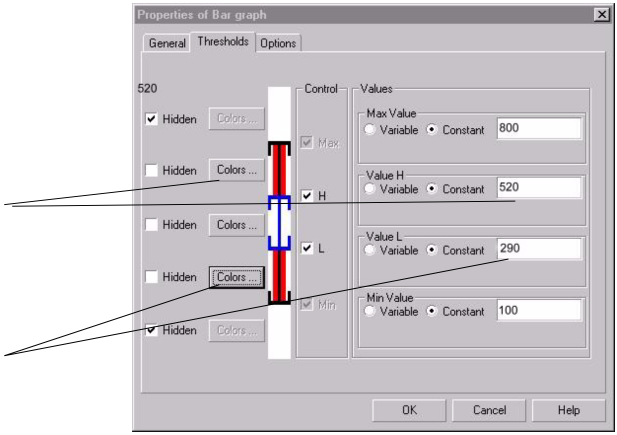
Access: Read

Read: ○ Unique ● Cyclic ○ Permanent

Entry Protection: ☐ Access by password

Write enabled: ☐ A ☐ B ☐ C

Click **Options** and set the object to cyclic reading. The temperature must be between 290° C and 520° C. If the temperature is outside these limits the display will switch to blue. Click **Thresholds** to define a high threshold (H) of 520 and a low threshold (L) of 290 and click **Color** to define the colors.


Properties of Bar graph
General
Thresholds
Options
Colors ...
Colors ...
Colors ...
Colors ...
Colors ...
OK
Cancel
Help

520
☑ Hidden
☐ Hidden
☐ Hidden
☐ Hidden
☑ Hidden

Control
☑ Max
☑ H
☑ L
☑ Min

Values
Max Value ○ Variable ● Constant 800
Value H ○ Variable ● Constant 520
Value L ○ Variable ● Constant 290
Min Value ○ Variable ● Constant 100

Color red: high limit

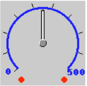
Color red: low limit

Click **OK** to confirm. The bar graph is displayed but the graduations are not identified.
Using the **Text** tool, enter the values to allow the operator to identify the positions.

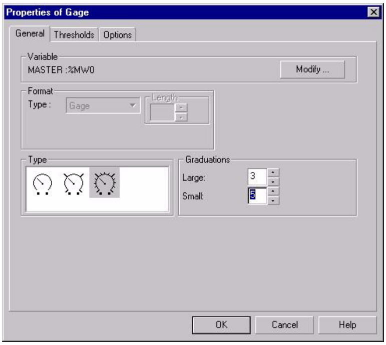
## Volume meter

| | |
|---|---|
| Volume meter<br>(D) | Provides a graphical representation of the control system data (i.e., power supply voltage control).<br>Minimum, maximum, high and low limits. |

Ex.



1. Select the **Volume meter** tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Select the type of the **Volume meter**.


Properties of Gage
General
Thresholds
Options
Modify ...
Format
Length
Type
Graduations
OK
Cancel
Help

Variable: MASTER :%MW0

Type : Gage

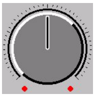
Large: 3

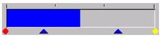
Small: 5

## Potentiometers

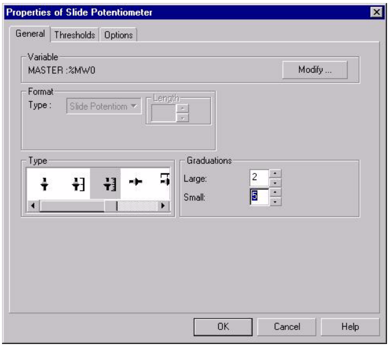
| | |
|---|---|
| Linear potentiometer | To modify the control system variable, graphically (i.e., limit setting).<br>Minimum, maximum, high and low limits. |
| Rotary potentiometer<br>(D,M) | |

Ex.





1. Select the **Linear slider potentiometer** tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Select the type of the **Linear slider potentiometer**.


Properties of Slide Potentiometer
General
Thresholds
Options
Modify ...
Format
Length
Type
Graduations
OK
Cancel
Help

Variable: MASTER :%MW0

Type : Slide Potentiom

Large: 2

Small: 5

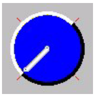
## Switches

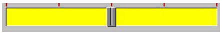
Linear slider switch

Rotary switch (rotactor)(D,M)

To modify the control system variable, graphically (i.e., choice of a type of production using the rotary selector).

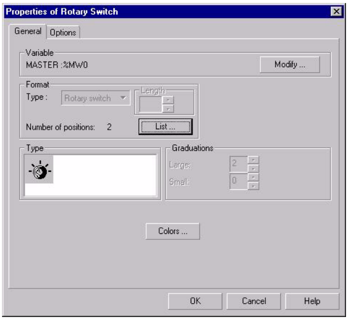
Ex.





### Rotactor,

1. Select the **Rotary switch** tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Select the type of the **Rotary switch**
5. Assign the word %MW34 to the object using the **Modify** button, click **Ok**. This word will contain the value selected by means of the rotary selector.


Properties of Rotary Switch
General
Options
Modify ...
List ...
Colors ...
OK
Cancel
Help

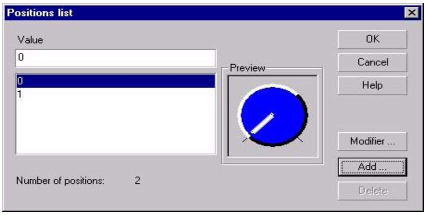
Variable: MASTER :%MW0

Format
Type : Rotary switch
Length
Number of positions: 2

Type

Graduations
Large: 2
Small: 0

6. Click **List** and, using the **Delete** or **Add** buttons, define the number of positions for the rotary selector and the value to be assigned in the word. Click **Ok**.


Positions list
Preview
OK
Cancel
Help
Modifier ...
Add ...
Delete

Value: 0

0
1

Number of positions: 2

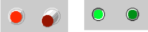
7. Using the **Color** button, define the color of the graduations and of the background.
8. Click **Ok twice** to confirm, the rotary selector will then be displayed but the graduations will not be identified.
9. Using the **Text** tool, enter the values to allow the operator to identify the positions.

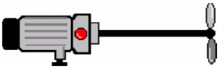
## Image box

Images box (D,M)

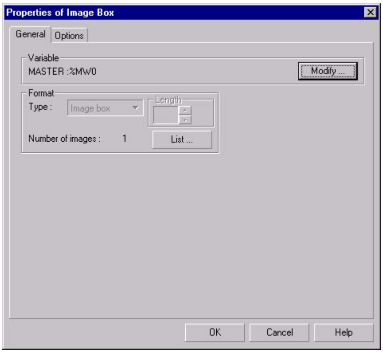
To display images reflecting the control system ststus to select images defining parameters for managing the control system. According to the value of a variable.
Image file: BMP, WMF, PCX

Ex.





1. Select the Image box tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Assign the word %MW34 to the object using the Modify button, click Ok.



Properties of Image Box

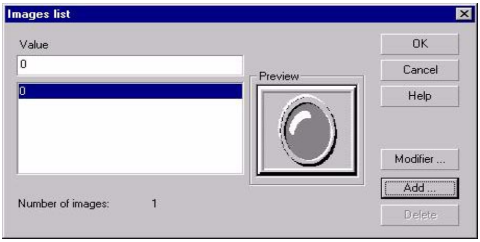
Variable: MASTER :%MW0

Format Type : Image box

Number of images : 1

This word will contain the value selected by means of the Image box.

Then, each image is assigned to a value of the variable fields by click on button "LIST".
A maximum of 16 images can be associated to the variable field



Images list

Value: 0

0

Number of images: 1

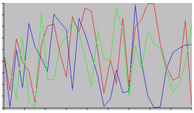
**NOTE** **If the value needed of the PLC variable associated to the field has not assigned an image, then the objet becames invisible and transparent.**

## Graphical curve

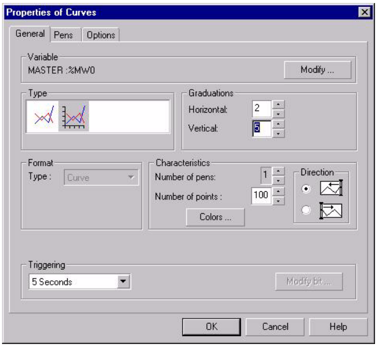
Graphical curve (D)

To monitor control system data changes in real-time (i.e., monitoring a temperature)

Ex.



1. Select the **Graphical curve** tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Assign the word %MW34 to the object using the **Modify** button, click **Ok**.
5. Select the type of **Graphical curve**.



Properties of Curves

Variable: MASTER :%MW0

Graduations: Horizontal: 2 Vertical: 5

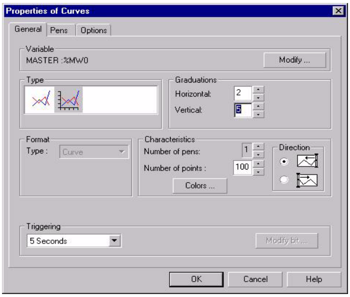
Format Type : Curve

Characteristics: Number of pens: 1 Number of points : 100

Triggering: 5 Seconds

General
Pens
Options
Modify ...
Type
Direction
Colors ...
Modify bit ...
OK
Cancel
Help

### Main characteristics of curve objects



Variable
MASTER :%MW0
Graduations
Horizontal: 2
Vertical: 5
Format
Type : Curve
Characteristics
Number of pens: 1
Number of points : 100
Triggering
5 Seconds

A curve object can display up to 4 different curve plottings. These plottings are called pens.

If the address of the object is %MWn (IEC syntax):
- the address of the first pen is %MWn
- the address of the second pen is %MWn+1
- the address of the third pen is %MWn+2
- the address of the fourth pen is %MWn+3

A new curve point is displayed:
- periodically every 5, 10 or 30 seconds or every 1.5 or 10 minutes,
- when a bit is uploaded in the dialog table (See chapter C, § 2. Dialog table content, Page 9, index on “graph plottings performed” and “Activating graphs plotting").

Duration of the curve window:
- the time displayed on the curve window depends on two parameters: Numbers of points and Time selected to display a new curve point periodically or bit in the dialog table.

Curve write starts:
- from the right: each new sampling moves the former values to the left, or,
- from the left: each new sampling moves the former values to the right.

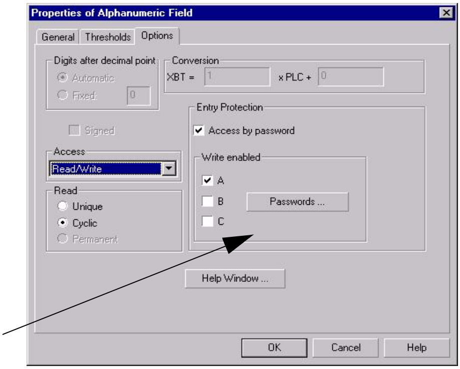
Curve objects can be refreshed (Options tab):
- on a cyclic basis: at the specified sampling period but only when the page including the curve is displayed (there is not any plotting on the curve when it is displayed),
- on a permanent basis: at the sampling period, including when the object is not displayed.

This option generates permanent data interchange with the PLC and can entail an increase in the response times. For more details: See chapter C, "Optimization for communication", Page 31.

## Variable field characteristic

### Protecting fields

Depending on the selected configuration, certain fields of the appli-cation page may not be write-accessed in confidential mode.
Access management for entry to a variable field is ensured by a system with several levels of protection. (see chapter D, "Confidential mode, password management", Page 18). The XBT-L1000 software can be used to define the various properties of the field.


Properties of Alphanumeric Field

Digits after decimal point
● Automatic
○ Fixed: 0
☐ Signed

Access: Read/Write

Read
○ Unique
● Cyclic
○ Permanent

Conversion
XBT = 1 x PLC + 0

Entry Protection
☑ Access by password

Write enabled
☑ A
☐ B
☐ C

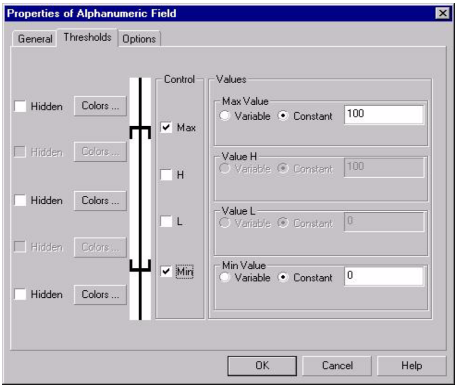
### Variable limits

.

The value of a variable can be in one of five posssible value zones:

- Value > Max
- H < Value < Max
- L < Value < H
- Min < Value < L
- Value < Min

For each of these zones, the object is given a particular color according to what was defined in XBT-L1000: variable color for alphanumeric objects, dial color for vumeters, etc.


Properties of Alphanumeric Field

☐ Hidden Colors ...
☐ Hidden Colors ...
☐ Hidden Colors ...
☐ Hidden Colors ...
☐ Hidden Colors ...

Control
☑ Max
☐ H
☐ L
☑ Min

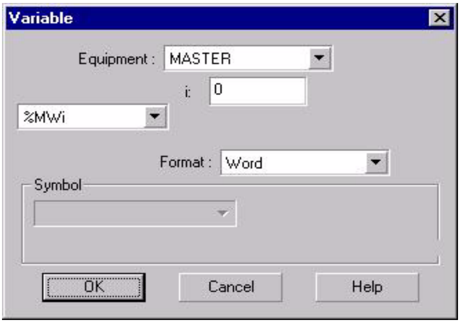
Values
Max Value: ○ Variable ● Constant 100
Value H: ○ Variable ● Constant 100
Value L: ○ Variable ● Constant 0
Min Value: ○ Variable ● Constant 0

For more details, see chapter D, "Field Characteristics", Page 34.

## PLC Variable

Select the field on XBT-L1000, press "ALT+ENTER" key or "Edit / field properties" menu, then "general" and "modify" button to assign the PLC variable to the field.

Click modify to define the PLC variable representing the content of the field and click **Ok** to confirm.


Variable
OK
Cancel
Help

Equipment : MASTER

i: 0

%MWi

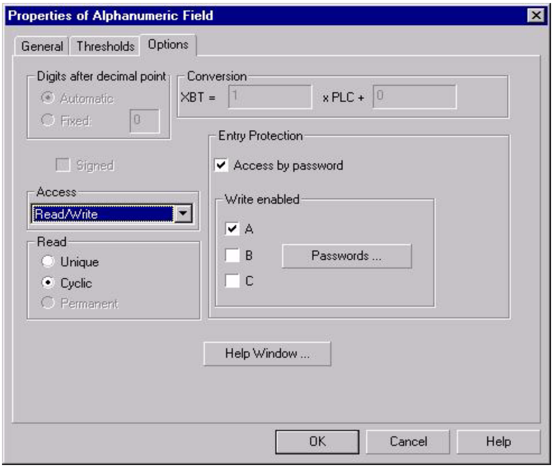
Format : Word

Symbol

## Acces to the PLC

PLC variables can be acceded from the terminal fields by :

- Read : operator can not modify the value.
- Write : operator can modify the value.
- Read/Write : both cases above.


Properties of Alphanumeric Field
General
Thresholds
Options
Passwords ...
Help Window ...
OK
Cancel
Help

Digits after decimal point
● Automatic
○ Fixed: 0

Conversion
XBT = 1 x PLC + 0

☐ Signed

Access
Read/Write

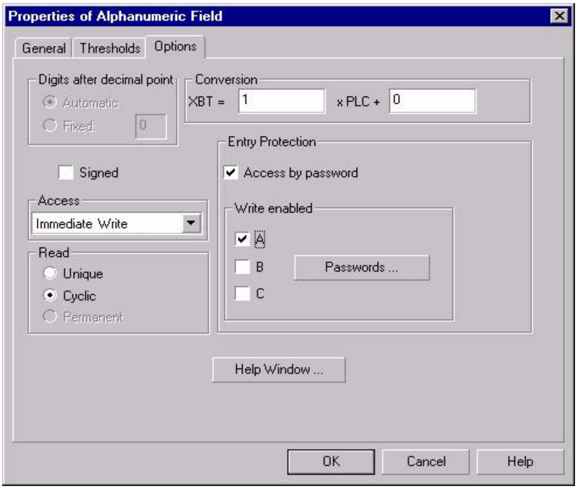
Read
○ Unique
● Cyclic
○ Permanent

Entry Protection
☑ Access by password

Write enabled
☑ A
☐ B
☐ C

## Immediate write

Select the Options tab:



Properties of Alphanumeric Field

Digits after decimal point
● Automatic
○ Fixed: 0

Conversion
XBT = 1 x PLC + 0

☐ Signed

Access
Immediate Write

Read
○ Unique
● Cyclic
○ Permanent

Entry Protection
☑ Access by password

Write enabled
☑ A
☐ B
☐ C

General
Thresholds
Options
Passwords ...
Help Window ...
OK
Cancel
Help

This entry mode is used by the operator to modify a field value in a continuous manner in order to:

- prevent sudden skipping from one value to another,
- view the result of an action "in real time" (adjustment, positioning, etc.).

See chapter D, "Immediate write", Page 37.

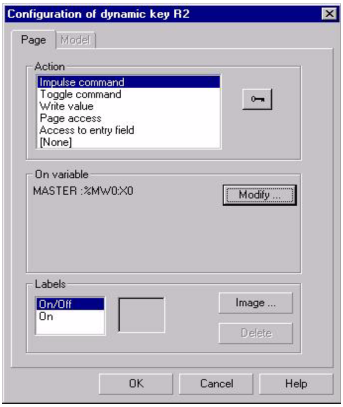
## Function key objects

### Static function keys

Static function keys can be defined for the application to be used as:
- Access to a page
- Momentary contact command
- "Toggle" command

### Dynamic function keys

Dynamic function keys are associated with the page displayed.
They can have the following functions:
- Access to a page
- Momentary contact command
- "Toggle" command
- Writing values,
- Positioning on an entry field
- Running a Windows 95 executable program (TXBT only)



Configuration of dynamic key R2

Action:
- Impulse command (selected)
- Toggle command
- Write value
- Page access
- Access to entry field
- [None]

On variable: MASTER :%MW0:X0

Labels:
- On/Off
- On

### Touch zones

There are no static and dynamic function keys on touchscreen terminals.They are replaced by touch zones which have the same functions and properties as the dynamic function keys of the terminals with keyboard.
Both static and dynamic function keys are also programed through configuration/function keys" menu.

### Configuration

- click on the button,
- click and slide on the area to determine the location and the size of the touch zone. With the default grid you can create touch zones including the pitch suitable for the physical division of the touchscreen pad,
- double-click on this zone and enter the configuration parameters in the same way as for a dynamic function key of a terminal with keyboard.

Parameters to be defined

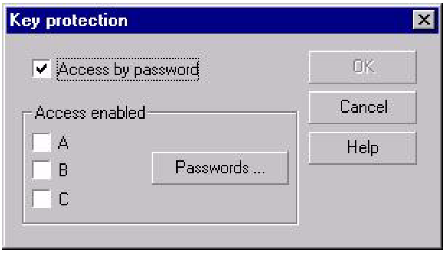
***Type of action.***

For static function key (terminals with keyboard only).
- page access: select an application page,
- impulse or toggle command: assignment of a command bit in the dialogue table (see chapter C),
- running a Windows 95 application on a terminal (TXBT only definition of executable program path).

Dynamic function key (terminals with keyboard)
Touch zone (touch terminals)
Touch key and zone (terminals with touch keys).
- page access: select an application page,
- impulse or toggle command: assignment of a command bit in the dialogue table (see chapter C) or elsewhere in the PLC for the dynamic function keys,
- running a Windows 95 application on a terminal (TXBT only definition of executable program path),
- writing values: transfer the value from a variable or a constant onto another variable.(see chapter D, "Value direct writing", Page 52).

**NOTE** **A password can be associated to actions such as writing value, impulse command and toggle command.**

**When one of these actions is selected, click on the key 🔑 to open the window of the protection key.**



Key protection

☑ Access by password

Access enabled

☐ A

☐ B

☐ C

**NOTE** **A static or dynamic function key already configured is displayed by the software in inverse video when configuring new function key.**
**Recommendations concerning the use of function keys:**
**- The dynamic function key word bits can be distributed between all the installation's pieces of equipment without any restriction.**
**- The static function key word bits are grouped together and defined by the dialog table.**
**The communication dialog between the terminal and the equipment have better performances if static function key commands are used. It is recommended to use static function keys for control functions, and dynamic function keys for moving around the pages and for entering data.**

***Label for the dynamic function keys***

This allows you to associate a label with the function key.

- Page access: 1 label (an image)
- Momentary contact or "toggle" command: a label for each status of the associated bit (values 0 and 1, associated with two images representing a released and pressed pushbutton)
- Access to a variable field
- Direct writing

By default the size of these images is adapted to the size of the keys (so they can be positioned opposite each other).

### Running a Windows 95 application on a TXBT terminal

The TXBT terminal enables you to run Windows 95 applications installed on the terminal (such as the calculator). If the Magelis application is running, it will continue in the background, with pages refreshed and alarms monitored.

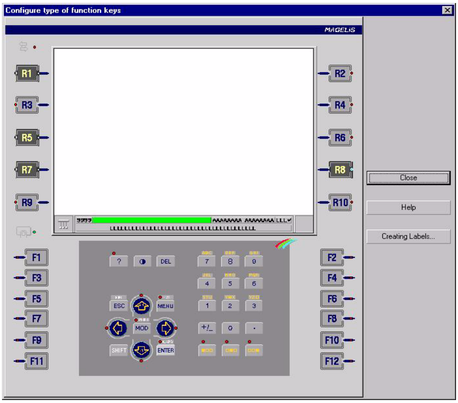
### Executable program path

This is the path (disk, directory/sub-directory) on the TXBT terminal and not the path on the PC on which XBT-L1000 is installed. If the executable program's location on the TXBT is changed, startup will not work.
Example: D:\WINDOWS95\CALC.EXE

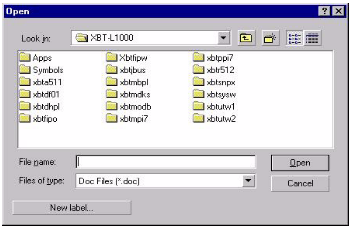
## Print labels of static function keys

This functionnality allows to print the sheets of re-usable labels of static function keys.

Select "configuration/function keys" menu or specific tool palette key, then press "creating labels" button.


Configure type of function keys
MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
ESC
MENU
MOD
SHIFT
ENTER
DEL
Close
Help
Creating Labels...

After that, a "*.DOC" existing file can be opened or a new file can be created.


Open
Apps
Symbols
xbta511
xbtdf01
xbtdhpl
xbtfipo
Xbtfipw
xbtjbus
xbtmbpl
xbtmdks
xbtmodb
xbtmpi7
xbtppi7
xbtr512
xbtsnpx
xbtsysw
xbtutw1
xbtutw2
Open
Cancel
New label...

Look in: XBT-L1000

File name:

Files of type: Doc Files (*.doc)

In that case, XBT-L1000 will open WORD with the sheet of label corresponding to the current terminal programed by XBT-L1000.

**NOTE** **Due to every printer having its own margins configuration, it is recommended to test on white sheets before using the sheets of labels.**
**New sheets of labels can be created by using WORD models (*.DOT) provided with XBT-L1000 software, apart from XBT-L1000 software.**
**The sheets of labels printed will never be associated to the current XBT-L1000 application, thereby "configure type of function keys" window will not be updated.**

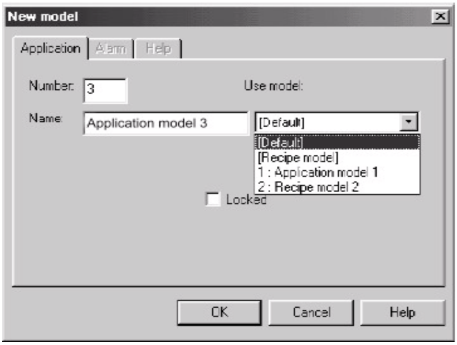
## Model pages

The designer has page models at his disposal. These are background pages containing text and static / animated / dynamic graphic objects that can be used for several application, help or alarm pages.

Characteristics
- a dialog application can contain several models,
- one and only one model is associated with each page.

Select **Page/New Model**. Select the **Application, Alarm** or **Help** model type. Configure the model using the editor tools.

**NOTE** **The model pages can be locked using the “lock icon” icon. This prevents unintentional modifications of pages. In fact, each modification on the model page is passed on the application pages, help or alarm associated. About XBT-FC terminals, do not modify or move the gray frame representing the tactile keys (loss of the reference). Place only one modifiable object under each tactile key to be sure of the object selection.**



Number: 3

Name: Application model 3

Use model: [Default]

[Default]
[Recipe model]
1 : Application model 1
2 : Recipe model 2

☐ Locked

It is possible to change a model from a page by double-clicking on the “Application page” tab (for instance) or by selecting the **Page/Properties** menu.

An object or an object selection within a page can be moved:
- to the model associated with the page (provided that it is not locked),
- to a new model to be created.

Carry out the following operations:
- select the object(s),
- right click on the mouse or select the **Edit/Move** menu.

## Application/Alarm/Help/Recipe pages

### Creating the page architecture

The following are general rules:
- One and only one page model is associated with each page,
- An application can contain several page models,
- Any given model can be associated with several different pages,
- A model type (application/alarm/help) is associated with a page type (application/alarm/help). For example, each page type has its own model type.

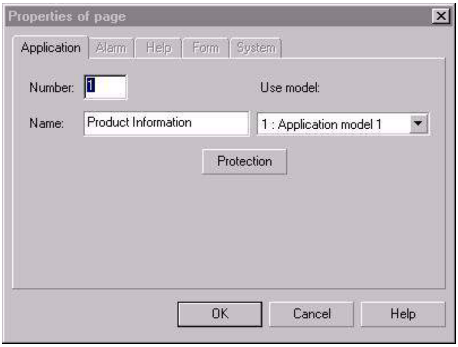
Tool bar buttons:

Keyboard shortcuts:

- F7 ( 🟨 Application page)
- Caps + F7 ( ⚠ Alarm page)
- Ctrl + F7 ( ❓ Help page)
- Ctrl + Caps + F7 ( ▭ Form page)

**NOTE** **Its is possible to create a new page from the window Pages tree (see "Tree structure control", Page 49).**

## Application page


Properties of page
Application
Alarm
Help
Form
System
Protection
OK
Cancel
Help

Number: 1

Use model: 1 : Application model 1

Name: Product Information

Indicate:
- Name and/or number of the new page
- Page model to be used
- Password (protection) if necessary

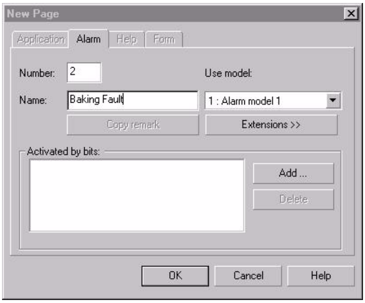
The application pages correspond to the “usual” man-machine dialog during normal operation of the terminal.

### Alarm page

The actual display of an alarm depends on the priority that has been assigned to it. Alarms occurring in the process are stored in the "Alarm list".

When configuring an alarm page, you must indicate:

- Name and/or number of the new page (the name of alarm page is the text displayed in the alarm bar),
- Alarm page model to be used.



Number: 2

Name: Baking Fault

Use model: 1 : Alarm model 1

**Purpose of alarm pages**

An alarm page is used to indicate:

- control system faults
- corrective actions

The advantage of the alarm page is the event-linked display. A control system word bit is associated with each alarm page. If the word bit is in state 1, the alarm is triggered.

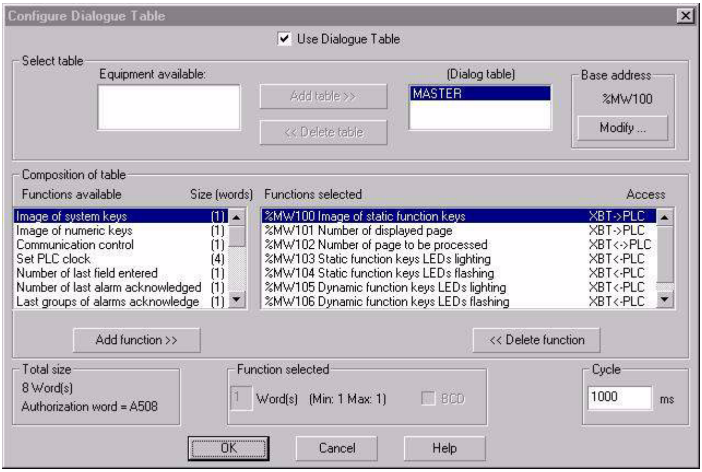
**Operation advantages**

- When a fault appears, it is often the consequence of other faults. The terminal's priority system allows the most serious fault to be displayed first (for example, the fault which has been defined as the most hazardous for the control system).
- The occurence of each fault is time-stamped.

**Maintenance advantages**

- The terminal store the occurence of faults sequentially (log) thus making it possible to find the origin of the fault.
- Several alarms may therefore occur simultaneously in the process.

**NOTE** **To be able to trigger alarms from the PLC, the dialogue table (available from "configuration/dialogue table has to be actived and the word "alarm table" has also to be selected on the dialogue table (See chapter C, § 2. Dialog table content, Page 9).**


Configure Dialogue Table
☑ Use Dialogue Table
Select table
Equipment available:
Add table >>
<< Delete table
(Dialog table)
Base address
Modify ...
Composition of table
Add function >>
<< Delete function
Total size
Function selected
Cycle
OK
Cancel
Help

(Dialog table): MASTER

Base address: %MW100

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size: 8 Word(s)
Authorization word = A508

Function selected: 1 Word(s) (Min: 1 Max: 1) ☐ BCD

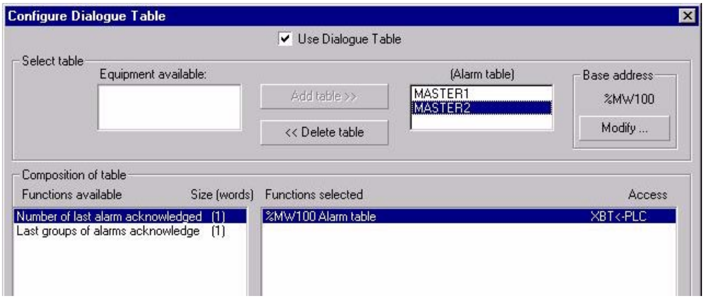
Cycle: 1000 ms

## Alarm table

The terminal can access alarms of all equipments registed in the equipment list (Configuration/Symbols equipments).

For this :

- Select the equipment and add the equipment table (Use the list zones at the top of the dialog table).


Configure Dialogue Table
☑ Use Dialogue Table
Select table
Equipment available:
Add table >>
<< Delete table
(Alarm table)
Base address
Modify ...
Composition of table

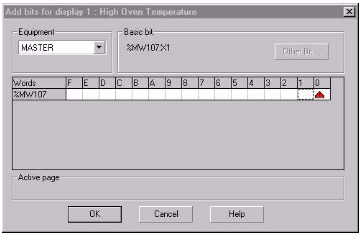
(Alarm table): MASTER1, MASTER2

Base address: %MW100

| Functions available | Size (words) |
|---|---|
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Alarm table | XBT<-PLC |

**On the XBTs**
these alarm words are consecutive and make up the alarm table. In the event of an alarm, the rank of the word bit (in the dialog table) which triggered the alarm is displayed in the alarm strip (See chapter D, § 5. Alarms, Page 38).


Add bits for display 1 : High Oven Temperature

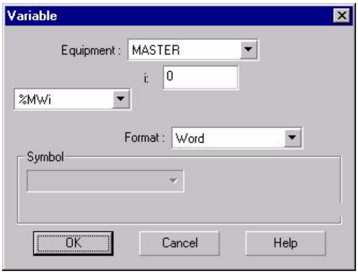
Equipment: MASTER

Basic bit: %MW107:X1

| Words | F | E | D | C | B | A | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| %MW107 | | | | | | | | | | | | | | | | ▲ |

Active page

**On the TXBTs**
this same principle exists, but it is also possible to assign any bits (internal bit, word bit, etc.)
- If using any other bit as an alarm bit, the field assigned to the "bit rank" in the alarm strip takes value 1.
- In the PLC\terminal exchanges, the bit is dealt with like a numerical field.
- The 2 types of operation can be used in the same application.


Variable

Equipment : MASTER

i: 0

%MWi

Format : Word

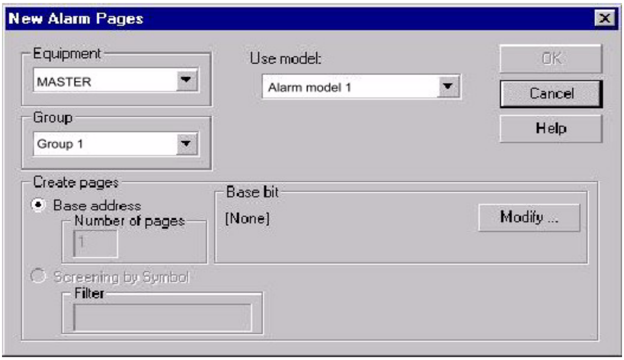
Symbol

For further details on low alarms traited by the terminal, see chapter D, § 5. Alarms, Page 38.

The Extensions button is used to enter the characteristics specific to an alarm page (See chapter D, § 5. Alarms, Page 38) :
- Alarm page priority
- Assignment to a group of alarms
- Alarm relay action and operator ackowledgment
- Type of alarm page appearance

## First alarm generation

A new group of alarms can easily and quickly be created by selecting "new alarm pages" from "page" menu.
All the new alarms belong to the same equipment, same group, and have the same model of alarm.


New Alarm Pages
OK
Cancel
Help
Create pages
Modify ...
Screening by Symbol
Filter

Equipment: MASTER
Group: Group 1
Use model: Alarm model 1
● Base address
Number of pages: 1
Base bit: [None]

Parameters to be defined:

- Address of bit from the dialogue table that will trigger the first alarm.
- Number of new alarm pages to be created (all of them will be consecutive with reference to the first one.
- A filter by the name of the symbol PLC database can be performed (see "Loading the PL7 or Concept symbols file", Page 11).

### Help page

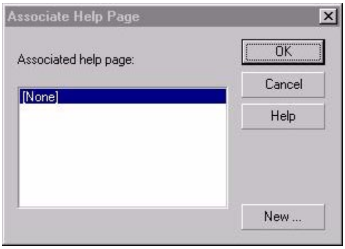
Help pages typically include information on the operation being monitored or controlled. When configuring a help page, indicate:
- Name and/or number of the new page,
- Help page model to be used.

Associating a help page with a page:

Select the **Page/Associate Help Page**... menu.

This menu allows you to:
- Associate an existing help page with the selected page,
- Associate a new help page with the selected page,
- Change the help page associated with the selected page.

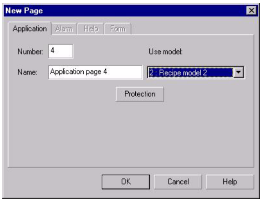
The “New” button allows you to create a new help page.


Associate Help Page
Associated help page:
[None]
OK
Cancel
Help
New ...

## Recipe page

A specific model of the application page can be used to create “recipe” pages.

To create a "recipe", a new application page as to be created and the recipe model as also to be associated to that page.



Number: 4
Name: Application page 4
Use model: 2 : Recipe model 2

A recipe page represents a file including recordings of the control system setup parameters or variables used to perform a specific type of action.

For instance, an industrial bakery can produce:
- viennese bread and buns: chocolate-filled pastry, croissants, brioches,
- bread: farmhouse bread, whole-wheat bread, rye bread, sticks of French bread,
- tarts: strawberry tarts, lemon tarts.

