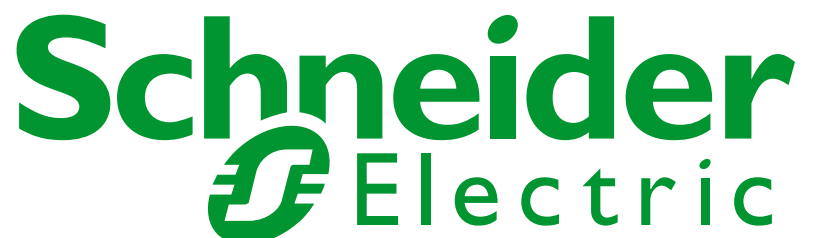


# Vijeo Designer Training

**XBT G, XBT GT, XBT GK, Smart / Compact, Flex iPC, XBT GTW, Vijeo Designer V5.1**

## STUDENT GUIDE

Monday, 04 January 2010



**Vijeo Designer V5.0 Software, XBTG, XBTGT, XBTGC, iPC, XBTGK, XBTGTW terminals**

The objective of this course is to provide you with an overview of the Vijeo Designer V5.0 software application as well as the XBTG and XBTGT ranges of touch screen panels.

The presentation is divided into 13 modules that can be accessed from this page:

- Module 1 provides a summary of the Schneider offer, in terms of both hardware and software.
- Modules 2 to 4 give a description of the Magelis XBTG, XBTGT, XBTGC, XBTGK, iPC, and XBTGTW terminals. Module 5 tells you how to initialize a terminal in terms of loading the Runtime system and adjusting the screen.
- Modules 6 to 8 detail the procedure for creating an HMI application and highlight the features of the Vijeo Designer software, such as toolbars, menus, windows and new functions compared with version 4.6.
- Modules 9 to 12 describe how to go about creating an application.
- Module 13 gives an overview of the simulator and the operating options for an application.

Summary

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# Module 1: Summary of the offer

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### Presentation

The Schneider offer includes the following components:

- The Runtime installation tool for loading the Runtime (or operating) system on the terminal

Vijeo Designer software, used to create your operator dialog application (or HMI application) comprising:

- A graphic editor for drawing and animating different application views
- The data manager for using files stored in the terminal memory: recipes, logs, alarms, saved projects
- A license manager allowing you to register your software so that you can use it indefinitely
- Documentation

The XBTG, XBTGT, XBTGC, and XBTGK terminal ranges, to meet all your touch-screen requirements:

- Monochrome or color screen
- 6 screen sizes ranging from 3 to 15 inches
- Passive or active matrix

Different Magelis iPC ranges are available. They are the Smart, Compact, and Flex, and are available in 8.4, 12, 15 & 19 inches depending on the iPC model.

- These industrial grade computers are designed to fit a variety of user requirements

#### ■ Vijeo Designer software V5.0 comprising:

- ☐ Graphic editor for building the application
- ☐ Runtime system used in the terminal
- ☐ Data manager for retrieving and converting target's files
- ☐ License manager
- ☐ Startup guide and user manuals



#### ■ XBTG, XBTGT, XBTGC, and XBTGK range of graphic terminals

- ☐ Passive or active matrix touch screens
- ☐ 6 screen sizes ranging from 3.8 to 15 inches
- ☐ Blue mode, amber/red mode, black & white or color (up to 64 K color) display
- ☐ QVGA, VGA, SVGA or XGA standard



#### ■ iPC (Smart / Compact / Flex) and XBTGTW

- ☐ 8.4 to 19 inch screens, SVGA – XGA
- ☐ No hard drive, software on Compact Flash
- ☐ Fast Ethernet & USB port(s), PCMCIA slots

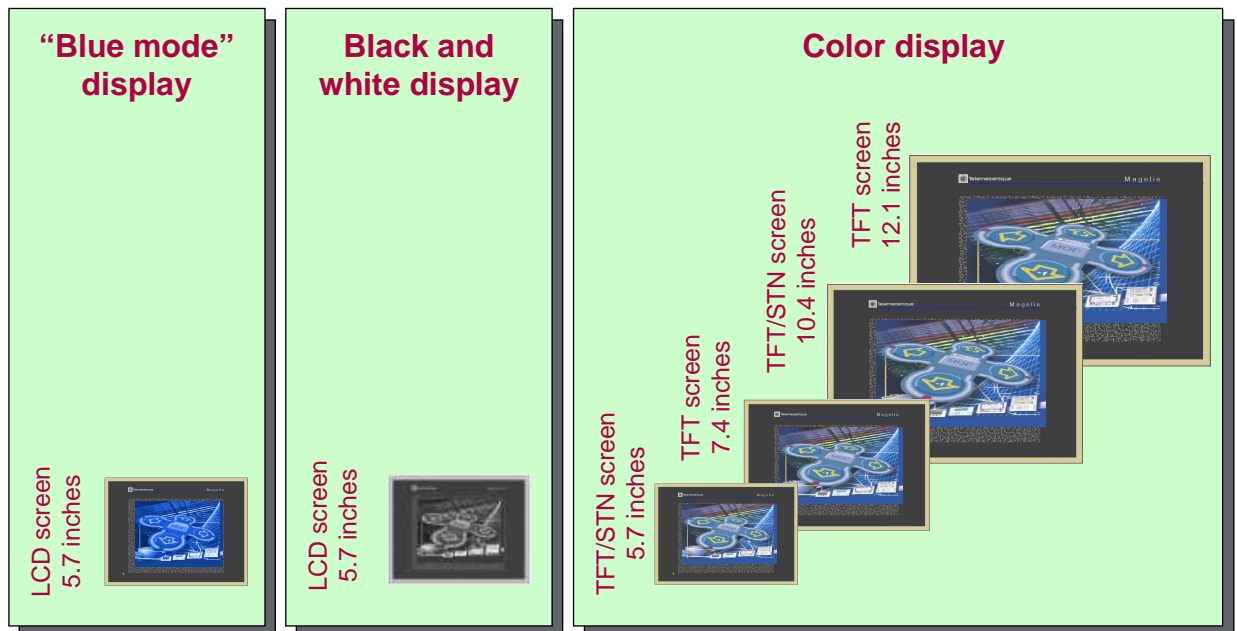


### XBT G range

The XBT G range of terminals offers 3 types of display for the 10 available terminals:

- A blue and white display for the 5-inch XBT G2110 terminal
- A black and white display for the 5-inch XBT G2120 and XBT G2130 terminals
- A color display for the 7 terminals ranging from XBT G2220 to XBT G6330





These color screens come in 4 sizes: 5, 7, 10 and 12 inches.



### XBT GT series

The XBT GT range of terminals offers 4 types of display for the 16 available terminals:

- An amber or red display for the 3-inch XBT GT1000 / 1005 series terminals
- A blue and white display for the 5-inch XBT GT2110 terminal
- A black and white display for the 5-inch XBT GT2120 and XBT GT2130 terminals
- A color display for the 5-inch XBT GT2220, XBT GT2130 and XBT GT2330 terminals

XBT GT1000 Series	XBT GT2000 Series		
<b>“Amber/red mode” display</b> <b>8 grayscale</b>	<b>“Blue mode” display</b> <b>16 grayscale</b>	<b>“Black and white” display</b> <b>16 grayscale</b>	<b>Color display</b> <b>QVGA</b>
LCD screen 3.8 inches 	LCD screen 5.7 inches 	LCD screen 5.7 inches 	LCD screen 5.7 inches 

### XBT GT series (cont)

- A color display for the other terminals, i.e. the XBT GT4000 to XBT GT7000 series.

These color screens come in 4 sizes:

7 inches

10 inches

12 inches

and 15 inches

XBT GT4000 Series	XBT GT5000 Series	XBT GT6000 Series	XBT GT7000 Series
Color display VGA 16 K color or 64 K color	Color display VGA 16 K color or 64 K color	Color display SVGA 64 K color	Color display XGA 64 K color
LCD screen 7.5 inches 	LCD screen 10.4 inches 	LCD screen 12.1 inches 	LCD screen 15 inches 

### XBT G2000 series

XBT G2000 terminals have the following main features:

- A 5-inch monochrome or color screen
- A passive (STN) or active (TFT) matrix
- A 16 x 12-cell touch panel
- Brightness and contrast can be adjusted by configuration
- Memory card slot (except for XBT G2110)
- 1 or 2 serial ports
- Ethernet link and printer port (Centronics) available on the XBT G2130 and XBT G2330

	XBT G2110	XBT G2120	XBT G2130	XBT G2220	XBT G2330
Panel LCD (inches)	5.7	5.7	5.7	5.7	5.7
Resolution	QVGA	QVGA	QVGA	QVGA	QVGA
Definition (pixels)	320 x 240	320 x 240	320 x 240	320 x 240	320 x 240
Display device	Blue mode	B & W	B & W	Color/STN	Color/TFT
Number of colors	/	/	/	64	256
Brightness control	No (max)	No (max)	No (max)	No (max)	4 levels
Contrast control	4 levels	4 levels	4 levels	4 levels	/
Touch panel matrix	16 x 12	16 x 12	16 x 12	16 x 12	16 x 12
Memory card	No	Yes	Yes	Yes	Yes
COM1 (Sub-D 25)	Yes	Yes	Yes	Yes	Yes
COM2 (Sub-D 9)	No	No	Yes	No	Yes
Ethernet (RJ45)	No	No	Yes	No	Yes
Print port	No	No	Yes	No	Yes
AUX port (sound output)	No (on COM1)	No	No	No	No



### XBT G4000 to XBT G6000 series

XBT G4000/5000/6000 terminals have the following main features:

XBT G4000 terminals have 7-inch color screens. The models differ in their provision of an Ethernet port.

XBT G5000 terminals differ in the type of matrix used (active or passive – different number of colors).

The 12.1-inch XBT G6330 terminal is top of the XBTG range.

	XBT G4320	XBT G4330	XBT G5230	XBT G5330	XBT G6330
Panel LCD (inches)	7.4	7.4	10.4	10.4	12.1
Resolution	VGA	VGA	VGA	VGA	SVGA
Definition (pixels)	640 x 480	640 x 480	640 x 480	640 x 480	800 x 600
Display device	Color/TFT	Color/TFT	Color/STN	Color/TFT	Color/TFT
Number of colors	256	256	64	256	256
Brightness control	4 levels	4 levels	No (max)	4 levels	4 levels
Contrast control	/	/	4 levels	/	/
Touch panel matrix	32 x 24	32 x 24	32 x 24	32 x 24	40 x 30
Memory card	Yes	Yes	Yes	Yes	Yes
COM1 (Sub-D 25)	Yes	Yes	Yes	Yes	Yes
COM2 (Sub-D 9)	Yes	Yes	Yes	Yes	Yes
Ethernet (RJ45)	No	Yes	Yes	Yes	Yes
Print port	Yes	Yes	Yes	Yes	Yes
AUX port	Yes	Yes	Yes	Yes	Yes
(Sound output)					

### XBT GT1000 series

XBT GT1000 terminals are 3.8-inch monochrome terminals (amber or red, defined in configuration) with the following main features:

The data display uses 8 gray levels, and screen brightness and contrast can be adjusted. Each terminal has 6 function keys (R1 to R6).

The XBT GT1100 terminal has a single RS232C/RS485 communication port (RJ45 connector).

The XBT GT1130 terminal also has an Ethernet link (RJ45 connector).

	XBT GT1100	XBT GT1130
Panel LCD (inches)	3.8	3.8
Resolution	QVGA	QVGA
Definition (pixels)	320 x 240	320 x 240
Display device	Amber or Red	Amber or Red
Gray levels	8	8
Brightness control	2 levels	2 levels
Contrast control	8 levels	8 levels
Touch panel	8 x 6 keys	8 x 6 keys
Function keys	6	6
Memory card	No	No
COM1 (RJ45)	1	1
Ethernet (RJ45)	No	Yes

### XBT GT 1005 series

XBT GT1005 terminals are 3.8-inch terminals with the following main features:

The display supports 8 grayscale levels or 256 colors, and screen brightness and contrast can be adjusted.

The XBT GT1005 terminals have a single RS232C/RS485 communication port (RJ45 connector).

The XBT GT1135 and 1335 terminals also have an Ethernet link (RJ45 connector).

All terminals in this series support USB, which allows you to transfer your application or to connect an external USB device (printer, barcode reader, USB hub, etc.).

	XBT GT1105	XBT GT1135	XBT GT1335
Panel LCD (inches)	3.8	3.8	3.8
Definition (pixels)	320x240	320x240	320x240
Display device	Amber/STN	Amber/STN	TFT
Display colors	8 levels grayscale	8 levels grayscale	256 colors
Touch panel	Analog	Analog	Analog
COM 1 (RJ45)	Yes	Yes	Yes
Ethernet (RJ 45)	No	Yes	Yes
USB port type A	Yes	Yes	Yes

### XBT GT2000 series

XBT GT2000 terminals are 5-inch monochrome or color terminals with an active or passive matrix and the following main features:

The monochrome terminals use 16 gray levels, and screen brightness and contrast can be adjusted.

The terminals have 2 serial communication ports:

- COM1 RS232C/RS422 (485): 9-pin Sub-D connector
- COM2 2-wire Modbus (RS485): RJ45 connector

The XBT GT2130 and 2330 terminals also have an Ethernet link (RJ45 connector).

The USB port allows you to transfer your application or to connect an external USB device (printer, barcode reader, USB hub, etc.).

	XBT GT2110	XBT GT2120	XBT GT2220	XBT GT2130	XBT GT2330
Panel LCD (inches)	5.7	5.7	5.7	5.7	5.7
Resolution	QVGA	QVGA	QVGA	QVGA	QVGA
Definition (pixels)	324 x 240	320 x 240	320 x 240	320 x 240	320 x 240
Display device	Blue mode	B & W	Color/STN	B & W	Color/TFT
Number of colors	16 gray levels	16 gray levels	4096	16 gray levels	65536
Brightness control	8 levels	8 levels	8 levels	8 levels	8 levels
Contrast control	8 levels	8 levels	8 levels	8 levels	/
Memory card	No	Yes	Yes	Yes	Yes
COM1 (Sub-D 9)	Yes	Yes	Yes	Yes	Yes
COM2 (RJ45)	Yes	Yes	Yes	Yes	Yes
Ethernet (RJ45)	No	No	No	Yes	Yes
USB port type A	1	1	1	1	1
AUX port	No	No	No	No	No

### XBT GT4000 series

XBT GT4000 terminals are 7-inch color terminals with the following main features:

They differ in the type of matrix used (different number of colors) and whether they have sound and NTSC/PAL video inputs.

	XBT GT4230	XBT GT4330	XBT GT4340
Panel LCD (inches)	7.5	7.5	7.5
Resolution	VGA	VGA	VGA
Definition (pixels)	640 x 480	640 x 480	640 x 480
Display device	Color/STN	Color/TFT	Color/TFT
Number of colors	4096	65536	65536
Brightness control	8 levels	8 levels	8 levels
Contrast control	8 levels	/	/
Memory card	Yes	Yes	Yes
COM 1 (Sub-D 9)	Yes	Yes	Yes
COM 2 (RJ45)	Yes	Yes	Yes
Ethernet (RJ 45)	Yes	Yes	Yes
USB port type A	1	1	1
AUX port	Yes	Yes	Yes
Sound OUT	Yes	Yes	Yes
Sound IN	No	No	Yes
NTSC/PAL IN	No	No	Yes

### XBT GT5000 series

XBT GT5000 terminals are 10-inch color terminals with the following main features:

They differ in the type of matrix used (different number of colors) and whether they have sound and NTSC/PAL video inputs.