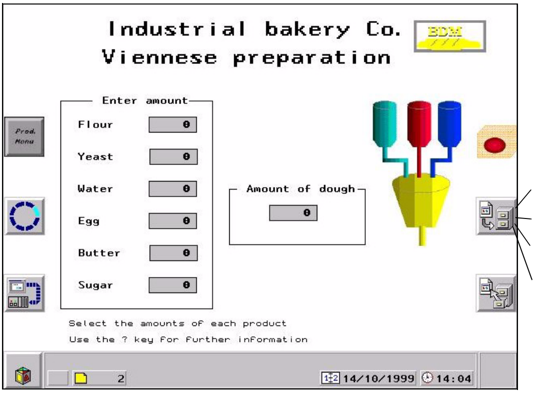
To make bread corresponds to the selection of a recipe. To make rye bread corresponds to the selection of a recipe recording. This means that, following the example provided above, there are only 3 recipes (3 application pages with model of recipes associated to each page).

For the first recipe called "viennese bread and buns", there are 3 differents recordings which contains a different set of values of the variable fields included on the first recipe page.

Then, for the second recipe called "bread", there are 4 recipes of the value of the values of the variable fields included on the second Recipe page.

Finally there are 2 recordings for the third recipe called "tarts".

Recipe 1



Industrial bakery Co.
Viennese preparation

Enter amount

Flour 0
Yeast 0
Water 0
Egg 0
Butter 0
Sugar 0

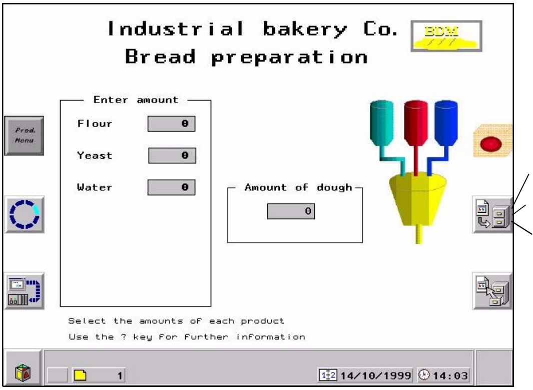
Amount of dough 0

Select the amounts of each product
Use the ? key for further information

2 14/10/1999 14:04

farmhouse bread
whole-wheat bread
rye bread
sticks of french bread
(records 1,2,3 and 4)

Recipe 2



Industrial bakery Co.
Bread preparation

Enter amount

Flour 0
Yeast 0
Water 0

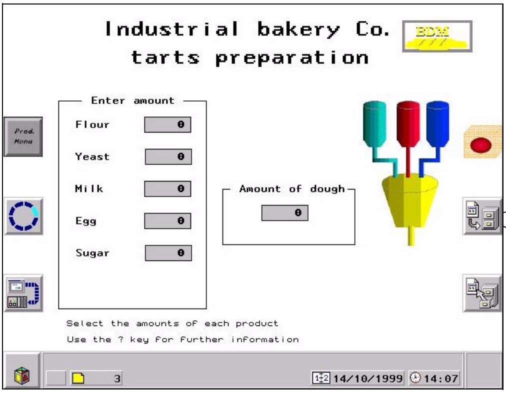
Amount of dough 0

Select the amounts of each product
Use the ? key for further information

1 14/10/1999 14:03

chocolate-filled pastry
croissants
brioches
(records 1,2 and 3)

Recipe 3



Industrial bakery Co.
tarts preparation

Enter amount
Flour 0
Yeast 0
Milk 0
Egg 0
Sugar 0

Amount of dough 0

Select the amounts of each product
Use the ? key for further information

3 14/10/1999 14:07

strawberry tarts
lemon tarts
(records 1 and 2)

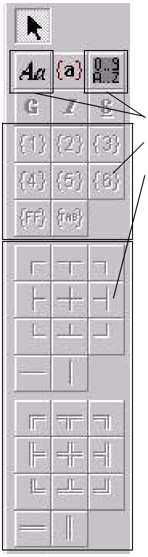
The following four dynamic function keys or touch zones are available by default on the recipe page model:

- a key for freezing/unfreezing the display on the terminal,
- a key for storing the recording displayed on screen in the PCMCIA card,
- a key for restoring and displaying the recordings previously saved in the PCMCIA card,
- a key for transferring the recording displayed to the control system.

All the application page objects can be used for the recipe pages. see chapter D, § 14. Use the recipe pages, Page 76, to know how to proceed to make recordings, call them, call different recipe pages, the usage limitations and the maximum number of recordings.

## Configuring a form page

Select Page/New Page/Form.



Indicate the name and/or the number of the new page.

The form pages can include the following elements:
- text objects,
- semi-graphic characters,
- printer control codes.

Text objects are static texts and alphanumeric variable fields. These elements are intended for printing only (see chapter C, § 2. Dialog table content, Page 9).

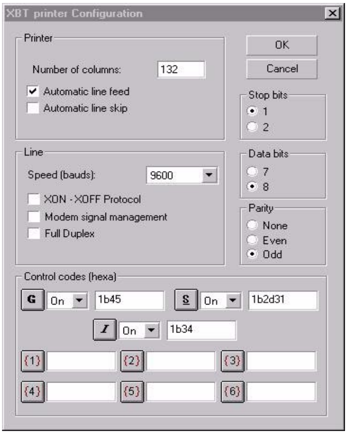
Semi-graphic characters are used to create simple or double frames for highlighting printed data (table of values, etc.).

Clicking on the icon Aa places the characters after the cursor.

The printer control codes {a} (ex : {1}, {2}, etc.) are used to define printer control sequences (printing of bar codes, bold characters, change of colors, etc.).

Select the {a} icon and place its position on the screen. The printed control codes ({1}, {2}, etc) are then introduced by clicking on its icon.

To configure each control code the menu "configuration / terminal parameters / printers" has to be selected.
The control codes are introduced in hexadecimal format according to the printer manufacturer documentation.



Printer
Number of columns: 132
☑ Automatic line feed
☐ Automatic line skip

Stop bits
● 1
○ 2

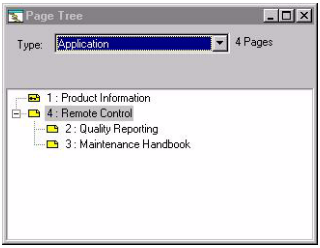
Line
Speed (bauds): 9600
☐ XON - XOFF Protocol
☐ Modem signal management
☐ Full Duplex

Data bits
○ 7
● 8

Parity
○ None
○ Even
● Odd

Control codes (hexa)
G On 1b45
S On 1b2d31
I On 1b34
{1}
{2}
{3}
{4}
{5}
{6}

## Tree structure control



Type: Application — 4 Pages

- 1 : Product Information
- 4 : Remote Control
  - 2 : Quality Reporting
  - 3 : Maintenance Handbook

.The software allows you to display the application's structure in a window. The pages are listed in increasing page number order.
The Application and System pages have a tree structure.
The alarm pages have a "flat" structure.

The page types are indicated by various icons. When the mouse pointer is positioned on an icon, a message is displayed indicating the type of page and its characteristics.
The terminal keys allow you to move around the tree structure.

Examples:

Unprotected application page, with an associated help page.

Application page protected by a password, with an associated help page.

Alarm page with an associated help page.

Unprotected system page.

Alias page: representation of a protected application page which is associated with other pages

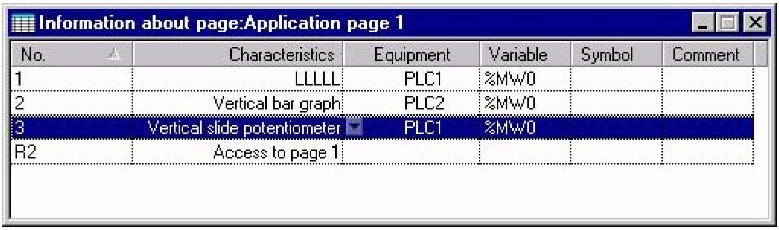
**NOTE** **A right click on one page of the tree structure allows creation of a new page of same type as the page selected.**

## Field information window

The software allows you to display the information regarding the main characteristics of the:

- variable fields,
- dynamic function keys,
- tactiles zones,

of the current page displayed.



Information about page:Application page 1

| No. | Characteristics | Equipment | Variable | Symbol | Comment |
|---|---|---|---|---|---|
| 1 | LLLLL | PLC1 | %MW0 | | |
| 2 | Vertical bar graph | PLC2 | %MW0 | | |
| 3 | Vertical slide potentiometer | PLC1 | %MW0 | | |
| R2 | Access to page 1 | | | | |

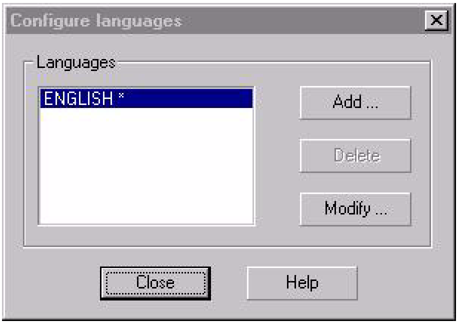
The window is displayed by selected Window / Field information menu.

By clicking on each variable of the field information window:

- The variable, the key or the tactile zone is selected in the editor,
- One click on the equipment column allows to modify the equipment of the field selected within the list proposed,
- The window for property field, key the windows for configuration of tactile zone can be opened by a double click or a right click,
- The window for modification of the variable can be opened directly by a double click on the variable
- One click on the title of each column allows to do increasing and decreasing sorts.

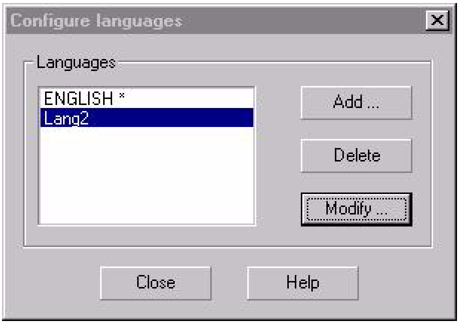
Symbols and comments of each field imported from PL7 or Concept are available in the window (see "Loading the PL7 or Concept symbols file", Page 11).

Configuration/Application languages menu.


Configure languages
Languages
Add ...
Delete
Modify ...
Close
Help

ENGLISH *

Add, delete or modify the application languages (3 maximum).


Configure languages
Languages
Add ...
Delete
Modify ...
Close
Help

ENGLISH *
Lang2

For each language (3 maximum), associate one of the 5 system languages available (see chapter F, § 1. XBT-F Specifications, Page 4) and select "close".
To translate the application, select the required language using the pull-down menu "Language" at the top of the window. Then, double-click on each text object and list-type alphanumeric field of the page to be translated. Repeat this last operation for all the fields of the pages to be translated.

**NOTE** **"Cyrillic translation": It is necessary to select " cyrillic " font available in the window of properties of the text zone (right click on the text zone, then select the option "text properties" before doing the text modification.**

# 6. Translation of the application

**NOTE** **If the application language selected is different from the reference language (language used on the creation of the application), it is not possible to add new values to the list proposed. To add new values, the reference language must be the language being currently used.**

**The length of the texts of the reference language (language used on the creation of the application) is not a limit for translating the application.**

It is possible to translate system page texts into a language different from one of the five languages available under XBT-L1000.

Double click on each text zone available in the system pages to modify the text.

Another possibility is in exporting the text, including the system pages, and doing the modification from a spreadsheet (see § 7. Import/Export, Page 53).

# 7. Import/Export

## Import/export texts

This function allows a quicker translation of the application.

The texts that can be imported or exported are:
- Static texts,
- Proposed lists,
- Name of pages (application, alarm, help and form) except model pages,
- System page texts (option available during export operation),
- Help windows,
- Alarm groups.

### Procedure (This function requires a spreadsheet)

1. From the application XBT L1000

- Once the application is created in the reference language (language used on creation of the application), all other languages must be added before doing the export operation (See § 6. Translation of the application, Page 51).
- Select "Export text" in the "File" menu
- If necessary, click option "System pages" to export text of system pages (translation into a language not available in the list of the basis (Cyrillic translation for example).
- Save the file under the name you want (Transl.txt for example).

2. From the Spreadsheet

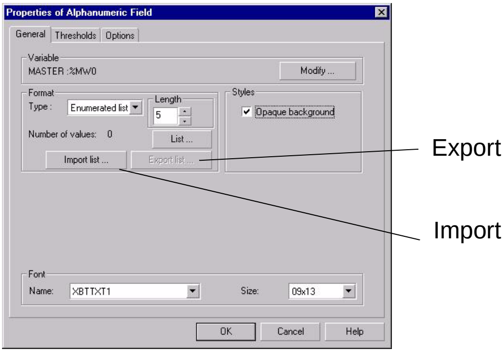
- Open the file exported from XBT L1000 (Transl.txt )
- **For a cyrillic translation**, Select the column with the text to translate (column B or C) and assign to the cells the True Type Cyrrilic font (supplied with the XBT-L1000).
  Special characters (top part of the font) of column B are replaced by cyrillic characters.
- Translate texts (column B or C).
- **For a cyrillic translation**, use an "on screen keyboard-type tool" (supplied with Windows 2000) or the "Font table" tool of Windows 95, 98 or NT.
- Save the file (Transl.txt) with "TXT" extension.

3. From the application XBT L1000

- **For a cyrillic translation**, change font for each text, each field of proposed list, and for texts of the application system pages.). Font changing in the properties of each field
- Select "Translation Import" in the "File" menu.
- Select the file and click on "Open".
- Configure terminal parameters so that the application uses the translated language by default.

## Import/export numbered list

A numbered list can be imported and exported directly by a single operation from its properties window, see "Import/export texts", Page 53.


Properties of Alphanumeric Field

Variable
MASTER :%MW0

Format
Type : Enumerated list
Length: 5
Number of values: 0

Styles
☑ Opaque background

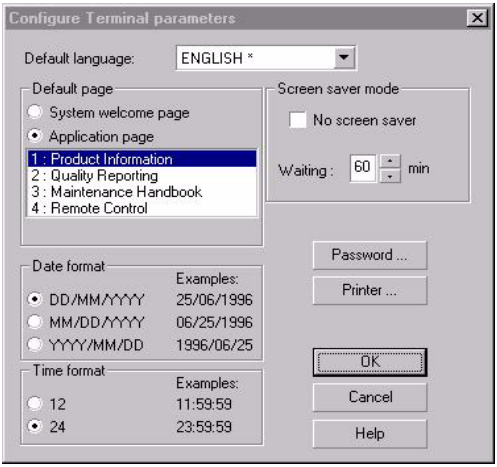
Font
Name: XBTTXT1
Size: 09x13

**NOTE** **File ".TXT" containing the numbered list texts can be opened with a spreadsheet. The first column contains the value of the variable field.**
**The following columns contains a language texts.**
**Each one value of the variable field and its associated text can be added at the list.**

After translation and/or adding of value / text, the proposed list is updated by clicking on "Import List".

# 8. Configuring the terminal parameters

Select the **Configuration/Terminal parameters** menu



Configure Terminal parameters

Default language: ENGLISH *

Default page
○ System welcome page
● Application page
1 : Product Information
2 : Quality Reporting
3 : Maintenance Handbook
4 : Remote Control

Screen saver mode
☐ No screen saver
Waiting : 60 min

Date format

| | Examples: |
|---|---|
| ● DD/MM/YYYY | 25/06/1996 |
| ○ MM/DD/YYYY | 06/25/1996 |
| ○ YYYY/MM/DD | 1996/06/25 |

Time format

| | Examples: |
|---|---|
| ○ 12 | 11:59:59 |
| ● 24 | 23:59:59 |

## Page number displayed by default at power up

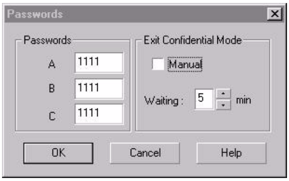
The 2 possibilities are:
- An application page,
- A system title page.

See chapter D, "Display at power up", Page 22.

# 8. Configuring the terminal parameters

## Passwords

The “Password” button allows you to configure three passwords A, B and C . Each password must consist of four alphanumeric characters. See chapter D, "Confidential mode, password management", Page 18.



A 1111
B 1111
C 1111
☐ Manual
Waiting : 5 min

Exit from the confidential mode can be either manual or automatic:
- manual: the operator explicitly requests an exit from the confidential mode,
- automatic: a timer which can be programmed to a value between 1 and 60 minutes is used by the terminal to automatically exit the confidential mode.

**NOTE** **For the 5" touch screen terminals, the password must be only a decimal type.**

## Default language

The language to be used by the terminal (system messages).

## Date format to be used:

dd/mm/yyyy (for example, 25/06/1996)
mm, dd, yyyy (for example, 06/25/1996)
yyyy, mm, dd (for example, 1996/06/25)

## Time format to be used

11 :59 :59
23 :59 :59

## Printer setup

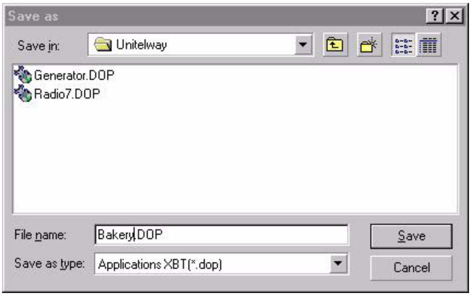
See chapter D, § 10. Printing, Page 57.

## Stand by screen display

- to enable or disable the stand by screen display,
- to define the wait time before stand by screen display.

# 9. Saving the application

Select the File/Save menu :



Save as
Save in:
Unitelway
Generator.DOP
Radio7.DOP
File name:
Save as type:
Save
Cancel

Bakery.DOP

Applications XBT(*.dop)

# 10. Application simulation

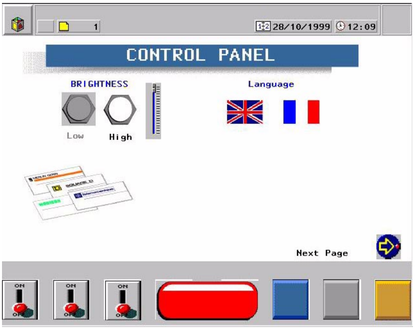
Simulation enables the XBT-L1000 application designer to test the real effect of his application without requiring a complete hardware configuration. This function is accessible via the Simulation menu.

Items simulated:
- Application and alarm pages,
- Page sequences,
- Variables input (with thresholds, etc.),
- Dialog table and alarms table.

**NOTE** **Help pages, keyboard LEDs, printouts, alarm relay and external application startup (TXBT-F) are not simulated.**
**Monochrome screen terminals are simulated with the standard color palette.**

The starting of the simulation opens 2 windows:
- the terminal simulation window,
- the PLC simulation window.

Ex.



WINDOW TERMINAL

The window simulates the information on the terminal's screen.
When this window is active, the PC keyboard simulates the terminal's keyboard.

**NOTE** **One left click of the mouse simulates a press on the touch screen.**

## Terminal simulation window

Key equivalents:

| Terminal | PC |
|---|---|
| R1... | F1.... |
| F1... | SHIFT F1... |
| HOME | HOME |
| ESC | ESC |
| SYST | PAGE UP |
| MENU | PAGE DOWN |
| MOD | INSERT |
| ALARM | END |
| ENTER | ENTER |
| Left, Right, Up, Down | Left, Right, Up, Down Arrow |
| +1 | SHIFT + UP |
| -1 | SHIFT + DOWN |
| DEL | DEL |
| Alphanumeric keypad | Alphanumeric keypad |
| ? | ? |
| shift + | shift + |
| +/- | + |

## PLC simulation window

Three tabs can be used to simulate:

- The displayed page variables (initially, a random value is allocated) by selecting each variable field cell, its value can be modified from the PC keyboard as it would have changed from the PLC.

- The alarm tables by clicking twice on each alarm bit, its state is changed from 0 to 1 and vice-versa.

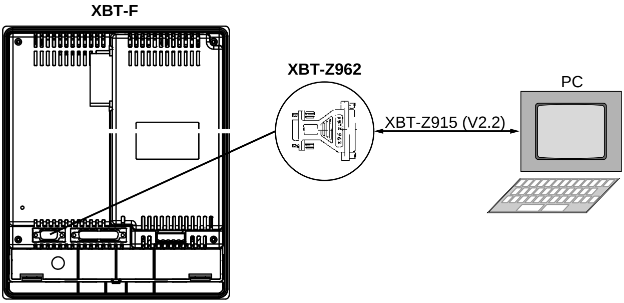
- The dialog table. Refresh of this window can be inhibited, to enable input of a page change, etc. The way to modify the dialogue table variables is the same used to modify the displayed page variables.

# 11. Transferring the application and the protocol to the terminal

Loading of the application in the terminal can be done either by local transfer (direct connection with a cable between the computer and the terminal) or by remote transfer (connection via a Unitelway or Fipway network, between the computer and the terminal).

## Local transfer

1. Install the terminal as shown in the service instructions.
2. Connect the terminal to the PC as shown in the service instructions (XBT-Z915 cable and adaptor XBT-Z962).
3. Turn the power on to the terminal.
4. Open the application to be loaded.
5. In XBT-L1000 select menu Transfers/Export towards terminal.



## Remote transfer

### Prior condition to fulfil before doing remote transfer on XBT-F and TXBT

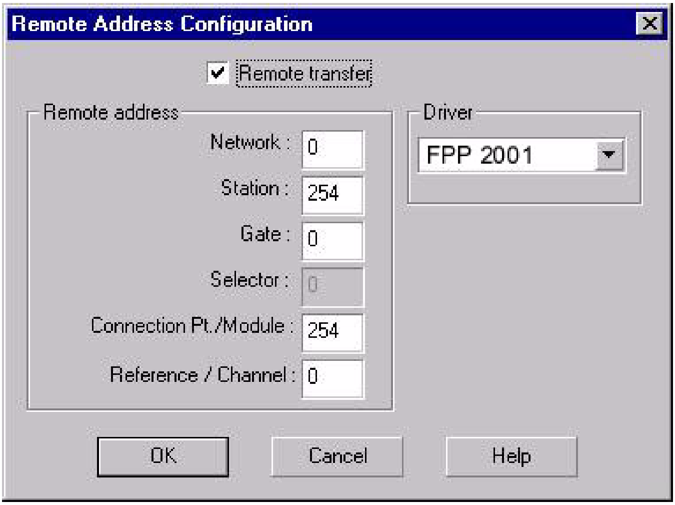
It is required that:

- Terminal is already configured with an application compatible with Unitelway or Fipway. The current application must have been loaded according to one of the following methods :
  - Local transfer.
  - Insertion of a PCMCIA card containing such application.
- A communication card Fipway must be installed in the computer for use of this protocol on the terminal. XBT-L1000 does not take into account the installation of software (library, drivers…) associated to the cards; therefore the installation must have been done previously.
- Terminal address is already configured on XBT-L1000 (Menu "Transfer/Remote" address). To get to address parameters click "remote transfer" box.

# 11. Transferring the application and the protocol to the terminal

### Capture of the remote address

- Select menu Transfer/remote address
- Capture terminal XWAY address (5 levels)



Remote Address Configuration

☑ Remote transfer

Remote address

Network : 0

Station : 254

Gate : 0

Selector : 0

Connection Pt./Module : 254

Reference / Channel : 0

Driver

FPP 2001

## Export operation

In the menu "Transfer", select "Export", then "towards terminal"

XBT-L1000 checks that the application you want to export is compatible with the XBT terminal which is connected your PC. XBT-L1000 also checks that the protocol installed is compatible with the connected terminal.

As XBT-L1000 controls the transfer, no particular operation needs to be done at the terminal.

XBT-L1000 displays a dialog window indicating transfer completion.

**NOTE** **Remote transfer is slower than a local transfer, particularly for Unitelway protocol.**
**It has the advantage of enabling modification of the dialogue application while the terminal is running.**

# 12. Transferring the application and the protocol to a PCMCIA card

## Import/export file

If a PCMCIA read/write card is available on a PC that has been loaded with the XBT-L1000 software, the application can be directly written on the card provided for the terminal. The Transfer/Import-export file menu is used to select the name of the PCMCIA unit.

Before performing an exportation to a PCMCIA card, it is necessary to define import/export file location (transfer menu, import/export file).
The application must be exported to the PCMCIA inside a directory called "appli". If it does not exist, the XBT-L1000 software will create this directory after performing "transfer menu / import / export file".
The name of the PCMCIA card as a hard PC unit is given automatically by the PC operating system (Windows 95, 98, NT).
In other cases (to a hard disk for example), the file name and its location can be different.

### XBT-L1000 -> PCMCIA card export

To export the application, select the **Transfers/Export/ to import/ export folder** menu. Insert PCMCIA card at the location provided on the terminal.

### PCMCIA -> XBT-L1000 card import

To import the application, insert the PCMCIA card into the PC and then the **Transfers/Import/from import/export folder** menu.
Before, use the **Export/to import/export folder** function to select the hard unit from which to import the application.

# 13. Updating the application

When an application that has been saved under an earlier version of the XBT-L1000 software is opened using a later version, the user will be prompted to have the software update the application to the later version.

This operation is used to update new system page formats and enables the designer to incorporate the enhanced functions of the new version into the existing application. Therefore, It is strongly recommended that the user perform the update.

**Note** **The model pages for application, alarm and help pages are not updated automatically. Thus, the alarm strip and the status line may have been re-located, deleted or modified by the designer.**

Updating the model pages:

1. Perform the updating proposed by XBT-L1000.
2. Create a new model for each type of page (application, alarm, help).
3. Delete the required elements (alarm strip, status line) from the existing models.
4. Cut/paste the elements required from the new models to the existing ones.

# Chapter C

# PLC and terminal Communications Dialog

# Contents

*This chapter includes the following sections:*

1. PLC/terminal communications dialog principle ____ 4

    Data exchanged ____ 4
    Exchange principle for data associated with fields ____ 6
    Principle of the communications dialog table ____ 7

2. Dialog table content ____ 9

    Notation convention for describing the table ____ 9
    Detailed description ____ 13

3. PLC/terminal communication dialog cycle ____ 30

    Processing by the terminal ____ 30
    Optimization for communication ____ 31
    Optimized communication ____ 32
    Non-optimized communication ____ 32

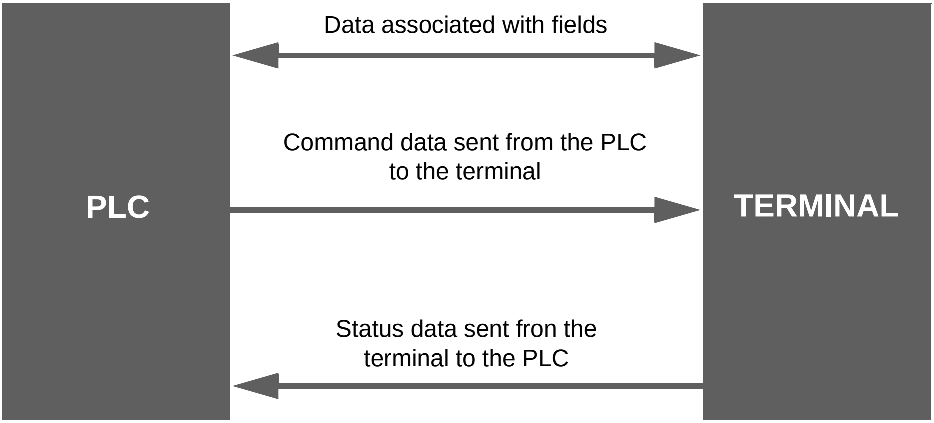
# 1. PLC/terminal communications dialog principle

The communications dialog between the terminal and the PLC consists of an exchange of data between one or several devices.
In all communication situations, the following should be defined:

- Data to be exchanged,
- Communication protocol.

## Data exchanged

Various types of data can be exchanged.


PLC
TERMINAL
Data associated with fields
Command data sent from the PLC to the terminal
Status data sent fron the terminal to the PLC

# 1. PLC/terminal communications dialog principle

**Data associated with fields**

These are variables which may be:
- displayed on the terminal,
- entered or modified on the terminal.

**Command data sent by the PLC to the terminal**

This concerns the following commands:
- Display an application or system page,
- Display an alarm page,
- Lock keys,
- Request to enter a variable field,
- Print command,
- Command of indicator lights associated with function keys,
- Clear log command,
- Set time-stamp command,
- Triggers graph plotting.
- etc.

**Status data sent by the terminal to the PLC**

This concerns the following status:
- Terminal status
  - confidential mode,
  - terminal configuration mode,
  - confirmation of entries by pressing the ENTER key,
  - cancelled entry by pressing the ESC key,
  - cancelled entry after a time-out,
  - print fault.
- Number of the displayed page,
- Number of the last field entered,
- Image of the keypad keys,
- Time-stamp status (date and time),
- Log occupancy rate as a percentage,
- Communication monitoring,
- Number of the last alarm acknowledged,
- Application signature,
- etc.

# 1. PLC/terminal communications dialog principle

## Exchange principle for data associated with fields

The exchange principle for the data associated with the fields depends on the protocol chosen according to the type of PLC.
The variables read or written are bits, single words, double words and word bits.

The terminal can be master or slave on the bus but it is always considered as the client and the PLC(s) as the server(s).

This means that the terminal always initiate data interchange to:
- refresh the fields (reading of values in the PLC),
- enter and edit fields (writing of values in the PLC).

**NOTE** **No PLC communication program needs to be written.**

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

PLC memory zone allocated for the XBT dialog table must NOT be used for anything else. It is the designer's responsibility to program the PLC logic properly.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

# 1. PLC/terminal communications dialog principle

## Principle of the communications dialog table

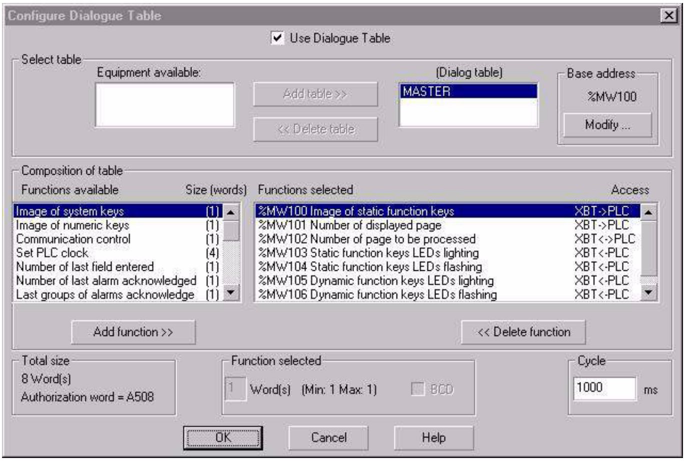
To simplify the communications dialog, all of the following are grouped together in a dialog table:

This table is located in one of the architecture PLCs and composed of n consecutive words (16-bit words).
It includes two parts:

**Status table**
**Status data sent by**
**the terminal to the PLC.**

**Command table**
**Commands sent by**
**the PLC to the terminal**

The number of words in the table depends on the choice of status data and commands that are to be processed during the dialog.
The XBT-L1000 software allows you to configure the dialog table.


Configure Dialogue Table
Select table
Add table >>
<< Delete table
Modify ...
Composition of table
Add function >>
<< Delete function
Total size
Function selected
Cycle
OK
Cancel
Help

☑ Use Dialogue Table

Equipment available:

(Dialog table): MASTER

Base address: %MW100

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size: 8 Word(s)
Authorization word = A508

Function selected: 1 Word(s) (Min: 1 Max: 1) ☐ BCD

Cycle: 1000 ms

# 1. PLC/terminal communications dialog principle

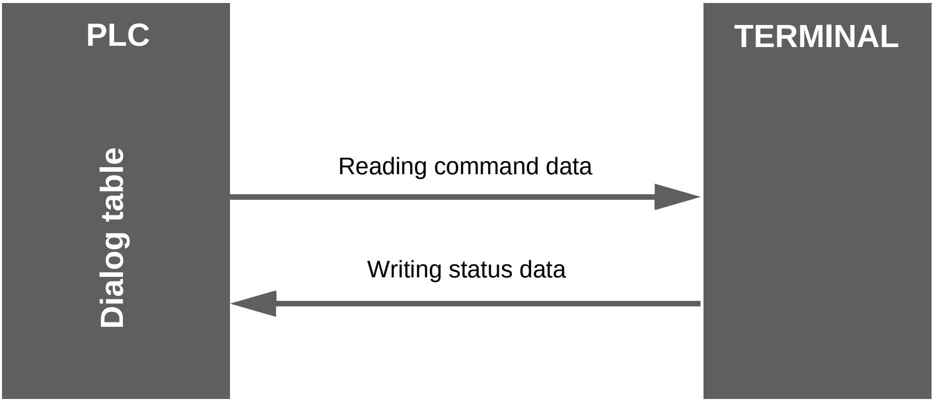
## WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

PLC memory zone allocated for the XBT dialog table must NOT be used for anything else. It is the designer's responsibility to program the PLC logic properly.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

When configuring the dialog table, you must define the dialog table's start address (basic address). The dialog table is in the PLC. The terminal periodically reads and writes to the table in the PLC.



### Secure use of the dialog table

A word is used in the table for security purposes: the "dialog table authorization" word.
The use of this word is a security for the PLC/terminal dialog. When this word is not set to the correct value in the PLC, the terminal does not write any word in the dialog table and does not execute any command.
This value is indicated by XBT-L1000. The PLC program must assign this value to the word “Dialog table authorization” so that the dialog table be processed by the terminal.

# 2. Dialog table content

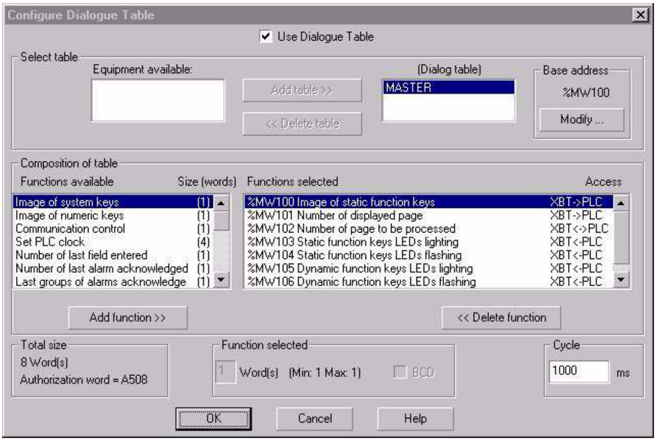
The number of words in the table depends on the choice of states and commands that are to be processed during the dialog. You may add or delete items as you choose.

## Notation convention for describing the table

%MWn word of 16 bits with address n.
%MWn, i : bit i of word n.
The address n is taken as the table's start address.
The table comprises a maximum of 135 words.
The description below gives the content of the various dialog table words; refer to the XBT-L1000 software's on-line help for further information on the various words.

**NOTE** **The word number is adapted in accordance with the words of the dialogue table used. The words are addressed in the order established in the "available functions".**

Ex.



☑ Use Dialogue Table

Select table

Equipment available:

(Dialog table): MASTER

Base address: %MW100

Composition of table

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size
8 Word(s)
Authorization word = A508

Function selected
1 Word(s) (Min: 1 Max: 1) ☐ BCD

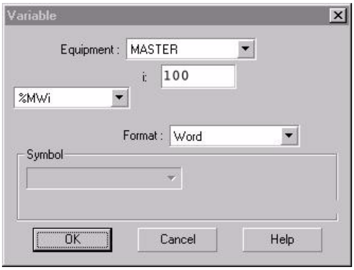
Cycle
1000 ms

**PLC <-- XBT**: Terminal writes the corresponding word(s) in the PLC.
**PLC --> XBT**: Terminal reads the corresponding word(s) in the PLC.
**PLC <--> XBT**: Terminal and the PLC can modify the corrresponding word(s) in the PLC.

# 2. Dialog table content

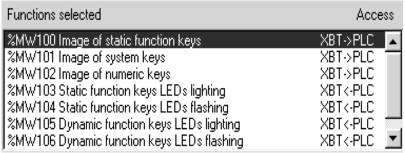
Select the **Configuration/Dialog table** menu.
Check the **Use dialog table** option.

Click **Modify** to change the address of the beginning of table %MW100.



Equipment : MASTER
i: 100
%MWi
Format : Word

In the **Function selections** list, delete or add the functions required by the application by means of the **Add Function** or **Delete Function** buttons to obtain the following list:



| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Image of system keys | XBT->PLC |
| %MW102 Image of numeric keys | XBT->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Once creation is completed, save the application using the **File/ Save** menu.

## 2. Dialog table content

| Word | Functions | Exchange | Page |
|---|---|---|---|
| %MWn+0 | Image of static function keys | PLC <- XBT | C13 |
| %MWn+1 | Image of system keys | PLC <- XBT | C13 |
| %MWn+2 | Image of numeric keys | PLC <- XBT | C13 |
| %MWn+3 | Communication control | PLC <- XBT | C14 |
| %MWn+4 to %MWn+7 | Set PLC clock | PLC <- XBT | C14 |
| %MWn+8 | Number of displayed page | PLC <- XBT | C15 |
| %MWn+9 | Number of last field entered | PLC <- XBT | C15 |
| %MWn+10 | Number of last alarm acknowledged | PLC <- XBT | C15 |
| %MWn+11 | Last groups of alarms acknowledged | PLC <- XBT | C15 |
| %MWn+12 | Report | PLC <- XBT | C17 |
| %MWn+13 | Log filling rate | PLC <- XBT | C17 |
| %MWn+14 | Graph plottings performed | PLC <- XBT | C17 |
| %MWn+15 | Application checksum | PLC <- XBT | C17 |
| %MWn+16 | Number of page to be processed | PLC<->XBT | C18 |
| %MWn+17 | Number of field to be entered | PLC<->XBT | C21 |
| %MWn+18 | Print command | PLC<->XBT | C23 |
| %MWn+19 | Activating graphs plotting | PLC -> XBT | C24 |
| %MWn+20 | Table write authorization | PLC -> XBT | C24 |
| %MWn+21 | Recipe transfer not allowed | PLC -> XBT | C25 |
| %MWn+22 | Clear Log | PLC -> XBT | C25 |

# 2. Dialog table content

| Word | Functions | Exchange | Page |
|---|---|---|---|
| %MWn+23 | Static function keys LEDs llighting. | PLC -> XBT | C26 |
| %MWn+24 | Static function keys LEDs flashing. | PLC -> XBT | C26 |
| %MWn+25 | Dynamic function keys LEDs lighting. | PLC -> XBT | C26 |
| %MWn+26 | Dynamic function keys LEDs flashing. | PLC -> XBT | C26 |
| %MWn+27 | Static function keys locking | PLC -> XBT | C26 |
| %MWn+28 | System keys locking | PLC -> XBT | C27 |
| %MWn+29 | Numeric keys locking | PLC -> XBT | C27 |
| %MWn+30 to %MWn+90 | Alarm table | PLC -> XBT | C28 |
| %MWn+91 to %MWn+94 | Set terminal clock | PLC -> XBT | C29 |
| %MWn+95 to %MWn+134 | Free format print table (40 words maxi) | PLC -> XBT | C29 |

# 2. Dialog table content

## Detailed description

### %MWn+0 : Image of static function keys

Images of the keypad keys sent to the PLC.
Bit at 1 = key pressed.

| | | Bit 11 | | Bit 0 |
|---|---|---|---|---|
| %MWn+0 | | F12 | | F1 |

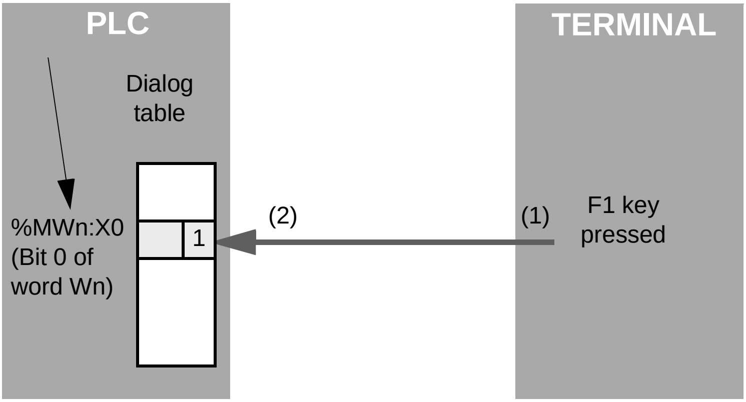
### %MWn+1 : Image of system keys
### %MWn+2 : Image of numeric keys

| %MWn+1 : system keys | %MWn+2 : numeric keys |
|---|---|
| Bit 0 : Up arrow | Bit 0 : 0 |
| Bit 1 : Down arrow | Bit 1 : 1 |
| Bit 2 : Right arrow | Bit 2 : 2 |
| Bit 3 : Left arrow | Bit 3 : 3 |
| Bit 4 : MOD | Bit 4 : 4 |
| Bit 5 : PRINT | Bit 5 : 5 |
| Bit 6 : MENU | Bit 6 : 6 |
| Bit 7 : SYST | Bit 7 : 7 |
| Bit 8 : ALARM | Bit 8 : 8 |
| Bit 9 : ESC | Bit 9 : 9 |
| Bit 10 : HOME | Bit 10 : . |
| Bit 11 : +1 | Bit 11 : +/- |
| Bit 12 : -1 | Bit 12 : DEL |
| Bit 13 : ENTER | Bit 13 : ? |
| Bit 14 : Reserved | Bit 14 : Ctrl (1) |
| Bit 15 : Action on tactile pad/ keyboard (2) | Bit 15 : Alt (1) |

**NOTE** **There are no images of the dynamic function and alphanumeric keys. For keys description, See chapter F, § 1. XBT-F Specifications, Page 4.**
**(1) Only for TXBT terminals**
**(2) Whenever the tactile pad or keyboard are locked , this bit is recorded.**

Ex.

*Indication to the PLC that the F1 key is pressed*



## WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

If communications between the XBT and PLC are lost, the operator's control over the machine may be completely or partially lost. It is the designer's responsibility to consider programming the PLC logic to account for this situation. An effective method is to use Wn+3 of the dialog table to control the communication.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

### %MWn+3 : Communication control

Word incremented by 1 at each processing cycle and used by the PLC application to monitor the terminal for proper operation.

### %MWn+4 to %MWn+7 : Set PLC clock

| order of bits | 15 8 | 7 0 |
|---|---|---|
| %MWn+4 | Seconds | Day of the week |
| %MWn+5 | Hours | Minutes |
| %MWn+6 | Month | Day of the month |
| %MWn+7 | Century | Year |

The terminal writes the time and date in the PLC with the dialog table cycle. There are 2 possible coding formats: Hexadecimal or BCD (choice made using XBT-L1000).
Day of the week: Monday = 1... Sunday = 7.

### %MWn+8: Number of displayed page

See %MWn+16: Number of the page to be processed.
This word contains the page number displayed on the terminal.
When the terminal displays a system page the word “number of the displayed page “ includes:
- in signed decimal: - 16 - N
- in non signed decimal: 65520 - N
- in hexadecimal: H’FFFO’ - N

N : System page number founded in pages tree structure for XBT-L1000.

### %MWn+9: Number of last field entered

See %MWn+17: Number of the field to be entered.
This word includes the number of the last field entered on the terminal and sent to the PLC. The entry logics is the following:

| MSB | LSB |
|---|---|
| field number in model page | field number in application page |

The field number is provided by XBT-L1000: Display/Field Number menu.

### %MWn+10: Number of last alarm acknowledged

### %MWn+11: Last groups of alarms acknowledged

See: %MWn+30 to %MWn+90, Table of alarms.
These two words are written together by the terminal when the operator acknowledges:
- a single alarm,
- a group of alarms,
- all the active alarms.

***%MWn+10*** : Number of the last alarm acknowledged, coded 1 to 1024.

***%MWn+11*** : Last group of alarms acknowledged with 1 bit per group of alarms (bit 0 = group 1 ...).

| Bit 15 |  | Bit 1 | Bit 0 |
|---|---|---|---|
| G16 |  | G2 | G1 |

The same alarm can be triggered by several bits which may belong to different PLCs equipment.(see chapter D, § 7. Process control using function keys, Page 50 and see chapter B, "Alarm table", Page 40).
The terminal stores the origin of the alarm so that the data related to alarm acknowledgement by the operator can be sent to the proper PLCs.
Depending on the type of acknowledgement, the terminal writes the following values at next cycle:

Acknowledgement of a single alarm: ENTER or icon ACK for **touchscreen terminals** :

***%MWn+10***: Number of the last alarm acknowledged = N°. from 1 to 1024.
***%MWn+11***: Last group of alarms acknowledged with 1 bit per group of alarms = H’FFFF’.
example: acknowledgement of alarm 5:
%MWn+10 = 5
%mWn+11 = H’FFFF’

Acknowledgement of a group of alarms: ACKALL :

***%MWn+10***: Number of the last alarm acknowledged = H’FFFF’. Only one group of alarms is selected in the list of alarms.
***%MWn+11***: Last group of alarms acknowledged with 1 bit per group of alarms = the bit corresponding to the group of alarms acknowledged it set to 0.

example: acknowledgement of group of alarms 2:
%MWn+10 = H’FFFF’
%mWn+11 = H’FFFD’

**NOTE** **All the active alarms of a group must be triggered by the same PLC to increase the performance levels.**

Acknowledgement of all the active alarms: ACKALL :

All the groups of alarms are selected from the list of alarms.
***%MWn+10***: Number of the last alarm acknowledged = H'FFFF'. Only one group of alarms is selected in the list of alarms.
***%MWn+11***: Last group of alarms acknowledged with 1 bit per group of alarms = H'0000'

### %MWn+12: Report

Bit 0: Confidential mode (Password selected A and/or B and/or C)
Bit 1: Reserved
Bit 2: ENTER on entry
Bit 3: ESC on entry
Bit 4: End of entry on TIME-OUT (1 min)
Bit 5: Printing in progress
Bit 6: Printing fault
Bit 7: Printing stopped
Bit 8: Recipe transfer in progress
Bit 9: Recipe transfer error
Bit 10: Terminal in stand-by
Bits 11 to 15: Reserved

### %MWn+13: Log filling rate

See %MWn+22: clear history.
Alarm history filling rate on the terminal as a percentage, sent to the PLC.

### %MWn+14: Graphs plottings performed

See word %MWn+19: Graph plotting activation.

### %MWn+15: Application checksum

The word includes a check sum calculated on the dialog application and which characterises each application version.

### %MWn+16: Number of page to be processed

See also %MWn+8: Number of the displayed page.
The word %MWn+16 has two functions:

- pages display,
- special command.

Page display:

When the PLC wants to display a page, it indicates its number in word %MWn+16: Number of the page to be processed in compliance with the following:

- from 1 to 64999 for the application pages,
- one of the following values for the system pages:
  - in signed decimal: - 16 - N
  - in non signed decimal: 65520 - N
  - in hexadecimal: H'FFF0' - N

N : System page number founded in pages tree structure for XBT-L1000.

When the display command is executed:

- %MWn+16 = H'FFFF,
- %MWn+8: includes the number of the page displayed in compliance with the above mentioned rules.

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

The PLC application must check the content of word %MWn+16 (value H"FFFF") to ensure that the command has been processed and check the number of the displayed page to ensure that the command has been correctly executed.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

Characteristic : Stand by screen display control

This word allows the PLC to put on or off the stand by screen display mode:

- For the stand by screen display, the system page 520 must be called, 65000 in the word number of page to treat.
- To put off the stand by screen display, the system page 0 must be called, 65520 in the word number of page to treat. This action puts off the stand by screen display mode and display the last page on the screen before the stand by screen display.

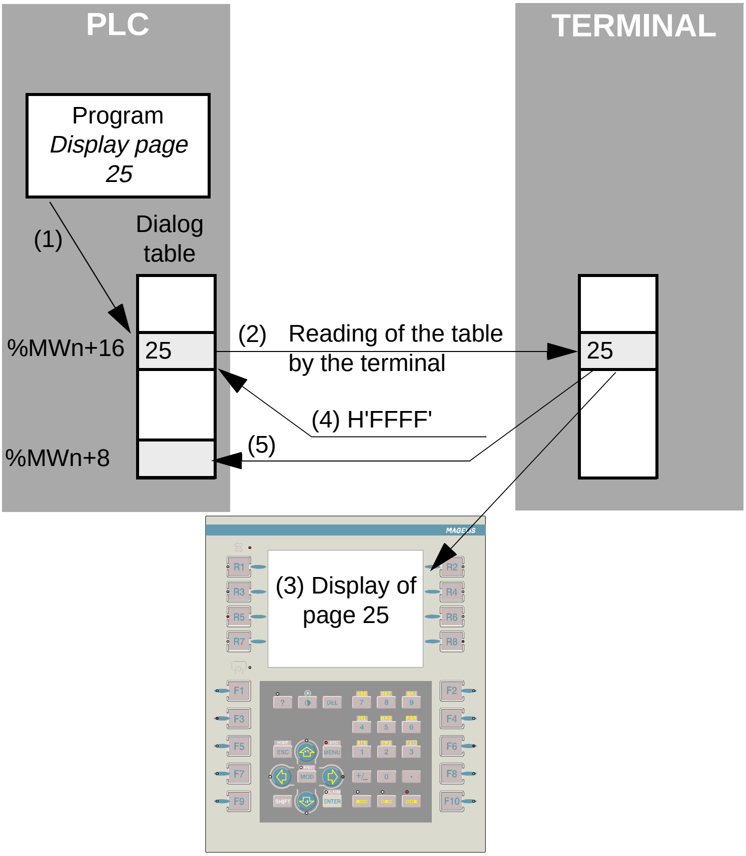
Special command:

If we put the following values in the word %MWn+16, we obtain the result below:

| Value %MWn+16 | Function |
|---|---|
| 65000 | moving to stand by screen |
| 65520 | exit from stand by screen |
| 65521 | brightness min |
| 65522 | brightness max |

Ex.

*Display of page 25 by the PLC*


PLC
TERMINAL
Program
Display page
25
(1)
Dialog
table
%MWn+16
25
(2) Reading of the table
by the terminal
25
(4) H'FFFF'
(5)
%MWn+8
MAGELIS
(3) Display of
page 25
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
SHIFT
ENTER
DEL

*(1) The PLC writes in the dialog table the number of the page to display, 25.*
*(2) The terminal periodically reads the dialog table in the PLC and (3) displays the required page.*
*Once the command has been processed, (4) the terminal writes H'FFFF' in the word “Number of the page to be processed” and (5) the number of the displayed page in the word “Number of the displayed page”.*

### %MWn+17 : Number of field to be entered

See also %MWn+9 : Number of the last field entered, %MWn+12: Report. The entry fields are managed by means of 3 words which inform the application of the operator actions:

- %MWn+9 : Number of the last field entered
- %MWn +12 : Report
- %MWn +17 : Number of the field to be entered

| MSB | LSB |
|---|---|
| field number in model page | field number in application page |

XBT-L1000 gives the number of field.

## ⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

The PLC program must check that the page displayed is correct before requesting an entry.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

### PLC request for entry

When the PLC requests an entry in a field, it indicates the number of the field in word %MWn+17: Number of the field to be entered.
The terminal indicates reception of the entry request by resetting the report bits 2, 3, 4 (%MWn+12).

If the entry field exists, the end of entry is indicated by %MWn+17 = Number of the field to be entered H'FFFF'.

- When the entry is confirmed by ENTER, %MWn+9 “Number of the last field entered" contains the number of the field entered.
- When the entry is cancelled by pressing ESC or due to a Time-Out, no modifications will be made.

The terminal sets one of the 3 status bits according to how the entry was ended (Time-Out, ESC, ENTER).

If the requested field cannot be entered: (unknown field, etc.), the end of the entry is given by 3 informations:

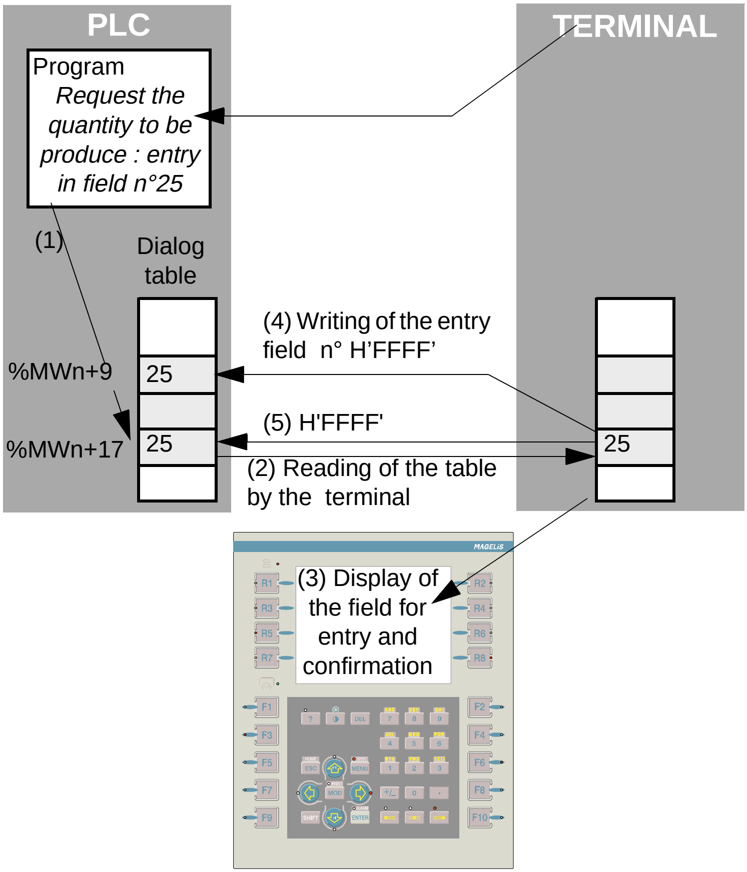
- %MWn+17: Number of the field to be entered = H'FFFF'.
- The 3 status bits (Time-Out, ESC, ENTER) remain at zero.
- The number of the last entry field is reset.

### Operator request for entry

The status word and the number of the last entry field are updated in the case of an operator request.

Ex.

*Request by the PLC for a quantity to be produced. The value is entered in field number 25*


PLC
TERMINAL
Program
*Request the quantity to be produce : entry in field n°25*
(1)
Dialog table
%MWn+9
25
%MWn+17
25
(4) Writing of the entry field n° H'FFFF'
(5) H'FFFF'
(2) Reading of the table by the terminal
25
(3) Display of the field for entry and confirmation
MAGELiS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
ENTER
SHIFT
DEL

(1) PLC writes in the dialog table, the number of the field to be entered. (2) The terminal periodically reads the dialog table in the PLC and (3) sets the required field to entry mode. Once the entry has been configured by the operator, the number of the field entered is sent to the PLC (4) and the words "Field to be entered" and "Report" are updated(5).

### %MWn+18 : Print command

| 15 8 | 7 0 |
|---|---|
| Print code | Length of the print table |

The "print command" word is written by the PLC.
A code is associated with each type of possible printing (MSB).

- Free format printout: H'01xx' (xx = table length in hexadecimal),
- History printout: H'02xx',
- Form printout: H'04xx'.

For **form printout**, xx represents the number of the form to be printed.

Free format printing consists of sending on the initiative of the PLC, the data contained in the free format printing table, located at the end of the dialog table (%MWn+95 and following), in the least significant byte, the **length in bytes** of information to be printed (80 bytes maximum).

The word %MWn+18 "Print command" is written to H'FFFF' by the terminal to indicate the end of the print command (see bits 5, 6, 7, of %MWn+12 "Report").

%MWn+18: H'010A' printing of 10 bytes in the printing table .

Ex.

%MWn+18: H'010A' printing of 10 bytes in the printing table .

## %MWn+19 : Activating graphs plotting

See also %MWn+14: Graph plotting performed.
The terminals can monitor the change of a control system data in real time (example: monitoring of an analog value). A curve has 1 to 4 pens with different colors.

The PLC can activate the recording of values and the 4 plottings of a graph simultaneously on a bit rising edge of word %MWn+19. The user can assign one of 16 bits of word %MWn+19 to a curve. He can thus activate 16 graphs (1 word = 16 bits). The bit of word %MWn+14 with the same order (graph plotting performed) is set to 1 when the graph is plotted (1 to 4 pens).

Word %MWn+14 (graph plotting performed) is used to inform the PLC of the result of the command (one graph = 1 word bit).

## %MWn+20 : Table write authorization

This word serves as a security for the PLC/terminal dialog. When this word is not at the correct value, the terminal cannot write any words in the PLC and cannot execute any commands.
This is the case for adjustment pages as PLC variables can always be read and written.

| Order of bit | 15 … 8 | 7 … 0 |
|---|---|---|
| | H' A5' | Dialog table lengh |

The value of this word is indicated (in Hexadecimal) in the dialog table configuration by XBT-L1000.
Example: For a table that is 20 words long, the PLC must write H'A514' in the authorization word.
A5 = authorization, 14 = number of words in the dialog table (in Hexadecimal).

Ex.

*For a table that is 20 words long, the PLC must write H'A514' in the authorization word.*
*A5 = authorization, 14 = number of words in the dialog table (in Hexadecimal).*

### %MWn+21: Recipe transfer not allowed

See also %MWn+8: Number of the displayed page and %MWn+12: Report.
The transfer of configuration parameters from the terminal to the process is a critical operation which must only be performed when the PLC is ready to receive these parameters.

When word %MWn+21 “Recipe transfer not allowed” is set to 0 in the dialog table, the recipe transfer is enabled.
If it is set to 1, transfer is inhibited.

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

A transfer in progress cannot be interrupted by a change in the status of word %MWn+21 "Recipe transfer not allowed".

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

During a transfer, the recipe page is displayed on the terminal screen. The PLC can thus identify the recipe being transferred using word %MWn+8.

Bits 8 “Recipe transfer in progress” and 9 “Recipe transfer error” of word %MWn+12 “Report” indicate to the PLC that the transfer is in progress. The PLC can then be synchronised on the end of transfer (bit 8 “Recipe transfer in progress” is set to 0) to restart the process with the new parameters.
Bit 9 “Recipe transfer error’’ of word %MWn+12 “Report” indicates an error during transfer.

### %MWn+22: Clear log

See also %MWn+13: Log filling rate.
The PLC must write H'00FF' in word %MWn+22 to clear the log.

- The terminal clears the log and resets the log filling rate word %MWn+13.
- The PLC must then reset the clear log command %MWn+22.

### %MWn+23 : Static function keys LEDs lighting

| | | Bit 11 | | Bit 0 |
|---|---|---|---|---|
| %MWn+23 | | F12 | | F1 |

### %MWn+24 : Static function keys LEDs flashing.

| | | Bit 11 | | Bit 0 |
|---|---|---|---|---|
| %MWn+24 | | F12 | | F1 |

### %MWn+25 : Dynamic function keys LEDs lighting.

| | | Bit 9 | | Bit 0 |
|---|---|---|---|---|
| %MWn+25 | | R10 | | R1 |

### %MWn+26 : Dynamic function keys LEDs flashing.

| | | Bit 9 | | Bit 0 |
|---|---|---|---|---|
| %MWn+26 | | R10 | | R1 |

If for the same key, the lighting and flashing bit are at 1, the indicator is flashing.

### %MWn+27 : Static function keys locking

| | | Bit 11 | | Bit 0 |
|---|---|---|---|---|
| %MWn+27 | | F12 | | F1 |

### %MWn+28 : System keys locking
### %MWn+29 : Numeric keys locking

| %MWn+28 : system keys | %MWn+29 : numeric keys |
|---|---|
| Bit 0 : Up arrow | Bit 0 : 0 |
| Bit 1 : Down arrow | Bit 1 : 1 |
| Bit 2 : Right arrow | Bit 2 : 2 |
| Bit 3 : Left arrow | Bit 3 : 3 |
| Bit 4 : MOD | Bit 4 : 4 |
| Bit 5 : PRINT | Bit 5 : 5 |
| Bit 6 : MENU | Bit 6 : 6 |
| Bit 7 : SYST | Bit 7 : 7 |
| Bit 8 : ALARM | Bit 8 : 8 |
| Bit 9 : ESC | Bit 9 : 9 |
| Bit 10 : HOME | Bit 10 : . |
| Bit 11 : +1 | Bit 11 : +/- |
| Bit 12 : -1 | Bit 12 : DEL |
| Bit 13 : ENTER | Bit 13 : ? |
| Bit 14 : Reserved | |
| Bit 15 : Total lock of tactile pad/ keyboard | |

**NOTE** **If the PLC locks the arrow keys, the terminal automatically switches off the indicator lights on those keys to indicate they are no longer active. The dynamic function and alphanumeric keys cannot be locked.**

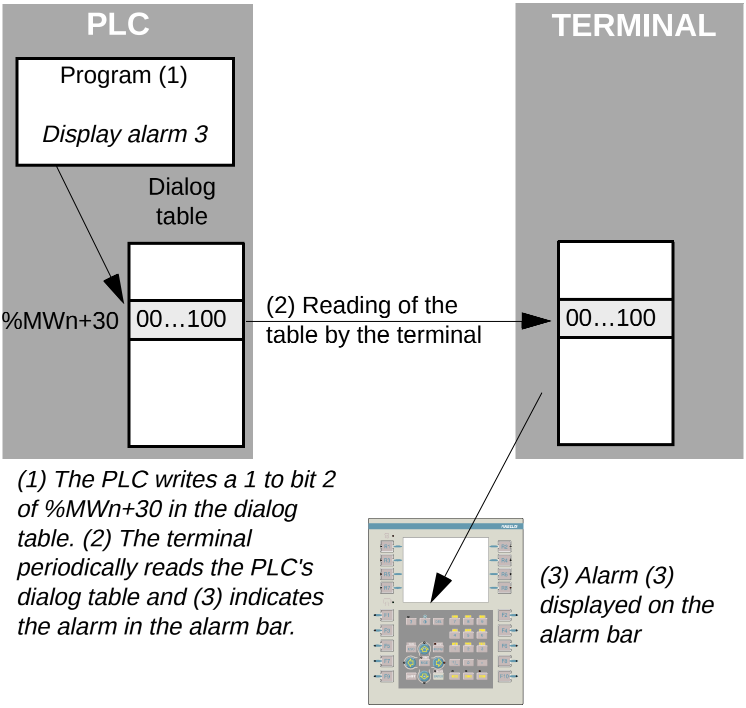
### %MWn+30 to %MWn+90 : Alarm table

See also %MWn+10: number of the last alarm acknowledged (32 words maximum on XBT, 64 words maximum on TXBT).
%MWn+11: Last group of alarms acknowledged.
The display of alarm is commanded by the PLC by setting a word bit to 1.

| | Bit 15 | | Bit 0 |
|---|---|---|---|
| %MWn+30 | AL16 | | AL1 |
| %MWn+31 | | | AL17 |

Ex.

*Activation of alarm n° 3*


PLC
TERMINAL
Program (1)
*Display alarm 3*
Dialog table
%MWn+30
00…100
(2) Reading of the table by the terminal
00…100

*(1) The PLC writes a 1 to bit 2 of %MWn+30 in the dialog table. (2) The terminal periodically reads the PLC's dialog table and (3) indicates the alarm in the alarm bar.*

*(3) Alarm (3) displayed on the alarm bar*

See chapter B, "Alarm table", Page 40.

### %MWn+91 à %MWn+94 : Mise à l'heure du terminal

| Order of bits | 15 8 | 7 0 |
|---|---|---|
| %MWn+91 | Seconds | Day of the week |
| %MWn+92 | Hours | Minutes |
| %MWn+93 | Month | Day of the month |
| %MWn+94 | Century | Year |

Whenever one of these words is modified, the terminal is set to the date and time given in this table.
There are 2 possible coding formats: Hexadecimal or BCD (choice made using XBT-L1000).
Day of the week: Monday = 1 ... Sunday = 7.

### %MWn+95 to %MWn+134 : Free format print table (40 words max)

See %MWn+18 : print command.

This table is used by the PLC to transfer a character string (80 maximum) to the equipment item (printer, etc.) connected to the terminal.

# 3. PLC/terminal communication dialog cycle

## Processing by the terminal

Five types of transactions are carried out by the terminal, either intermittently or in a processing cycle:

### Dialog table cycle

This comprises reading and writing by the terminal of the parameters selected from the dialog table, including the alarms table, at intervals specified in XBT-L1000.

### Permanent variables refresh cycle

At intervals specified in XBT-L1000. (See chapter B, "Graphical curve", Page 27.)

### Displayed page variables refresh cycle

### Single reading of variables when calling up a new page

### Immediate writing of variable

when the function key is pressed or a value entered.

# 3. PLC/terminal communication dialog cycle

## Optimization for communication

The following recommendations enable terminal/PLC communications to be optimized, thus improving operator dialog response times. They apply, regardless of the communication protocol used.

- make a careful allocation of the variables to single, cyclic or permanent reading, according to how they are used by the terminal,
- use contiguous addresses for the cyclic reading of variables on a page,
- use contiguous addresses for the single reading of variables on a page,
- do not overload the dialog table with words not needed by the application,
- adjust the dialog table period according to the traffic generated by the dialog application on the one hand and the other equipment items of the control system structure on the other hand.

**NOTE** **The operator actions are processed immediately, independent of the value of the dialog table period.**

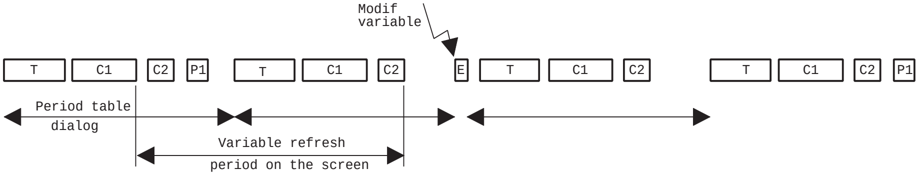
A very short dialogue cycle can slow down :

- variables refresh,
- new page display.

As a rule, only the words which are useful for the application should be selected to optimize communication.

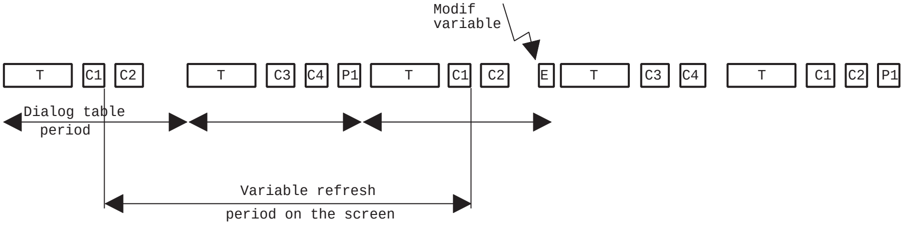
# 3. PLC/terminal communication dialog cycle

## Optimized communication


Modif
variable
T
C1
C2
P1
T
C1
C2
E
T
C1
C2
T
C1
C2
P1
Period table
dialog
Variable refresh
period on the screen

## Non-optimized communication

(Dialog table period too short, variables too widely scattered for page animation).


Modif
variable
T
C1
C2
T
C3
C4
P1
T
C1
C2
E
T
C3
C4
T
C1
C2
P1
Dialog table
period
Variable refresh
period on the screen

Keys :

| | |
|---|---|
| T | dialog table read/write |
| Ci | cyclic reading of n consecutive variables for animating the displayed page |
| Pi | permanent reading of n consecutive variables for recording a curve |
| E | immediate writing of a variable |

# Chapter D

# Operating the terminal

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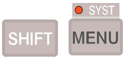
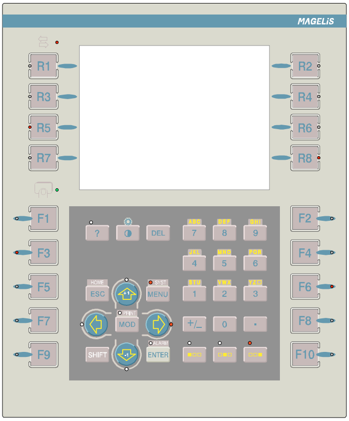
# 1. Keys and indicator lights

This section describes the function of the terminal's various keys. Each key function is described in the following paragraphs, and the corresponding keys are indicated.

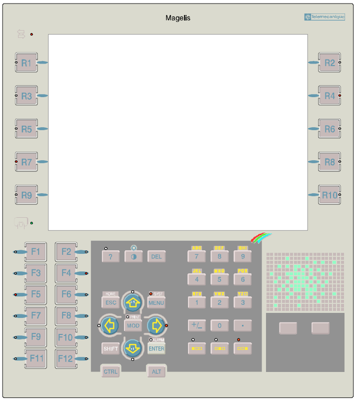
**NOTE** **Some functions (example: SYST) can be accessed by simultaneously pressing SHIFT and the associated key (example: SHIFT + MENU => SYST))**


SYST
SHIFT
MENU

***XBT***


MAGELiS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
?
DEL
7
8
9
4
5
6
1
2
3
0
+/_
.
HOME
ESC
SYST
MENU
MOD
SHIFT
ENTER

***TXBT***


Magelis
Telemecanique
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
ESC
MENU
MOD
SHIFT
ENTER
CTRL
ALT
DEL

# 1. Keys and indicator lights

## Touchscreen terminals

Touchscreen terminals do not have a keypad.
Regarding to the Touchscreen with touch keys, the keys run the same way as the touch zone. Those keys give a "mechanical feeling" that isn't felt on the tactile zone (manipulation with gloves).
For each key of terminals with keyboard an equivalent will be given for touchscreen terminals.