	XBT GT5230	XBT GT5330	XBT GT5340
Panel LCD (inches)	10.4	10.4	10.4
Resolution	VGA	VGA	VGA
Definition (pixels)	640 x 480	640 x 480	640 x 480
Display device	Color/STN	Color/TFT	Color/TFT
Number of colors	4096	65536	65536
Brightness control	8 levels	8 levels	8 levels
Contrast control	8 levels	/	/
Memory card	Yes	Yes	Yes
COM 1 (Sub-D 9)	Yes	Yes	Yes
COM 2 (RJ45)	Yes	Yes	Yes
Ethernet (RJ 45)	Yes	Yes	Yes
USB port type A	2	2	2
AUX port	Yes	Yes	Yes
Sound OUT	Yes	Yes	Yes
Sound IN	No	No	Yes
NTSC/PAL IN	No	No	Yes

### XBT GT6000 and 7000 series

XBT GT6000 and 7000 terminals are 12- and 15-inch color terminals with the following main features :

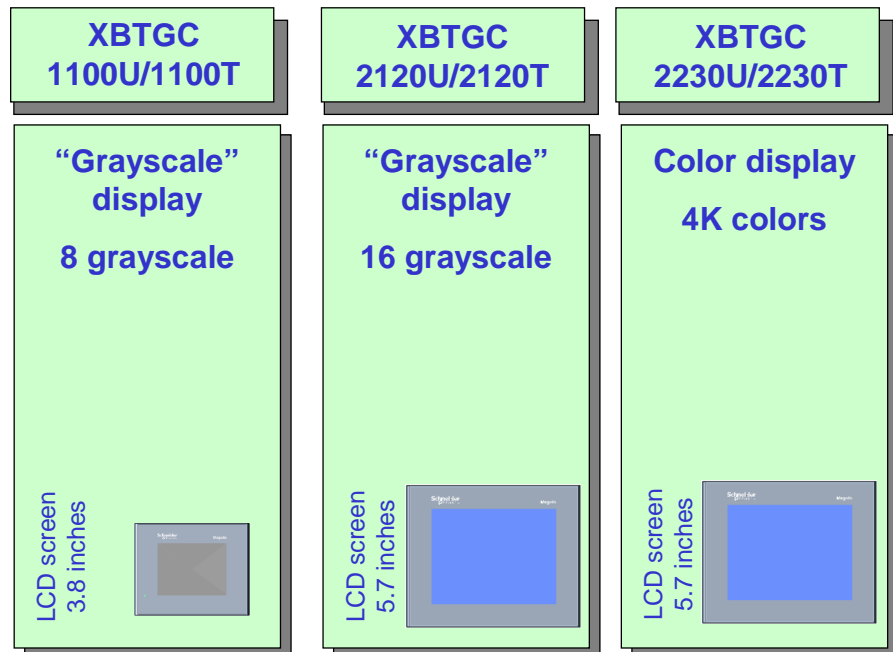
They differ in terms of whether they have sound and NTSC/PAL video inputs.

	XBT GT6330	XBT GT6340	XBT GT7340
Panel LCD (inches)	12.1	12.1	15
Resolution	SVGA	SVGA	XVGA
Definition (pixels)	800 x 600	800 x 600	1024 x 768
Display device	Color/TFT	Color/TFT	Color/TFT
Number of colors	65536	65536	65536
Brightness control	8 levels	8 levels	8 levels
Contrast control	/	/	8 levels
Memory card	Yes	Yes	Yes
COM 1 (Sub-D 9)	Yes	Yes	Yes
COM 2 (RJ45)	Yes	Yes	Yes
Ethernet (RJ 45)	Yes	Yes	Yes
USB port type A	2	2	2
AUX port	Yes	Yes	Yes
Sound OUT	Yes	Yes	Yes
Sound IN	No	Yes	Yes
NTSC/PAL IN	No	Yes	Yes

### XBT GC Series

The XBTGC series offers 3 types of display for the 6 XBTGC terminals:

- A grayscale display for the 3.8-inch XBTGC 1100 U/T terminals
- A grayscale display for the 5.7-inch XBTGC 2120 U/T terminals and
- A color display for the 5.7-inch XBTGC 2230 U/T terminals





### XBT GC Series

XBT GC terminals are 3.8-inch and 5.7-inch grayscale or color terminals with the following main features:

The monochrome terminals use 8 and 16 grayscale levels, and screen brightness and contrast can be adjusted.

The XBTGC 2120 and 2230 terminals have 1 serial communication port:

- COM1 RS232C/RS422

The XBTGC 2230 terminal also has an Ethernet link (RJ45 connector).

The USB port allows you to transfer your application or to connect an external USB device (printer, barcode reader, USB hub, etc.).

	XBTGC 1100U/T	XBTGC 2120U/T	XBTGC 2230U/T
Panel LCD (inches)	3.8	5.7	10.4
Definition (pixels)	320x240	320x240	320x240
Display device	B & W	B & W	Color/STN
Brightness control	8 levels	8 levels	8 levels
Contrast control	8 levels	8 levels	8 levels
Display colors	8 grayscale levels	16 grayscale	4K colors
Memory card	No	No	No
COM 1 (RS232/RS422)	No	Yes	Yes
Ethernet (RJ45)	No	No	Yes
USB port type A	1	1	1

### XBT GK series

The XBT GK series offers 3 types of terminals:

- A grayscale display for the 5-inch XBT GK2120 terminal
- A color display for the 5-inch XBT GK 2330 terminal and
- A color display for the 10-inch XBT GK5330 terminal



### XBT GK series

XBT GK terminals are 5-inch grayscale or color terminals with the following main features:

The monochrome terminals use 16 grayscale levels, and screen brightness and contrast can be adjusted.

The terminals have 2 serial communication ports:

- COM1 RS232C/RS422 (485): 9-pin Sub-D connector
- COM2 2-wire Modbus (RS485): RJ45 connector

The XBT GK2330 and 5330 terminals also have an Ethernet link (RJ45 connector).

The USB port allows you to transfer your application or to connect an external USB device (printer, barcode reader, USB hub, etc.).

The XBTGK Series supports the use of function keys and function keys from a connected keyboard.

	XBT GK2120	XBT GK2330	XBT GK5330
Panel LCD (inches)	5.7	5.7	10.4
Definition (pixels)	320x240	320x240	640x480
Display device	B & W	Color/TFT	Color/TFT
Brightness control	8 levels	8 levels	8 levels
Contrast control	8 levels	8 levels	/
Display colors	16 grayscale levels	64K colors	64K colors
Memory card	Yes	Yes	Yes
Function keys	24	24	30
COM 1 (Sub-D 9)	Yes	Yes	Yes
COM 2 (RJ45)	Yes	Yes	Yes
Ethernet (RJ 45)	No	Yes	Yes
USB port type A	1	1	2
AUX port	No	No	Yes

### Magelis iPC Range

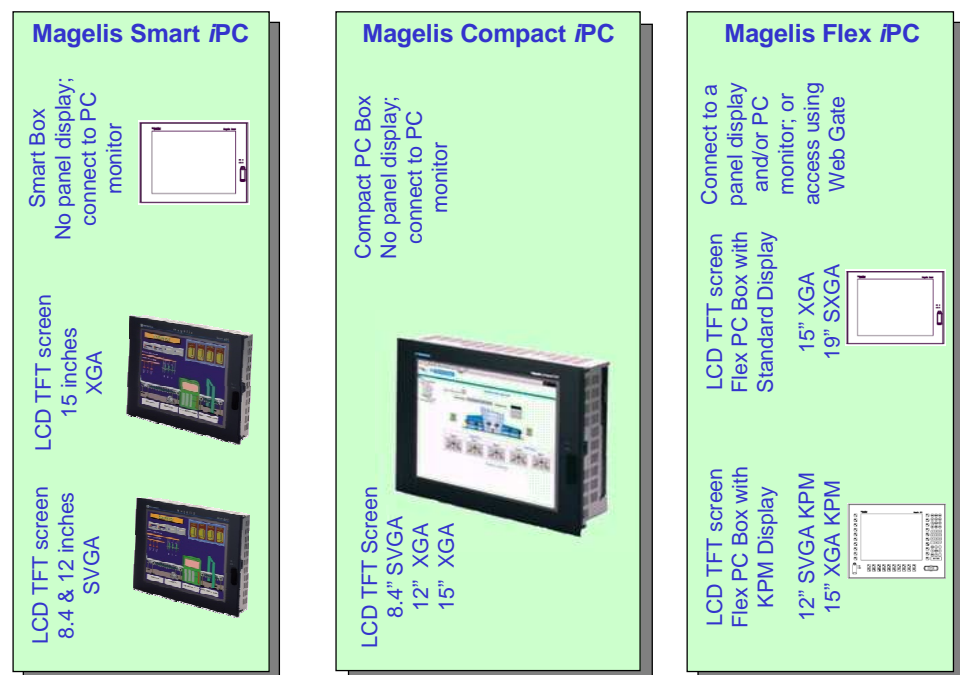
The Magelis iPC range of industrial computers offers 3 different versions of the product to meet your industrial computing needs

Vijeo Designer is running on Smart, Compact, and Flex iPC

The Smart iPC Series is an extension of the terminal line and operates in a Microsoft Windows environment. It offers a choice of an 8.4, 12 or 15 inch display. The Smart Box does not have a panel display, allowing you to connect to your PC monitor.

The Compact iPC Series also comes in an 8.4, 12 or 15 inch monitor size. The Compact PC Box does not have a panel display, allowing you to connect to your PC monitor. The Compact iPC Series features a Celeron M processor in the 8.4 and 12 inch models up to a Pentium M in the 15 inch version.

The Flex iPC Series comes in 12, 15, or 19 inch monitor size. You can use the panel display or connect the Flex iPC to a PC monitor. Also, with dual monitor support, you can use both the panel display and the PC monitor at the same time.



## Module 1: Summary of the offer

### Smart iPC Series

The Magelis Smart iPC Series have either 8.4", 12" or 15" panel displays, or they have no panel display but you can connect the unit to a PC monitor. The Smart iPC Series have the following features

Choice of processors

Increased resolution

Available ports differ between the models

These units are designed to run Vijeo Designer, SCADA client software, or FactoryCast HMI web server modules

	MPC ST11 NAJ00H	MPC ST21 NAJ10T MPC ST11 NDJ00H	MPC ST52 NDJ20H MPC ST21 NAJ10R	MPCST52 NDJ10R MPC ST52 NAJ20H	MPC SN01
Panel LCD (inches)	8.4" LCD TFT	12" LCD TFT	15" LCD TFT	15" LCD TFT	No panel display; connect to a PC monitor
Resolution	800x600 SVGA	800x600SVGA	1024x768 XGA	1024x768 XGA	800x600 SVGA, 1024x768 XGA, 1280x720, 1280x800, 1280x1024 SXGA, 1440x900, 1600x1200, 1680x1050, 1920x1080, 1920x1200, 2560x1600
Front Panel Ports	No	1xUSB	1xUSB	1xUSB	No
Processor	Celeron M@600GHz	Celeron M@600GHz	Celeron M@600GHz	VIA @667MHz	Celeron M @600MHz
RAM	256MB→1024MB (SRAM)	256MB→1024MB (SRAM)	256MB→1024MB (SRAM)	256MB→512MB (SRAM)	256MB→1024MB (SRAM)
Storage	Compact Flash 1GB	Compact Flash 1GB	Compact Flash 1GB	Compact Flash 512MB	Compact Flash 1GB or 1GB
Extension	1 or 2 x PCMCIA type I / III	1 or 2 x PCMCIA type I / III	2 x PCMCIA type I / III	2 x PCMCIA type I / III	No
Ethernet ports	1x10/100 RJ45	2x10/100 RJ45	1x10/100 RJ45	1x10/100 RJ45	1x10/100 RJ45
I/O Ports	4xUSB, 1xRS232, DIO	4xUSB, 1xRS232, DIO	2xUSB, 2xRS232, 2xPS2,	2xUSB, 2xRS232, 2xPS2, 1xLPT1	4xUSB, 2xRS232 1xLPT1
Power Supply	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	DC 24V
Certifications	UL508, CSA	UL508, CSA	UL508, UL1604, CSA	UL508, UL1604, CSA	UL508, CSA
Dimensions	230x177x60 mm	313x239x60 mm	395x294x65 mm	395x294x65 mm	218x165x65 mm
Applications	Internet Explorer, Media Player, Office readers, Vijeo Designer Runtime	Internet Explorer, Media Player, Office readers, Vijeo Designer Runtime (NAJ10R only)	Internet Explorer, Media Player, Office readers, Vijeo Designer Runtime	Internet Explorer, Media Player, Office readers, Vijeo Designer Runtime	XP Embedded, Internet Explorer, Media Player, Office readers, Vijeo Designer Runtime

## Module 1: Summary of the offer

### Compact iPC Series

The Magelis Compact IPC Series have either 8.4", 12" or 15" panel displays, or they have no panel display but you can connect the unit to a PC monitor. The Smart iPC Series have the following features

Choice of processors, Celeron or VIA

Increased resolution

Available ports differ between the models

These units are totally open and provide an attractive and upgradable solution, particularly for machine builders.

	MPC KT12 NAX00H	MPC KT55 NAX20H MPC KT12 NDX00H	MPC KT52 NAX00R MPC KT55 NDX20H	MPC KT22 NAX00R MPC KT55 NAX00R	MPC KN02
Panel LCD (inches)	8.4" LCD TFT	15" LCD TFT	15" LCD TFT	12" LCD TFT	No panel display; connect to a PC monitor
Resolution	800x600 SVGA	1024x768 XGA	1024x768 XGA	1024x768 XGA	800x600 SVGA, 1024x768 XGA, 1280x720, 1280x800, 1280x1024 SXGA 1440x900, 1600x1200, 1680x1050, 1920x1080, 1920x1200, 2560x1600
Front Panel Ports	No	1xUSB	1xUSB	1xUSB	No
Processor	Celeron M@600GHz	Celeron M@600GHz	Celeron M@600GHz	VIA @667MHz	Celeron M@1GHz
RAM	256MB→1024MB (SRAM)	512MB→2048MB (SRAM)	256MB→512MB (SRAM)	256MB→1024MB (SRAM)	512MB→1024MB (SRAM)
Internal Drive	≥20GB	≥20GB	≥20GB	≥20GB	1GB
Reader	No	Diskette and CD-ROM	Diskette and CD-ROM	No	No
Extension	1xPCI, 1xPCMCIA type I/III	1xPCI, 2xPCMCIA type I/III	1xPCI, 2xPCMCIA type I/III	1xPCI, 1xPCMCIA type I/III	1xPCI
Ethernet ports	1x10/100 RJ45	1x10/100 RJ45	1x10/100 RJ45	2x10/100 RJ45	1x10/100 RJ45
I/O Ports	4xUSB, 1xRS232	2xUSB, 2xRS232, 2xPS2, 1xLPT1	2xUSB, 2xRS232, 2xPS2,	4xUSB, 1xRS232 1xLPT1	4xUSB, 2xRS232
Power Supply	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
Certifications	UL508, CSA	UL508, CSA	UL508, UL1604, CSA	UL508, UL1604, CSA	UL508, CSA
Dimensions	230x177x60 mm	313x239x60 mm	395x294x65 mm	395x294x65 mm	218x165x115 mm
Applications	Windows Professional, Vijeo Designer Runtime	Windows Professional, Vijeo Designer Runtime	Windows Professional, Vijeo Designer Runtime	Windows Professional Vijeo Designer Runtime	Windows XP Professional, Windows2000 Professional, Windows Vista Vijeo Designer Runtime

### Flex iPC Series

The Magelis Flex iPC Series have either 12", 15", or 19" panel displays, or you can connect the unit to a PC monitor. You can also have dual monitor support by having both the display unit and the PC monitor at the same time. The Flex iPC Series have the following features

Celeron processors

Available ports

These units are totally open and provide an attractive and upgradable solution, particularly for machine builders.

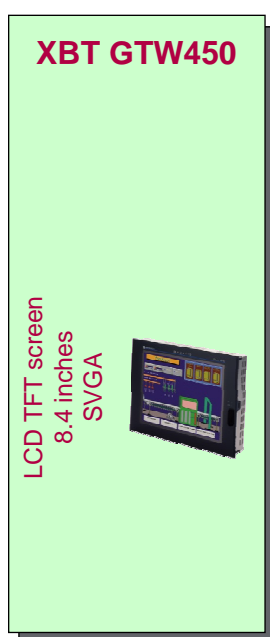
	Flex PC Box with KPM Display (PTX MPC02)	Flex PC Box with Standard Display (PTX MPC05)
Panel LCD (inches)	12" or 15" LCD TFT, or connect to a PC monitor, or connect to both	15" or 19" LCD TFT, or connect to a PC monitor, or connect to both
Definition (pixels)	800x600 SVGA, 1024x768 XGA	800x600 SVGA, 1024x768 XGA, 1280x720, 1280x800, 1280x1024 SXGA, 1440x900, 1600x1200, 1680x1050, 1920x1080, 1920x1200, 2560x1600
Processor	Celeron M@1.86GHz	Celeron M@1.86GHz
RAM	512MB	512MB
Storage	Compact Flash 1GB	Compact Flash 1GB
Extension	2 x PCI, or 1xPCI/1xPCI Express, or 1xPCI/1xISA	2 x PCI, or 1xPCI/1xPCI Express, or 1xPCI/1xISA
Ethernet ports	1x10/100 RJ45	1x10/100 RJ45
USB ports	4xUSB	4xUSB
COM1	1xRS232/RS422/RS485	1xRS232/RS422/RS485
COM2	1xRS232	1xRS232
COM3, COM4	2xRS232x2DSUB 9 pin	2xRS232x2DSUB 9 pin
Power supply	AC 100...240V	AC 100...240V
Certifications	UL508, CSA, FCC Part 15 Class A, CE Marking (Safety, EMI, EMS)	UL508, CSA, FCC Part 15 Class A, CE Marking (Safety, EMI, EMS)
Dimensions	243x125x289 mm	243x125x289 mm
Applications	Windows 2000 Professional, Windows Vista, Windows XP Professional, XP Embedded, Vijeo Designer Runtime	Windows 2000 Professional, Windows Vista, Windows XP Professional, XP Embedded, Vijeo Designer Runtime

### XBT GTW series

The XBT GTW series of industrial computers offers 2 models to meet your industrial computing needs.

The XBT GTW450 comes with an 8.4 inch display and operates in a Microsoft Windows environment.

The larger XBT GTW750 comes with a 15 inch display.





### XBT GTW series

The XBT GTW series are either 8.4" or 15" monitors with the following features:

Choice of processors

Increased resolution in the 15" range

Available ports differ between the models

These units are designed to run Vijeo Designer, SCADA client software, or to FactoryCast HMI web server modules

	XBT GTW450 8.4"	XBT GTW750 15"
<b>Touch screen</b>	8.4" LCD TFT	15" LCD TFT
<b>Resolution</b>	SVGA 800 x 600	XGA 1024 x 768
<b>Front panel ports</b>	-	1 x USB
<b>Processor</b>	Celeron M@600GHz	CeleronM@600Mhz
<b>RAM</b>	256MB → 1024MB (SRAM)	256MB → 1024MB (SRAM)
<b>Storage</b>	Compact Flash 1GB	Compact Flash 1GB
<b>Reader</b>	-	Diskette and CD-ROM
<b>Extension</b>	1 or 2 x PCMCIA type I (or type III)	2 x PCMCIA type I (or 1 type III)
<b>Ethernet ports</b>	1 x 10/100 RJ45	1 x 10/100 RJ45
<b>I/O ports</b>	4 x USB, 1 x RS232, DIO	2 x USB, 2 x RS232, 2 x PS2, 1 x LPT1
<b>Power supply</b>	AC 100...240V	
<b>Certifications</b>	UL508, CSA	UL508, UL1604, CSA
<b>Dimensions</b>	230 x 177 x 60	395 x 294 x 65
<b>Applications</b>	Internet Explorer Media Player, Office readers, Vijeo Designer RT*	Internet Explorer Media Player, Office readers, Vijeo Designer RT*

\*RT: Run Time

---

# Module 2a: XBT G terminal



2

### Terminal overview

We will begin with a general overview of the terminal:

- Front panel
- Rear panel
- Side panel

Front panel



Rear panel



Side view

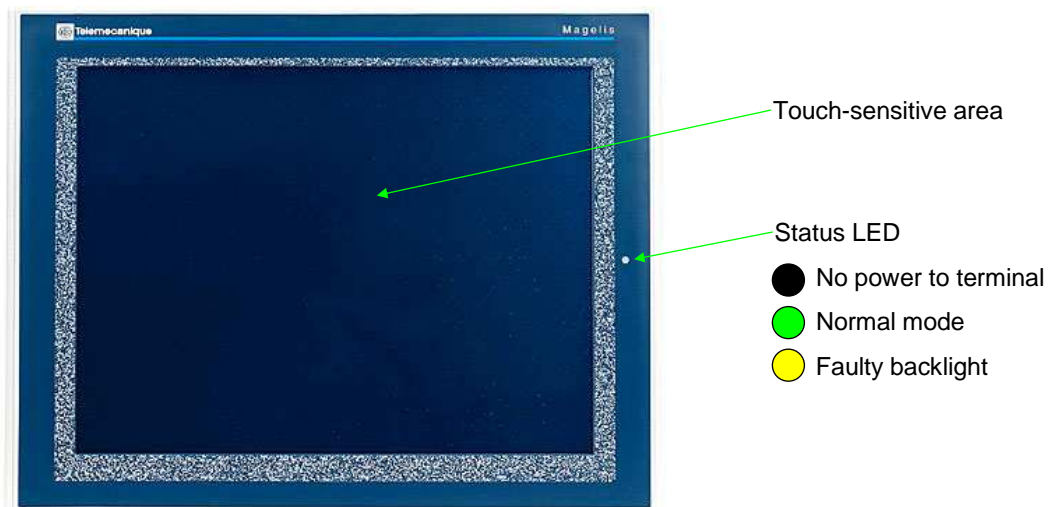


### Front panel

Only the front panel or screen can be used by the operator to display or control the HMI application.

The touch-sensitive area or panel is superimposed on the screen for control purposes.

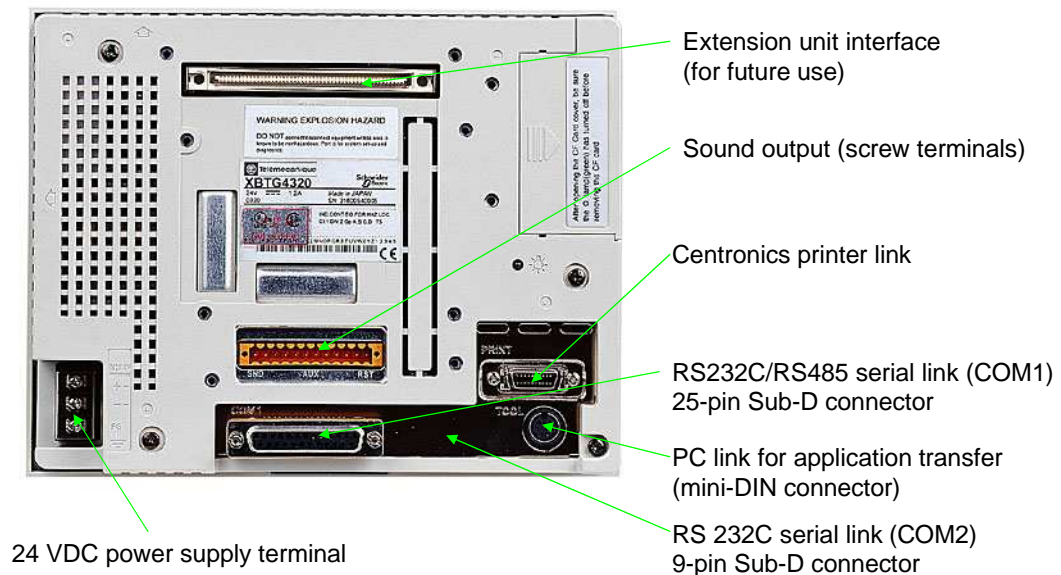
The status LED indicates which of the following operating modes the terminal is in: no power to terminal, normal mode or faulty.



### Rear panel

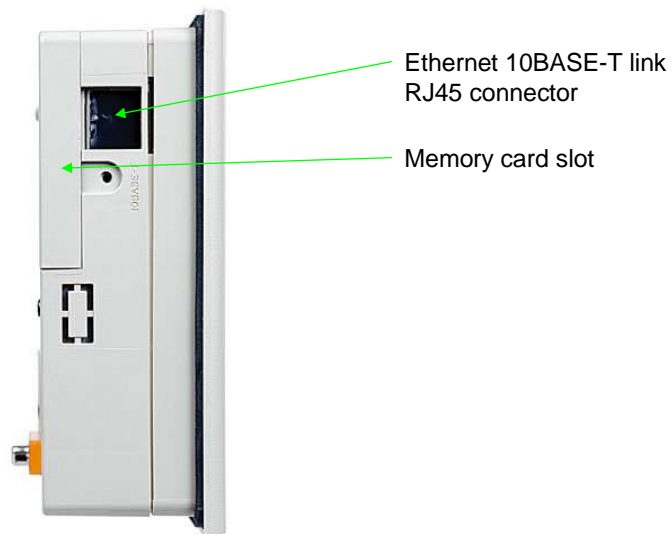
The rear panel provides access to the following connectors required for connecting the terminal:

- A connector for a future extension unit. It is used to communicate using the Modbus Plus protocol.
- An auxiliary connector for a loudspeaker
- A printer connector
- One or more connectors for a target device or devices, such as a PLC or a barcode reader (serial and Ethernet link(s))
- A PC connector
- A connector for the power supply



### Side panel

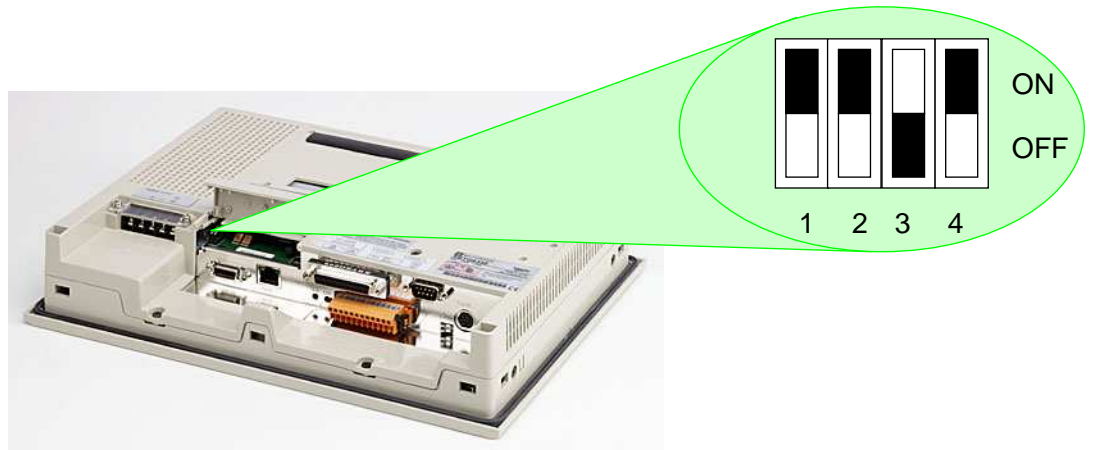
Depending on the type of terminal, there are also some connectors on the side panel, such as an Ethernet link and a memory card slot



### Micro-switches

The memory card also has 4 micro-switches used to configure the terminal.

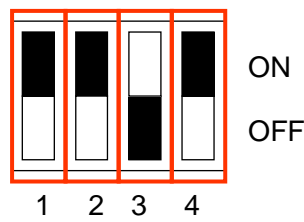
The positioning of the micro-switches is described on the following page.



Position of micro-switches

The micro-switches should be set according to your requirements:

- The switch in position 1 means that you can start the application from the memory card or internal memory.
- The switch in position 2 must be ON to enable downloading and the switch in position 3 must be OFF.
- The switch in position 4 means that you can start the application from the memory card with the protective cover open.



1	ON	Start-up from memory card enabled
	OFF	Start-up from memory card disabled
2	ON	Leave in ON position. Download is available
	OFF	Download is not available
3	ON	
	OFF	Leave in OFF position
4	ON	Start-up from memory card enabled with protective cover open
	OFF	Start-up from memory card only enabled if protective cover closed



### PC accessories

You can connect a Magelis XBT G terminal to your PC if your PC has a serial connector or a USB port.

The memory card adaptor supports the use of a Compact Flash memory card in your PC, inserted in the PCMCIA slot.



#### ●PC cable for transferring applications

- To connect your PC to the terminal
- XBT ZG 915 (COM port)
- XBT ZG 925 (USB port)



#### ●Compact Flash card adaptor

- XBT ZG ADT

---

# Module 2b:XBT GT Terminals



3

### XBT GT overview

This page shows the XBT GT terminals:

Front panel for use by the operator

Rear and side panels with connectors

The XBT GT1000 series terminals have function keys on the front panel

Front panel



Rear panel

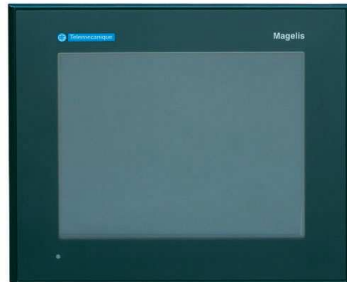


Side view



### XBT GT overview (cont)

Front panel



Rear panel



### Front panel

The touch-sensitive area is used to display and control your HMI application.

This analog area (as opposed to matrix for XBT G terminals) offers improved brightness and resolution (no matrix) and removes the grid from the screen.

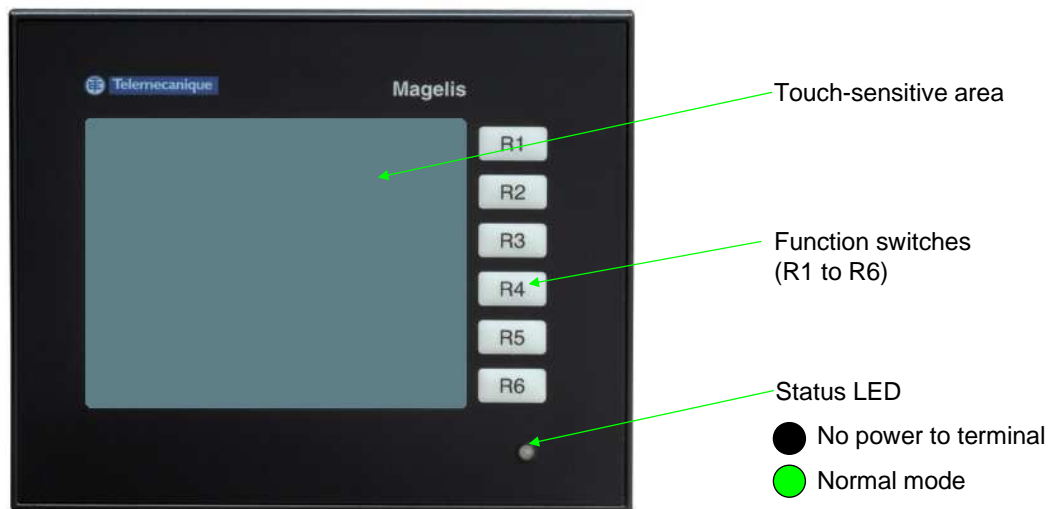
As XBT GT1000 terminals are small in size, they also have 6 function keys to complement the touch-screen area.