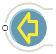
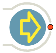
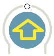
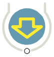
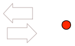
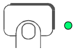
Pressing this touch zone called the ***service touch*** icon provides access to a context “keyboard”. Depending on the presence of some functions, the “keyboard” may or may not display the corresponding “buttons”.

| Keys and indicator lights | Functions of the keys and indicator lights |
|---|---|
| ○ ALARM<br>ENTER | ***ENTER***: To confirm a choice or an entry, acknowledge an alarm.<br>Press the ENTER touch icon on the touchscreen terminal to access this function. |
| ⚠ | Acknowledge an alarm on **touchscreen terminals**. |
| ○ PRINT<br>MOD | ***MOD***: Switch to entry mode on all the applicable fields or graphic objects (not existing on **touchsreen terminals**). |
| HOME<br>ESC | ***ESC***: To cancel an entry, or suspend or stop an action in progress.<br>To display the preceding pages successively. To exit from alarm display.<br>Press the service and ESC touch icons to access this function on touchscreen terminals. |
| SHIFT | ***SHIFT***: To access a key's second function.<br>No equivalent touch icon is available on touchscreen terminals. |
| ● SYST<br>MENU | ***MENU***: To access a menu that contains the run-time functions that cannot be accessed directly by means of a key:<br>- application page selection,<br>- the "secondary" run-time functions.<br>Press the service and MENU touch icon to access this function. |

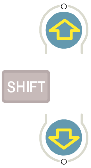
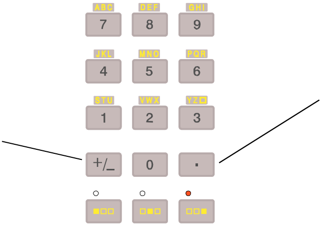
# 1. Keys and indicator lights

| Keys and indicator lights | Functions of the keys and indicator lights |
|---|---|
| SHIFT HOME ESC | ***HOME***: To return to the page displayed when the terminal is switched on.<br>Press the service and HOME touch icons to access this function on touchscreen terminals. |
| SHIFT ● SYST MENU | ***SYST*** : To access the system pages that contains the maintenance configuration functions.<br>Status of the indicator lights associated with the SYST key:<br>- Off: the terminal is in running mode.<br>- On: the terminal is in confidential mode.<br>- Flashing: PC <-> XBT transfer in progress or no application in the terminal.<br>Press the service and SYST touch icons to access this function on touchscreen terminals. |
| SHIFT ○ ALARM ENTER<br>For touchscreen terminal<br>●<br>ALARM | ***ALARM*** : To display the alarms<br>Status of the indicator light associated with the key:<br>- Off: the current list of alarms is empty.<br>- On: the list contains alarms that have already been displayed.<br>- Flashing: the list of alarms contains new alarms.<br>Press the service and ALARM touch icons to access this function on touchscreen terminals. |
| SHIFT ○ PRINT MOD | ***PRINT***: Print command.<br>Status of the indicator lights associated with each key:<br>- Off: no printing possible<br>- On: printing possible (list of alarms, etc.)<br>- Flashing: printing error.<br>Press the service and PRINT touch icons to access this function on touchscreen terminals. |

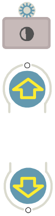
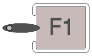
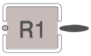
# 1. Keys and indicator lights

| Keys and indicator lights | Functions of the keys and indicator lights |
|---|---|
|   | The left and right arrow keys are used to:<br>- To select an object in a page.<br>- To move during an entry in an alphanumeric field.<br>- To change the cursor position on a switch or a potentiometer.<br>Status of the indicator lights associated with each key:<br>- Off: key inactive.<br>- On: indicates the possibility of moving around in a page from field to field.<br>- Flashing: indicates the possibility of moving around in the selected variable alphanumeric field or of changing a cursor position. |
|   | The up/down arrow keys are used to:<br>- To move around in a page.<br>- To select a value in a list of values.<br>- To change the cursor position of a swtich or a potentiometer.<br>Status of the indicator lights associated with each key:<br>- Off: key inactive.<br>- On: indicates the possibility of moving around in a page from field to field.<br>- Flashing: indicates the possibility of moving around in the selected alphanumeric variable field, changing the cursor position or selecting a value in a list.<br>For **touchscreen terminals**, press the object icon to select an object in a page. If data entry or cursor moving is valid for the object, touch icons corresponding to the object context are displayed (for example: a numeric pad for entering a numerical value, increment/decrement arrows for a potentiometer, etc.). |
|  | ***Communication indicator light***<br>- On: no cable or incorrect wiring,<br>- Off: cable correct, no exchange with the PLC,<br>- Flashing: exchanges with the PLC. |
|  | ***Keypad indicator light***<br>- Off: no keys pressed, on the keypad or on the touchscreen pad.<br>- On, green: when pressing any key or a touch zone.<br>- On, red: the terminal is in standby mode. Press any key or the touchscreen pad to exit this mode. Press any key or the tactile pad to exit this mode. |

# 1. Keys and indicator lights

| Keys and indicator lights | Functions of the keys and indicator lights |
|---|---|
|  | ***Entering data in the various fields***<br>The up/down arrow keys combined with the SHIFT key are used to increment or decrement the value in a variable field if the "access" parameter of the object entered has been configured to immediate write (or immediate read/write). The value is entered in the control system each time the SHIFT + arrow up/down key is pressed.<br>Status of the indicator lights associated with each key:<br>- Off: key inactive.<br>- Flashing: indicates the possibility of modifying the value of each digit. |
| | ***To delete the character to the left of the cursor*** |
|  | .<br> ABC<br>DEF<br>GHI<br>7<br>8<br>9<br>JKL<br>MNO<br>PQR<br>4<br>5<br>6<br>STU<br>VWX<br>YZ□<br>1<br>2<br>3<br>+/_<br>0<br>.<br>Alphanumeric entry keys<br>To reverse the sign of the variable field being entered<br>Decimal point<br>Combined with the alphanumeric keys, these keys give access to the capital character situated on the left, in the middle, on the right of the group of letters.<br>Combined with SHIFT and the alphanumeric keys, these keys give access to the small letter situated on the left, in the middle, on the right of the group of letters.<br>The indicator lights indicate if letter entry is possible. |

# 1. Keys and indicator lights

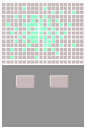
| Keys and indicator lights | Functions of the keys and indicator lights |
|---|---|
|  | ***Contrast and brightness adjustment***<br>Contrast adjustment: press and hold the adjustment key and make the adjustment by means of the up and down arrow keys.<br>**NOTE : The contrast cannot be adjusted on the XBT-F10" color and TXBT 10" color terminals.**<br>Brightness adjustment: press and hold the SHIFT key and the adjustment key, and make the adjustment by means of the up and down arrow keys.<br>For ***touchscreen terminals***, adjustment are only available via the “Terminal parameters” system page. |
|  | ***Static keys (see chapter A, § 7. Managing the control system, Page 32.)*** |
|  | ***Dynamic keys (see chapter A, § 7. Managing the control system, Page 32).*** |

## Extra keys for TXBT

### Access to Windows 95 functions

A PC keyboard equipped as standard for Windows 95 comprises two additional keys; the START and MENU keys. To access the same functions on the TXBT, use the following equivalents:

- ***Start*** key: Obtained by pressing Ctrl+Esc on the TXBT, used to start up an application.
- ***Menu*** key: Obtained by clicking the mouse right-hand button on the TXBT, used to access the most common functions associated with an icon.



"**Mouse**" function with touchscreen pad and right/left click buttons
Used to select a field or an item in a list (for example: list of pages). Cannot be used to modify a graphic variable field. Gives access to the Windows 95 functions.

# 1. Keys and indicator lights

## External keyboard

An external keyboard can be connected to the DIN 8-pin connector.
The 2 keyboards remain active.
The front of the 2 terminals have QWERTY keyboards. Any external keyboard should also be a QWERTY keyboard.

## TXBT and external keyboard equivalents

| TXBT keyboard keys | External keyboard keys |
|---|---|
| Rx | Fx |
| Fx | ALT + CTRL + Fx |
| ? | |
| DEL | DEL |
| HOME | HOME, |
| ESC | ESC |
| +1 | SHIFT + arrow up |
| SYST | SYST |
| MENU | PageDown |
| PRINT | ALT + PrtScrn |
| MOD | INSER |
| SHIFT | SHIFT |
| -1 | SHIFT + arrow down |
| ALARM | SHIFT + ENTER or END |
| ENTER | ENTER |
| CTRL | CTRL |
| ALT | ALT |

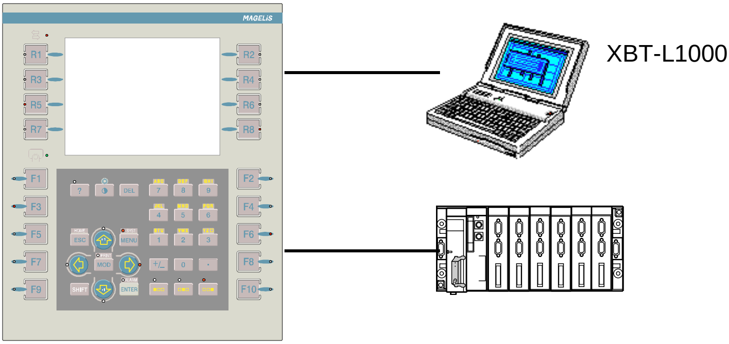
# 2. Operating Principle

## Basic Principle

The terminals have 3 operating modes:

### Application transfer

This mode enables transfers between the XBT-L1000 and the terminal. ( XBT-L1000 <-> XBT transfer: application and protocol).
**Case of XBTs**: local transfer XBT-L1000 <-> XBT
**Case of TXBTs**: local transfer XBT-L1000 <-> TXBT or remote transfer via the PLC network (**Unitelway, Fipway or ISAway**).



**WARNING**

**UNINTENTIONAL EQUIPMENT OPERATION**

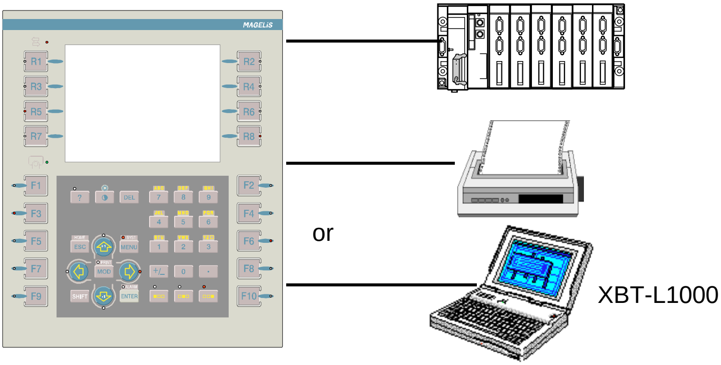
Connect the serial link and printer link to the XBT with the power OFF.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

# 2. Operating Principle

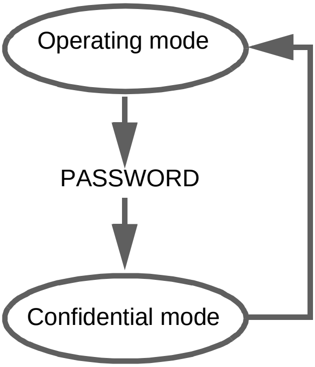
## Operating mode

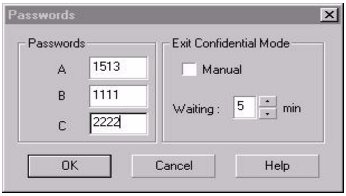
This mode is used for on-line control of thecontrol system:
- PLC control
- Displaying information, variables, alarms
- Entering values
- Discrete command
- Print, log consultation functions, etc.


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
SHIFT
ENTER
DEL
or
XBT-L1000

## Confidential mode

Besides providing access to the running mode functions, this allows you to access advanced functions requiring a password:
- Access to pages that are protected in run-time mode
- Access to system pages


Operating mode
PASSWORD
Confidential mode


Passwords

Passwords
A 1513
B 1111
C 2222

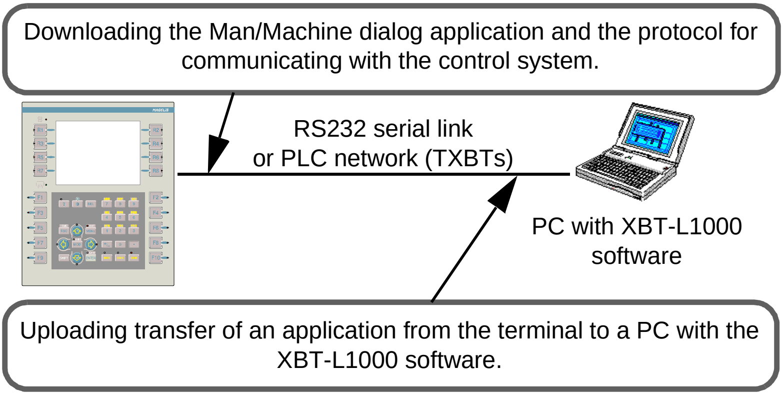
Exit Confidential Mode
☐ Manual
Waiting : 5 min

OK
Cancel
Help

In the "PASSWORD (advanded)" system pages it is possible to configure the automatic exit after a limited writing time (1 to 60 minutes).see "Confidential mode, password management", Page 18.

## Application transfer

In this mode, 2 types of transfers are possible:



Downloading the Man/Machine dialog application and the protocol for communicating with the control system.

Uploading transfer of an application from the terminal to a PC with the XBT-L1000 software.

**SYST indicator light**: the SYST indicator light flashes during the transfer.

### XBT-L1000/Terminal transfer procedure

See chapter B, § 11. Transferring the application and the protocol to the terminal, Page 61.

**Wiring:** Refer to the terminal instructions for the XBT, or to the TXBT Magelis Product Line Reference Manual. See chapter B, § 12. Transferring the application and the protocol to a PCMCIA card, Page 63.

# 2. Operating Principle

---

## Operating mode

Operating mode is used for on-line control of the control system:

- Page display
- Entry/Modification of the process's parameter values
- Process control (discrete)
- Print
- Printing of form pages,
- Consulting and acknowledging alarms
- Consulting the alarm log
- Accessing the terminal configuration (printer link, time-stamp link, link with the control system, languages)
- Accessing the terminal's self-diagnostic functions (keypad, display unit, etc.) (TXBT only).

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

Pressing the MENU key allows the inexperienced and untrained operator to accidentally display the wrong page, modify the terminal configuration, or lose the messages and alarms on the screen. This can lead to confusion, panic, and, as a consequence, loss of control over the machine. It is strongly recommended that the PLC be programmed to lock the MENU key as well as the other currently unused keys in order to prevent this from happening.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

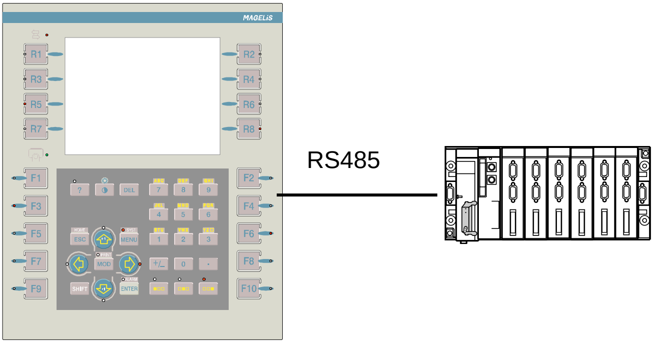
### Operating configuration

**NOTE** **Wiring : see service instruction for the terminal and communication protocol in use.**

Ex.

***Running with a PLC's RS 485 type console connector***

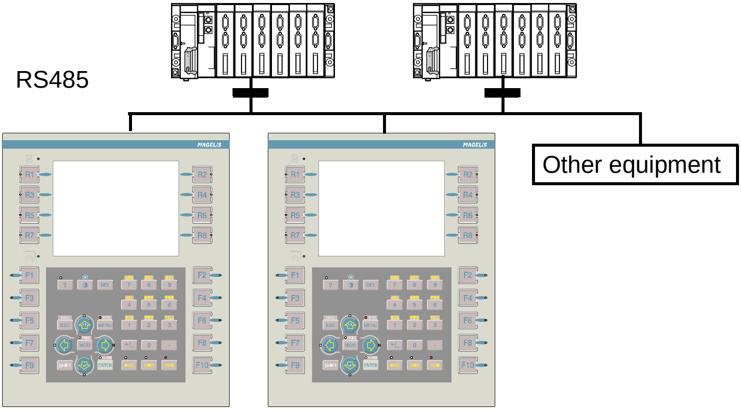
- *Terminals with UNITELWAY protocol*
- *PLC: TELEMECANIQUE PLC with an RS485 type console connector interface (type TSX07, TSX37, TSX57 ...)*
- *Type of link: RS485 single-point*
- *Protocol: UNITELWAY.*



Ex.

***Running on a PLC communication network***

- *PLC: PLC supporting the terminal's communication protocol,*
- *Type of multipoint link:*
    - *RS422, RS485,*
    - *PCMCIA card (FIPIO, FIPWAY, MODBUS PLUS protocol,...*
- *Protocol: multipoint protocol (UNITELWAY, FIPWAY,...*

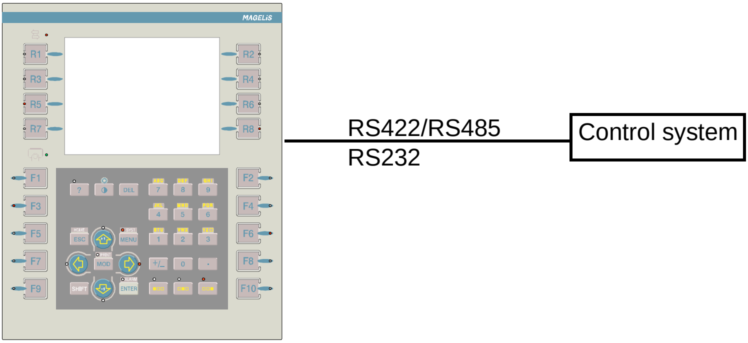


# 2. Operating Principle

Ex.

***Running with direct point-to-point link to the control system***

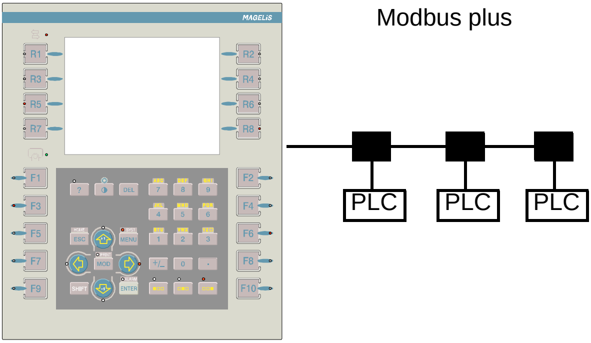
- *The control system designates a system other than the PLC.*
- *Type of multipoint link:*
  - *RS422 or RS485, RS232*
  - *PCMCIA card (FIPIO, FIPWAY, MODBUS PLUS protocol,...*
- *Protocol: depending on the control system.*


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
SHIFT
ENTER
DEL
RS422/RS485
RS232
Control system

Ex.

***Running on a PLC using Modbus Plus**:*

- *PLC: Any PLC supporting Modbus Plus*
- *Type of Link: Modbus Plus*
- *Protocol: Modbus Plus*


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
SHIFT
ENTER
DEL
Modbus plus
PLC
PLC
PLC

## Confidential mode, password management

To restrict reading and writing of certain data to only those authorized, you can protect access to pages or fields by means of passwords.

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

The XBT should only be installed and used by the authorized personnel that have been assigned the appropriate confidential mode PASSWORDS by the project manager.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

If the right passwords are not entered, this protection system will then:
- Prevent access to application or system pages. The protected pages are no longer accessible from a static or dynamic function key (the associated labels no longer appear on the terminal screen) and they do not appear in the list of pages.
- Inhibit writing in dynamic variable fields: alphanumeric variable field, linear/rotary potentiometer, linear/rotary switch, image box. The protected fields are displayed as if they were configured in read only mode. The labels associated with the dynamic function keys and enabling access to these fields are no longer displayed on the terminal screen.

**NOTE** **When an entire page is protected, password protection for individual field of that page is disabled.**

### There are three different passwords: A, B and C

The value of these passwords is defined in XBT-L1000, Configuration/ Terminal parameters. When the Configure Terminal parameters window appears, select the Password button to show the Passwords dialog box. Each password is a string of 4 alphanumeric characters (default value 1111).

See chapter B, § 8. Configuring the terminal parameters, Page 55.

Exit from the confidential mode can be either manual or automatic:

- manual: the operator explicitly requests an exit from the confidential mode,
- automatic: a timer which can be programmed to a value between 1 and 60 minutes is used by the terminal to automatically exit the confidential mode.

Configuration of the parameters for automatic exit of the confidential mode can be performed via the terminal system page “Passwords/ advanced properties” or for XBT-L1000, menu configuration/ parametres terminal/PASSWORDS.
When exporting an application to a terminal, the properties are set to the following values: automatic exit from confidential mode: NO.

**NOTE** **To ensure that your passwords remain confidential, there is no way of consulting the value from the Magelis terminal.**
**The only way of finding out the value of a lost or forgotten password is to consult the application using XBT-L1000.**

### Operating principle

A page or field can be protected by password A and/or B and/or C. Depending on whether the user has filled out passwords A, B or C on the terminal, he will be able to access the corresponding pages and fields.

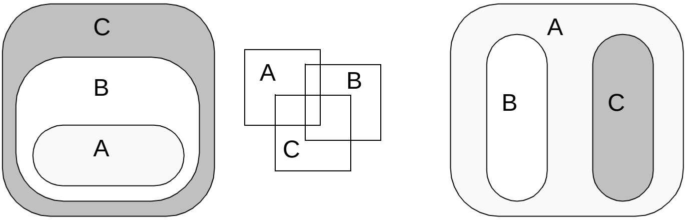
Examples :

| Page or field number | Protection defined in XBT-L1000 |
|---|---|
| 1 | none |
| 2 | A |
| 3 | B |
| 4 | A, B |
| 5 | A, C |
| 6 | A, B, C |

- If only A has been entered, the user will be able to access pages or fields 1, 2, 4, 5 and 6.
- If only B has been entered, the user will be able to access pages or fields 1, 3, 4, and 6.
- If C has been entered, the user will be able to access pages or fields 1, 5, and 6.

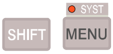
# 2. Operating Principle

This operating principle enables protection perimeters to be defined completely free.

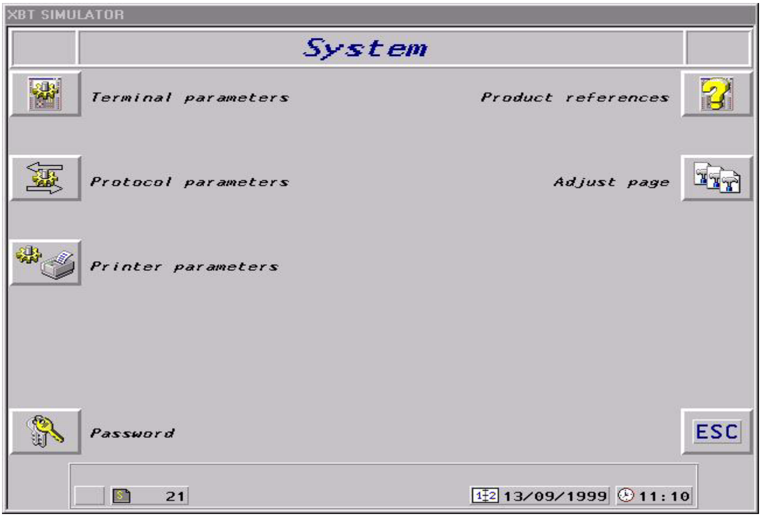


The status line informs the user of the passwords entered.(see chapter A, § 3. Application pages, Page 20).

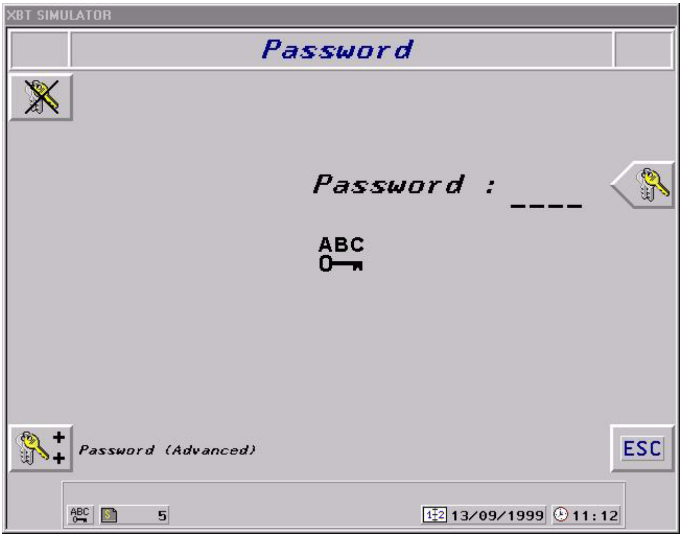
### Password entry


SYST
SHIFT
MENU

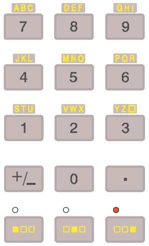
Press the **MENU** or **SYST** key to display the system page on terminals with keyboard and press the status touch zone then **MENU** or **SYST** for touchscreen terminals.


XBT SIMULATOR
System
Terminal parameters
Product references
Protocol parameters
Adjust page
Printer parameters
Password
ESC
21
13/09/1999
11:10

Press the dynamic key (or the touch zone) associated with the Password icon, to display the Password system page.


XBT SIMULATOR
Password
Password : ____
ABC
Password (Advanced)
ESC
5
13/09/1999
11:12

Press the dynamic key associated with the Password icon or press the corresponding touch zone on touchscreen terminals.


ABC 7
DEF 8
GHI 9
JKL 4
MNO 5
PQR 6
STU 1
VWX 2
YZ 3
+/_
0
.

Enter the password using the alphanumeric keys and then confirm with ENTER.
The password level appears in the lower strip.
The SYST indicator light comes on.
For the terminal with the 5" tactile keys, the password must be a numeric type.

## Disabling the password manually

- Go to the password system page.
- Press the dynamic key corresponding to locking/unlocking of protection mode (barred key).

The SYST indicator light goes out.

**NOTE** **Manual disabling of password is available even if automatic exit from confidential mode has been configured.**

# 3. Page display

## Display at power up

### For the XBTs

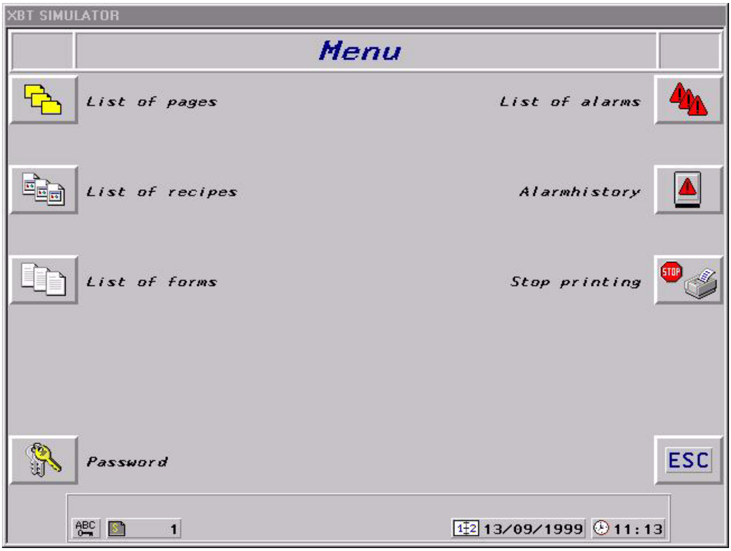
When the terminal is switched on, it automatically displays the following information:

- Reference and version of the embedded software,
- Reference of the software downloaded by XBT-L1000.

Then, depending on the configuration chosen when the application was created with XBT-L1000, the terminal will display either:

- an application page that can be selected with XBT-L1000 (see below),
- the MENU page.

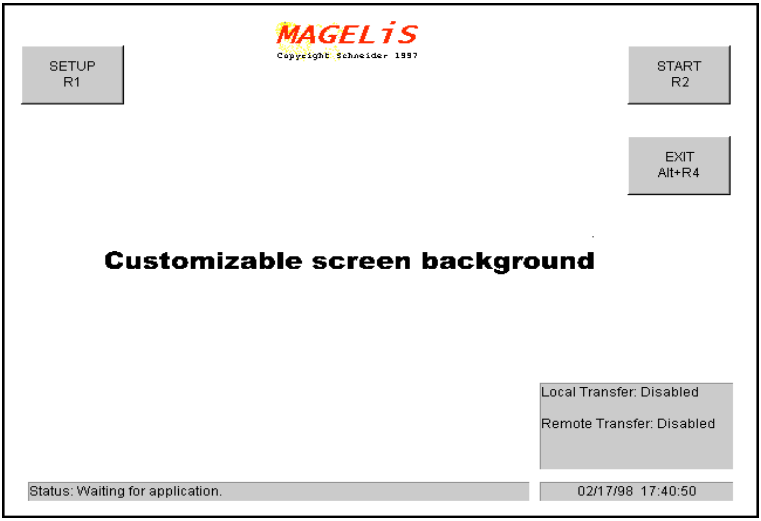
This page, displayed at power up, will then be accessible using the HOME key.


XBT SIMULATOR
Menu
List of pages
List of alarms
List of recipes
Alarmhistory
List of forms
Stop printing
STOP
Password
ESC
ABC
1
13/09/1999
11:13

# 3. Page display

## For the TXBTs

When the terminal is switched on, the home screen appears if the terminal contains no Magelis graphic application.



Customizable screen background

Local Transfer: Disabled

Remote Transfer: Disabled

Status: Waiting for application.

02/17/98 17:40:50

- Home screen background

The screen background can be replaced by simply replacing the TXBT.BMP file in the ....\TXBT\TOOLS directory. The file definition must be 640x480, 256 colors).

The functions possible from the home screen are started using dynamic keys.

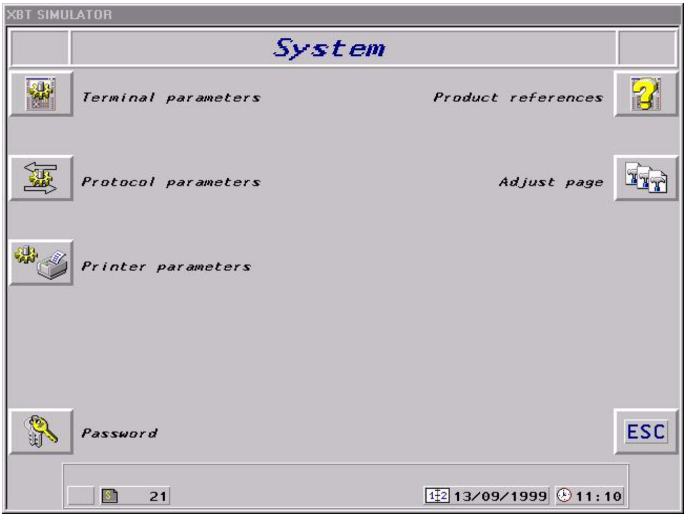
- Running the Magelis graphic R2 application

The Magelis graphic application is run with key R2.

Depending on the configuration chosen when creating the application with XBT-L1000, the terminal displays either:

  - An application page, or
  - A home system page.

# 3. Page display


XBT SIMULATOR
System
Terminal parameters
Product references
Protocol parameters
Adjust page
Printer parameters
Password
ESC
21
13/09/1999
11:10

- Access to Windows 95, running an application

The CTRL+ESC keys are used to start an application.

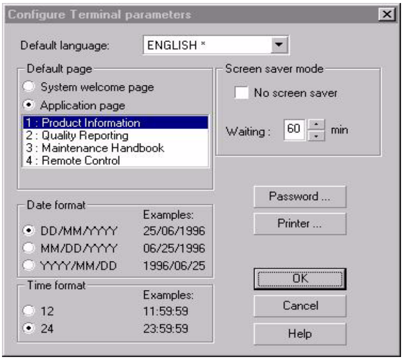
- Closing the home screen

The home screen cannot be iconized and keys ALT+R4 are used to close it.

- Setup

The home screen specifies the type of transfer, which can be configured: see TXBT Manual.

Selection of the default page to be displayed with XBT-L1000
To select the default page, See chapter B, § 8. Configuring the terminal parameters, Page 55.


Configure Terminal parameters
Password ...
Printer ...
OK
Cancel
Help

Default language: ENGLISH *

Default page
○ System welcome page
● Application page
1 : Product Information
2 : Quality Reporting
3 : Maintenance Handbook
4 : Remote Control

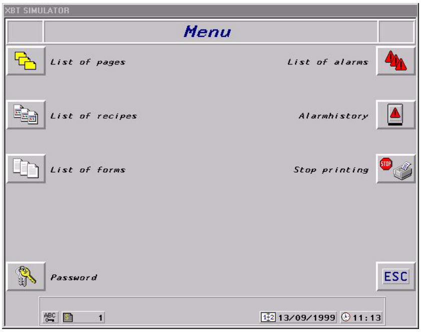
Screen saver mode
☐ No screen saver
Waiting : 60 min

Date format — Examples:
● DD/MM/YYYY 25/06/1996
○ MM/DD/YYYY 06/25/1996
○ YYYY/MM/DD 1996/06/25

Time format — Examples:
○ 12 11:59:59
● 24 23:59:59

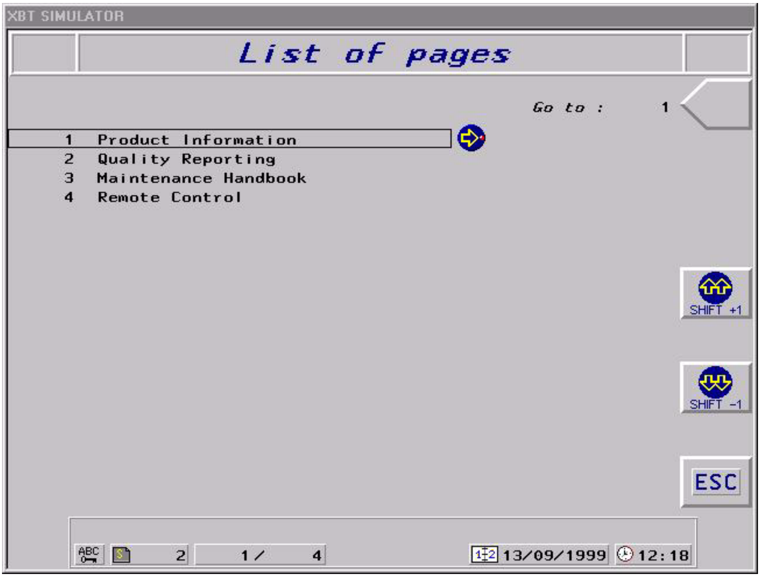
## Displaying a page using the directory of pages

Display the Menu system page using the **MENU** key or the status touch zone then the **MENU** zone on touchscreen terminals.


XBT SIMULATOR
Menu
List of pages
List of alarms
List of recipes
Alarmhistory
List of forms
Stop printing
Password
ESC
1
13/09/1999
11:13

Press the dynamic key (or touch zone) associated with the **List of pages** icon.

Select the required page with the up and down arrow keys.


XBT SIMULATOR
List of pages
SHIFT +1
SHIFT −1
ESC
2
1 / 4
13/09/1999
12:18

Go to : 1

```
1  Product Information
2  Quality Reporting
3  Maintenance Handbook
4  Remote Control
```

Confirm access to the page with the right arrow key.

# 3. Page display

## Displaying a page using its number

Go to the list of pages (see "Displaying a page using the directory of pages", Page 25).
Press the dynamic key associated with the ***Page number*** text or select the touch icon on touchscreen terminals.

or

SYST MENU Display the list of pages by pressing the ***MENU*** key.

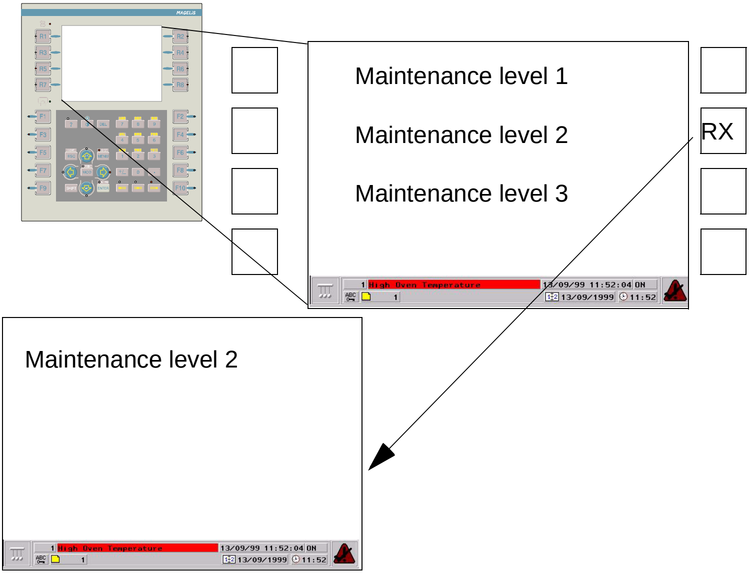
PRINT MOD Go to the page number entry field by pressing the ***MOD*** key.

ALARM ENTER Enter the page n° and press ***ENTER*** to confirm.

## Displaying a page by means of a dynamic function key, tactile zone or tactile key

The dynamic function keys (Rx) are associated with a page and can be configured to make the terminal change from one page to another. The function key is configured using the XBT-L1000 software and allows a page to be displayed directly.

Ex.


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
Maintenance level 1
Maintenance level 2
Maintenance level 3
RX
1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52
Maintenance level 2
1 High Oven Temperature 13/09/99 11:52:04 ON
1 13/09/1999 11:52

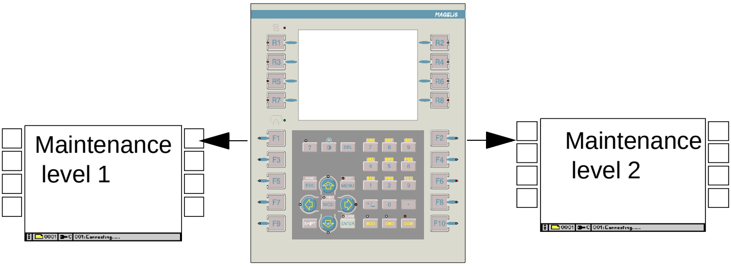
On touchscreen terminals, a page can be selected by directly pressing on a touch zone associated with this page. On terminals with tactile keys, a page can be selected by directly pressing a tactile key.