The status LED is green in normal mode.

For the XBT GT 2000 to 7000 terminals, this LED can indicate one of 5 different statuses:

- LED off: no power to terminal
- Green: normal operation
- Orange fixed: faulty backlight
- Orange flashing: initializing software
- Red: powering up

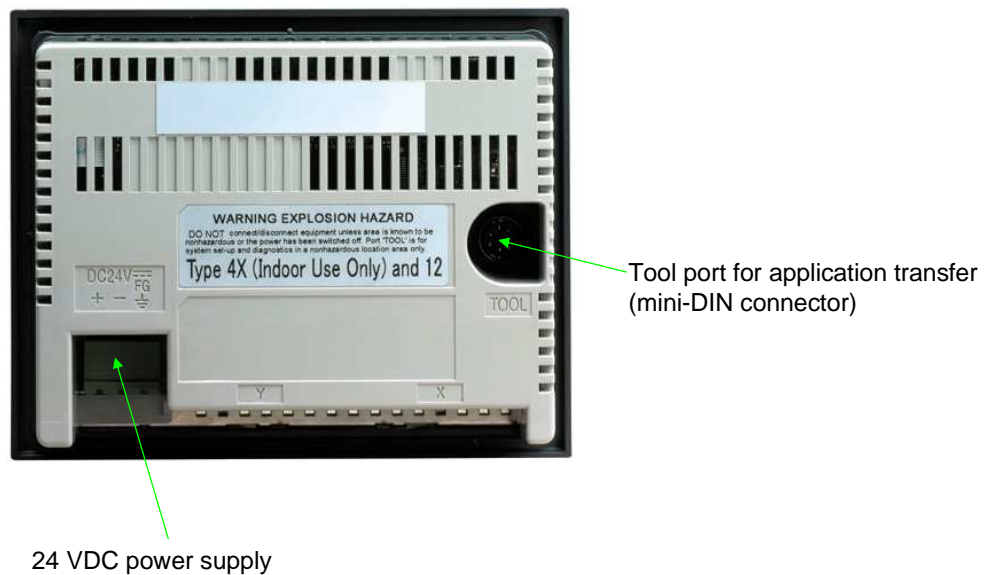
Note that as the backlight lamp has a long service life, it cannot be changed on the XBT GT1000, 2000 and 4000 terminals.



### XBT GT1000 series rear panel

The rear panel of the XBT GT1000 series terminals provides access to the following connectors required for connecting the terminal:

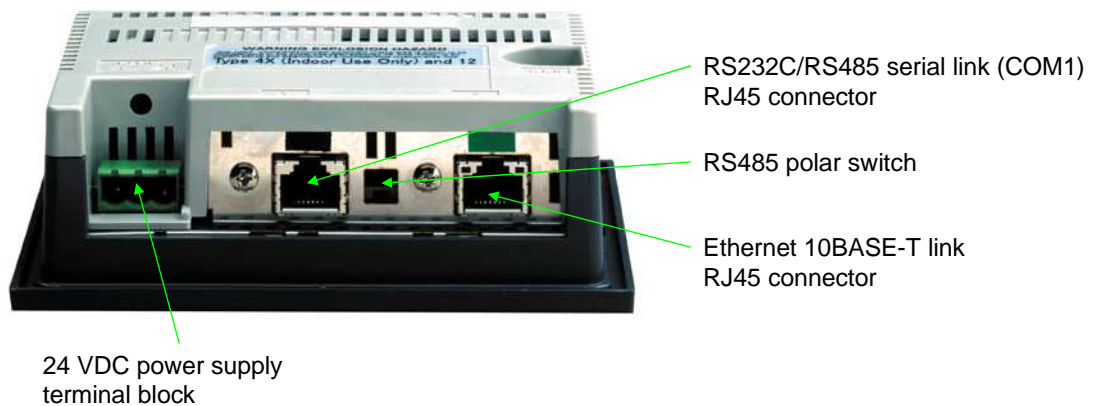
- A PC connector for transferring the application. The cable used for this operation is identical to the cable used to transfer the application to an XBT G terminal: XBT ZG 915 or XBT ZG 925.
- A connector for the power supply. Use a terminal block to power the terminal.



### XBT GT1000 series side panel

The side panel provides access to the following connectors required for connecting the terminal:

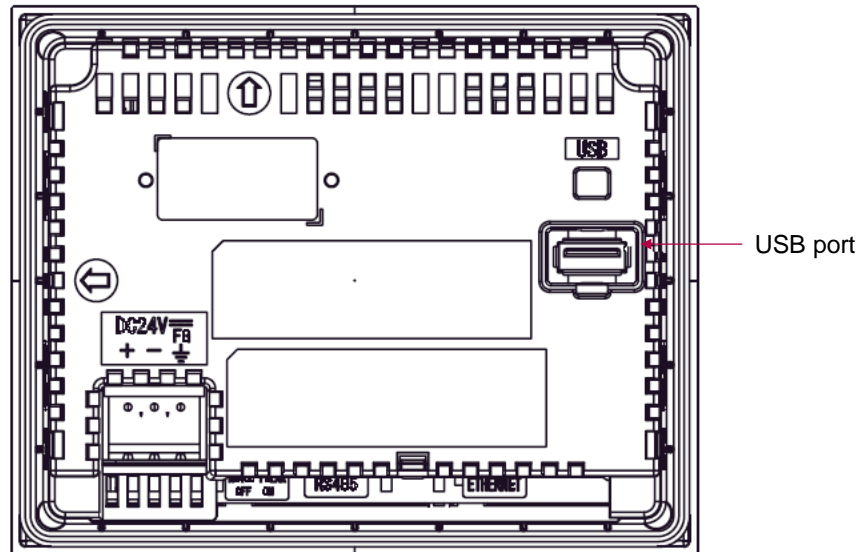
- An RJ45 connector for the RS232C or RS485 serial link to a PLC or other device such as a barcode reader
- If you are using the Modbus protocol and polarization is not via another bus device, the RS 485 line must be polarized (switch ON). This means connecting D1 to the +5 V and D0 to the 0 V terminal via a 620 Ohm resistor
- A connector for the Ethernet link
- A connector for the 24 V power supply



### XBT GT 1005 series rear panel

The rear panel provides access to the following connectors required for connecting the terminal:

- One or two type-A USB ports for connecting a PC or external devices such as a USB hub, barcode reader or printer

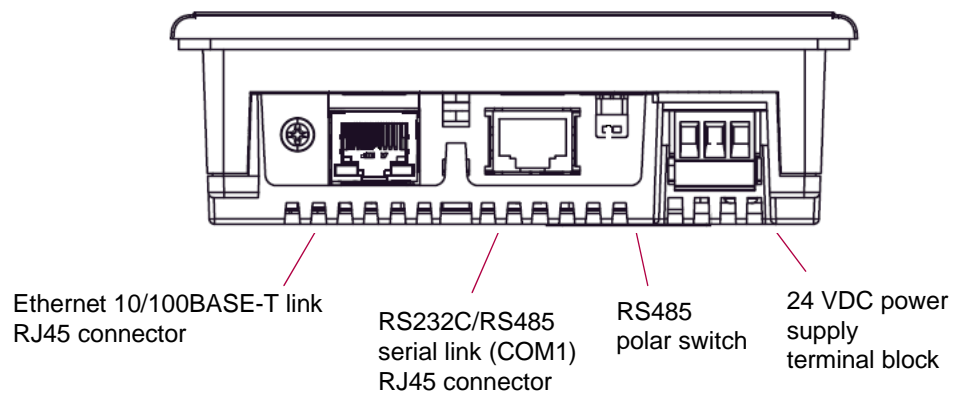




### XBT GT 1005 series bottom panel

The bottom panel provides access to the following connectors required for connecting the terminal:

- Connectors for other devices such as a PLC or a barcode reader (serial and Ethernet 10/100 Megabits/s link(s))
- A connector for the power supply
- You can also access the RS485 polarization switch.



### XBT GT 2000/7000 series rear panel

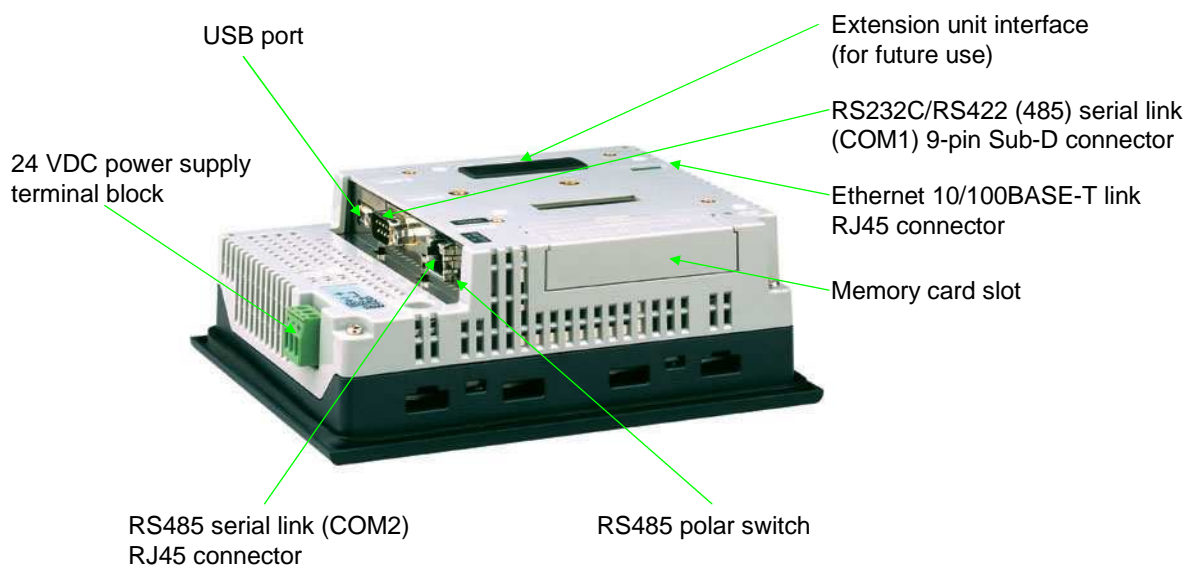
The rear panel provides access to the following connectors required for connecting the terminal:

- A connector for a future extension unit such as a video card or for access to fieldbuses
- One or more connectors for other devices such as a PLC or a barcode reader (serial and Ethernet 10/100 Megabits/s link(s))

The Ethernet connector has 2 LEDs: green (transmission OK) and orange (transmission in progress)

- One or two type-A USB ports for connecting the PC or external devices such as a USB hub, barcode reader, printer
- A connector for the power supply
- An auxiliary connector (not accessible on XBT GT 1000 and 2000 terminals) as an I/O interface to external devices such as a lamp or a loudspeaker
- XBT GT x340 terminals also have a video interface and a sound input (microphone connector).
- You can also access the RS485 polarization switch and the terminal configuration micro-switches from the memory card slot.

The memory card LED is on while the memory card is in its slot and the cover is closed.



AUX port (XBT GT 4000 to 7000): alarm output, run-time events, etc.

Position of switches

Set the RS485 polarization switch


The micro-switches are set in the same way as for the XBT G terminals:

- Operation with or without memory card
- Operation with cover open

For the XBT GT2000 to 7000 terminals, you can set micro-switch 3 to ON to install the Runtime system using a USB port. When installation is complete, reset the switch to OFF.

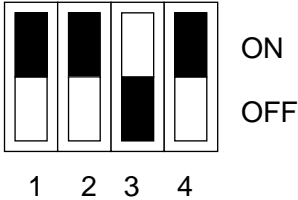
OFF

ON



ON

OFF



ON	RS485 serial line is polarized (resistor on D1 and D0)
OFF	No polarization

1	ON	Start-up from memory card enabled
	OFF	Start-up from memory card disabled
2	ON	Leave in ON position
	OFF	
3	ON	For installing Runtime using a USB port (XBT GT terminal)
	OFF	Leave in OFF position
4	ON	Start-up from memory card enabled with protective cover open
	OFF	Start-up from memory card only enabled if protective cover closed

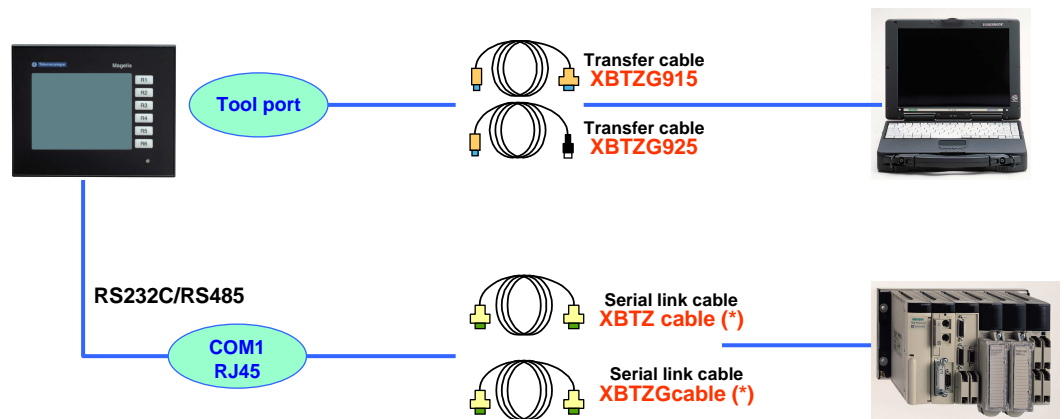
VijeoDesigner Training Course  
Schneider Electric | Industry Business | Training Department – 04 January 2010

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### XBT GT1000 options

Schneider offers a wide range of cables for connecting your XBT GT1000 terminal to various devices, such as your PC or your PLC.

- For example, the XBTZG915 cable can be used to transfer your application, or the XBTZ or XBTZG cable can be used to connect a PLC via the serial link. See the catalog for the full list of cables available.

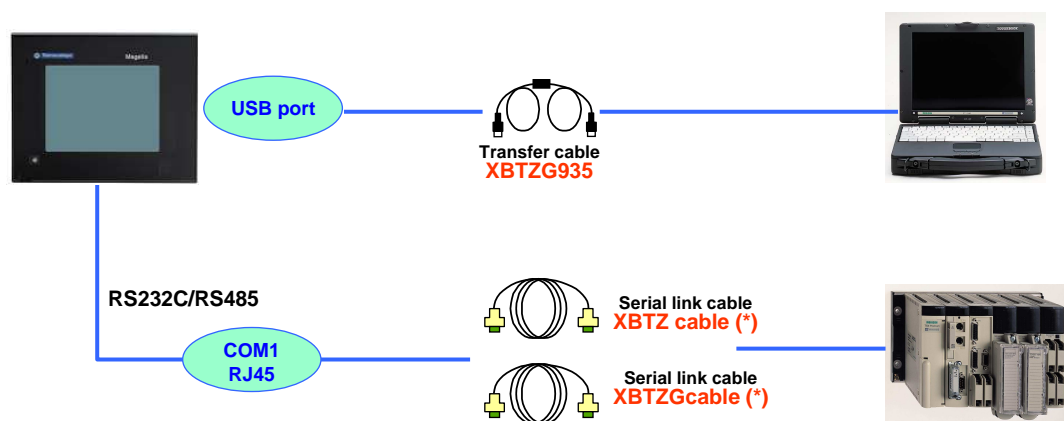


(\*) see the catalog

### XBT GT 1005 options

Use an XBTZG935 cable to connect your XBT GT1005 series terminal to various devices, such as your PC or your PLC.

See the catalog for the reference of the cable you will need to connect your devices via serial links (XBTZ or XBTZG cables).

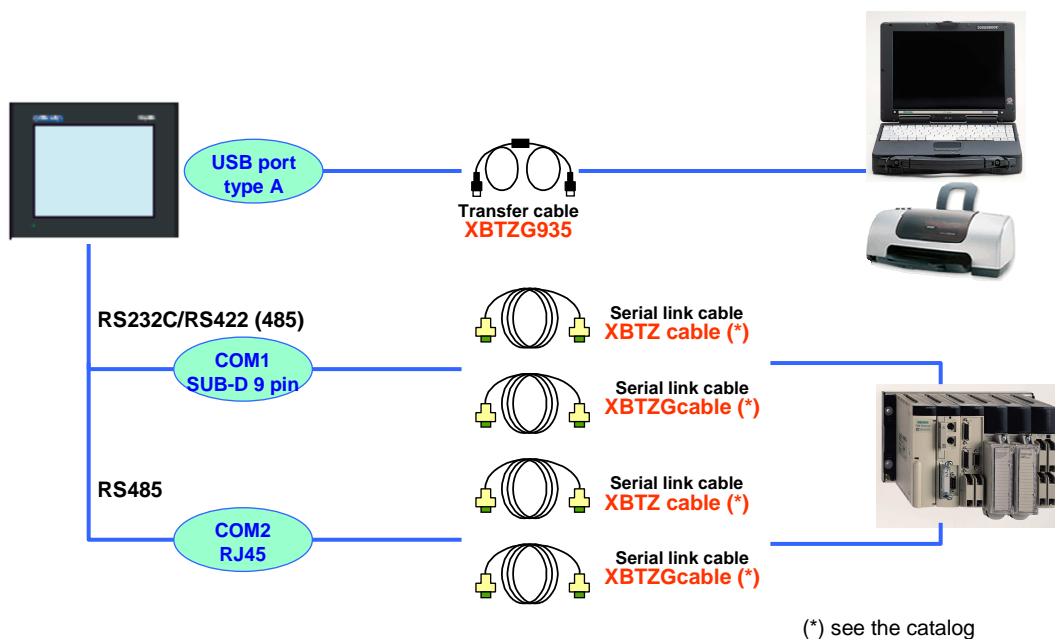


(\*) see the catalog

### XBT GT2000 to 7000 options

Use an XBTZG935 cable (USB - USB) to transfer your application to the terminal.

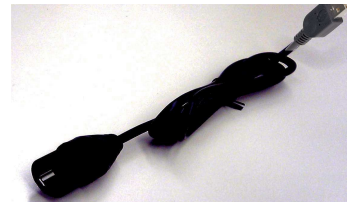
See the catalog for the reference of the cable you will need to connect your devices via serial links (XBTZ or XBTZG cables).



### XBT GT Accessories

The Schneider catalog contains a wide range of accessories to complement the XBT GT terminal offer, such as memory cards, USB cable holder, USB extension cable, etc.

- CF card (from 64 to 512 Mb)
- LED for backlight (XBT GT5000 to XBT GT 7000 series)
- Installation gasket
- Installation fastener
- Screen protection sheet
- Panel cut-out adapter
- USB holder
- USB extension cable



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# Module 2c: XBT GK Terminals



4



### XBT GK overview

This page shows the XBT GK terminals:

Front panel for use by the operator

Rear panel with connectors

Front panel



Rear panel



### XBT GK 2120 / 2330 rear panel

The rear panel provides access to the following connectors for the terminal:

- One or more connectors for other devices such as a PLC or a barcode reader (serial and Ethernet 10/100 Megabits/s link(s))

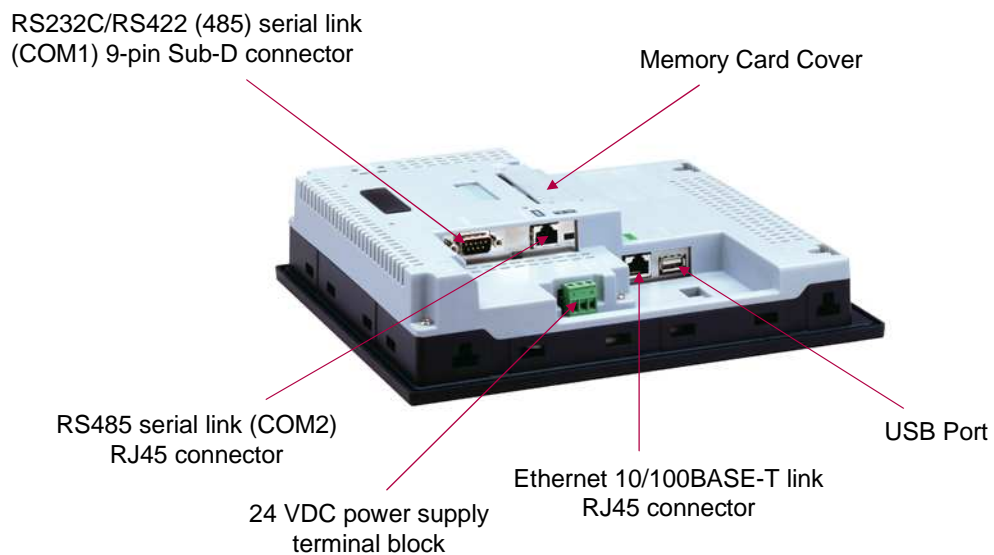
Ethernet is available only on XBTGK 2330.

The Ethernet connector has 2 LEDs: green (transmission OK) and orange (transmission in progress)

- One type-A USB port for connecting the PC or external devices such as a USB hub, barcode reader, printer

- A connector for the power supply

The memory card LED turns on when a memory card is in the memory card slot and the cover is closed.



### XBT GK 5330 rear panel

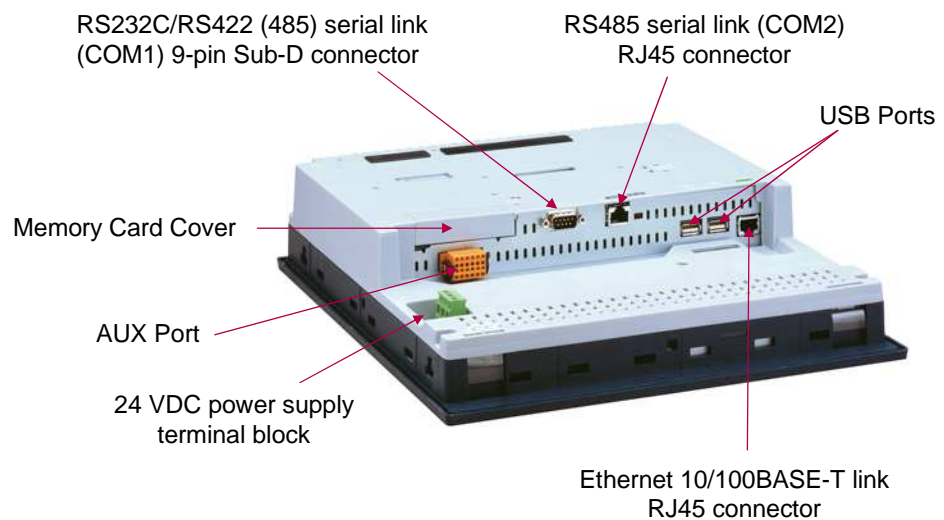
The rear panel provides access to the following connectors required for connecting the terminal:

- One or more connectors for other devices such as a PLC or a barcode reader (serial and Ethernet 10/100 Megabits/s link(s))

The Ethernet connector has 2 LEDs: green (transmission OK) and orange (transmission in progress)

- Two type-A USB ports for connecting a PC or external devices such as a USB hub, barcode reader, printer
- A connector for the power supply
- An auxiliary connector as an I/O interface to external devices such as a lamp or a loudspeaker

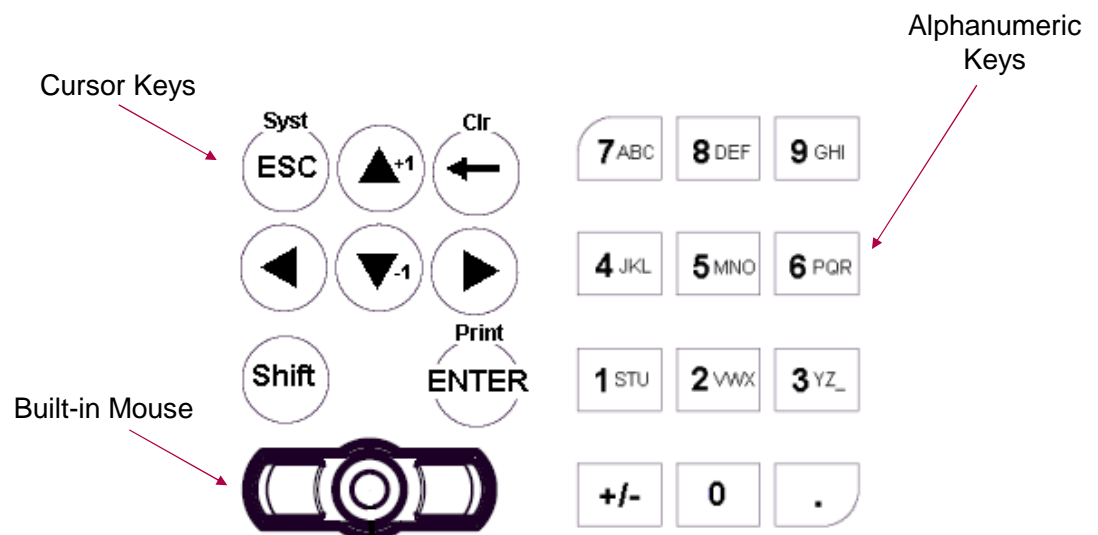
The memory card LED turns on when a memory card is in the memory card slot and the cover is closed.



### XBT GK keypad

The XBTGK target machine provides you with an Alphanumeric Keypad for you to input data. The keypad contains the following parts:

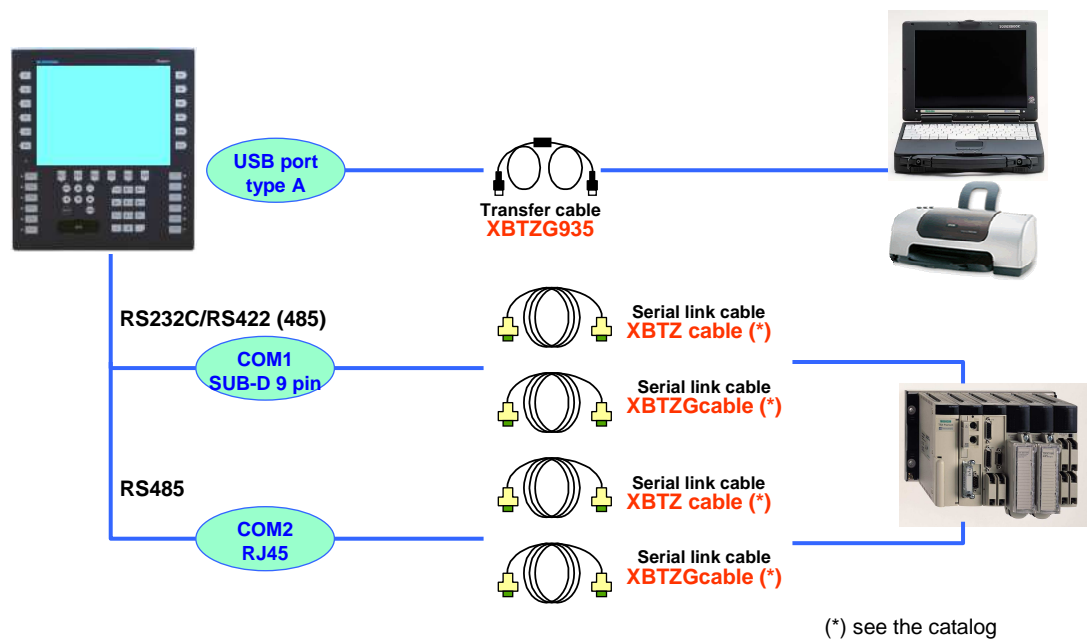
- Alphanumeric keys, which enable you to enter the 26-letter alphabet, numbers 0 to 9, and other characters
- Cursor keys, which enable you to change the string or numeric input in the data input field; and
- Built-in mouse, which controls the cursor and activates objects on the terminal.



### XBT GK options

Use an XBTZG935 cable (USB - USB) to transfer your application to the XBT GK terminal.

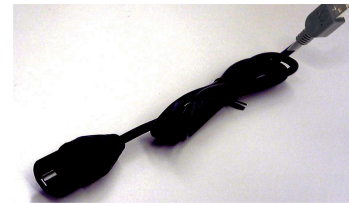
See the catalog for the reference of the cable you will need to connect your devices via serial links (XBTZ or XBTZG cables).



### XBT GK accessories

The Schneider catalog contains a wide range of accessories to complement the XBT GK terminal offering, such as memory cards, USB cable holder, USB extension cable, etc.

- CF card (from 64 to 512 Mb)
- Installation gasket
- Installation fastener
- Screen protection sheet
- Panel cut-out adapter
  
- USB holder
- USB extension cable



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# Module 2d: XBT GC Terminals



5

### XBT GC Overview

This page shows the XBT GC terminals:

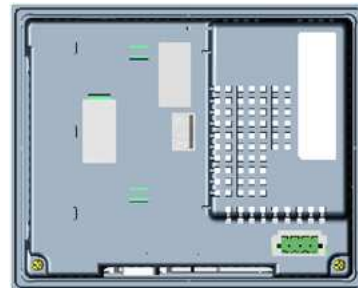
Front panel for use by the operator

Rear, side, and bottom panels with connectors

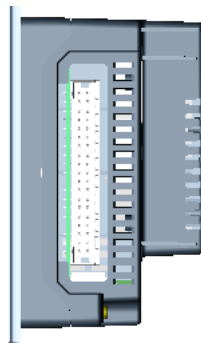
Front panel



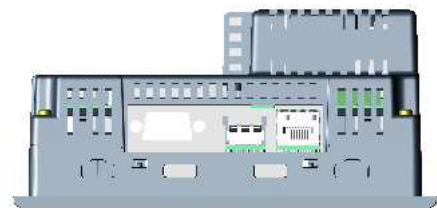
Rear panel



Side View



Bottom View



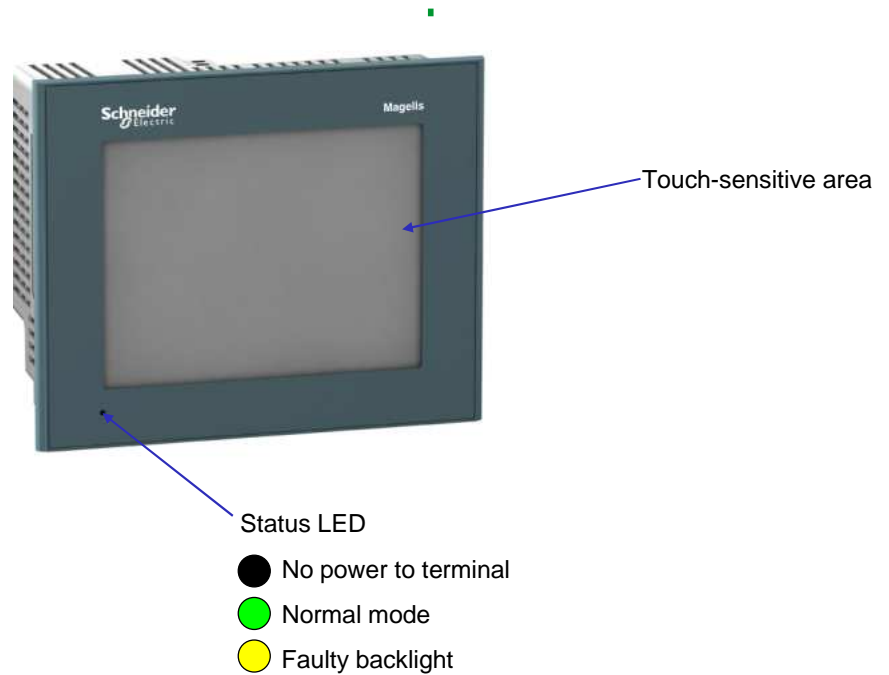


### XBT GC Series Front panel

The front panel or screen can be used by the operator to display or control the HMI application.