# 3. Page display

## Displaying a page by means of a static function key

A static function key (Fx) remains the same for all the application pages. The function key is configured using the XBT-L1000 software and allows a page to be displayed directly.

Ex.

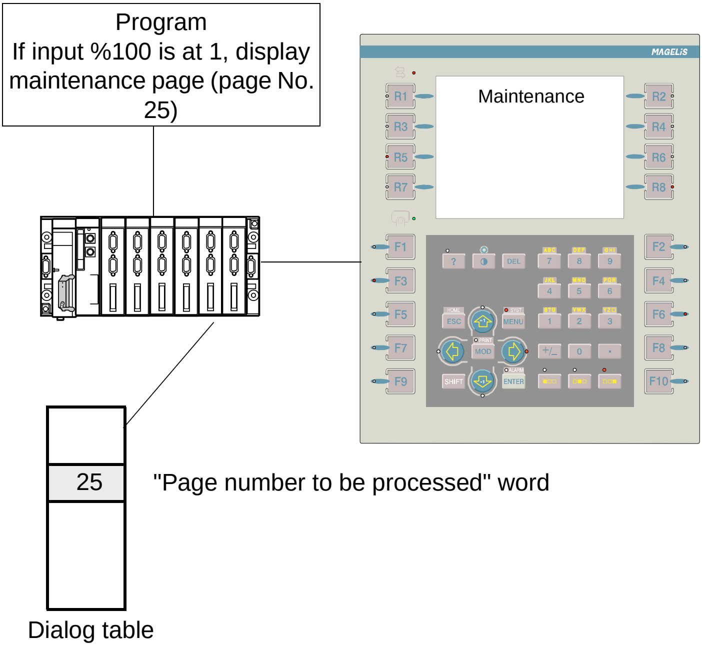

Maintenance level 1
MAGELIS
Maintenance level 2

## Displaying a page using a word from the PLC

It is possible to display a page using a word in the PLC. A PLC word must be allocated in the dialog table. In this table, a word is reserved in which the program writes the number of the page to be displayed. see chapter C, § 2. Dialog table content, Page 9 , for the word coding procedure.

Ex.

*Example:*
*Display of the Maintenance page (application page No. 25) by the PLC*
*The terminal periodically reads the dialog table in the PLC and displays the desired page; no program has to be written in the PLC to manage communications.*


Program
If input %100 is at 1, display maintenance page (page No. 25)
MAGELIS
Maintenance
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MENU
MOD
SHIFT
ENTER
DEL
25
"Page number to be processed" word
Dialog table

## Displaying a system page by writing a public variable

A public variable is an XBT internal variable, available from the variable definition window :
- XBT equipement,
- Symbols list : theme, access system page,...

It is possible to display a system page when writing in the public variable "Access system page" the system page number desired.

A dynamic function key configured in value writing can be used to display the system page desired by configuring its caracteristics:
- Action : writing value
- On variable : XBT:5064-system page acces
- Value : Constant=Number of page to be displayed
- Label : the desired bitmap

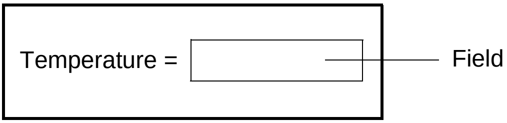
# 4. Variable fields

See chapter D, § 12. Variables adjustment on the TXBT, Page 68.
Variable fields are zones enabling:

- the display of values reflecting the control system status: status of a word bit, single or double word, floating word, character string, or,
- the entry of parameters allowing the control system to be controlled: modification of word bits, single, double or floating words, character string.

The display format may be binary, decimal, hexadecimal, numbered list, or an ASCII character string.

Ex.



When creating the application with XBT-L1000, controller variables are associated with the variable fields and the dynamic graphic objects.

## For the XBT-Fs

Whatever the protocol, the accessible variables are single words, double words, floating words, and word bits. For the MODBUS and MODBUS PLUS protocols, other types of variables are also available, see the protocols service instruction.

## For the TXBTs

In the case of XWAY protocols, the accessible variables are:

- internal word,
- constant word,
- internal word bit,
- double internal word,
- internal bit,
- single words, double words, floating words, word bits,
- local and remote input/output bit,
- system bit,
- step bit,
- step macro bit,
- step macro input step bit,
- step macro output step bit.

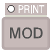
# 4. Variable fields

In the case of a protocol other than XWAY, the accessible variables are singlel words, double words, floating words, and word bits.

The XBT-L1000 software makes it possible to define different field properties. (See chapter B,  "Variable field characteristic", Page 29.).

## Accessing a field

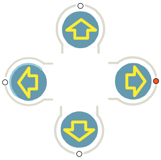
### Accessing the various fields in a page



The ***MOD*** key allows you to select:
- The first field on the page

or
- The last field entered (the last field whose entry was confirmed by ENTER).

The selected field is framed with a dotted box and the cursor is displayed in the variable field.



The arrow keys allow you to move from field to field.
When you are positioned in the desired field, press the ***MOD*** key to enable the input mode.
On touchscreen terminals, press the touch icon of the selected field for accessing the fields directly.

For the terminals with tactile keys, press the tactile keys for accessing the fields directly.

**NOTE** **When configuring touch zones with XBT-L1000, the objects must be aligned on the XBT-L1000 default grid, otherwise the operator may be unable to select certain objects. If nothing has been entered after one (1) minute, the input mode is cancelled.**
**The order in which the page fields go to entry mode depends on the object alignment under XBT-L1000.**

## Accessing a field by means of dynamic function keys, tactile zone or tactile keys

It is possible to select a field on a page by configuring a dynamic function key (Rx) associated with the page to select the field.
The same application procedures has access to an application page using the Rx key, with the action parameter : access to field.

## Access to a field using the TXBT mouse

A field can be selected using the TXBT mouse by positioning the pointer on the field and clicking.

## Request for entry on the initiative of the PLC

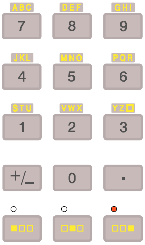
The PLC can request an entry in a page variable field (example: request for a set point).

The word “Field number to be entered” is reserved in the dialog table. The program writes the number of the field to be entered in this word. This number is provided by XBT-L1000, Display/Field number menu. See chapter C, § %MWn+21: Recipe transfer not allowed, Page 25, for coding of this word.

**NOTE** **Each field is automatically numbered by XBT-L1000. Numbering starts by number 1 for each page. The PLC program must thus check that the number of the page displayed is correct before requesting a field entry.**

# 4. Variable fields

## Field entry



### Entering numeric fields

Use the 0 to 9, A to Z and +/- (+/- select, + by default) keys to enter alphanumeric values.
Use the ENTER key to confirm the input value within the fields and send the results to the PLC.
Use the horizontal arrow keys to move from one digit to another within the field.

### Deleting characters

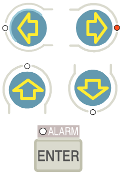
The ***DEL*** key deletes the character to the left of the fixed digit.

### Canceling the entry

You can cancel the entry in progress by pressing ***ESC***; no modification is made to the field.

### Terminals with the 5" tactile keys characteristics

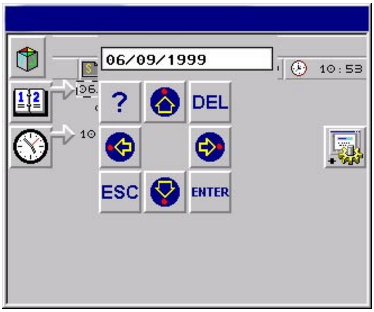
The alphanumeric fields entry is performed in accordance with the coder wheel (limitation of the space for the keyboard display). Entry is done this way :



- Choice of the digit under modification,

- Selection of the value for the digit,

- Validation of the modified digits set.



### Entering graphic fields

Once positioned on the object required, press the ***MOD*** key to switch to entry mode or press the touch zone of the object.
Use the up, down, right and left arrows (LEDs flashing) to modify the value of a field.
Press the ***ENTER*** key to validate field entry.

## Field Characteristics

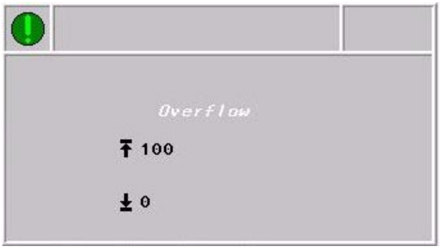
### Protecting fields

To configure password acces to a variable field, see chapter B, § 8. Configuring the terminal parameters, Page 55. To know how the terminal manages password acces , see "Confidential mode, password management", Page 18.

### Thresholds

Four thresholds can be set for a variable field: Min (minimum), L (low), H (high), and Max (maximum).
The value of these thresholds can be:
- constant,
- variable: the value is read when the page is displayed (read-only).

Min and Max are the absolute display limits for the variable, L and H are its intermediate thresholds (pre-alarm, etc.).
If the operator enters a value which is >Max or < Min, it is not sent to the controller and a warning message appears.



Overflow

100

0

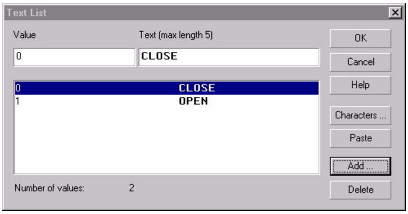
# 4. Variable fields

### Variable display rules

- A value that cannot be displayed is represented by # characters (overflow value).
- A value not filled out by the PLC is represented by ? characters.
- A write-only variable is represented by * characters.

### Numbered list

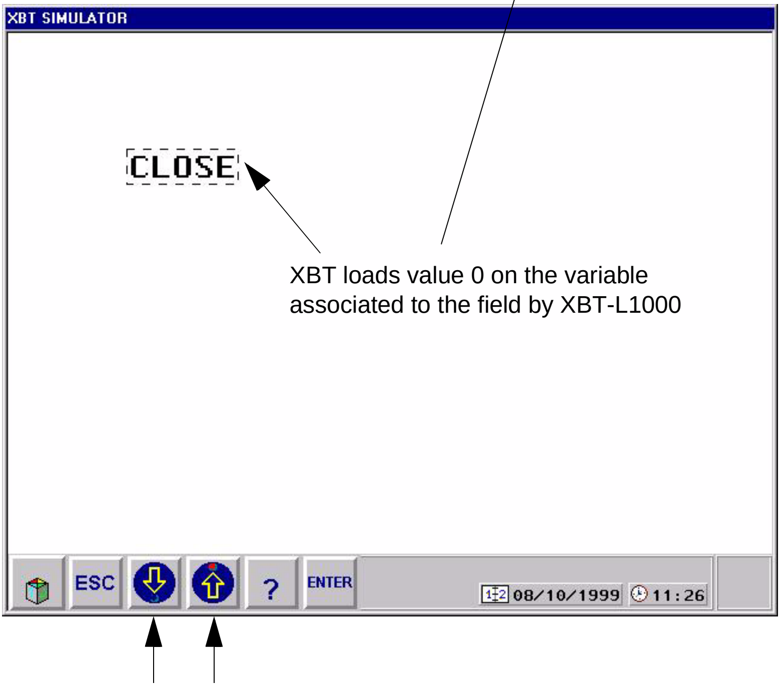
The XBT-L1000 software allows a string of text to be assigned to each value of the variable associated with the field.


Text List

Value: 0
Text (max length 5): CLOSE

| Value | Text |
|---|---|
| 0 | CLOSE |
| 1 | OPEN |

Number of values: 2
OK
Cancel
Help
Characters ...
Paste
Add ...
Delete


XBT SIMULATOR
CLOSE
ESC
?
ENTER
08/10/1999
11:26

XBT loads value 0 on the variable associated to the field by XBT-L1000

Keys to select strings programmed using XBT-L1000

**NOTE** **The texts list, in the configured languages, can be imported to or exported from EXCEL format (filename .XLS).**
**See chapter B, § 7. Import/Export, Page 53.**

Ex.

*A field (%MW10) that accepts two values with two associated strings of text (0: CLOSE 1: OPEN).*
*If you select OPEN using the arrow keys, and confirm by pressing ENTER, the %MW10 word will take the value 1 in the PLC.*
*Inversely, if the PLC writes the value 1 on %MW10 the OPEN text will be displayed.*

If the word %MW10 value is neither 0 nor 1, not any text will be displayed. The field became invisible.

### Data types

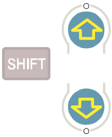
Word bits, single words, double words, floating point words, character strings.

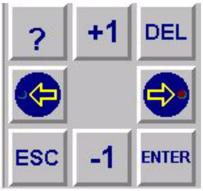
### Alphanumeric display format

Binary, integer, decimal (five digits maximum after the decimal point), hexadecimal, ASCII, text numbered list.

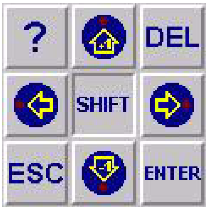
### Immediate write

Immediate write in a field consists in incrementing or decrementing the field value. It is performed by pressing the shift + “up arrow” key or shift + “down arrow” key on terminals with keyboard or by pressing the touch zones +1 and -1 on touchscreen terminals. If in XBT-L1000, the access has been correctly configured in "immediate writing" or " immediate reading/writing", the value is transmitted to the PLC each time the key is pressed and without the need to press ***ENTER*** key or ***ENTER*** tactile zone on the terminnal.





**NOTE** **Entry by coder wheel (XBT-FC terminals) :**
**the immediate entry is accessible by a previous press on the SHIFT touch zone.**



To configure the variables with XBT-L1000, see chapter B, "Variable field characteristic", Page 29.

This entry mode is used by the operator to modify a field value in acontinuous manner in order to:

- prevent sudden skipping from one value to another,
- view the result of an action "in real time" (adjustment, positioning, etc.).

# 5. Alarms

## Principle

Alarms are triggered and then displayed when a word bit in the PLC(s) is ON. Several alarms may be active simultaneously, and are stored by the terminal in the alarm list.

**⚠ WARNING**

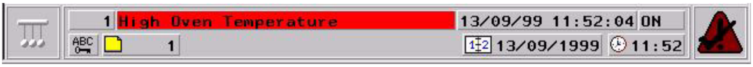
**UNINTENTIONAL EQUIPMENT OPERATION**

The XBT does not support any type of processor nor machine control in association with alarms. It is the designer's responsibility to consider programming PLC logic to account for programmed alarms.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

Ex.

*Example : display on an XBT-F terminal*



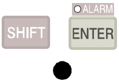
1 High Oven Temperature 13/09/99 11:52:04 ON

ABC 1

1‡2 13/09/1999 11:52

For the detailed description of the alarm list, see "Description of the alarm list", Page 46.

### Alarm indicating



ALARM on Touchscreen terminals

***"Alarm" indicator light***.

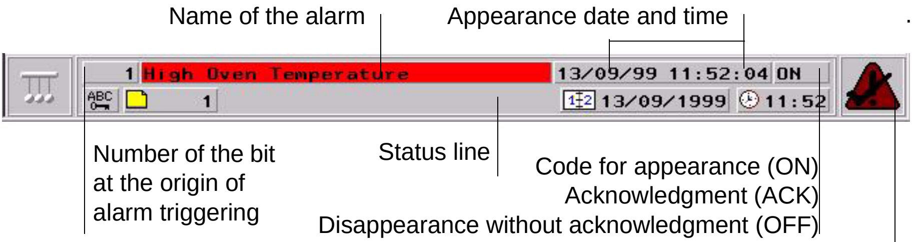
The "Alarm" indicator light keeps the operator constantly informed of the alarm list status:

- Off: the current list of alarms is empty,
- On: the list contains alarms that have already been displayed,
- Flashing: the list of alarms contains new alarms.

***On the application pages***

The designer can place an alarm bar, corresponding to the last alarm that has occurred, in the alarm pages. This bar is updated whenever a new alarm occurs, whatever its type (with or without a required acknowledgement) and priority. If several alarms occur simultaneously, the highest priority alarm is displayed; if there are no alarms, the bar remains displayed but is empty.

# 5. Alarms


Name of the alarm
Appearance date and time
Number of the bit at the origin of alarm triggering
Status line
Code for appearance (ON)
Acknowledgment (ACK)
Disappearance without acknowledgment (OFF)

1 High Oven Temperature 13/09/99 11:52:04 ON

ABC 1 1‡2 13/09/1999 11:52

**Absent**: no alarm
**Steady yellow** : alarm acknowledged (ACK) - Alarm at state ON
**Steady green**: alarm at state OFF (must be acknowledged if the caracteristic of the alarm is to be acknowledged)
**Flashing red**: alarm at state ON

SHIFT ➩

Direct display of the alarm indicated in the strip (without displaying the alarm list) is performed by pressing the keys shown opposite.
On touchscreen terminals, press directly the alarm strip.

- On-line printing:
  see "Continious printing of an alarm page", Page 59.
- Alarm bit:
  see chapter B, "Application/Alarm/Help/Recipe pages", Page 37.
- Alarm relay:
  see "Alarm relay command", Page 45.

## Alarm page parameters

Alarm pages have various parameters:

- A 32-character maximum message. This message will be displayed in the alarm strip, the alarm list and the history and will be printed,
- Text, variable fields, static graphic objects used to indicate the fault and the relevant corrective actions.

Ex.

*Conveyor fault*
*Turn power off*
*Remove jammed part*
*Restart*

**NOTE** **The alarm page can remain empty on request of the designer. The management of alarms is then provided by messages only.**

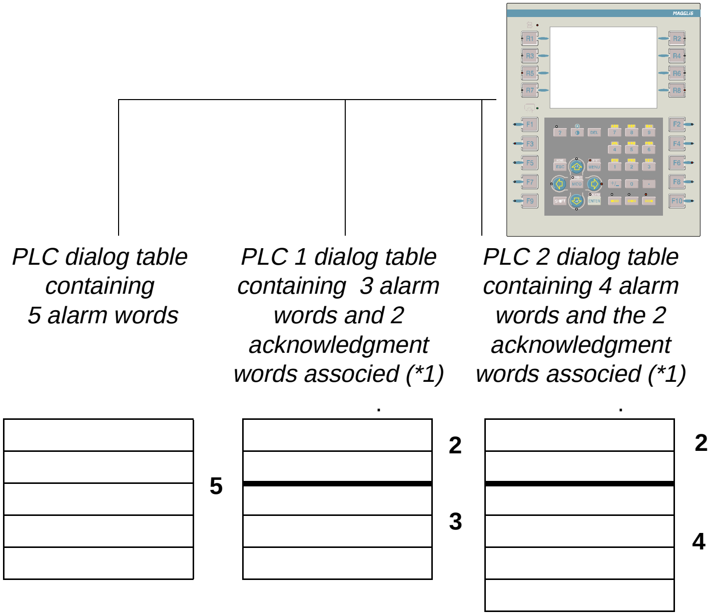
- a priority,
- a request for acknowledgement,
- an alarm relay command,
- an assignment to a group of alarms,
- a type of action on alarm appearance (display, printing, storage).

## Alarm table

- A word bit is associated with each separate alarm. All these words make up the alarm table which is part of the dialog table.
- A terminal can process the alarms from several PLCs.
- The alarm table can be distributed between several of the automated process's PLCs.

For each PLC, the alarm bits are distributed in packets of 16 alarms, i.e., "n" words of 16 bits per PLC.
The terminal can accept up to 32 words depending on the type of terminal.

Ex.


MAGELIS
PLC dialog table containing 5 alarm words
PLC 1 dialog table containing 3 alarm words and 2 acknowledgment words associed (*1)
PLC 2 dialog table containing 4 alarm words and the 2 acknowledgment words associed (*1)
5
2
3
2
4

* 1 : words "N° last acknowledged alarm" and "last acknowledged alarm group" (see chapter C, § 2. Dialog table content, Page 9).

Any given alarm may be triggered by several differents bits that may belong to diffenrent PLCs.

see "Alarm table", Page 40

## Alarm group

Alarm groups can be configured in order to group together alarm pages in modules.

An alarm group is a set of alarms identified by **different color attributes per group** for the appearance (ON), disappearance (OFF) and acknowledgment (ACK) statuses. There are 16 groups.

Each group is identified by an 8-character name modifiable allowing quick identification by the operator of a part of the machine or of the installation.

Ex.

*Group 1 : cracker1*
*colors defined :*
*- appearance : flashing red*
*- disappearance : steady green*
*- acknowledgment : flashing cyan*

*Group2 : convoy.4*
*colors defined :*
*- appearance : steady yellow*
*- disappearance:flashing magenta*
*- acknowledgment : flashing blue*

*According to the colors, the user can quickly identify the control system unit in which the fault has occurred (example: cracker1).*

In the list of alarms, it is possible to select:
- display of the alarms from a single group out of the 16.
- display of the alarms from the 16 groups.

The dynamic key or the touch zone associated with the ***ACK ALL*** icon is used to acknowledge the alarms of the group(s) present on the screen (see "Description of the alarm list", Page 46).

## Display priority in the alarm list

A priority can be allocated to each alarm page using the XBT-L1000 software.
The alarm pages can take different priorities. 16 levels are possible from 1 to 16, with the lowest display priority being priority No. 16.

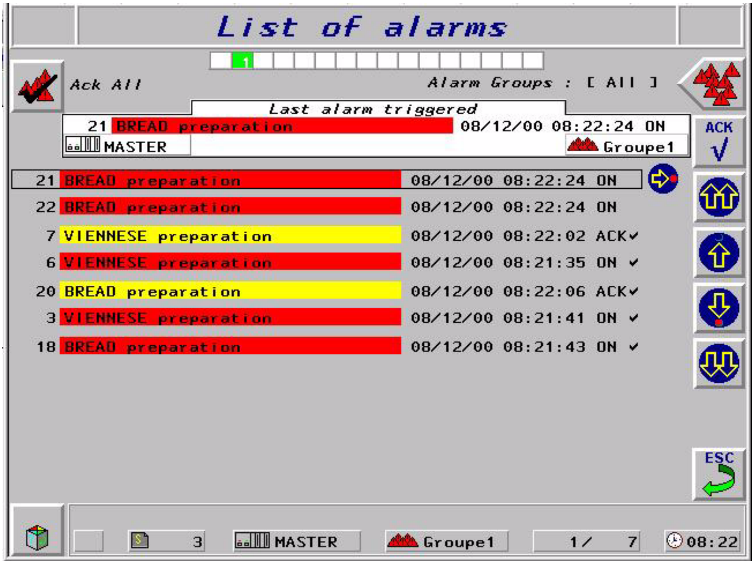
### Alarm list storage principle

1. Alarms not consulted are displayed at the top list. Below them are displayed alarms already consulted (identified by a mark)i.e. alarms which wera already present the last time the list of alarms was displayed.

2. Alarm priority (1 at the top, 16 at the bottom).

3. When the alarm priority is the same, they are stored in such a way that the oldest one is displayed first. The possible cause of a series of faults can thus be identified rapidly.

The first alarms displayed at the top are the not consulted (new) alarms, triggered while displaying any other page (criteria n°1).

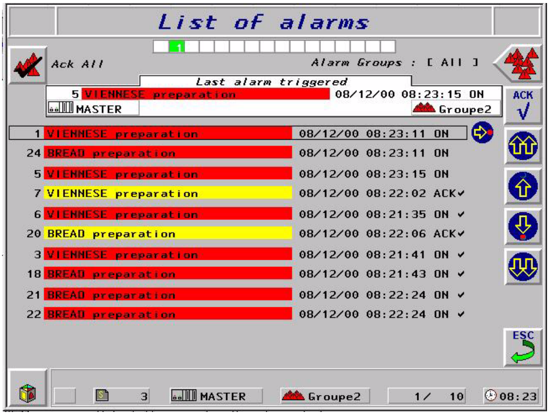


```
Last alarm triggered
21 BREAD preparation            08/12/00 08:22:24 ON
MASTER                                         Groupe1

21 BREAD preparation        08/12/00 08:22:24 ON
22 BREAD preparation        08/12/00 08:22:24 ON
 7 VIENNESE preparation     08/12/00 08:22:02 ACK✓
 6 VIENNESE preparation     08/12/00 08:21:35 ON ✓
20 BREAD preparation        08/12/00 08:22:06 ACK✓
 3 VIENNESE preparation     08/12/00 08:21:41 ON ✓
18 BREAD preparation        08/12/00 08:21:43 ON ✓
```

# 5. Alarms

After triggered and already consulted, alarms are sorted by priority or time (criteria n°2 or 3)



```
 5 VIENNESE preparation      08/12/00 08:23:15 ON
MASTER                                 Groupe2

 1 VIENNESE preparation      08/12/00 08:23:11 ON
24 BREAD preparation         08/12/00 08:23:11 ON
 5 VIENNESE preparation      08/12/00 08:23:15 ON
 7 VIENNESE preparation      08/12/00 08:22:02 ACK✓
 6 VIENNESE preparation      08/12/00 08:21:35 ON ✓
20 BREAD preparation         08/12/00 08:22:06 ACK✓
 3 VIENNESE preparation      08/12/00 08:21:41 ON ✓
18 BREAD preparation         08/12/00 08:21:43 ON ✓
21 BREAD preparation         08/12/00 08:22:24 ON ✓
22 BREAD preparation         08/12/00 08:22:24 ON ✓

3   MASTER   Groupe2   1/ 10   08:23
```

SHIFT ○ALARM ENTER

The list of alarms is displayed after pressing the ***SHIFT + ENTER*** keys or the status touch zone and then ALARM for touchscreen terminals.

The last alarm displayed appears under “last alarm triggered”.

| | Number of alarms in "Alarm list" page (1) | | | |
|---|---|---|---|---|
| | Terminals with keyboard | Touchscreen terminal | | |
| | | Without keys | With keys | |
| | | | Line | Column |
| 5" | 512+100 | 512+100 | 0 | |
| 10" | 512+100 | 512+100 | 512+100 | 512+100 |

(1) : 512+100 = 512 classic alarms + 100 diagnostic alarms (diagnostic alarms are available with option XBT-L1003+)

## Alarm display principle

When an alarm appears:

- The ALARM indicator light flashes. The alarm is stored in the alarm list. The alarm can be acknowledged by the operator directly on the application page by pressing the ***ENTER*** key or ⚠ for touchscreen terminals.
- The alarm relay is closed (if this function is selected).
- The alarm strip is updated.

## Acknowledging alarms

When designing pages, it is possible to define whether the alarm page should be systematically acknowledged or not. These 2 types of alarms are managed in the following way:

### Alarms which must be acknowledged

An alarm which must be acknowledged remains in the list of alarms until it is acknowledged by the operator, even if the cause of the fault is no longer present (the alarm bit is back to 0). Its status is then OFF.

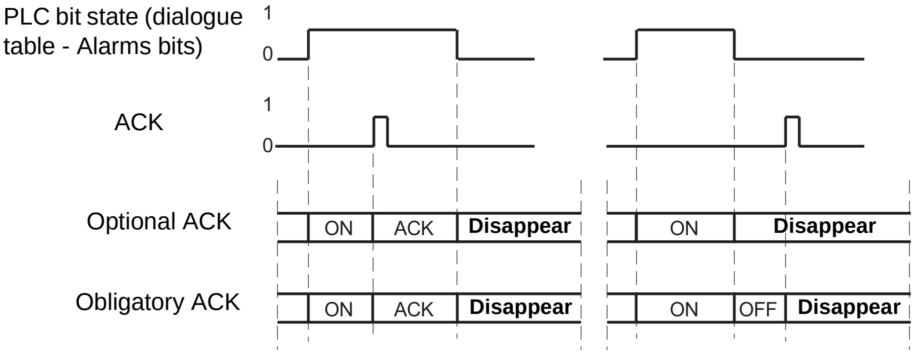
Advantage: transient faults are isolated (instability of a discrete sensor for example).

### Alarms with optional acknowledgment

An optional acknowledgment alarm disappears from the list as soon as the cause of the fault is no longer present (the alarm bit is back to 0), whether the alarm has been acknowledged or not.

Advantage: Do not monopolize the screen with faults display that are considered minor for the application.

### Obligatory and optional ACK


PLC bit state (dialogue table - Alarms bits)
1
0
ACK
1
0
Optional ACK
ON
ACK
Disappear
ON
Disappear
Obligatory ACK
ON
ACK
Disappear
ON
OFF
Disappear

***Alarm acknowledgement from the alarm strip***
Press the ***ENTER*** key on the terminal or the touch zone on touchscreen terminals to acknowledge the alarm displayed in the alarm strip.
The alarm message switches to ***ACK*** status.

**NOTE** **The alarm strip can be displayed on alarm pages. Acknowledgement will thus be effective on the strip alarm and not on the alarm displayed.**

***Alarm acknowledgement from the list of alarms***
Press the ***ENTER*** key on the terminal to acknowledge the alarm selected in the list. The alarm message switches to ***ACK*** status. The dynamic key or the touch zone associated with the ***ACK ALL*** icon is used to acknowledge the alarms from the group(s) displayed.

## Alarm relay command

The alarm relay option is available for each alarm.
The alarm relay energizes as soon as an alarm defined with the "alarm relay" option is triggered.
The relay deenergizes as soon as all the active alarms defined with the "alarm relay" option have been acknowledged by the operator(ACK), or have disappeared.

**NOTE** **In the event of a power loss to the terminal, the alarm relay de-energizes.**

## Description of the alarm list

The alarm list includes:

- the active alarms which are present but not acknowledged by the operator (ON),
- the active alarms acknowledged by the operator (ACK),
- alarms with mandatory acknowledgement and which have not been acknowledged but for which the triggering cause is no longer present (OFF).

The alarm list is refreshed whenever an alarm appears or disappears. The alarm list remains displayed awaiting a user action.

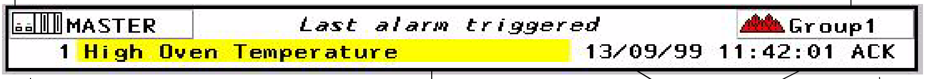
### Case of the last coming out alarm

The last coming out alarm is shown on a different way :

.

Source equipement

Alarm membership group



```
MASTER          Last alarm triggered          Group1
   1 High Oven Temperature      13/09/99 11:42:01 ACK
```

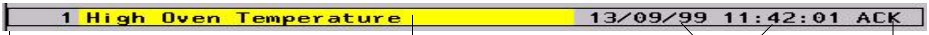
N° of the bit at the origin of alarm triggering (see "Principle", Page 38)

Name of the alarm

Appearance date and time

Code for appearance (ON)
Acknowledgment (ACK)
Disappearance without acknowledgment (OFF)

### Case of other alarms



```
   1 High Oven Temperature      13/09/99 11:42:01 ACK
```

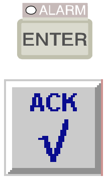
Number of the bit at the origin of alarm triggering (see "Principle", Page 38)

Name of the alarm

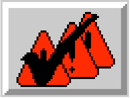
Appearance date and time
Code for appearance (ON)
Acknowledgment (ACK)
Disappearance without acknowledgment (OFF)

The function key associated with the "group" icon is used to select an alarm group or all the alarms.
The status line indicates the alarm group and the equipment connected (PLC) which triggered the alarm selected in the list.

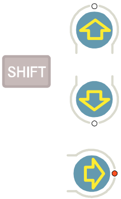
### Possible actions in the alarm list



***ENTER*** : to acknowledge an alarm, the alarm status becomes ***ACK***.



***ACK ALL***: allows overall acknowledgment of all the alarms or those of the selected group.



***Up and down arrows***: to navigate in the alarm list.
***SHIFT + up and down arrow or double up/down arrows on touchscreen terminals:*** previous page/next page.

***Right arrow***:to display the alarm page corresponding to the selected alarm.

***PRINT***: to print the alarm list.

## Alarm display by the PLC

The dialog table enables the dialog between the PLC and the terminal. This table contains words which are reserved for alarm display. see chapter C, § 2. Dialog table content, Page 9, for the coding of these words.

# 6. Alarm history log

## Principle

The terminals can manage an alarm page log. The alarm descriptions and state, the equipment data, the date and time status are stored in this log. The alarms are stored one after the other, and when the log is full, the oldest alarms are overwritten by the most recent ones.The log recording capacity is 500 events.

Each alarm event:
- Appearance,
- Acknowledgment,
- Disappearance.

is recorded and time-stamped.

The following functions can be performed:
- On the PLC's initiative:
  - Printing the alarm log,
  - Clearing the alarm log.
- On the operator's initiative:
  - Displaying the alarm log,
  - Printing the alarm log,
  - Clearing the alarm log (in confidential mode),
  - Displaying the selected alarm page.

The log is useful for analyzing the sequence of events which has led to a given machine state.

# 6. Alarm history log

## Displaying the alarm history log

The alarms are shown with the most recent alarm displayed first.
The events relative to each alarm are: appearance, acknowledgment, clearing.

***MENU***: To access the alarm log.

***Up and down arrows***: To scroll through the alarm log.
***SHIFT + up and down arrow or double up/down arrows on touchscreen terminals***: previous page/next page.

***Right arrow***: to display the alarm page corresponding to the selected alarm.

***PRINT***: To print the alarm log.
***ESC***: To return to the previous page.

| | Number of alarms in "alarm history log" | | | |
|---|---|---|---|---|
| | Terminals with keyboard | Touchscreen terminal | | |
| | | Without keys | With keys | |
| | | | Line | Column |
| 5" | 1000 | 1000 | 0 | |
| 10" | 1000 | 1000 | 1000 | 1000 |

## Clearing the alarm history log

### At the operator's initiative

1. Prior display of the history.
2. Press the key or the touch zone ***Delete history***.
3. Validate history clearing: the complete history is cleared.

**NOTE** **History clearing can be restricted to confidential mode. For this, protect the system page "Delete history" by a password.**

### On the PLC initiative

The alarm history is cleared by means of the history reset command word in the dialog table (see chapter C, § 2. Dialog table content, Page 9).

# 7. Process control using function keys

## Printing the alarm history log

see "Printing the alarm Log", Page 61.

The terminals are used to :
- control the control system (impulse command or toggle command),
- write directly the constant or variable value,

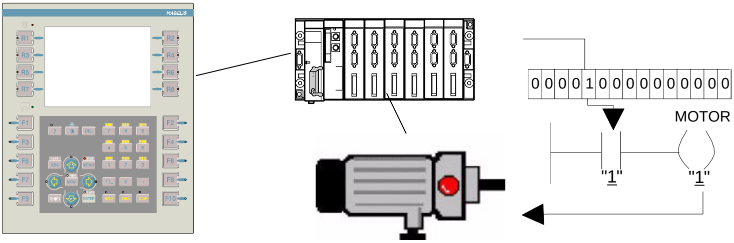
from :
- the static function keys (Fx) or dynamic function keys (Rx) in the case of terminals with a keyboard.
- touch zones for touchscreen terminals,
- touch zones and keys for terminals with tactile keys.

## Momentary contact command

The system is actuated by pressing a function key, the touch zone or the key of a terminal with tactile keys, which starts an action; if the key or the touch key or zone is released the action stops.

Ex.

*Controlling a motor*


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
ESC
MOD
MENU
DEL
ENTER
0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
MOTOR
"1"
"1"

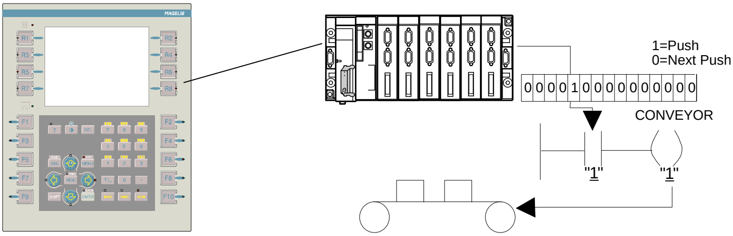
# 7. Process control using function keys

## Push on/Push off toggle command

The control system is actuated by pressing the function key, the touch zone or the key of terminal with tactile keys, which start an action; the action is stopped by pressing the function key or the touch key or zone again.

Ex.

*Conveyor belt advance command*



### Control using static function keys (Fx)

When creating the application, a word bit, defined automatically by the dialog table, is associated with each momentary contact and "push on/ push off" toggle static function key. This word bit will be in the Master PLC.

### Control using dynamic function keys (Rx), touch key or zone

When creating the application, the following are associated with each momentary contact and push on/push off dynamic function key:
- One label comprised of 1 or 2 graphics,
- A word bit whose PLC address must be declared when configuring with XBT-L1000.

Dynamic function keys may be configured to communicate with any PLC attached to the terminal.

### Command using the TXBT mouse

The dynamic function keys can be controlled by positioning the pointer on the corresponding key label and clicking.

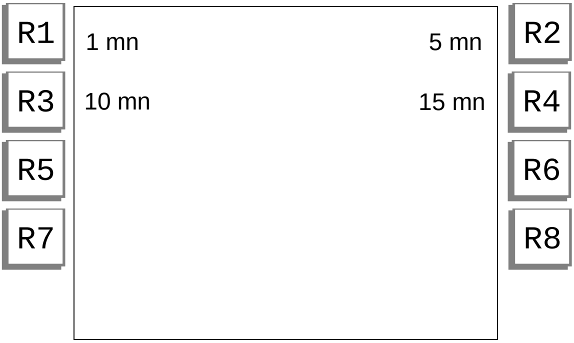
### Assigning static function keys in the dialog table

See chapter E, "Assigning the static function keys", Page 27.

## Value direct writing

The customer must press a function key, a tactile zone or a tactile key of a XBT terminal, to write a PLC variable or a constant in another PLC variable.

Selection of a mixing delay



But the customer can also directly operate on PLC or terminal variables. For example, in the case of the PLC, increase/decrease a variable with a fixed step.

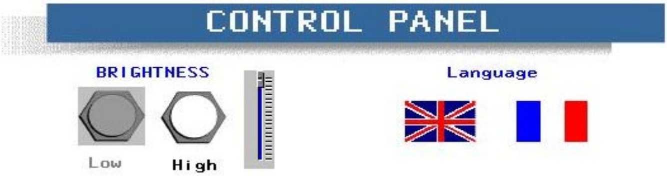
For example, in the case of the terminal :

- change the application language :
  - Action : Writing value
  - Variable : XBT:5062-language
  - Value : Constant=0,1,2 (1,2,or 3rd programmed language)
  - Label : bitmap

- directly control the screen brightness (control of the function night/dayfor example),
  - Action : Writing value
  - Variable : XBT:5063-brightness
  - Valeur : Constant=0 to 100 (% of brightness)
  - Label : bitmap

- directly call a system page. (see "Displaying a system page by writing a public variable", Page 29).

Ex.


CONTROL PANEL
BRIGHTNESS
Low
High
Language

# 8. Running Windows 95 application on the TXBT

The TXBT terminal can be used to run Windows 95 applications installed on the terminal (for example the calculator). If the Magelis application is already running, it will continue to work in the background, the pages are refreshed and the alarms monitored.
The software can be started up in 2 ways.

## Startup with a Windows 95 command

### Program startup

- Click on the Start button (or use the CTRL+ESC keys), then select Program.
- Select the program to be executed

### Program startup using the Run command

- Click on the Start button (or use the CTRL+ESC keys) and then Run.
- In the Open zone, type in the location and name of the program you want to start.

If you cannot remember the location or name of the program file, click on Browse.

# 8. Running Windows 95 application on the TXBT

## Running using the Rx dynamic function keys

The executable program can be run by pressing an Rx key (for example the calculator).

### Configuration with XBT-L1000

Ex.

*Starting the calculator with key R4 as soon as the measurement is displayed.*

- Select the page linked to the dynamic key in the Page Tree Structure window.
  The configuration screen appears.

- Select the dynamic function key to be assigned.
  The configuration dialog box appears.

- Select Run Application.
- Type in the executable program path in the “Open” editing field.

*D:\WINDOWS95\CALC.EXE*
*Executable program path*
*This is the path (drive, directory/sub-directories) on the TXBT terminal and not the path on the PC equipped with XBT-L1000.*
*If the location of the executable program on the TXBT is changed, startup will be impossible.*

# 9. Key locking by the PLC

In order to prevent the operator from performing certain functions depending on the control system status, the PLC is able to lock out the terminal. There are 3 reserved words in the dialog table that allow various keys to be locked. These keys are:

- static function keys,
- system keys,
- numeric keys.

Word bit at 1 = key locked
The word concerning the system keys also contains a bit allowing the total lock of the keyboard or of the tactile pad. This total lock also affects the keys of a terminal with tactile keys.

See chapter C, § 2. Dialog table content, Page 9, for the word coding procedure.

⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

Pressing the ***MENU*** key allows the inexperienced and untrained operator to accidentally display the wrong page, modify the terminal configuration, or lose the messages and alarms on the screen. This can lead to confusion, panicking, and, as a consequence, loss of control over the machine. It is strongly recommended that the PLC be programmed to lock the ***MENU*** key as well as the other currently unused keys in order to prevent this from happening.

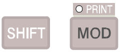
**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

# 10. Printing

## General

The following information can be printed:

### Printing at the operator’s initiative



- Alarm log
- List of active alarms.
- Form pages,
- Screen hardcopies (TXBT only),
- Terminal references.
  The PRINT key is used to send the command.
- Active window capture (TXBT only).
  The SHIFT+ALT+PRINT keys are used to send the command.

### Printing at the PLC’s initiative

- Alarm log,
- Free format printing,
- On-line alarm printing,
- Form page printing.

See chapter C, § 2. Dialog table content, Page 9,. for the word coding "Printing command".

**NOTE** **The recommended printing format for the “Alarm history printing”, “On-line alarm printing” and “Alarm list printing” functions is 132 columns. On a 80-column printer, the “alarm group” and “equipment” information is not printed out.**

## Print set-up

### Case of XBT Terminals

**• Printer selection**

A serial printer must be used and no declaration in XBT-L1000 is required. For connection, refer to the service instructions.

### • Printer set-up

Printer setup is performed with XBT-L1000 or locally in the terminal. The System menu is used to consult and configure the printer parameters. The printing formats are entered on XBT-L1000 via the Configure/ Parameters menu of the Printer terminal.

**NOTE** **If the printer has been configured with fewer columns than the required printing format, the result will be truncated.**
**Characters whose ASCII code is < 32 and > 125 will be replaced by "." characters when printed. Except for free format and form page printing.**

### Case of TXBT terminals

### • Printer selection

A parallel printer must be used.

- Select the Start menu (you can use the CTRL+ESC keys to call up the Start menu).
- Select the Settings/Printers command
- Click on the Add printer icon.
- Execute the Windows 95 procedures and choose LPT1 as the printer port. For connection, refer to the TXBT manual.

### • Printer setup

On the TXBT, printer setup is that of Windows 95.
The printing setup screen can be accessed:

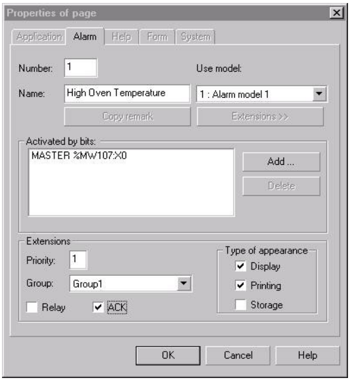
- Either directly with Windows (Start menu, etc.)
- In the Magelis application, using the "System menu" (SHIFT-MENU) then "Printer parameters" (R5)

## Stop printing

This function is accessed with the system menu. Any printing in progress (log, continuous, etc.), even if the printer is faulty, will be stopped without any request for confirmation; i.e. the print buffer will be emptied and the print queue will be cancelled.

## Continious printing of an alarm page

The option must be selected when the page is created using XBT-L1000 by selecting the "print" option.


Properties of page
Application
Alarm
Help
Form
System
Copy remark
Extensions >>
Add ...
Delete
OK
Cancel
Help

Number: 1

Use model: 1 : Alarm model 1

Name: High Oven Temperature

Activated by bits: MASTER %MW107:X0

Extensions

Priority: 1

Group: Group1

☐ Relay ☑ ACK

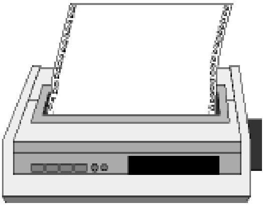
Type of appearance

☑ Display

☑ Printing

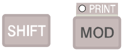
☐ Storage

At each dialog table read cycle, the "printable" alarms are printed with the alarm name.
A header is printed containing the page number and name, and the printing date and time

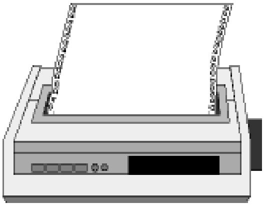


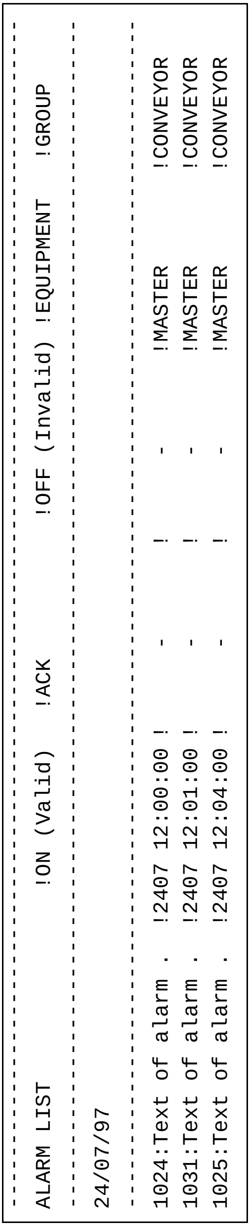
```
------------------------------------------------------------------------------------------------
ALARM                         !ON (Valid)    !ACK           !OFF (Invalid)  !EQUIPMENT !GROUP
------------------------------------------------------------------------------------------------
24/07/97 12:01:30
------------------------------------------------------------------------------------------------
1024:Text of alarm .          !2407 12:00:00 !      -       !      -        !MASTER    !CONVEYOR
1024:Text of alarm .          !      -       !2047 12:01:00!      -         !MASTER    !CONVEYOR
1024:Text of alarm .          !      -       !      -       !2047 12:04:00  !MASTER    !CONVEYOR
```

## Printing the list of active alarms



Press the “Print” key or the PRINT touch zone on display of the “List of alarms” page.
The list of alarms is printed as it is at the time the operator requests the printout. If alarms occur during printing, they will not appear in the list.





```
----------------------------------------------------------------------------------------
ALARM LIST            !ON (Valid)      !ACK         !OFF (Invalid) !EQUIPMENT     !GROUP
----------------------------------------------------------------------------------------
24/07/97
----------------------------------------------------------------------------------------
1024:Text of alarm .  !2407 12:00:00 !      -       !      -       !MASTER        !CONVEYOR
1031:Text of alarm .  !2407 12:01:00 !      -       !      -       !MASTER        !CONVEYOR
1025:Text of alarm .  !2407 12:04:00 !      -       !      -       !MASTER        !CONVEYOR
```

# 10. Printing

---

## Printing a form page

### From system pages at the operator's initiative

Display the page "MENU", then the forms list select a form in the list, specify the number of copies and press the key ⇨.

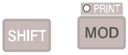
### From a function key or a tactile zone at the operator's initiative

Configure the function key or the tactile zone to write the number of the form in the printing command word of the dialog table (voir § 4. Variable fields, page 30).

### At the PLC's initiative

Printing a form is performed with the printing command word of the dialogue table (voir § 4. Variable fields, page 30), the most recent alarm is shown first.
Printer configuration : see § 11. Terminal configuration, Page 64.

## Printing the alarm Log



### At the operator's initiative

Press the key or the tactile zone "PRINT".

### At the PLC's initiative

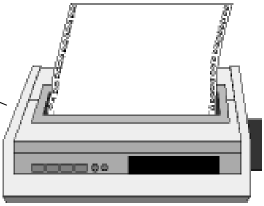
Printing history log is performed with the printing command word in the dialog table (See chapter C, § 2. Dialog table content, Page 9).

The history log is printed in a sequential form (see § 11. Terminal configuration, Page 64).

```
----------------------------------------------------------------------------------------------------
ALARM HISTORIC           !ON (Valid)    !ACK            !OFF (Invalid) !EQUIPMENT    !GROUP
----------------------------------------------------------------------------------------------------
24/07/97
----------------------------------------------------------------------------------------------------
1024:Text of alarm .  !2407 12:00:00!       -       !       -       !MASTER       !CONVEYOR
1024:Text of alarm .  !2407 12:01:00!2047 12:01:00 !       -       !MASTER       !CONVEYOR
1024:Text of alarm .  !2407 12:04:00!       -       !2047 12:05:00  !MASTER       !CONVEYOR
```

Is printed for each alarm:
- alarm number and the page name
- appearance (ON), acknowledgement (ACK), disappearance (OFF) date and time
- alarm group.

An asterisk * at the beginning of a line indicates that information has been lost in the previous line. This happens when the log overflows, in which case the oldest events are overwritten by the most recent events.



# 10. Printing

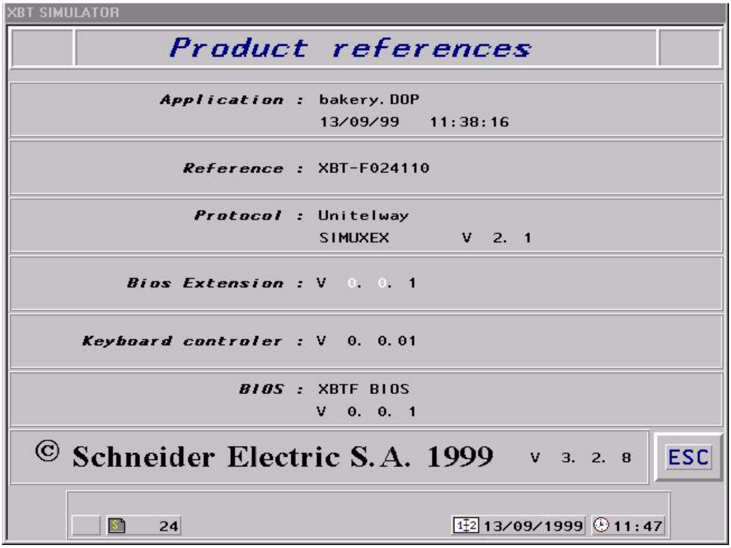
## Free format printing

Free format printing consists of sending the data contained in the free format printing table, located after the dialog table:
- To the terminal's printer port,
- On the PLC's initiative.

A dialog table word is used to manage the dialog. See chapter C, § 2. Dialog table content, Page 9, for the word coding procedure.
Printing terminal's reference: It is possible to print the terminal's references. Those references are exactly the ones displayed in the system page "Terminal's reference".

## Printing of the product references

It is possible to print the terminal's references. These references are those displayed in the system page "product references".



Product references

Application : bakery.DOP
13/09/99 11:38:16

Reference : XBT-F024110

Protocol : Unitelway
SIMUXEX V 2. 1

Bios Extension : V 0. 0. 1

Keyboard controler : V 0. 0.01

BIOS : XBTF BIOS
V 0. 0. 1

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# 11. Terminal configuration

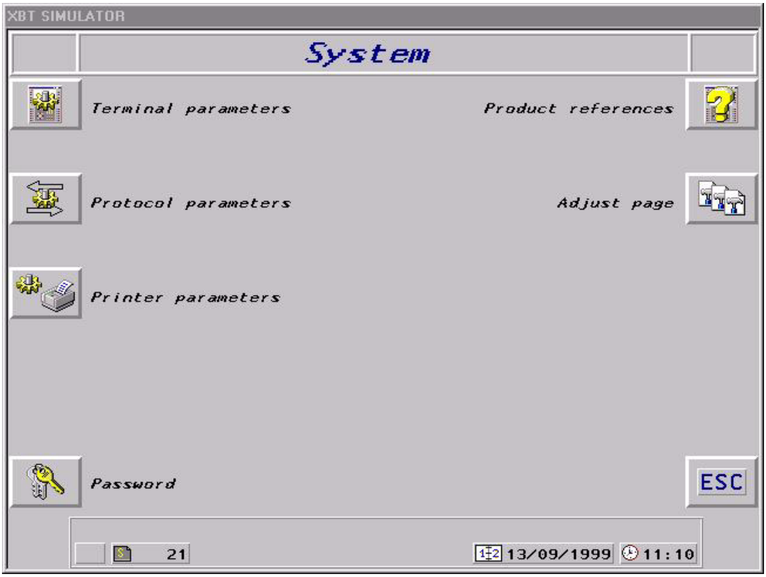
The terminal configuration parameters can be modified on the terminal directly. They are then saved in the PCMCIA card without using XBT-L1000. However, any modification performed in the terminal cannot be retrieved by XBT-L1000 when importing an application.

The terminal configuration function is accessible from the system menu and is used for consulting or modifying the following parameters:

- terminal data and time and format,
- language,
- screen parameters,
- product references,
- printer parameters,
- printer <-> Terminal protocol line parameters,
- screen brightness and stand by screen display,
- automatic exit from the confidentiel mode.

SHIFT SYST MENU

Press the ***SYST*** key or the status touch zone then SYST on touchsreen terminals to display the system menu. If access is protected by a password, enter it (see "Confidential mode, password management", Page 18).


XBT SIMULATOR
System
Terminal parameters
Product references
Protocol parameters
Adjust page
Printer parameters
Password
ESC
21
13/09/1999
11:10

### Parameter modification principle

- Select the parameter by dynamic function keys or pressing the touch zones.
- Depending on the type of parameter, the modification is performed using:
  - Numeric keys
  - Arrow keys (for parameter lists)
  - Context keyboards displayed on touchscreen terminals.
- Press ENTER to confirm the modification.

## ⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

Since all alarms are always time/date stamped and the control program may rely on the XBT's real time clock, it is important to set or verify the XBT's date and time after every installation, repair, disassembly, shipment, or battery change.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

## Terminal parameters

### Terminal date and time

Time format: 24.mn.ss or 12:mn:ss,
Date format: DD.MM.CCYY or MM.DD.CCYY or CCYY.MM.DD.

### Language

To change language: Select the language with the "up" and "down" arrow keys and confirm by pressing ENTER.

### Screen

The brightness and contrast of the screen can be adjusted. For terminals with keyboard, the adjustments are identical to those performed using the keyboard keys.
On touchscreen terminals, this parametrer can be adjusted using the touch zones (depending on screen technology).

### Clear screen

A clearing page is provided on touchscreen terminals for de-activating the touchscreen pad in order to clear the screen surface. Simultaneously press the two opposite touch zones to re-activate the pad and exit the clearing page.

### Printer

The printer setup parameters, except for the printer control codes used for the forms, can be modified.

### Standby

Screens can be damaged if a steady image is displayed for a long time. It is thus recommended to select the following in the "Terminal parameters" system page:

- Standby: YES
- Wait: 60 minutes.

**NOTE** **These parameters are initialized to the above values after exporting an application from the PC to the terminals.**

## Parameters of the operations line

### Case of the XBT terminal

The parameters displayed depend on the protocol and some may ormay not be modifiable.

Ex.

*Case of the UNI-TELWAY protocol:*
*Bit rate: 300 bauds*
*Parity: even*
*Address: Master*
*Error counter N°. 1: 0*
*Error counter N°. 2: 0*
*Error counter N°. 3: 0*
*Error counter N°. 4: 0*

Counter reset by dynamic key.

### Case of the TXBT terminal

• Protocol parameters

The following parameters are displayed:

- Protocol name
- Controller names and addresses (max. 15) and status of communications with them (if possible)
- TXBT local address
- Four error counters
- Last communication error that appeared
- Counter reset by dynamic function key

• Application parameters

The following parameters are displayed:

- Application reference and protocol used
- Currently running application path: the application can be on the disk in this directory ....\TXBT\APPLI (default directory which can be changed) or on the PCMCIA memory card
- Size of PCMCIA memory card (if installed)
- The text of the last error which appeared (excluding communication error)

• Password

Declaration of password A, B or C

## Printer line parameters

The following parameters are displayed by default:

- Printer
  - Number of columns: 132
  - Automatic line skip: YES
  - Automatic line feed: NO
- XBT-Printer serial line
  - Baudrate (Bauds): 9600
  - XON/XOFF protocol: NO
  - Link: RS 232
  - Duplex : Half Duplex
  - Stop bits: 1 BIT
  - Data bits: 8 BITS
  - Parity: ODD

# 12. Variables adjustment on the TXBT

## Principle

The TXBT can be used to adjust the variables of the connected PLCs. Adjustment is available for the following communication protocols:

- UniTelway
- IsaWay
- Modbus
- Fipway
- Fipio
- Modbus+

## Accessible objects

### XWAY Protocols

- Simple word
- Double word
- Internal word
- Floating word
- Word bit
- Constant word
- Internal word bit
- Internal double word
- Internal bit
- Local input/output bit
- Remote input/output bit
- System bit
- Step bit
- Step macro bit
- Step macro input step bit
- Step macro output step bit.

### Modbus and Modbus+

The objects accessible for adjustment are input and output registers, input and output bits, bits extracted from registers.

Adjustment can be via the symbols if the symbol/identifier association has been loaded into the TXBT from XBT-L1000.

# 12. Variables adjustment on the TXBT

## Loading the PL7 symbols file

### Creation of symbols file

To create a symbols file with PL7:
1. Open the variables editor.
2. Select the File/Export command.
3. Select the disk and/or directory in which the file is to be stored.
4. Enter a filename: for example Appli.SCY
5. Select export mode.

### Symbols file transfer to TXBT

The resulting symbols file (e.g. Appli.SCY) must be positioned on the TXBT terminal. To do this:
1. Select the Configuration/Enclosures menu... then select ***Files***.
2. Select the file(s) (e.g. Appli.SCY) to be loaded onto the TXBT: the file is now a part of the Magelis application and will be exported at each export operation.
3. Select the ***Transfer/Export*** menu. The application is then exported, along with the selected file(s).

**NOTE** **The terminal does not check consistency between the PLC application and the symbols file loaded. A change made to this file will not be automatically accepted. For this, it has to be deleted and added again.**

## Access to adjustment

The adjustment function can be accessed using the dynamic function keys in 2 ways:

### From the system page

To display this page, press the ***Menu*** key and then press the dynamic function key associated with the Adjustment item.

### From an application page

The adjustment function can be run from an application page, by assigning the variable adjustment tool startup function to a dynamic function key associated with this page.

# 12. Variables adjustment on the TXBT

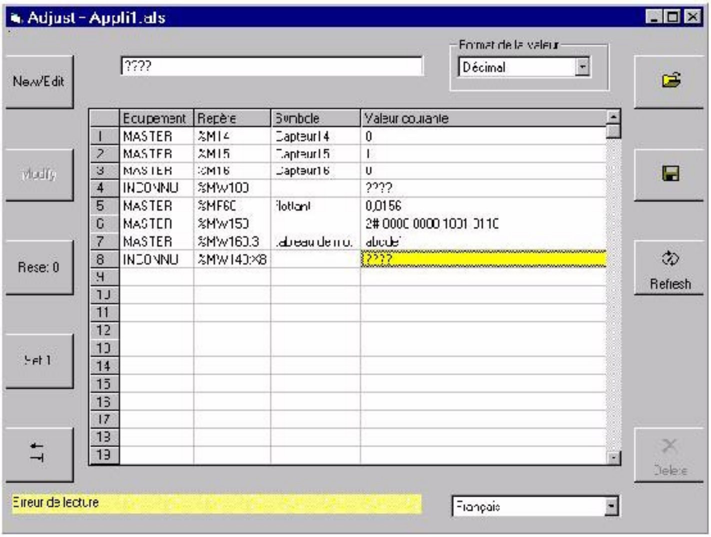
---

To configure this function with XBT-L1000:
1. Select the page linked to the dynamic key in the Page Tree Structure window.
2. Select the ***Configuration/Function keys*** menu and the terminal front panel appears.
3. Click (double-click) on the dynamic function to be assigned.
4. Select ***Execution of Application***
5. Click on ***Open*** and enter ***ADJUST.EXE***.

**NOTE** **The complete file path is required if the executable program is not in the APPLI directory.**

## Procedure

1. Select the device.
2. Enter a variable (New/Edit R1),
3. Start continuous refresh (Refresh R6)



????

| | Equipement | Repère | Symbole | Valeur courante |
|---|---|---|---|---|
| 1 | MASTER | %M14 | Capteur14 | 0 |
| 2 | MASTER | %M15 | Capteur15 | 1 |
| 3 | MASTER | %M16 | Capteur16 | 0 |
| 4 | INCONNU | %MW100 | | ???? |
| 5 | MASTER | %MF60 | flottant | 0,0156 |
| 6 | MASTER | %MW150 | | 2# 0000 0000 1001 0110 |
| 7 | MASTER | %MW160.3 | Tableau de mo. | abcde |
| 8 | INCONNU | %MW140:X8 | | ???? |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |

Erreur de lecture

### Modifying a value
1. Select the cell to be modified.
2. Enter the new value.
3. Confirm entry (Modify R3)

### Deleting a variable

1. Select the row.
2. Delete the row (Delete R10).

### Display format

The data read in the controller can be displayed in the following formats:
- Signed decimal integers
- Hexadecimal values (0 to 0xFFFFFFFF)
- Bit string
- One place floating point format
- ASCII character string. This contains 1 to 4 characters. The non-ASCII characters are represented by “.”.

### List of variables

The list of variables displayed can be saved with key R4 into a .ALS file and then called back with key R2. The list called up overwrites the current list.

**NOTE** **1. If “???” are displayed, this means that the variable could not be accessed.If only one vairable isn't accessible, all the variables will be displayed with "???".**
**2. ESC goes back to the Magelis application previous page. Adjustment is not stopped, but its window moves into the background.**
**3. Alt-R4 (or click on X) stops adjustment.**
**4. The variable adjustment page is not password protectable. Protection of the Adjust page from unwanted users can be accomplished by key-locking the system page.**

# 13. Variables adjustment on the XBT

## Principle

Adjustment is used to modify variables of connected PLCs from an XBT.

## Accessible objects

- bits (with MODBUS and MODBUS PLUS protocols),
- words,
- double words,
- word bits,
- floating words.

## Access to adjustment

The adjustment function is accessible from the system pages.

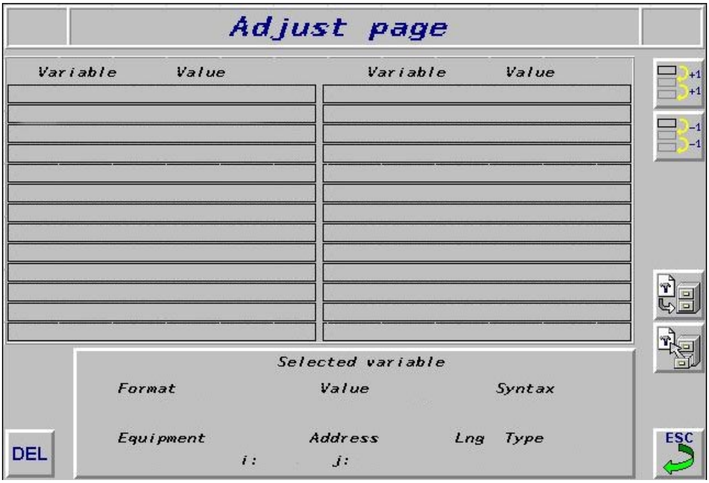
| | Number of displayable variables | | | |
|---|---|---|---|---|
| | Terminals with keyboard | Touchscreen terminal | | |
| | | Without keys | With keys | |
| | | | Line | Column |
| 5" | 6 | 5 | 0 | |
| 10" | 26 | 26 | 10 | 13 |

Up to 16 adjustment pages can be defined, i.e. 416/448 variables maximum for a 10" product (tactile/keyboard) and 80/96 variables maximum for a 5" product (tactile/keyboard).

# 13. Variables adjustment on the XBT

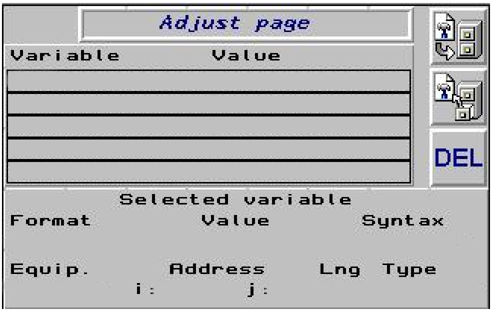
Ex.

*Adjustment page on a 10" product.*


Adjust page
Variable
Value
Variable
Value
+1
+1
-1
-1
Selected variable
Format
Value
Syntax
Equipment
Address
Lng
Type
i:
j:
DEL
ESC

Ex.

*Adjustment page on a 5" product.*


Adjust page
Variable
Value
DEL
Selected variable
Format
Value
Syntax
Equip.
Address
Lng
Type
i:
j:

## Creating or modifying the Adjustment page

When the Adjustment page is displayed, the operator can:

1. Select the variable to be modified in the list or add a new variable to this page or delete a variable from this page.

2. From the entry panel, modify the characteristics of the variable selected from the list, i.e.:

- The variable type (in compliance with the protocol) which indirectly defines the variable format,
- The syntax type in compliance with the protocol,
- The variable address which must be comprised between:
  - [Min..Max] for the word, double word, word bit, floating word variables. The minimum and maximum limits depend on the protocol.
  - [0..15] for the word bit number.
- The equipment, selecting it in the equipment list of the current application.

**NOTE** **XBT cannot be selected.**
**The display format if it complies with the variable type:**
**- word bit variable: possible display but binary only,**
**- floating variable: possible display but decimal only,**
**- string variable (Jbus protocol): possible display but in ASCII only,**
**- double word variable: possible displays but decimal, hexadecimal and in ASCII only,**
**- word variable: all types of display are possible.**

**For the character string type, another parameter can be used to set up the string length. By default, the length is 16 characters, which is the maximum length possible.**

# 13. Variables adjustment on the XBT

## Saving an adjustment

An adjustment page can be saved on the PCMCIA card only and cannot be imported to the XBT-L1000.

## Loading an adjustment page

An adjustment page selected must be selected in the list of adjustment pages using the arrows.

**NOTE** **The variable adjustment page is not password protectable. Protection of the Adjust page from unwanted users can be accomplished by key-locking the system page.**

### Freezing display

This icon is used to freeze display in the current state. The operator can thus edit the values displayed or enter new values.

### Saving parameters

This icon is used to save the recording of the values displayed on screen to the PCMCIA card under a name selected by the operator.

**NOTE** **It is possible to store up to 5000 variables values iin up to 125 records max.**

Ex.

How do we get to the recording on the product?

Recording 1 -> X variables values
Recording 2 -> X variables values
. .
. .
. .
Recording n -> X variables values

125 Max 5000 Max

### Restoring a recording

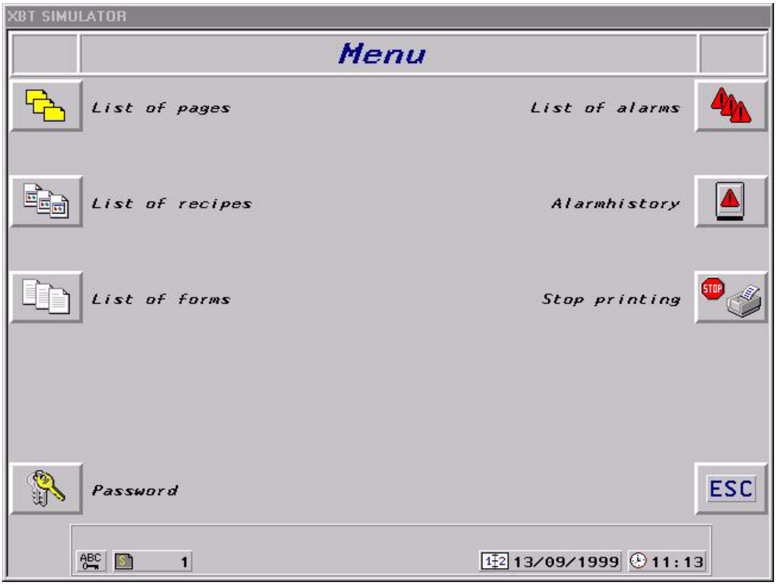
This icon is used to access the list of recordings.
Select the required recording using the arrow keys.

### Transferring the recording to the control system

The values of the recording are transferred to the control system, in compliance with the transfer rules (see chapter C, "%MWn+21: Recipe transfer not allowed", Page 25).

See chapter B, "Recipe page", Page 44.

# 14. Use of recipe pages


XBT SIMULATOR
Menu
List of pages
List of alarms
List of recipes
Alarmhistory
List of forms
Stop printing
STOP
Password
ESC
ABC
1
13/09/1999
11:13

D

Press tactile zone or dynamic function key to first select one recipe among the different recipe pages programmed under XBT-L1000, and after that select one of the recordings already stored of the previously recipe page selected (see chapter B, "Recipe page", Page 44).

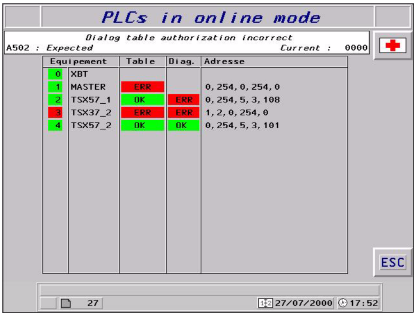
**NOTE** **Recipes are recorded and called by a number, not by an alphanumerique.**

# 15. System page "Connected PLC"

A system page "**Connected PLC**" that gathers all synthetic data regarding the whole equipment configured in the application is also available.

- Name of the equipment
- Communication status between terminal and equipment
- State of management of the device dialog table (alarm or reflex)
- State of management of the device diagnostics buffer
- Incorrect value of the "Authorization" word of the dialog table

### *10" Terminals*



PLCs in online mode

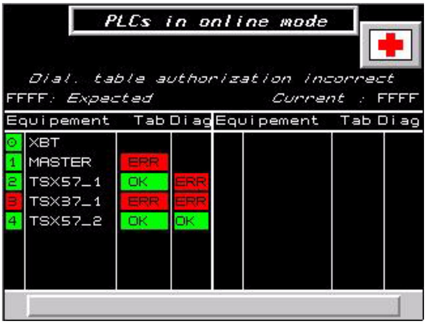
Dialog table authorization incorrect

A502 : Expected Current : 0000

| | Equipement | Table | Diag. | Adresse |
|---|---|---|---|---|
| 0 | XBT | | | |
| 1 | MASTER | ERR | | 0,254,0,254,0 |
| 2 | TSX57_1 | OK | ERR | 0,254,5,3,108 |
| 3 | TSX37_2 | ERR | ERR | 1,2,0,254,0 |
| 4 | TSX57_2 | OK | OK | 0,254,5,3,101 |

If the value of the "Authorization word" is invalid, you can correct this value from the system page.

### *5" Terminals*



PLCs in online mode

Dial. table authorization incorrect

FFFF: Expected Current : FFFF

| | Equipement | Tab | Diag | Equipement | Tab | Diag |
|---|---|---|---|---|---|---|
| 0 | XBT | | | | | |
| 1 | MASTER | ERR | | | | |
| 2 | TSX57_1 | OK | ERR | | | |
| 3 | TSX37_1 | ERR | ERR | | | |
| 4 | TSX57_2 | OK | OK | | | |

# 16. Loading extension tasks at application transfer

On a TXBT terminal, it is possible to add functions on top of the basic XBT-F functions. These extra functions are called Extension tasks (see TXBT manual).

# 17. Loading extra files at application transfer

On a TXBT terminal, when making a PC -> TXBT transfer, it is possible to load extra files into the TXBT (see the TXBT manual).

# Chapter E

# Application Development Example

# Contents

*You will be guided step by step through the example, the goal being to create rapidly your first application.*
*Chapters 2, 3 and the appendix respectively give all the information on the implementation methodology, terminal operation and the various handling procedures.*

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  Management of production ____ 6
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  Maintenance ____ 8
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## ⚠ WARNING

**UNINTENTIONAL EQUIPMENT OPERATION**

This example application will change register contents in remote devices. This may cause unanticipated change in device status. If this example is used in a functioning system, ensure that all effects of any register changes are fully understood before running this example.