The touch-sensitive area or panel is superimposed on the screen for control purposes.

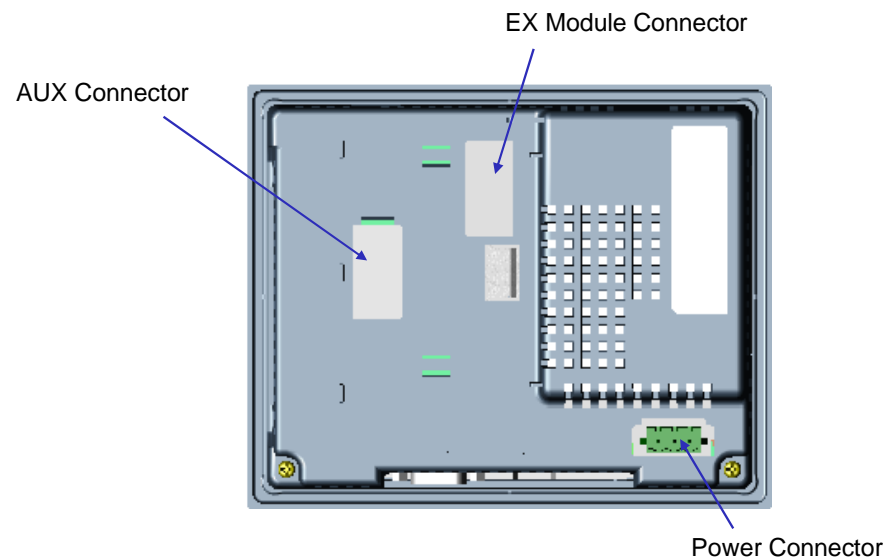
The status LED indicates which of the following operating modes the terminal is in: no power to terminal, normal mode or faulty.



### XBT GC Series Rear Panel

The rear panel provides access to the following connectors required for connecting the terminal:

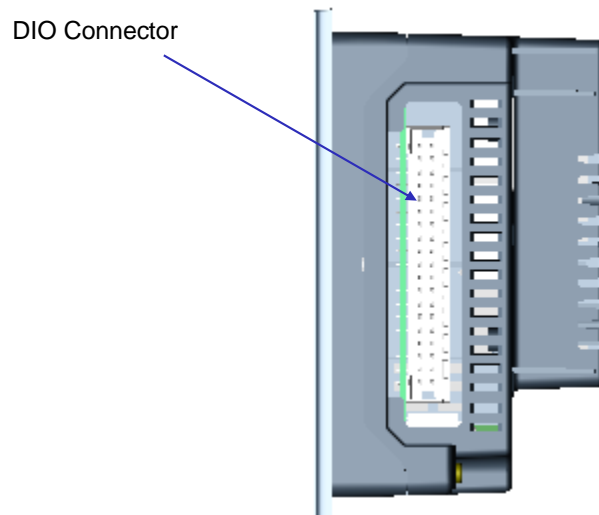
- An auxiliary connector as an I/O interface to external devices
- A connector for the EX module
- A connector for the power supply



### XBT GC Series Side View

The side panel provides access to the following connector required for connecting the terminal:

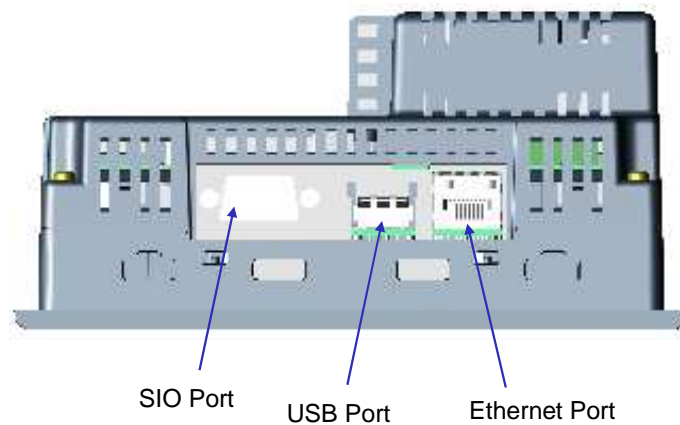
- A connector for a DIO module



### XBT GC Series Bottom View

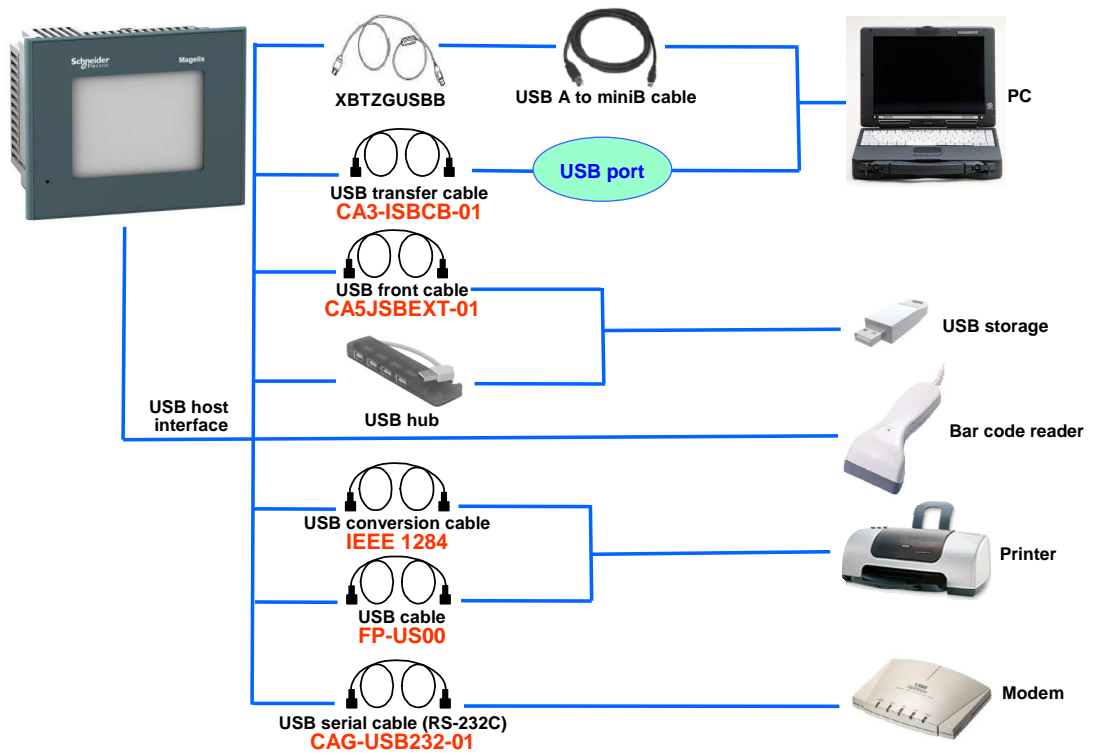
The bottom of the panel provides access to the following connectors required for connecting the terminal:

- An SIO port for connecting a printer, modem, or other devices .
- A USB port for connecting the PC or external devices such as a USB hub, USB keyboard, mouse, barcode reader, printer
- An Ethernet port to connect to the Ethernet



### XBT GC Options

Schneider offers a wide range of cables for connecting your XBT GC terminal to various devices, such as your PC, USB storage, bar code reader, printer, or modem. See the catalog for the reference of the cable you will need to connect your devices.



### XBT GX Accessories

You can obtain a wide range of accessories to complement the XBT GC terminal offer, such as USB storage, bar code reader, printer, modem, USB hub, USB cable, USB conversion cables, XBTZGUSBB cable, and USB A to miniB cable.

- USB storage
- Bar code reader
- Printer
- Modem
- USB hub
- USB cable
- USB conversion cables
- XBTZGUSBB cable
- USB A to miniB cable

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# Module 2e: iPC Terminals



6

### iPC Overview

This page shows the iPC terminals:

Front panel for use by the operator

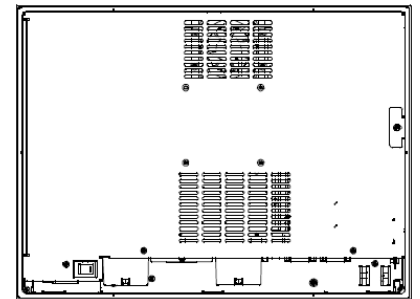
Rear, side, and bottom panels with connectors

The XBT GT1000 series terminals have function keys on the front panel.

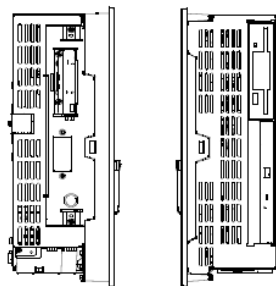
Front Panel



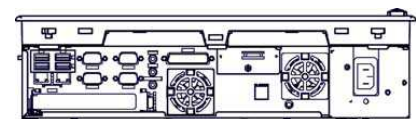
Rear Panel



Side Views



Bottom View





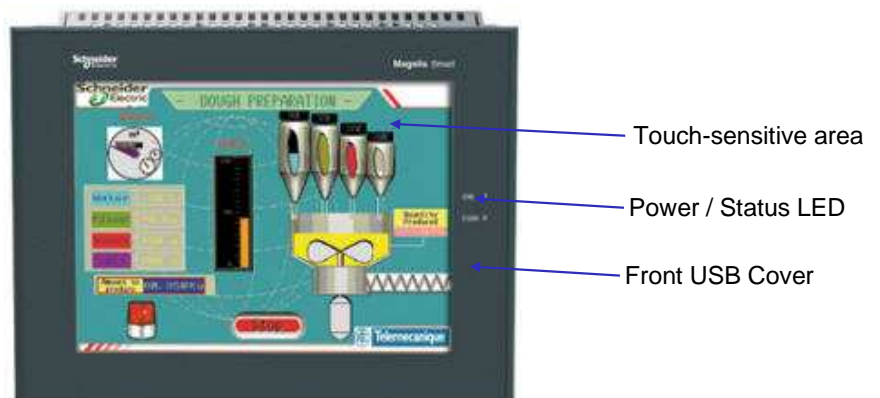
### Compact / Smart iPC Series Front Panel

The front panel or screen can be used by the operator to display or control the HMI application.

The touch-sensitive area or panel is superimposed on the screen for control purposes.

The power / status LED indicates which of the following operating modes the terminal is in: no power to terminal, normal mode or faulty.

Some units have a USB port behind the front USB cover.



### Flex iPC Series Front panel

There are two types of Flex iPC front panel displays:

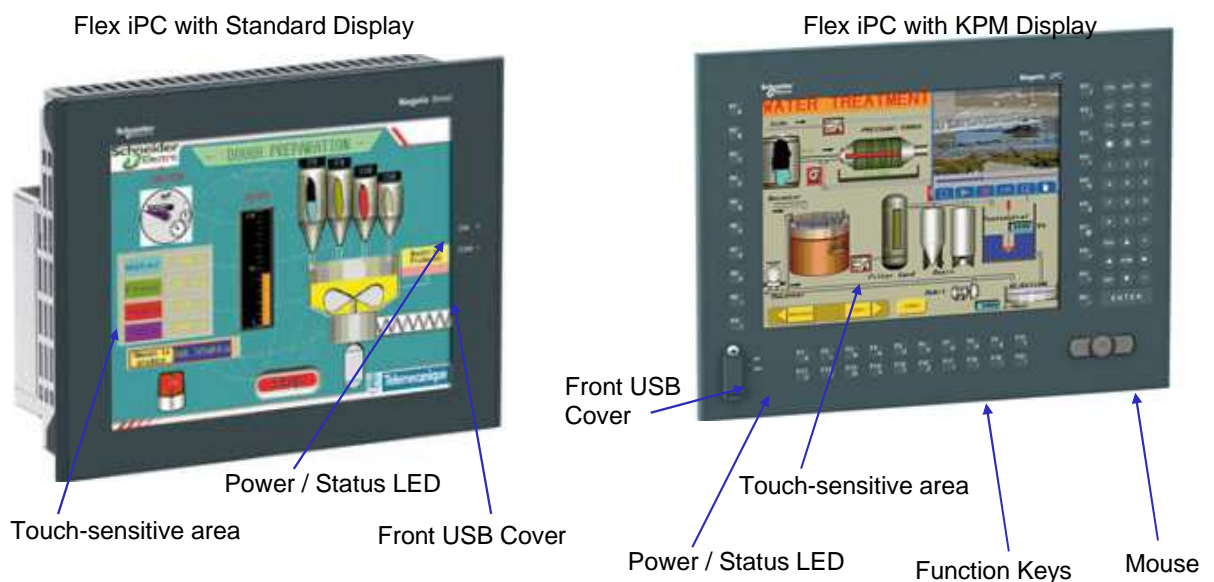
- The Flex iPC with Standard Display
- The Flex iPC with KPM Display.

The front panel of the Flex iPC with Standard Display shows:

- The touch-sensitive area or panel is superimposed on the screen for control purposes.
- The power / status LED indicates which of the following operating modes the terminal is in: no power to terminal, normal mode or faulty.
- A USB port is behind the front USB cover.

The front panel of the Flex iPC with KPM Display shows:

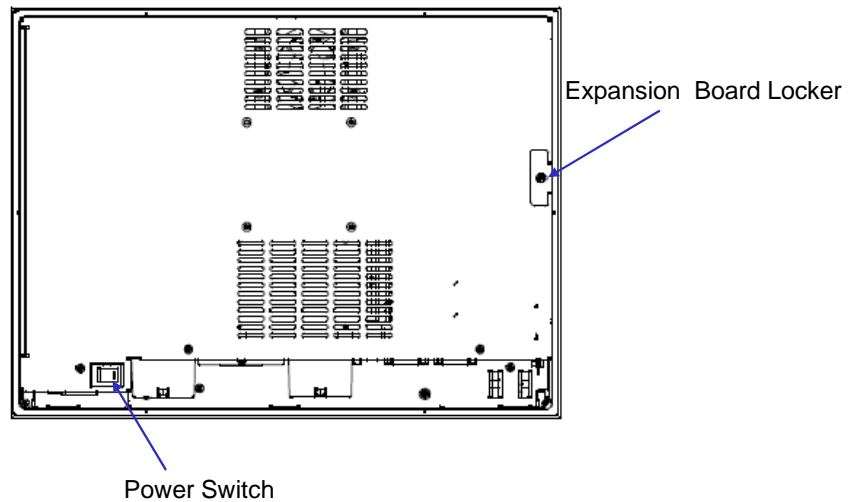
- A USB port is behind the front USB cover.
- The power / status LED indicates which of the following operating modes the terminal is in: no power to terminal, normal mode or faulty.
- The touch-sensitive area or panel is superimposed on the screen for control purposes.
- Function keys and mouse



### Compact iPC Series Rear panel

The Compact iPC Series' rear panel provides access to the following:

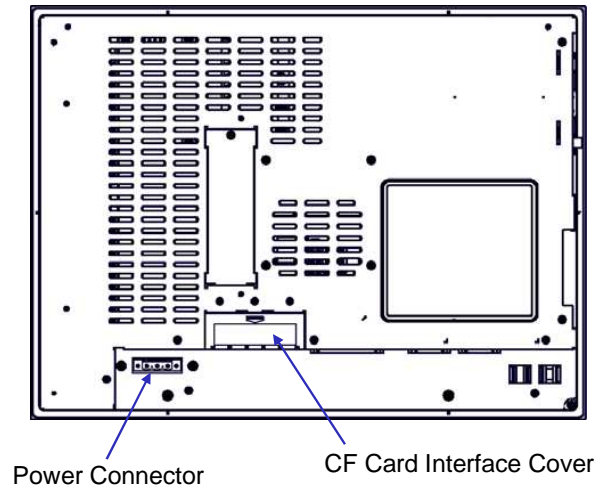
- The expansion board locker
- The power switch