**Failure to follow this instruction can result in death, serious injury, or equipment damage.**

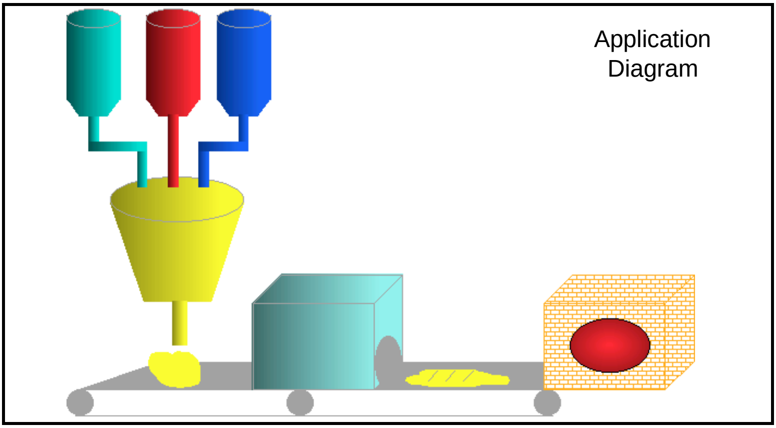
# 1. Expression of requirements

The Industrial Bakery Co. makes various types of bread.

## Bread production consists of two operations

1. Preparing the dough
The operation consists in mixing water, flour and yeast in a kneader.
Depending on the amount of dough to be made, the operator must indicate: the amounts of water, flour and yeast required.
The weight of the dough obtained must be indicated to the operator.
The operator will have to be assisted when entering the amounts of water, flour and yeast to be used according to the type of dough to be made.

2. Baking the dough
The operator selects the baking temperature.
The baking temperature range will be displayed.
If there is a problem (baking temperature too high or too low) an alarm will be activated and the operations to be performed will be indicated to the operator.



# 1. Expression of requirements

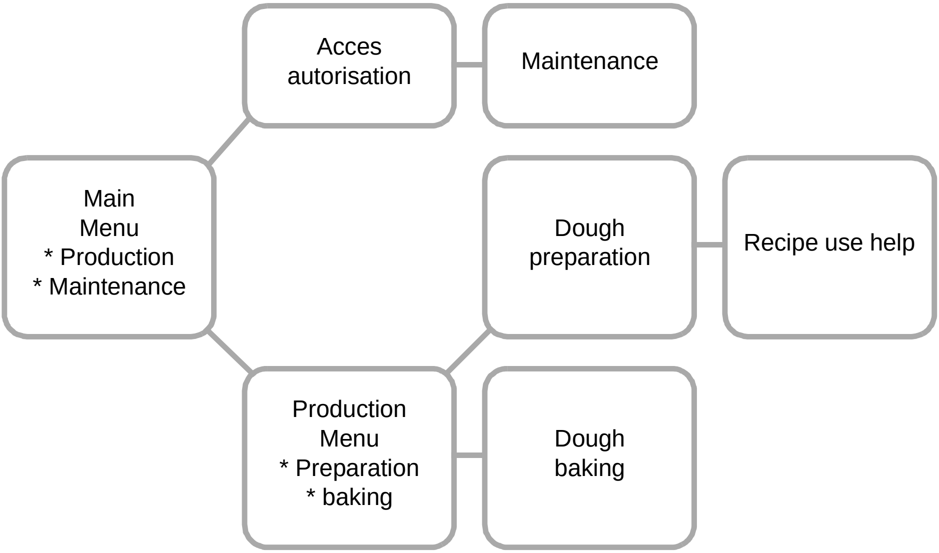
The following two operations are performed besides the production operations:

## Installation maintenance

In order to guarantee the quality of the product, daily checks must be performed by the maintenance department. This operation, performed by authorized personnel (maintenance operator), consists in checking the kneader (On/Off). The production operators are not allowed to perform this type of operation.

## Management of production

The client wishes to enter the amounts of water, flour, salt and yeast only once per type of bread (filing of these parameters for re-use).
The application will be organized as follows:


Acces autorisation
Maintenance
Main Menu
* Production
* Maintenance
Dough preparation
Recipe use help
Production Menu
* Preparation
* baking
Dough baking

# 1. Expression of requirements

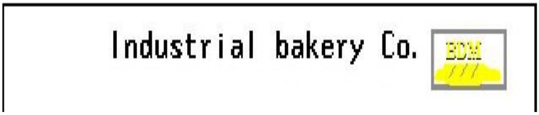
If there are any problems during baking (temperature too high or too low):

- the operator must be informed immediately, whatever screen is displayed,
- he must also be able to access the information indicating the operations to be performed in that case.

## Additional information

The company wants its name and logo to be displayed on the following screens:

- Dough preparation,
- Dough baking,
- Maintenance.



Industrial bakery Co.

## Navigating between the various screens

The company wants navigation between the:

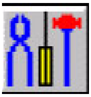
- main menu,
- maintenance,
- production menu,
- dough preparation,
- dough baking,

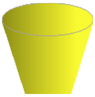
screens to be indicated to the operator by icons which will be associated with dynamic function keys on the terminal.

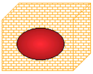
soit indiquée à l'opérateur par des icônes qui seront associés à des touches fonctions dynamiques du terminal.

| | |
|---|---|
| Main Menu | Acces to main menu |
| Prod. Menu | Acces to production menu |

# 1. Expression of requirements


Access to the Maintenance screen.


Access to the Dough Preparation screen.


Access to the Dough Baking screen.

## Process control

The F1 static function key is used to start up the process.
Press this key to start the process and press it again to stop it.

## Maintenance

For the maintenance operations you will have to:
1. Switch off the kneader by pressing the F2 function key.
2. Check the various parts of the kneader.
3. Switch the kneader back on by pressing F2 again.
Access to the Maintenance screen is protected by a password: PW01.

## Locking the Kneader On/Off key

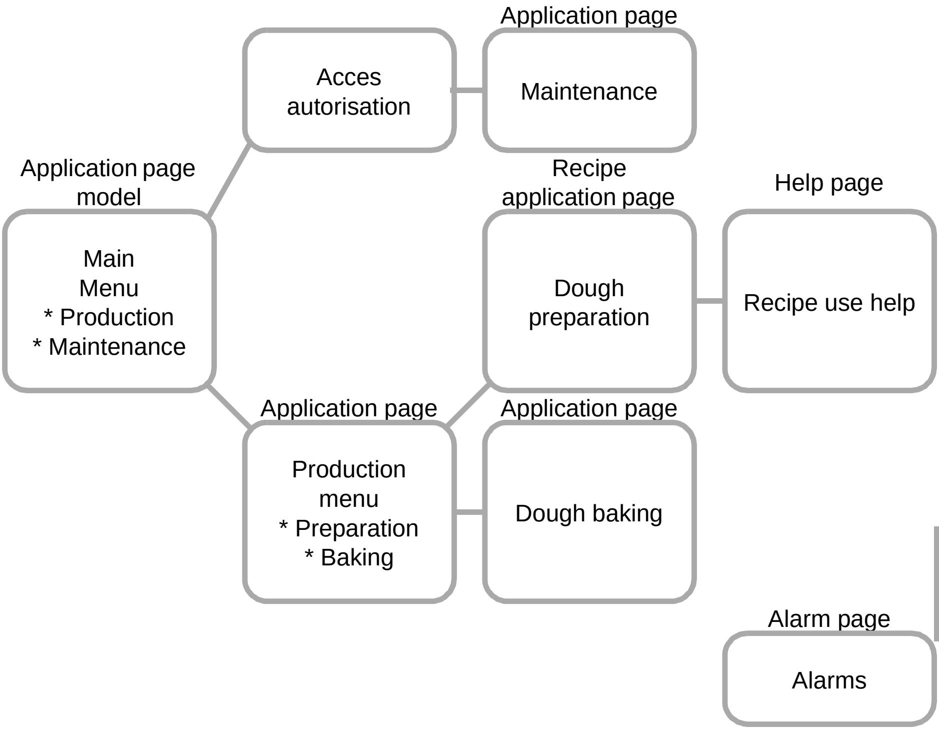
The F2 static function key is locked when the following pages are displayed:
- Menu
- Dough preparation and dough preparation help
- Dough baking and dough baking help

and is unlocked when the Maintenance page is displayed.

# 2. Analyzing the expression of requirements

## Application tree structure

Analysis of the requirements is used to structure the application in several types of pages:


Application page
Acces autorisation
Maintenance
Application page model
Main Menu * Production * Maintenance
Recipe application page
Help page
Dough preparation
Recipe use help
Application page
Application page
Production menu * Preparation * Baking
Dough baking
Alarm page
Alarms

An application page Model will be used to display the company name and logo on the application pages (Dough preparation, Dough baking, Maintenance).

### Navigating between application pages

The dynamic function keys associated with the corresponding icons will be used for navigating between pages.

# 2. Analyzing the expression of requirements

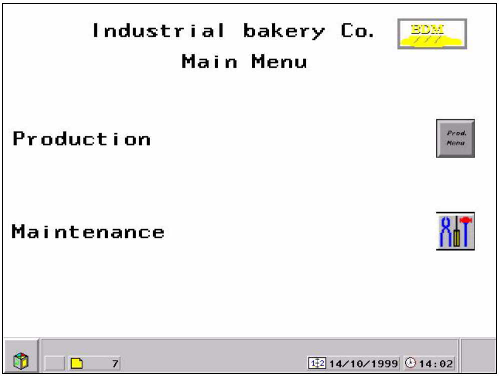
## Application tree structure balance

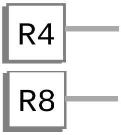
The application will include:

- 5 application pages:
  - Main menu
  - Production menu
  - Maintenance
  - Dough preparation
  - Dough baking
- 1 alarm page
- 2 help pages
  - Dough preparation help
  - Dough baking help

## Main menu application page

Application model 1 which includes the company name and logo is used for this application page.


Industrial bakery Co.
BDM
Main Menu
Production
Prod. Menu
Maintenance
7
14/10/1999
14:02

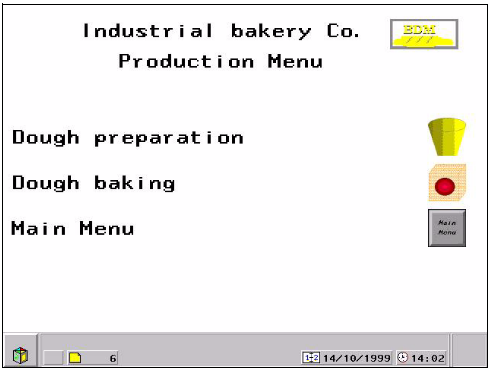


Acces to production menu screen

Acces to maintenance screen

## Production Menu application page

Application model 1 into which the company name and logo are entered is used for this application page.



Industrial bakery Co.
Production Menu

Dough preparation

Dough baking

Main Menu

**R4** Acces to dough preparation screen

**R6** Acces to dough baknig screen

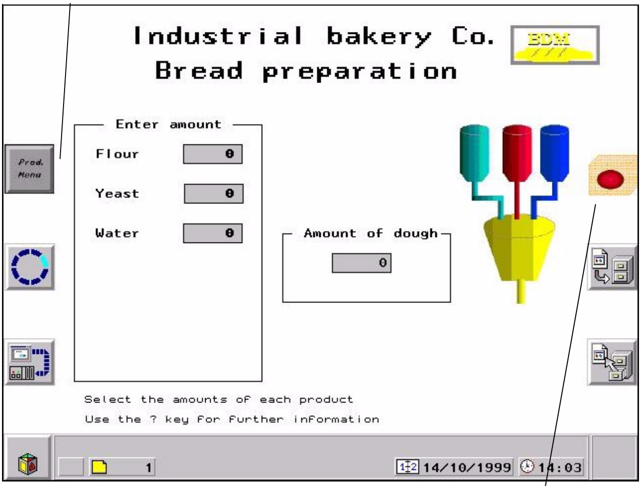
**R8** Acces to main menu screen

## Dough preparation application page

The recipe model into which the company name and logo are entered is used for this application page. The four icons for management of the recordings are included in this specific model (see next page).

# 2. Analyzing the expression of requirements

Access to Production menu screen using dynamic key R1 associated with the icon. R1



Industrial bakery Co.
Bread preparation

Enter amount

Flour 0

Yeast 0

Water 0

Amount of dough 0

Select the amounts of each product
Use the ? key for further information

1 14/10/1999 14:03

Access to the baking monitoring screen by pressing the R6 dynamic key associated with the icon. R6

○ ?

Access to the help page associated with the dough preparation applica-tion page by pressing the ? key on the keyboard.

**Dough preparation**

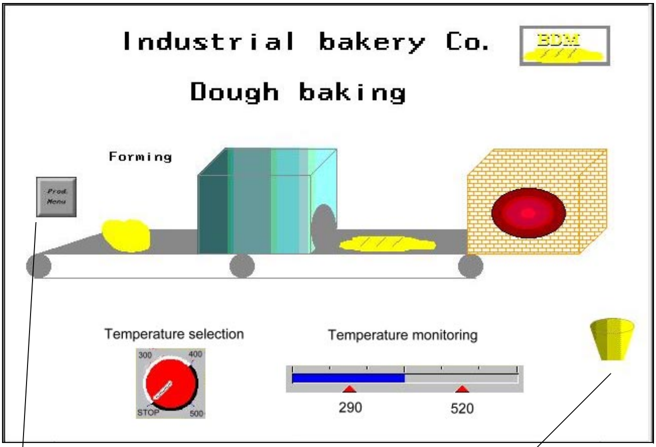
| | | | |
|---|---|---|---|
| | Freeze display Record | | Record parameters |
| | Transfer recording to the control system | | Restore recording |

**Entering the amount**

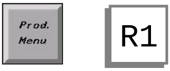
Enter the amounts of flour, yeast and water required.
Press the “Save parameters” key (R8) to record these amounts. Enter the recording name (name of the type of bread).
Perform the same procedure for the other types of bread. To restore a recording, press the “Restore recording” (R10) key. Use the arrows to select a recording in the list.
Validate. Transfer the parameters using the “Transfer recording” (R9) key.

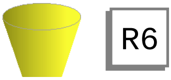
# 2. Analyzing the expression of requirements

## Dough baking application page


Industrial bakery Co.
BDM
Dough baking
Forming
Prod. Menu
Temperature selection
300
400
STOP
500
Temperature monitoring
290
520

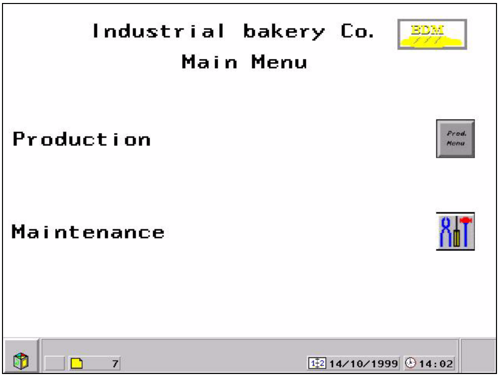
Access to the Production menu screen using dynamic key R1 associated with the icon.


Prod. Menu
R1



Access to the Dough Preparation screen using dynamic key R6 associated with the icon.

## Maintenance page



Industrial bakery Co.
Main Menu

Production

Maintenance

7 14/10/1999 14:02

R4

R8

Password : PW01

Industrial Bakery Co.
Maintenance

Kneader maintenance

The kneader must be empty when performing this operation

1. Switch off the kneader: F2
2. Check the kneader parts
3. Switch the kneader on: F2

# 2. Analyzing the expression of requirements

## Static function keys

### Process control

F1: toggle command

### Maintenance

(switching off the kneader)
F2: toggle command
Static function keys F1 and F2 are locked when the following pages are displayed:

- Main menu,
- Production menu,
- Dough preparation and dough preparation help,
- Dough baking,

and are unlocked when the Maintenance page is displayed.

## Data associated with the application

### Data associated with the alphanumeric and graphic fields

Amount of flour: %MW30.
Amount of water: %MW31.
Amount of yeast: %MW32.
Amount of dough produced: %MW33. (This data is provided by the control system).
Temperature selected with the rotary selector switch: %MW34.
Temperature monitored by the bar graph: %MW35.

### Dialog table data

The start address of dialog table is %MW100.
%MW100: word containing the bits associated with the static function keys.
%MW101: word containing the number of the displayed page.
%MW102: word containing the static function key locking command.
%MW104: word containing the alarm bit.

The function of the words will be explained later in this document.

# 3. Creating the application

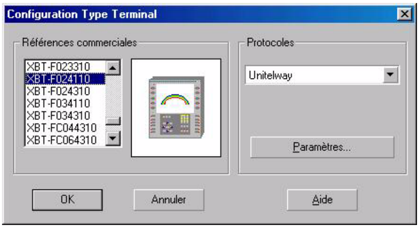
---

The XBT-L1000 software and the protocols must be installed on the PC. Refer to the corresponding service instructions.

## Selecting the terminal and protocol

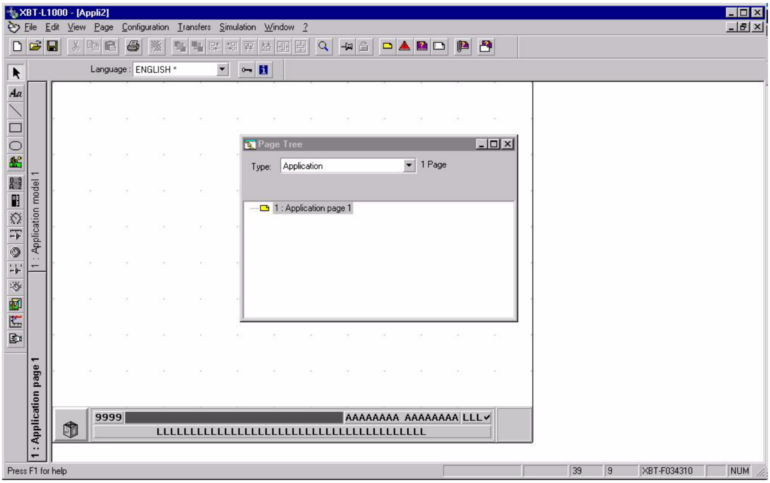
1. Start up the XBT-L1000 software. If an application is already displayed, choose the ***File/New*** menu.

2. Choose the type of XBT


Configuration Type Terminal
Références commerciales
XBT-F023310
XBT-F024110
XBT-F024310
XBT-F034110
XBT-F034310
XBT-FC044310
XBT-FC064310
Protocoles
Paramètres...
OK
Annuler
Aide

Protocoles: Unitelway

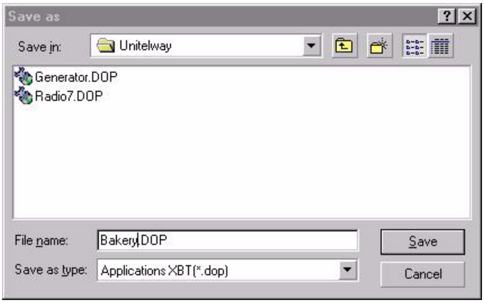
Select the **protocol** (e.g.: ModBus Plus) and confirm by clicking **OK**. The default page will then be displayed.


XBT-L1000 - [Appli2]
File
Edit
View
Page
Configuration
Transfers
Simulation
Window
?
Language : ENGLISH *
1 : Application model 1
1 : Application page 1
Page Tree
Type:
1 Page
1 : Application page 1
9999
AAAAAAAA AAAAAAAA LLL
LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
Press F1 for help
39
9
XBT-F034310
NUM

Type: Application

# 3. Creating the application

Save the application using the **File/Save** menu under the name: Bakery.DOP; this name will then be displayed in the title bar



Save in: Unitelway

Generator.DOP
Radio7.DOP

File name: Bakery.DOP

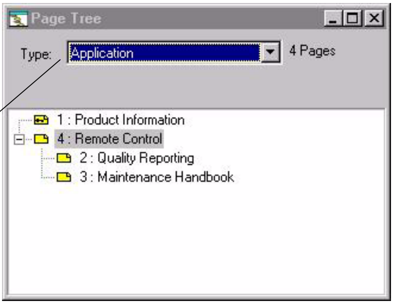
Save as type: Applications XBT(*.dop)

## Creating the page model

Two model pages are available by default when creating an application: one model for standard application pages and another for the recipe pages. The designer can edit them or create new ones.

### Application page model

Reminder: the company wants all the application pages to have the same page background.



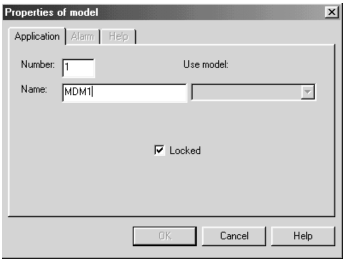
Type: Application

4 Pages

- 1 : Product Information
- 4 : Remote Control
  - 2 : Quality Reporting
  - 3 : Maintenance Handbook

Choose Application page model in the tree structure window

Choose the ***Page/Properties*** menu.
Indicate the name of the model (MDM1 model) and deselect the Locked option. Click ***Ok***.



Number: 1

Name: MDM1

Use model:

☑ Locked

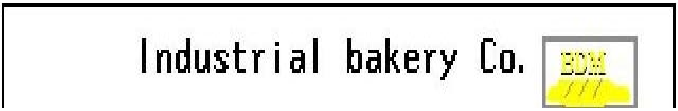
**Entering text**
To enter "Industrial Bakery Co" text see chapter B, "Text", Page 17.

**Importing an image**
To select the logo of the company "*.BMP" for instance, see chapter B, "Create graphics", Page 18.

Now that the model page has been created, we are going to create the pages.

**Note** **The model page created will appear in gray on the XBT-L1000 background, but will appear in color on the terminal.**

The image is inserted, position it at the desired place.

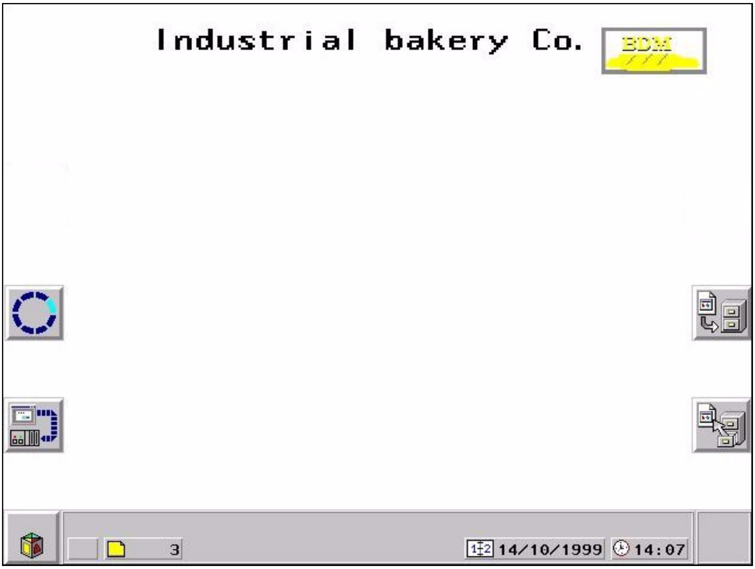


Now that the model page has been created, we are going to create the pages.

**Note** **The model page created will appear in gray on the XBT-L1000 background, but will appear in color on the terminal.**

### Recipe page model

The recipe page models have the same properties as the application page models except that the latter includes the four additional icons for managing “recipe” recordings.

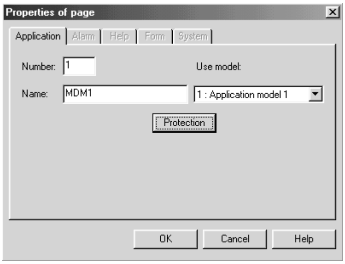

Industrial bakery Co.
BDM
3
14/10/1999
14:07

## Creating the various pages

### Application page

,

1. Select the application page type in the ***Page tree structure*** window, a page called Application page 1 exists by default, with the model page displayed in gray in the background.
2. Choose the ***Page/Properties*** menu (or click the right mouse button).


Properties of page
Application
Alarm
Help
Form
System
Protection
OK
Cancel
Help

Number: 1

Name: MDM1

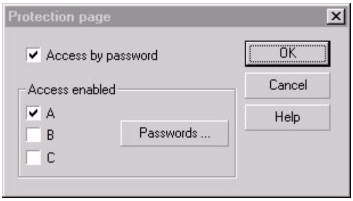
Use model: 1 : Application model 1

The first page to be created in the example is called: MENU.

3. Enter the name of the page, click Protection and, if necessary, deselect the ***Access with password*** box and confirm with ***Ok***. Click ***Ok*** again. The menu page has now been created.

4. Choose the ***Page/New Page*** menu or click the new page icon and proceed in the same way as in step 3 to create the "Dough preparation" page, and then create the "Dough baking" page in the same way.

5. To access the maintenance page, click Protection and select the checkbox Access by password. Check box A and click on Passwords..., enter PW01 in the A field. Select ***Ok***, ***Ok***, and ***Ok***.

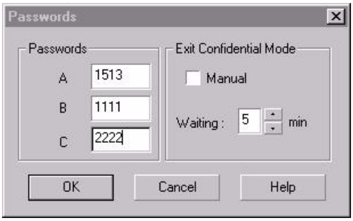

Protection page
Access enabled
Passwords ...
OK
Cancel
Help

☑ Access by password

☑ A

☐ B

☐ C


Passwords
Passwords
Exit Confidential Mode
OK
Cancel
Help

A 1513

B 1111

C 2222

☐ Manual

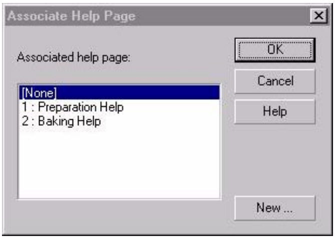
Waiting : 5 min

### Help page

Create the help pages (Preparation and Baking) by selecting the Page/New page/Help menu.

### To associate a help page with an application page

1. Select the application page in the Tree structure page (for example: Dough preparation application page).
2. Select the ***Page/Associate help page*** menu or click the corresponding icon.
3. Select the help page you want to associate (for example: Preparation) and click ***OK*** to confirm. Also associate the Baking help page.

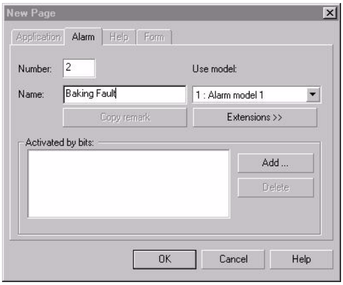

Associate Help Page
OK
Cancel
Help
New ...

Associated help page:

[None]
1 : Preparation Help
2 : Baking Help

### Alarm page

Create the alarm pages (Baking problem) in the same way as the application pages by choosing the ***Page/New page/Alarm*** menu or by clicking the corresponding icon. Enter the name of the alarm page (Baking fault) and click ***OK*** to confirm. For the complete alarm processing, see "Alarm processing", Page 30.


New Page
Application
Alarm
Help
Form
Copy remark
Extensions >>
Add ...
Delete
OK
Cancel
Help

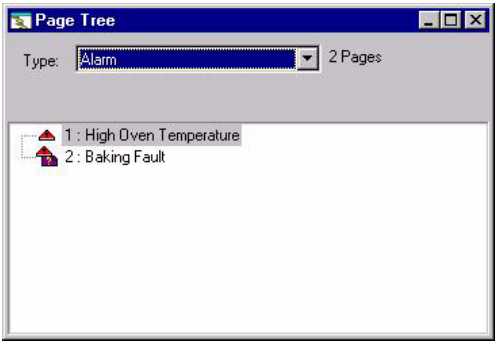
Number: 2

Use model: 1 : Alarm model 1

Name: Baking Fault

Activated by bits:

The page architecture is displayed in the tree structure window



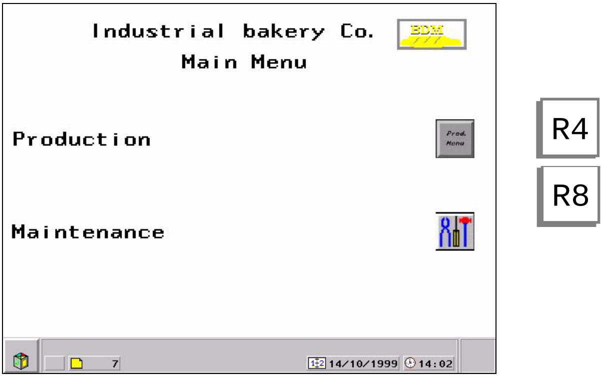
Type: Alarm

2 Pages

1 : High Oven Temperature
2 : Baking Fault

## Creating navigation between the application pages

Navigation between the application pages is performed by means of dynamic function keys (example: Main menu page).

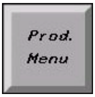


Industrial bakery Co.
Main Menu

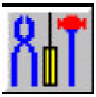
Production

Maintenance

7 14/10/1999 14:02



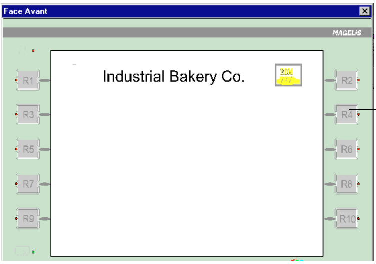
Access to the Production screen: R4 dynamic key associated with the icon



Access to the Maintenance screen: R8 dynamic key associated with the icon

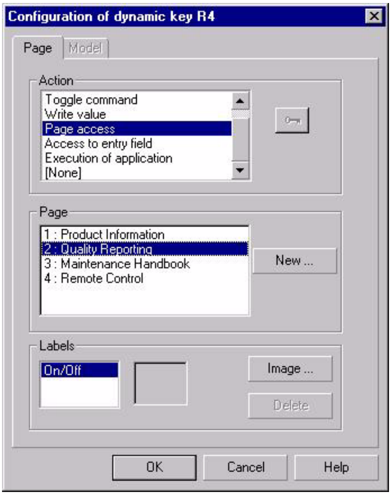
# 3. Creating the application

1. Double click the dynamic function key to be assigned

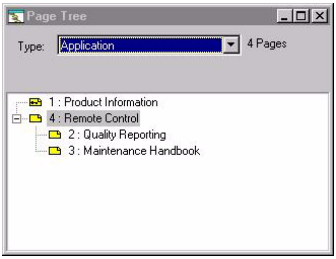

Face Avant
MAGELIS
Industrial Bakery Co.
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10

Example: R4

2. Select ***Action/Page access***, the destination page (Dough preparation), click ***Image*** and insert the image associated with the R4 key (see "Creating the page model", Page 17)

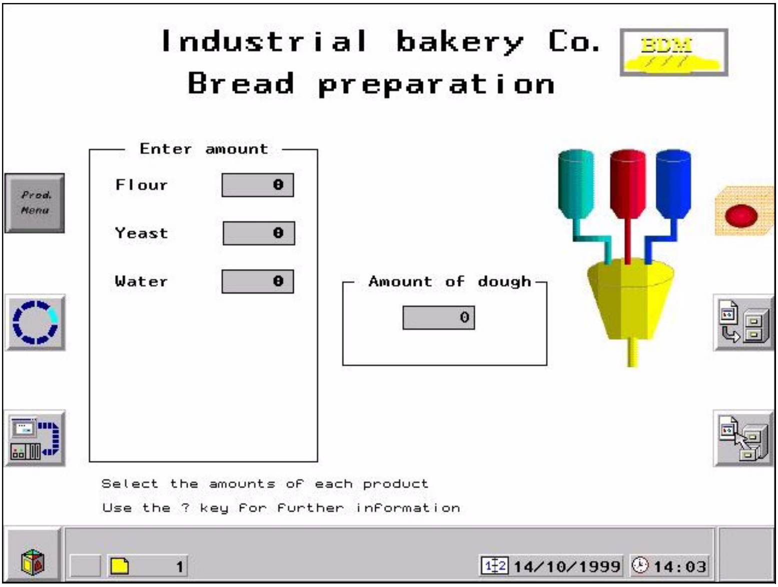

Configuration of dynamic key R4
Page
Model
Action
Toggle command
Write value
Page access
Access to entry field
Execution of application
[None]
Page
1 : Product Information
2 : Quality Reporting
3 : Maintenance Handbook
4 : Remote Control
New ...
Labels
On/Off
Image ...
Delete
OK
Cancel
Help

Create the navigation between all the application pages in the same way (see § 2. Analyzing the expression of requirements, Page 9). The Tree structure window displays the navigation architecture you have created..


Page Tree
Type:
Application
4 Pages
1 : Product Information
4 : Remote Control
2 : Quality Reporting
3 : Maintenance Handbook

**NOTE** **Right click on one page of the tree structure to create a new page of same type as the page selected.**

## Creating the page content



Industrial bakery Co.
Bread preparation

Enter amount

Flour 0

Yeast 0

Water 0

Amount of dough

0

Select the amounts of each product

Use the ? key for further information

### Text

For entering the text in the various pages, See chapter B, § Text, Page 17.

### Line, Rectangle, Ellipse

1. Select the tool button.
2. Using the mouse, define the object size.
3. Select the Edit/Property menu (or right mouse click or double click).
4. Define the object properties (filled in or empty, color, etc.).

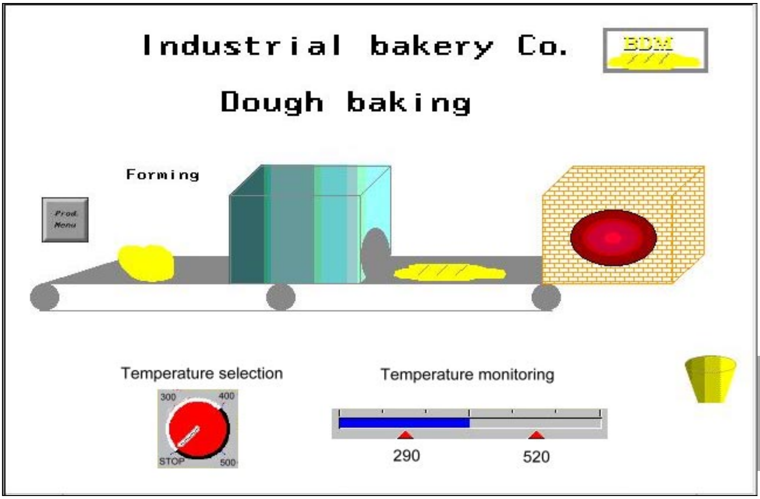
### Alphanumeric fields

The Dough preparation application page has 3 entry fields and one read only field.

1. Select the Create an Alphanumeric Field tool button.
2. Using the mouse, click on the required location.
3. Define the object properties.

To introduce the characteristics of the amount entry fields, such as number of characters, format, PLC variable associated and its access from the terminal, see chapter B, "Alphanumeric variable field", Page 20 and see chapter B, "Variable field characteristic", Page 29.

Exemples:
Amount of flour : %MW30
Amount of water : %MW31
Amount of yeast : %MW32
Amount of producted dough : %MW33


Industrial bakery Co.
BDM
Dough baking
Forming
Prod. Menu
Temperature selection
300
400
STOP
500
Temperature monitoring
290
520

The "Dough baking" application page includes:
- texts and drawings, whose entry principle has already been described,
- 1 temperature rotary selector switch,
- 1 temperature monitoring bar graph.

### Rotary switch

1. Select the **Rotary switch** tool button.
2. Using the mouse, select the required location.
3. Select the Edit Properties menu (or click the right mouse button or press ALT ENTER).
4. Select the type of the **Rotary switch**
5. Assign the word %MW34 to the object using the **Modify** button, click **Ok**. This word will contain the value selected by means of the rotary selector( 4 positions : 0, 300,400, 500).
6. Click **List** and, using the **Delete** or **Add** buttons, define the number of positions for the rotary switch and the value to be assigned in the word. Click **Ok**.
7. Using the **Color** button, define the color of the graduations and of the background.
8. Click **Ok twice** to confirm, the rotary switch will then be displayed but the graduations will not be identified.
9. Using the **Text** tool, enter the values to allow the operator to identify the positions.

To introduce the characteristics of the temperature selection see chapter B, "Switches", Page 25.