### Smart iPC Series Rear panel

The Smart iPC Series' rear panel provides access to the following:

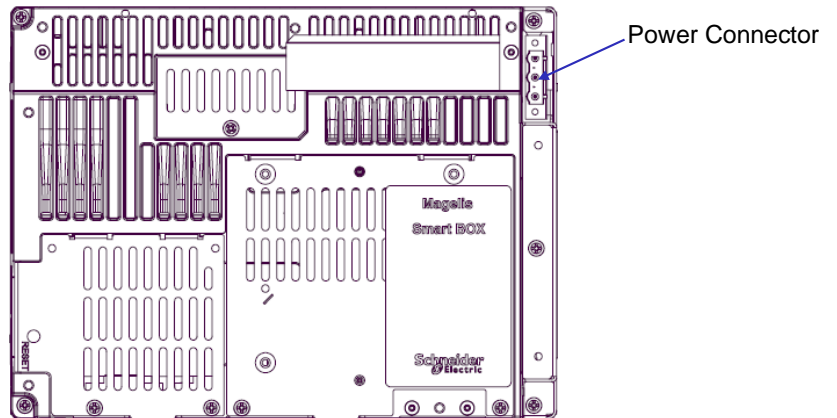
- The CF Card interface cover
- The power connector



### Smart Box Rear Panel

The Smart BOX rear panel provides access to the following:

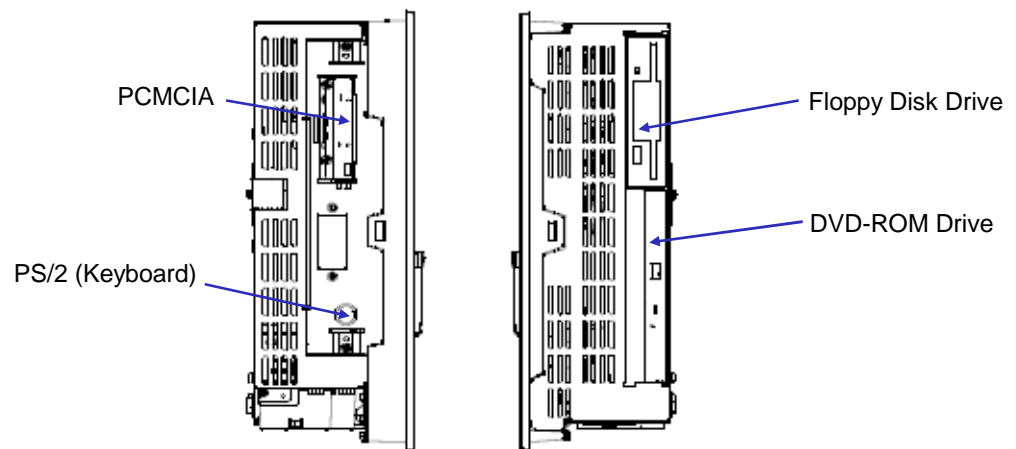
- The power connector



### Compact iPC Series Side Panels

The side panels for the Compact iPC Series provide access to the following:

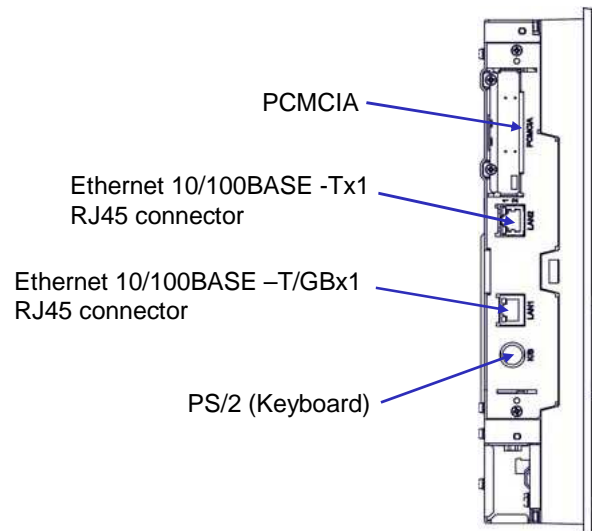
- A floppy disk drive
- A DVD-ROM drive
- A PCMCIA slot
- A PS/2 connector to connect to a keyboard



### Smart iPC Series Side Panel

The side panel for the Smart iPC Series provides access to the following:

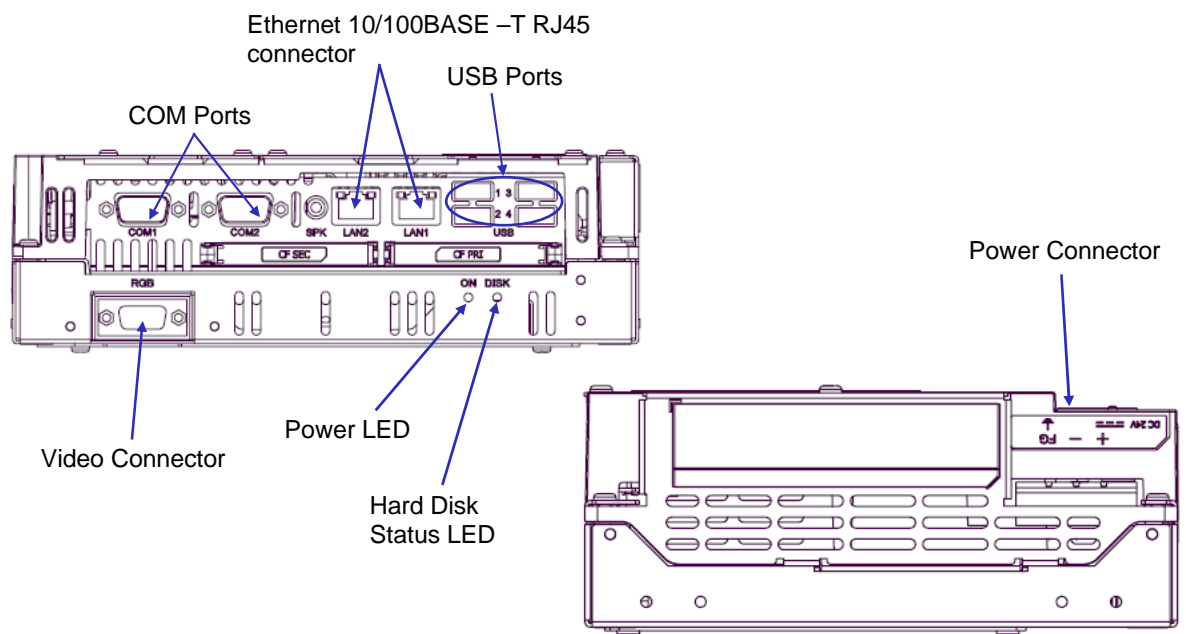
- A PCMCIA slot
- Connectors for the Ethernet link
- A PS/2 connector to connect to a keyboard



### Smart BOX Series Side Panels

The Smart BOX side panels provide access to the following:

- 2 COM ports
- Connectors for the Ethernet link
- 4 USB ports
- Video connector
- Power LED
- Hard disk status LED
- Power connector

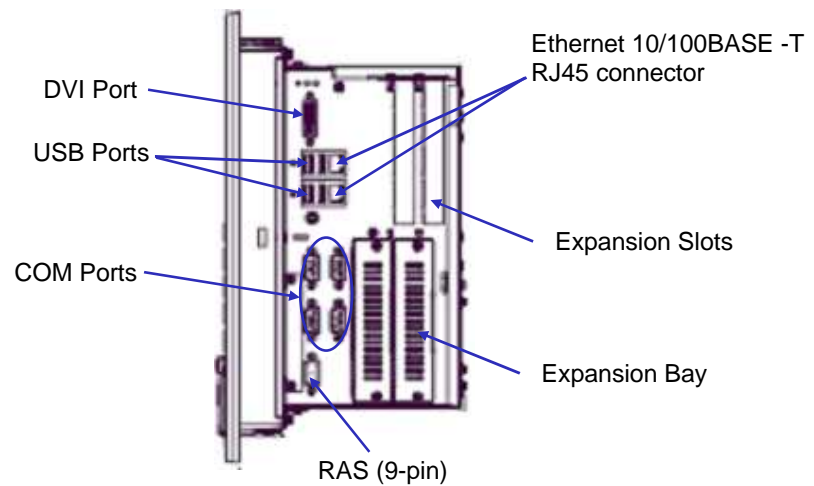




### Flex iPC Series Side Panel

The side panel for the Smart iPC Series provides access to the following:

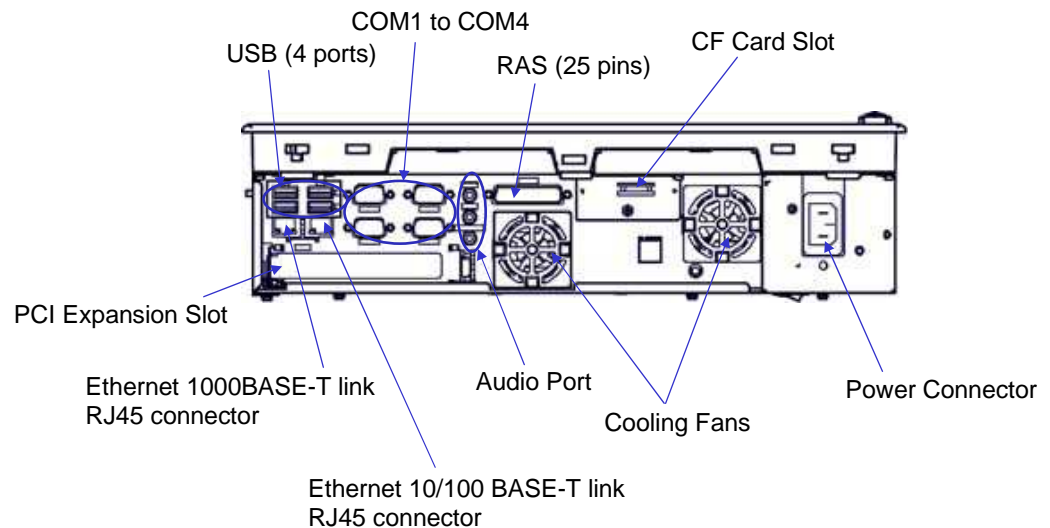
- A DVI port
- 2 USB ports
- 4 COM ports
- Connectors for the Ethernet link
- Expansion slots
- Expansion bay
- A 9-pin RAS



### Compact iPC Series Bottom Panel

The bottom panel for the Compact iPC Series provides access to the following connectors required for connecting the terminal:

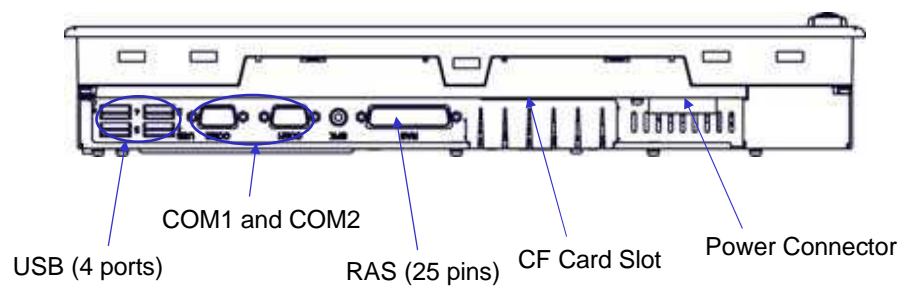
- An extension card slot for connecting the PCI 2.2 interface slot
- 4 USB ports
- 4 COM RS-232C serial ports
- A RAS interface for connecting the D-SUB 25 pin
- A CF Card slot
- A connector for the power supply
- 2 cooling fans
- An audio port for connecting the line in, speaker out, mic in
- Two connectors for the Ethernet link



### Smart iPC Series Bottom Panel

The bottom panel for the Smart iPC Series provides access to the following connectors required for connecting the terminal:

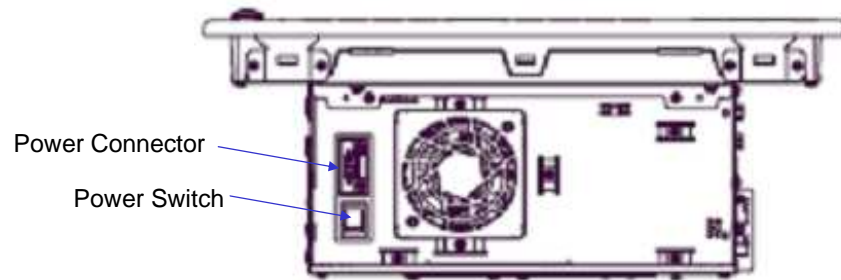
- 4 USB ports
- 2 COM RS-232C serial ports
- A RAS interface port (D-SUB 25 pin)
- A CF Card slot
- A connector for the power supply



### Flex iPC Series Bottom Panel

The bottom panel for the Smart iPC Series provides access to the following connectors required for connecting the terminal:

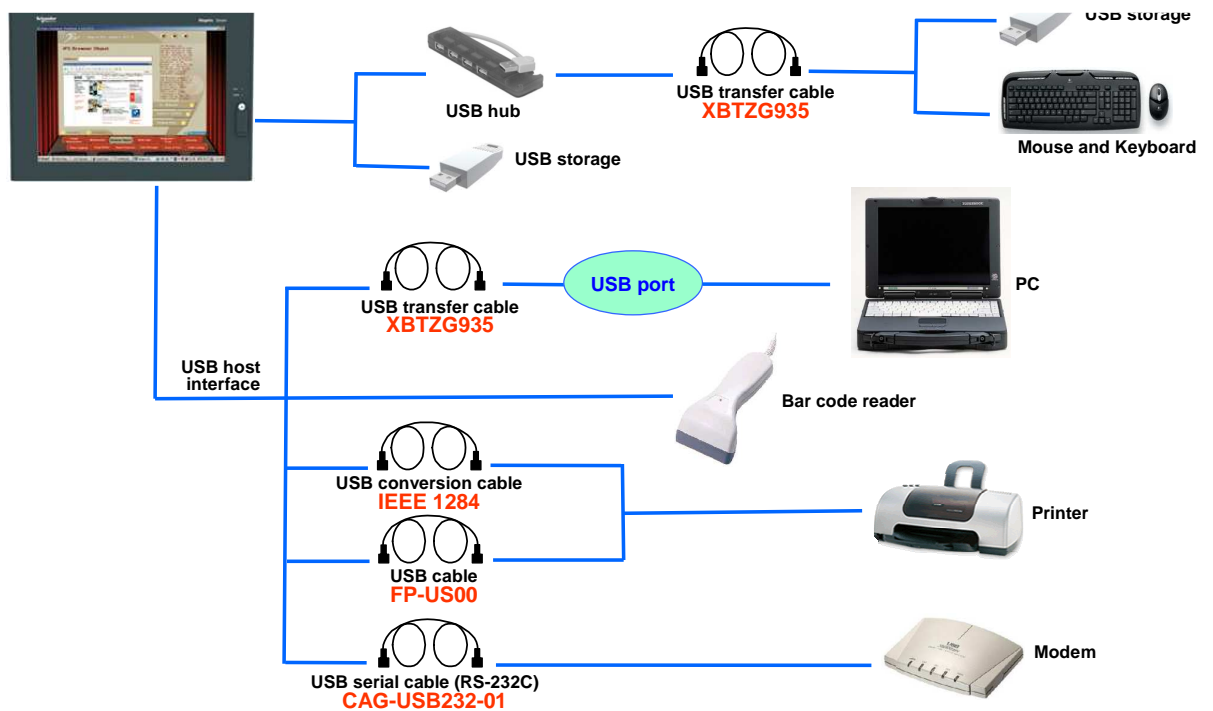
- A connector for the power supply
- A power switch



### iPC Series Options

Schneider offers a wide range of cables for connecting your iPC terminal to various devices, such as your PC, USB storage, bar code reader, printer, or modem.