### Bar-graph

1. Select the Bar Graph tool button.
2. Using the mouse, define the object size.
3. Select the **Edit/Bar Graph Properties** menu (or right mouse click or double click).
4. Select the type of bar graph (for example: horizontal, large graduation).
5. Assign the word %MW35 to the object using the **Modify** button. This word will contain the oven temperature value. Click **Ok**.
6. Click **Options** and set the object to cyclic readings. The temperature must be between 290° C and 520° C. If the temperature is outside these limits the display will switch to blue. Click **Threshold** to define a high threshold (H) of 520 and a low threshold (L) of 290 and click **Color** to define the colors.
7. Click **OK** to confirm. The bar-graph is displayed but the graduations are not identified.
8. Using the **Text** tool, enter the values to allow the operator to identify the positions.

To introduce the characteristics of the temperature monitoring, see chapter B, "Bar-graph", Page 22.

## Assigning the static function keys

In order to assign the static function keys:

1. Select the ***Configuration/Function Keys*** menu. The front panel of the terminal will then be displayed.
2. Double click the required function key (For example: F1).
3. Select the toggle command type.
4. Click ***Ok*** to confirm.

**Note** **Bits associated with the dialog static function keys that can be used in the PLC application**

A reserved word in the dialog table indicates the status of the function keys in the form of a word bit: bit at 1 = key pressed.
In our example the word %MW100 is used.

| | | | Bit 1 | Bit 0 |
|---|---|---|---|---|
| %MW100 | | | F2 | F1 |

Bits B0 and B1 are associated with the F1 and F2 command keys.

## Locking the static function keys

To perform this function, you must:
- know the number of the displayed page,
- lock or unlock the key as the case may be.

### Number of the displayed page

A word in the dialog table contains the number of the displayed page; the ***Page/property*** menu gives the number of each page:
- Menu: page No. 1
- Dough preparation: page No. 2
- Dough baking: page No. 3
- Maintenance: page No. 4

In our example word %MW101 is used.

### Locking the static function keys

A word in the table is assigned to static function key locking. In ourexample word %MW102 is used.

|  |  |  | Bit 1 | Bit 0 |
|---|---|---|---|---|
| %MW102 |  |  | F2 | F1 |

Set bit B1 to 1 to lock the F2 key.

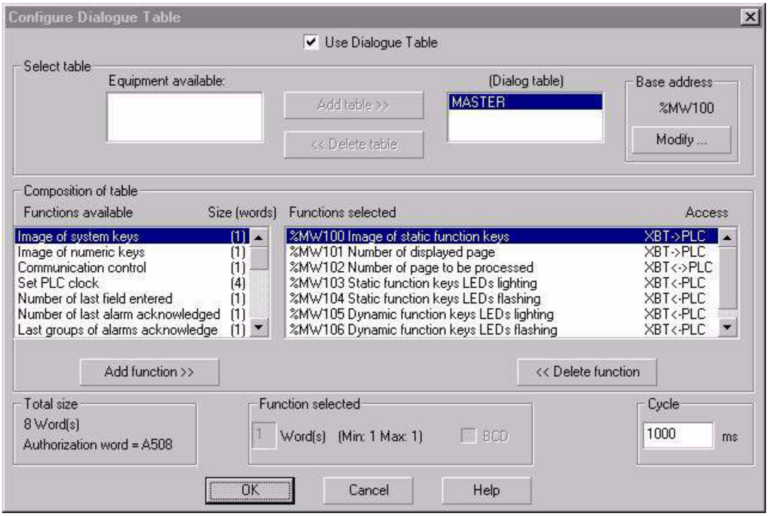
### Key locking by the PLC

The program has the following structure:
If %MW101 (No. of the displayed page) = 1, 2 or 3 set bit B1 of word %MW102 to 1 (F2 locked).
If %MW101 (No. of the displayed page) = 4 set bit B1 of word %MW102 to 0 (F2 unlocked).

## Creating the dialog table

Several elements of the dialog table have been declared in the preceding chapters:
- %MW100: word containing the bits associated with the static function keys.
- %MW101: word containing the number of the displayed page.
- %MW102: word containing the static function key locking command.
- %MW104: word containing the alarm bit.

Select the **Configuration/Dialog table** menu
Check the ***Use dialog table*** option.
For more explication, see chapter C, § 2. Dialog table content, Page 9.



☑ Use Dialogue Table

Equipment available:

(Dialog table): MASTER

Base address: %MW100

| Functions available | Size (words) |
|---|---|
| Image of system keys | (1) |
| Image of numeric keys | (1) |
| Communication control | (1) |
| Set PLC clock | (4) |
| Number of last field entered | (1) |
| Number of last alarm acknowledged | (1) |
| Last groups of alarms acknowledge | (1) |

| Functions selected | Access |
|---|---|
| %MW100 Image of static function keys | XBT->PLC |
| %MW101 Number of displayed page | XBT->PLC |
| %MW102 Number of page to be processed | XBT<->PLC |
| %MW103 Static function keys LEDs lighting | XBT<-PLC |
| %MW104 Static function keys LEDs flashing | XBT<-PLC |
| %MW105 Dynamic function keys LEDs lighting | XBT<-PLC |
| %MW106 Dynamic function keys LEDs flashing | XBT<-PLC |

Total size
8 Word(s)
Authorization word = A508

Function selected
1 Word(s) (Min: 1 Max: 1) ☐ BCD

Cycle
1000 ms

## Alarm processing

### Reminder of the expression of requirements

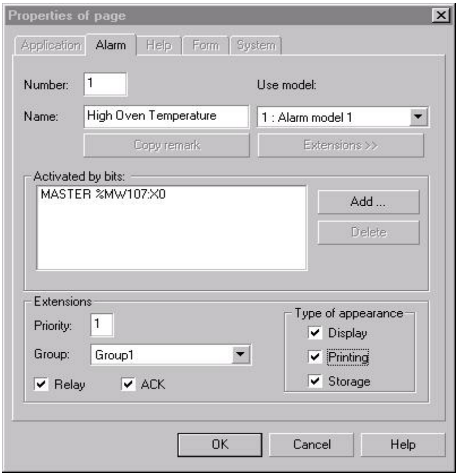
If the baking temperature is too high, an alarm will be displayed in a strip on the application pages, the Alarm indicator will flash;
- you can acknowledge the alarm by pressing ENTER,
- or consult the alarm page by pressing SHIFT+ ENTER.

### PLC command to display the alarm

The dialog table contains words reserved for displaying alarms. Display is commanded by the PLC by setting a word bit to 1 in the dialog table. In our example, bit B0 of word %W104 is used.

### Alarm configuring by the PLC

Go to the alarm page by means of the ***Page tree structure*** window, select the ***Page/Properties*** menu and click the ***Extension*** button in the Property window.



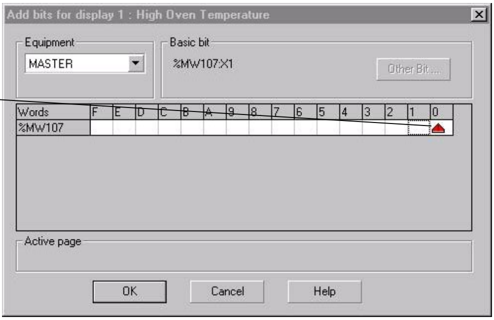
Properties of page

Number: 1
Use model: 1 : Alarm model 1
Name: High Oven Temperature
Activated by bits: MASTER %MW107:X0
Extensions
Priority: 1
Group: Group1
☑ Relay ☑ ACK
Type of appearance
☑ Display
☑ Printing
☑ Storage

Select Type of action: ***Display*** (type of action when the alarm is triggered).
Select the ***ACK*** box: compulsory acknowledgment of the alarm when it is triggered.

Click ***Add*** to assign the alarm bit (bit 0 of word %MW104)

|  | Bit 15 |  |  | Bit 0 |
|---|---|---|---|---|
| %MW104 | AL16 |  |  | AL0 |



Click bit 0 to assign the alarm. The word is defined in the dialog table.

Add bits for display 1 : High Oven Temperature

Equipment: MASTER

Basic bit: %MW107:X1

| Words | F | E | D | C | B | A | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| %MW107 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▲ |

Active page

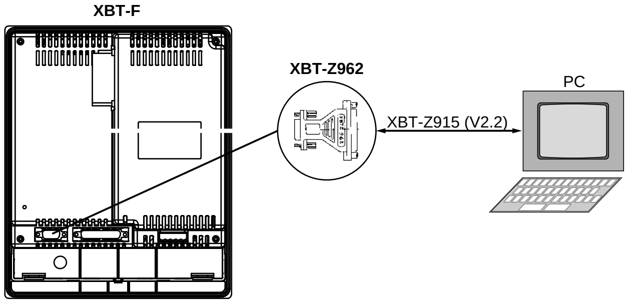
For more informations, see chapter B, "Alarm page", Page 39.

# 4. Loading the application in the terminal

1. Connect the terminal to the PLC using the relevant cable (ex.: XBTZ968 for a TSX Micro with Unitelway V2.0).
2. Connect cable ***XBT-Z915, revision index 22 and the XBT-Z962*** between the PC and the terminal.
3. Switch on the terminal (refer to the terminal service instruction for wiring of power supply).
4. Click "***Transfers***", "***Export***" to terminal using the software (application open).

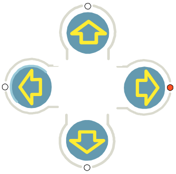
Example : Transfert from PC to PCMCIA card

Ex.



See chapter B, § 12. Transferring the application and the protocol to a PCMCIA card, Page 63, to direct export/import to PCMCIA memory card.

The dynamic function keys are used to navigate between pages.



After pressing ***MOD***, use the arrow keys to navigate from one field to the other.

Once you are positioned on the desired field, press ***MOD*** to select the field.
If you do not enter any value in the field within one minute, the field will exit the entry mode.

## Cancelling the entry

Press the ***ESC*** key if you want to cancel the current entry; the field will then not be modified in any way.

# Chapter F
# Appendices

F

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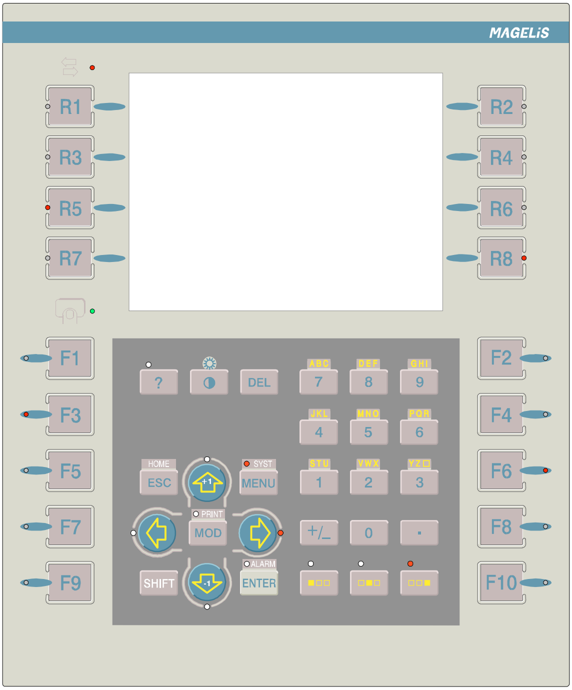
# 1. XBT-F Specifications

## XBT-F 01


MAGELiS
R1
R2
R3
R4
R5
R6
R7
R8
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
?
DEL
ABC
7
DEF
8
GHI
9
JKL
4
MNO
5
PQR
6
HOME
ESC
+1
SYST
MENU
STU
1
VWX
2
YZ□
3
PRINT
MOD
+/_
0
.
SHIFT
-1
ALARM
ENTER

# 1. XBT-F Specifications

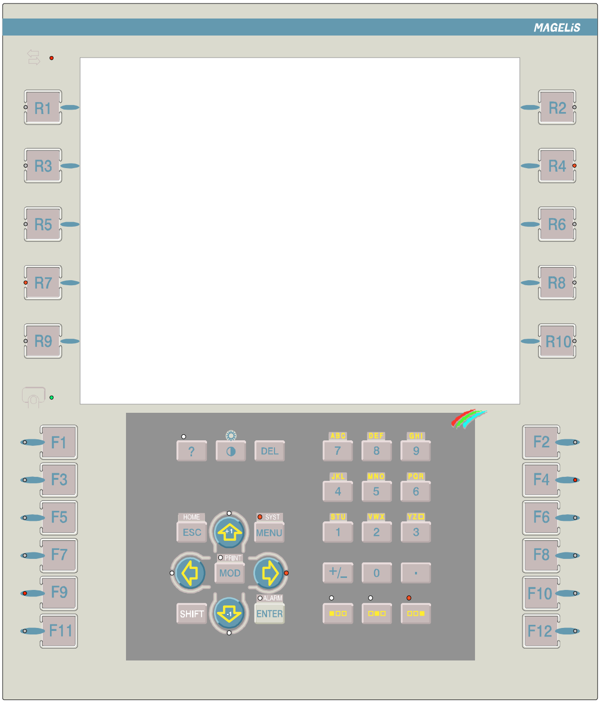
| | |
|---|---|
| ***Types of display*** | LCD 5.7"<br>320*240 pixels<br>STN monochrome 16 grey levels |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple : 5 % maximum<br>Consumption : 35 W |
| ***Memory*** | Application + protocol : PCMCIA card,<br>50 to 450 pages of applications, alarms and help according to the memory card in use<br>Alarm log : 1000 events<br>Recipe : 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422, asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Keyboard*** | Customisable membrane keypad |
| ***Indicating*** | 1 communication status indicator light<br>1 indicator light per function key<br>1 indicator light per service key<br>1 keypad/standby screen busy indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Weight*** | 3.96 lb (1.8 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%,<br>Storage : - 4 to +140 °F (- 20° to + 60 °C). |
| ***Degree of protection*** | IIP65 per IEC529 and degree 1 per NFC20-010; UL Type 4, 4X, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 10 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish<br>System pages can be translated in any other language |
| ***Static function keys*** | 10 |
| ***Dynamic function keys*** | 8 |

# 1. XBT-F Specifications

## XBT-F 02


MAGELIS
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
?
DEL
ABC
DEF
GHI
7
8
9
JKL
MNO
PQR
4
5
6
HOME
ESC
SYST
MENU
STU
VWX
YZ
1
2
3
PRINT
MOD
+/_
0
.
SHIFT
ALARM
ENTER

# 1. XBT-F Specifications

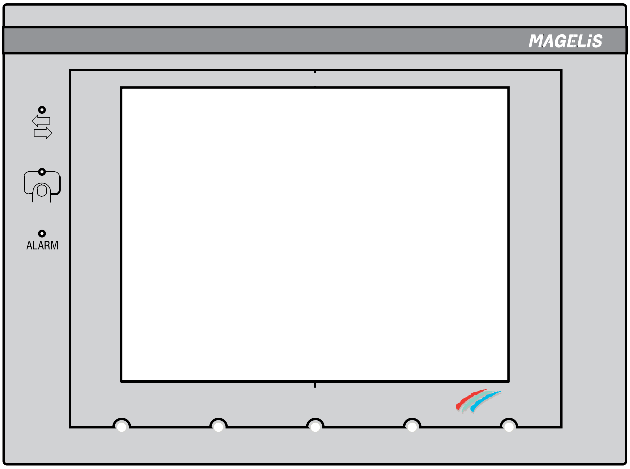
| | |
|---|---|
| ***Types of display*** | LCD 10.4"<br>640*480 pixels<br>STN monochrome (9.5" screen), 16 grey levels and TFT color (10.4" screen), 256 colors. |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 30 to 300 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Keyboard*** | Customisable membrane keypad |
| ***Indicating*** | 1 communication status indicator light<br>1 indicator light per function key<br>1 indicator light per service key<br>1 keypad/standby screen busy indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Ethernet TCP/IP Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Weight*** | 5.95 lb (2.7 Kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%,<br>Storage : - 4 to +140 °F (- 20° to + 60 °C). |
| ***Degree of protection*** | IIP65 per IEC529 and degree 1 per NFC20-010 ;<br>UL Type 4, 4X, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 12 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |
| ***Static function keys*** | 12 |
| ***Dynamic function keys*** | 10 |

# 1. XBT-F Specifications

## Touchscreen XBT-F 032


MAGELiS
ALARM

# 1. XBT-F Specifications

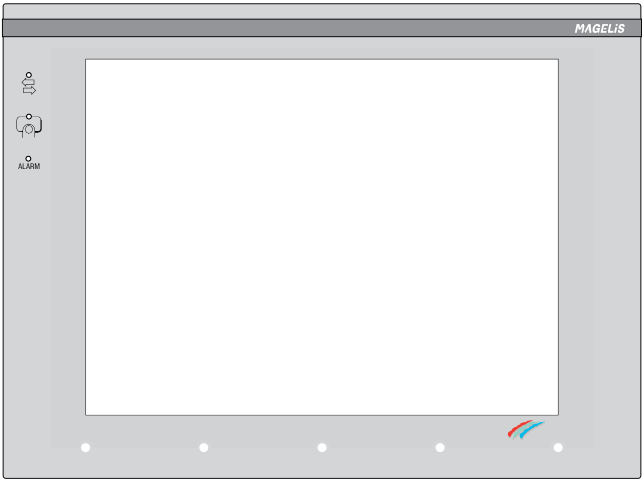
| | |
|---|---|
| ***Types of display*** | LCD STN 5.7"<br>320*240 pixels<br>256 colors |
| ***Touchscreen pad*** | Resistive matrix<br>6x8 touch zones |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 50 to 450 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Weight*** | 3.53 lb (1.6 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 8 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

## Touchscreen XBT-F 034


MAGELIS
ALARM

# 1. XBT-F Specifications

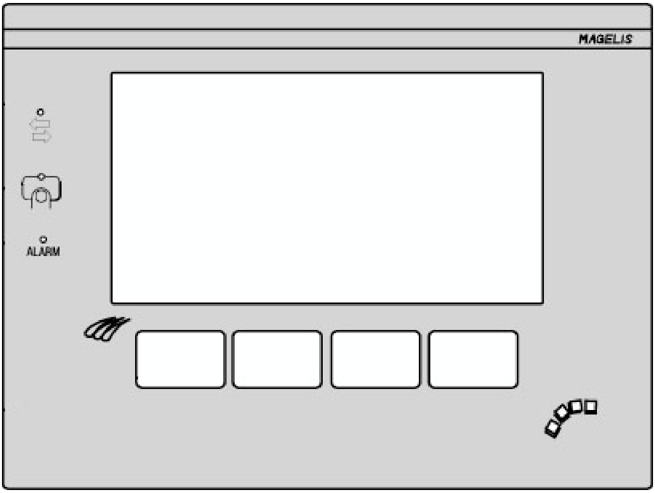
| | |
|---|---|
| ***Types of display*** | LCD 10.4"<br>640*480 pixels<br>256 colors. |
| ***Touchscreen pad*** | Resistive matrix<br>10x13 touch zones |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 30 to 300 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Ethernet TCP/IP Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Weight*** | 5.29 lb (2.4 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 10 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

## XBT-FC 02


MAGELIS
ALARM

# 1. XBT-F Specifications

| | |
|---|---|
| ***Types of display*** | LCD STN 5.7" touch screen<br>320*240 pixels<br>256 colors |
| ***Touchscreen pad*** | Resistive matrix<br>6x8 touch zones |
| ***Keyboard*** | 4 keys on 1 row |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 50 to 450 pages of applications, alarms and help according to the memory card in use.<br>No alarms<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |

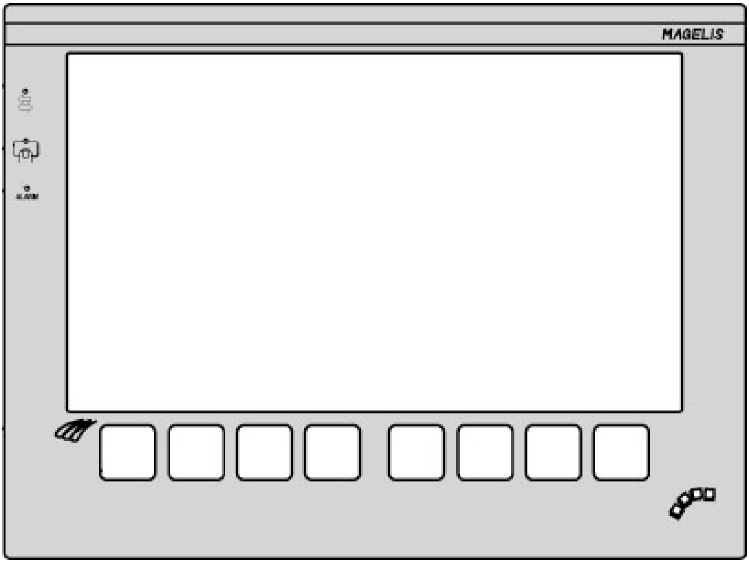
F

# 1. XBT-F Specifications

| | |
|---|---|
| ***Weight*** | 3.53 lb (1.6 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 8 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

## XBT-FC 04



# 1. XBT-F Specifications

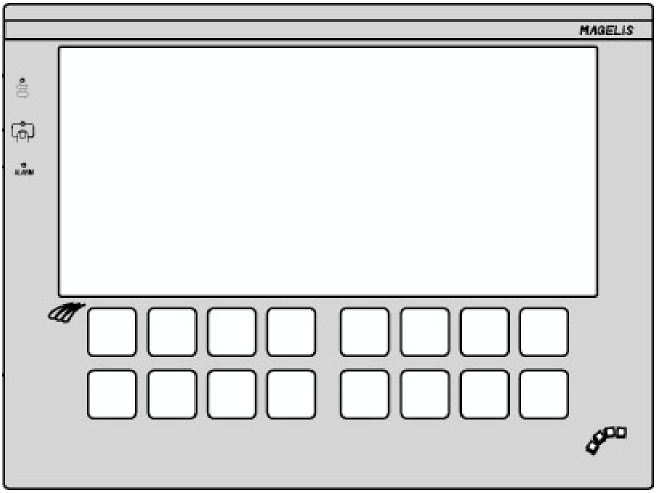
| | |
|---|---|
| ***Types of display*** | LCD 10.4" touch screen<br>640*480 pixels<br>256 colors. |
| ***Touchscreen pad*** | Resistive matrix<br>8x13 touch zones |
| ***Keyboard*** | 8 keys on 1 row |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 30 to 300 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Ethernet TCP/IP Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |
| ***Weight*** | 5.29 lb (2.4 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 10 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

## XBT-FC 08



# 1. XBT-F Specifications

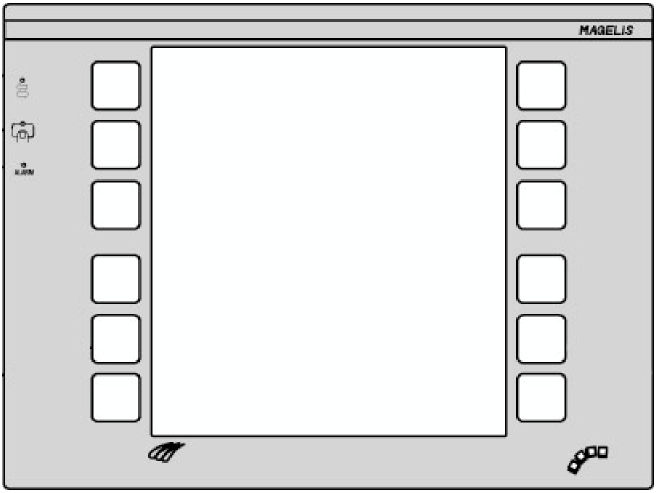
| | |
|---|---|
| ***Types of display*** | LCD TFT 10.4" touch screen<br>640*480 pixels<br>256 colors. |
| ***Touchscreen pad*** | Resistive matrix<br>6x13 touch zones |
| ***Keyboard*** | 16 keys on 2 rows |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card, 30 to 300 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Ethernet TCP/IP Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |
| ***Weight*** | 5.29 lb (2.4 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 10 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

## XBT-FC 06



# 1. XBT-F Specifications

| | |
|---|---|
| ***Types of display*** | LCD TFT 10.4" touch screen<br>640*480 pixels<br>256 colors. |
| ***Touchscreen pad*** | Resistive matrix<br>10x9 touch zones |
| ***Keyboard*** | 12 keys on 2 columns |
| ***Power*** | 24 VDC<br>Voltage limits : 18 to 30 VDC<br>Ripple: 5 % maximun<br>Consumption: 35 W |
| ***Memory*** | Application+protocol: PCMCIA card,<br>30 to 300 pages of applications, alarms and help according to the memory card in use.<br>Alarm log: 1000 events<br>Recipes: 125 recordings and 5000 values maximum<br>255 form pages<br>512 classic alarm bits (+100 diagnostic alarm bits) |
| ***Serial link*** | RS232/RS485/RS422 asynchronous serial link |
| ***Printer / XBT-L1000 link*** | RS232 asynchronous serial link |
| ***Indicating*** | 1 communication status indicator light<br>1 touchscreen pad pressed/standby screen indicator light<br>1 alarm indicator light |
| ***Exchange protocols*** | Downloadable from the protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, Modbus plus, Modbus, Ethernet TCP/IP Modbus, Jbus and those used for AEG, Allen Bradley, GE, Siemens and Omron PLCs. |
| ***Time-stamp*** | yes (no back-up) |

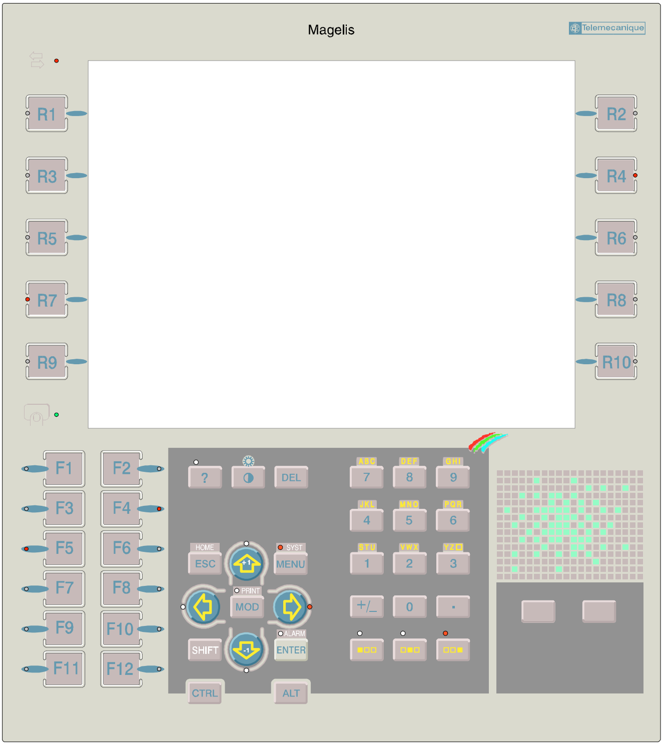
# 1. XBT-F Specifications

| | |
|---|---|
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |
| ***Weight*** | 5.29 lb (2.4 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | IP65 per IEC529 and degree 1 per NFC20-010;<br>UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 10 push latches (provided), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System languages*** | English, French, German, Italian, Spanish.<br>System pages can be translated in any other language |

# 1. XBT-F Specifications

---

## TXBT


Magelis
Telemecanique
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
?
DEL
ABC
7
DEF
8
GHI
9
JKL
4
MNO
5
PQR
6
HOME
ESC
+1
SYST
MENU
STU
1
VWX
2
YZ
3
PRINT
MOD
+/_
0
.
SHIFT
-1
ALARM
ENTER
CTRL
ALT

# 1. XBT-F Specifications

| | |
|---|---|
| ***Types of display*** | LCD 10.4”<br>640x480 pixels<br>Color (10.4" screen), 256 colors |
| ***Power supply*** | 24 VDC<br>Voltage limit: 18 to 30 VDC<br>Ripple: 5% maximum<br>Consumption: 80 W |
| ***Hard disk*** | 1.6 Gb or more |
| ***Dynamic RAM*** | 16 Mb expandible to 32 Mb |
| ***Application memory*** | Application+protocol: PCMCIA type II card<br>Faults history: PCMCIA card |
| ***Serial link*** | PLC: isolated serial link, RS232C/RS485/RS422<br>PC: Non-isolated serial link, RS232C |
| ***Printer link*** | Parallel |
| ***External keyboard*** | PS/2 compatible |
| ***Bus or network*** | Slot for PCMCIA type II and III card |
| ***ISA bus cards*** | 2 format 2/3 slots |
| ***Keypad*** | Customisable membrane keypad |
| ***Indication*** | 1 communication status indicator light<br>1 indicator light per function key<br>1 indicator light per service key<br>1 keypad/standby screen busy indicator light |

# 1. XBT-F Specifications

| | |
|---|---|
| ***Signaling Exchange protocol*** | Downloadable from protocol diskette using the XBT-L1000 software.<br>Protocols: UNI-TELWAY, FIPWAY, FIPIO, ISAWAY, Modbus plus, Modbus, Jbus |
| ***Time-stamp*** | yes (with back-up) |
| ***Alarm relay*** | min. 1.0 mA / 5V AC/DC usage limits<br>max. 1.0 A / 24 V DC - 220 V AC resistive load<br>max. 0.5 A / 24 V DC - 220 V AC inductive load |
| ***Weight*** | 11.2 lb (5.1 kg) |
| ***Temperature*** | Operating : +32 to +113 °F (0 to 45 °C),<br>Humidity : 0 to 85%.<br>Storage : - 4 to +140 °F (- 20° to + 60 °C) |
| ***Degree of protection*** | P65 per Section IEC529 and degree 1 per NFC20-010; UL type 4, 4x, NEMA 4 |
| ***Installation and attachment*** | Built-in, attached with 12 push latches (supplied), on panel 0.06 to 0.24 inches thick (1.6 to 6 mm). |
| ***System language*** | French, English, Spanish, Italian, German.<br>System pages can be translated in any other language |
| ***Static function keys*** | 10 |
| ***Dynamic function keys*** | 12 |
| ***Application, help and alarm pages*** | Application, alarm and help pages: limited to disk capacity, maximum of 1024 pages |

# 2. System messages

---

## System messages generated by XBT

(system messages in English, not configurable)

**WIRING FAULT**
***SWITCH POWER OFF :*** Incorrect cable.

***WAITING FOR TRANSFER :*** Waiting for downloading.

***NO PROGRAM :*** No application in the product.

***DOWNLOAD IN PROGRESS :*** Downloading to XBT in progress.

***DOWNLOAD ABORTED :*** Downloading to XBT cancelled by the operator.

***DOWNLOAD FAILED :*** Unsuccessful downloading to XBT.

***DOWNLOAD COMPLETED :*** Downloading to XBT succesfully completed.

***UPLOAD IN PROGRESS :*** Uploading to the PC in progress.

***UPLOAD ABORTED :*** Uploading to the PC cancelled by the operator.

***UPLOAD FAILED :*** Unsuccessful uploading to the PC.

***UPLOAD COMPLETED :*** Uploading to the PC successfully completed.

***CONNECTING :*** Cable reading and search for the communication configuration in progress.

***APPLICATION FAULT :*** Application error (incoherence).

## 2. System messages

### System messages generated by XBT (5 languages), language selected during configuration.

***WRONG PASSWORD :*** Entry of an incorrect password.

***PAGE DOES NOT EXIST :*** Call-up of a non-existent page.

***PROTECTED ACCESS PAGE :*** Call-up of a page protected by password.
Remedy: enter the password protecting the page.

***IMPOSSIBLE TO WRITE VARIABLE :*** Writing of a non-existent variable or XBT <-> PLC connection problems. Possible cause: equipment address error, variable address error.
Remedy: change the parameters of the variable in XBT-L1000.

***OVERFLOW MIN <= VALUE >= MAX :*** Entry of a value which is outside the limits.

***INCORRECT DIALOG TABLE AUTHORIZATION :*** Incorrect authorization word.
Remedy: write in the word “Authorization” the value given by XBT-L1000 in the dialog box “Configure dialog table”, "Authorization word=" field.

***DIALOG TABLE READING IMPOSSIBLE :*** Connection problems between XBT <-> PLC.
Same possible cause, same remedy: see “Impossible to write variable”.

***DIALOG TABLE WRITING IMPOSSIBLE :*** Writing to a protected zone or XBT <-> PLC connection problems.
Same possible cause, same remedy: see “Impossible to write variable”.

***PRINTING ACKNOWLEDGED :*** Transient display if printing requested by the user is possible.

***IMPOSSIBLE ACTION, PRINTING IN PROGRESS :*** Transient display when printing is in progress.

***IMPOSSIBLE ACTION, FAULTY PRINTER :*** Transient display when printer is faulty, or the terminal is still connected to XBT-L1000 or there is no paper in the printer.

***SAVING IN PROGRESS*** : Transient display during saving on the PCMCIA card of:
- a recipe recording,
- an adjustment page.

***SAVING IMPOSSIBLE :*** Transient display after request for saving on the PCMCIA card of:
- a recipe recording,
- an adjustment page.

Possible cause: PCMCIA card full or zone allocated to storage full.

***LOADING IN PROGRESS :*** Transient display during loading from the PCMCIA card of:
- a recipe recording,
- an adjustment page.

***LOADING IMPOSSIBLE :*** Transient display after request for loading from the PCMCIA card of:
- a recipe recording,
- an adjustment page.

Possible cause: file damaged.

***TRANSFER IN PROGRESS :*** Transient display during transfer to the control system of recipe recording data. The transfer can be aborted by pressing ESC (key or touch zone).

***TRANSFER IMPOSSIBLE :*** Transient display after request for transfer of a recipe recording to the control system.
Possible cause: connection problem between the terminal and the control system.

## No saving of value for objects set to error

Transient display after saving a recipe recording on the PCMCIA card.

**Possible causes**

- the objects could not read their variables (symbol: or ),
- the request for saving has been initiated while all the objects had not read their variables. The objects are not displayed yet.

**Remedies:**

- check that the equipment item of the variable(s) associated with the objects set to error is properly connected to the terminal,
- check that the variables of the objects set to error are declared in the PLC.

- wait for the full page to be displayed before requesting saving. In both cases: delete incomplete saving, solve the problem, save again.

## Objects set to error not initialized

Transient display after loading of a recipe recording from the PCMCIA card.

**Possible causes:**

- some objects were set to error during saving and thus not saved,
- one or several objects have been added to the page since last saving of the recording; no value has thus been recorded by the objects.

**Remedy: in both cases, the terminal initializes the relevant objects to 0.**

- The objects must be set to a correct value.
- The recording must be saved again and include the values correctly initialized by the user.
- All these actions must be performed before transfer to the control system in order not to transfer erroneous values.

**OPERATION IN LOCAL MODE: Display in the status line.**

In this mode, the terminal does not indicate the status of the control system but usually the status of a recipe recording which has just been loaded from the PCMCIA card.

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# INDEX

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# 10 GOLDEN SUGGESTIONS FOR A SUCCESSFUL MAGELIS APPLICATION

1 Avoid superposing bitmaps in XBT-L1000 application; use a picture processing software (Paint,...) to di this and import only a single bitmap in XBT-L1000 application.

2 Place the alphanumeric fields on a self colored frame. Don't place it on a big bitmap or on an animated object. If needed, insert a self colored rectangular shape between the background picture and the alphanumeric field. The legibility will be better.

3 An image box is better than the gathering of several animated lines, ellipses and rectangles.

4 For placing a background picture, place it in the model page rather than in the application page.

5 To improve the imported pictures processing, use a picture processing software (Paint,...) to adjust size and colors of pictures (use colorpal.pal or grey_pal.pal files in the XBT-L1000 installation directory).

6 To speed up the unitelway communication, change the number of addresses used by the terminal (2 becames 3).

7 Don't try to minimize at all cost the dialog table period. In all events, the operator actions are processed immediately, independent of the value of the dialog table period.

8 Do not use words with floating point if a simple word is enough.

9 Avoid the use of different fonts or different type of fields on the same page.

10 Only store the useful alarms.

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XBT X000EN W914084570111 A05
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