See the catalog for the reference of the cable you will need to connect your devices.



### iPC Accessories

You can use a wide range of accessories to complement the iPC terminal offer, such as USB storage, bar code reader, printer, modem, USB hub, USB transfer cable, and USB conversion cables.

- USB storage
- Bar code reader
- Printer
- Modem
- USB hub
- USB transfer cable XBTZG935
- USB conversion cables

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# Module 3: Memory Management



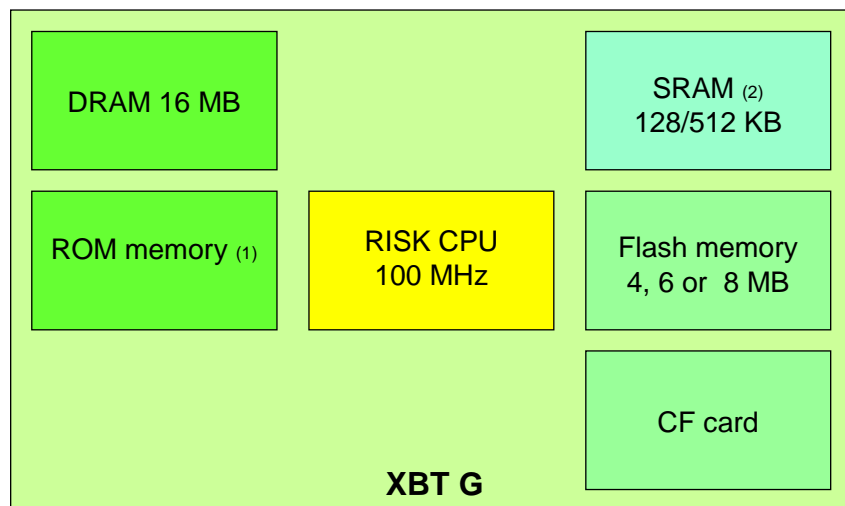
7

### Internal structure of an XBT G terminal

A Magelis XBT G terminal's memory has the following structure:

- Working memory
  - 16 megabytes of dynamic memory, or DRAM
- User memory, comprising:
  - 128 or 512 kilobytes of static memory, or SRAM, containing data
  - and 4, 6 or 8 megabytes of EPROM Flash memory containing the application

The application can also be transferred to the optional memory card (Compact Flash card).



(1) Contain the fonts

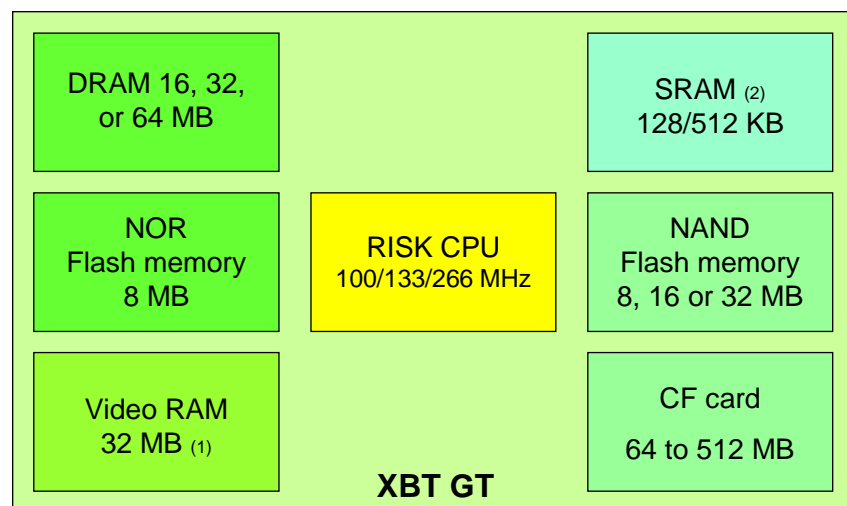
(2) Saved by a lithium battery



### Internal structure of an XBT GT terminal

The Magelis XBT GT terminal's memory has the following structure:

- Working memory
  - 16 to 64 megabytes of dynamic memory, or DRAM
- User memory:
  - 128 or 512 kilobytes of static memory, or SRAM, containing data: (configuration and events in runtime mode, alarms, etc.)
  - 8, 16 or 32 megabytes of NAND EPROM Flash memory containing the application
  - The application can also be transferred to the optional memory card (Compact Flash card)
- The NOR EPROM Flash memory (8 megabytes) contains the fonts
- XBT GT4000 to 6000 terminals also have 32 megabytes of video memory which can be extended



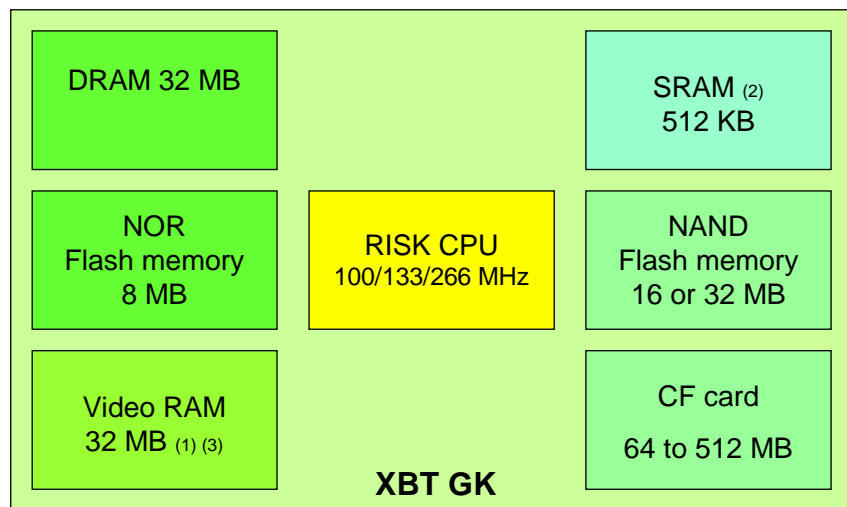
(1) Extendable memory

(2) Saved by a lithium battery

### Internal structure of an XBT GK terminal

The Magelis XBT GK terminal's memory has the following structure:

- Working memory
  - 32 megabytes of dynamic memory, or DRAM
- User memory:
  - 512 kilobytes of static memory, or SRAM, containing data: (configuration and events in runtime mode, alarms, etc.)
  - 16 or 32 megabytes of NAND EPROM Flash memory containing the application
  - The application can also be transferred to the optional memory card (Compact Flash card)
- The NOR EPROM Flash memory (8 megabytes) contains the fonts
- XBT GK5330 terminals also have 32 megabytes of video memory which can be extended

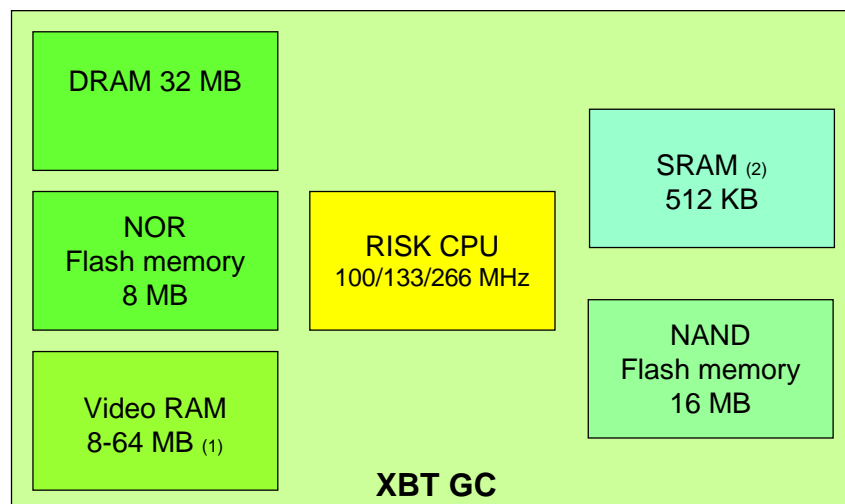


- (1) Extendable memory  
(2) Saved by a lithium battery  
(3) Available only for the XBT GK5330

### Internal Structure of an XBTGC Terminal

The Magelis XBT GC terminal's memory has the following structure:

- Working memory
  - 32 megabytes of dynamic memory, or DRAM
- User memory:
  - 512 kilobytes of static memory, or SRAM, containing data: (configuration and events in runtime mode, alarms, etc.)
  - 16 megabytes of NAND EPROM Flash memory containing the application
- The NOR EPROM Flash memory (8 megabytes) contains the fonts
- XBT GC terminals also have 8-64 megabytes of video memory which can be extended



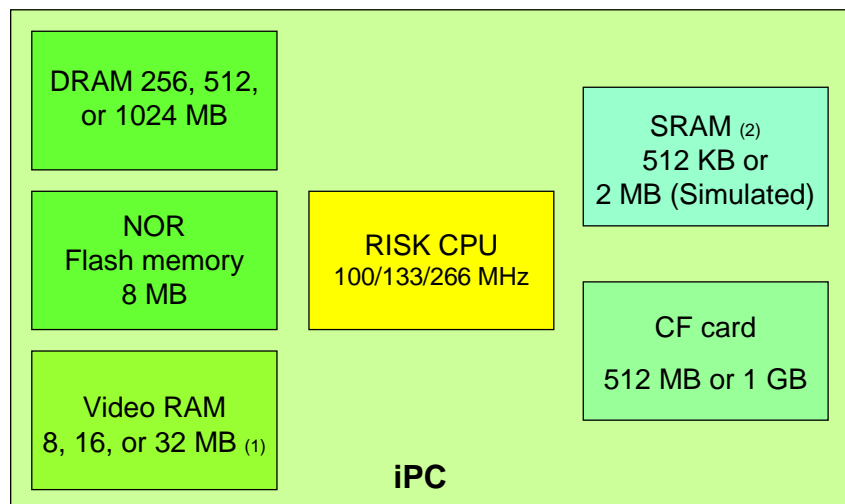
(1) Extendable memory

(2) Saved by a lithium battery

### Internal Structure of an iPC Terminal

The Magelis iPC terminal's memory has the following structure:

- Working memory
  - 256, 512, or 1024 megabytes of dynamic memory, or DRAM
- User memory:
  - 512 kilobytes or 2 megabytes of static memory, or SRAM, containing data: (configuration and events in runtime mode, alarms, etc.)
  - The application can also be transferred to the optional memory card (Compact Flash card)
- The NOR EPROM Flash memory (8 megabytes) contains the fonts
- iPC terminals also have 8, 16, or 32 megabytes of video memory which can be extended



(1) Extendable memory

(2) Saved by a lithium battery

XBTG Internal Memory

This table shows the memory sizes of each terminal in the XBT G range:

- Working memory
- Data memory
- Application memory

	XBT G2110	XBT G2120 XBT G2220	XBT G2130 XBT G2330	XBT G4320	XBT G4330 XBT G5230 XBT G5330 XBT G6330
DRAM memory	16 MB	16 MB	16 MB	16 MB	16 MB
SRAM Data	128 KB	128 KB	512 KB	128 KB	512 KB
Flash EPROM Application	4 MB	4 MB	6 MB	6 MB	8 MB

### XBT GT internal memory

This table shows the memory sizes of each terminal in the XBT GT range:

- Working memory
- Data memory
- Application memory
- Video memory (for the XBT GT4000 to 7000 series)

		XBT GT1100 XBT GT1300	XBT GT2110	XBT GT2120 XBT GT2220 XBT GT2130 XBT GT2330	XBT GT4230 XBT GT4330 XBT GT5230 XBT GT5330 XBT GT6330	XBT GT4340 XBT GT5340 XBT GT6340 XBT GT7340
DRAM	Memory	16 MB	16 MB	32 MB	32 MB	64 MB
	SRAM Data	512 KB	128 KB	512 KB	512 KB	512 KB
Flash EPROM	NOR Application	8 MB	8 MB	8 MB	8 MB	8 MB
	NAND		16 MB	16 MB	32 MB	32 MB
Video RAM		/	/	/	32 MB (*)	32 MB (*)

(\*) 32 MB extension

### XBT GK internal memory

This table shows the memory sizes of each terminal in the XBT GK range:

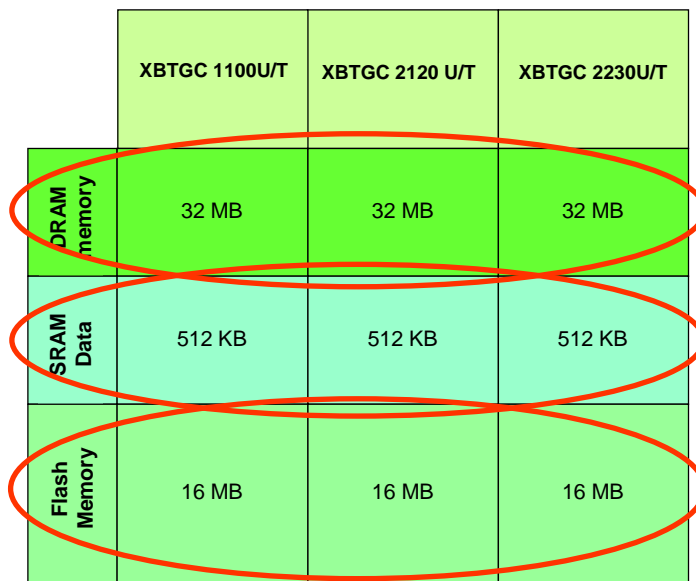
- Working memory
- Data memory
- Application memory
- Video memory (for the XBT GK 5330)

		XBT GK2120 XBT GK2330	XBT GK5330
Flash EPROM (Application)	DRAM memory	32 MB	32 MB
	SRAM Data	512 KB	512 KB
	NOR	8 MB	8 MB
	NAND	16 MB	32 MB
Video RAM		/	32 MB (*)

### XBT GC Internal Memory

This table shows the memory sizes of each terminal in the XBT GC range:

- Working memory
- Data memory
- Application memory



	XBTGC 1100U/T	XBTGC 2120 U/T	XBTGC 2230U/T
DRAM memory	32 MB	32 MB	32 MB
SRAM Data	512 KB	512 KB	512 KB
Flash Memory	16 MB	16 MB	16 MB



### iPC Internal Memory

This table shows the memory sizes of the Compact iPC, Smart iPC, and Flex iPC series of terminals:

- Working memory
- Data memory
- Application memory

	Compact iPC	Smart iPC	Flex iPC
DRAM memory	256, 512, or 1024 MB	256, 512, or 1024 MB	512 MB
SRAM Data	512 KB	512 KB or 2 MB	2 MB
Flash Memory	/	/	/

### Memory or Compact Flash card

If you need to use a memory or Compact Flash card:


- Don't forget to set the micro-switch correctly in position 1 and configure your application to use the card as backup or working memory.
- Insert the card in its slot.
- Remember to replace the protective cover so that you can use the card normally.

As we have already seen, you can configure the card for use even with the protective cover open.



Application starting mode

- A terminal can operate with or without a memory card.
- If you're not using a memory card, when you power the terminal on, it runs the application saved in the internal memory with the Runtime system installed
  - If you are using a memory card, the application's starting mode depends on the position of the first micro-switch.

No memory card	With memory card	
	Switch 1	Result
<div>The terminal executes the application saved in the internal memory</div> <div></div>	OFF	The terminal executes the application saved in the internal memory
	ON	The terminal copies the content of the CF card to the internal memory and executes the application

---

# Module 4: Communication

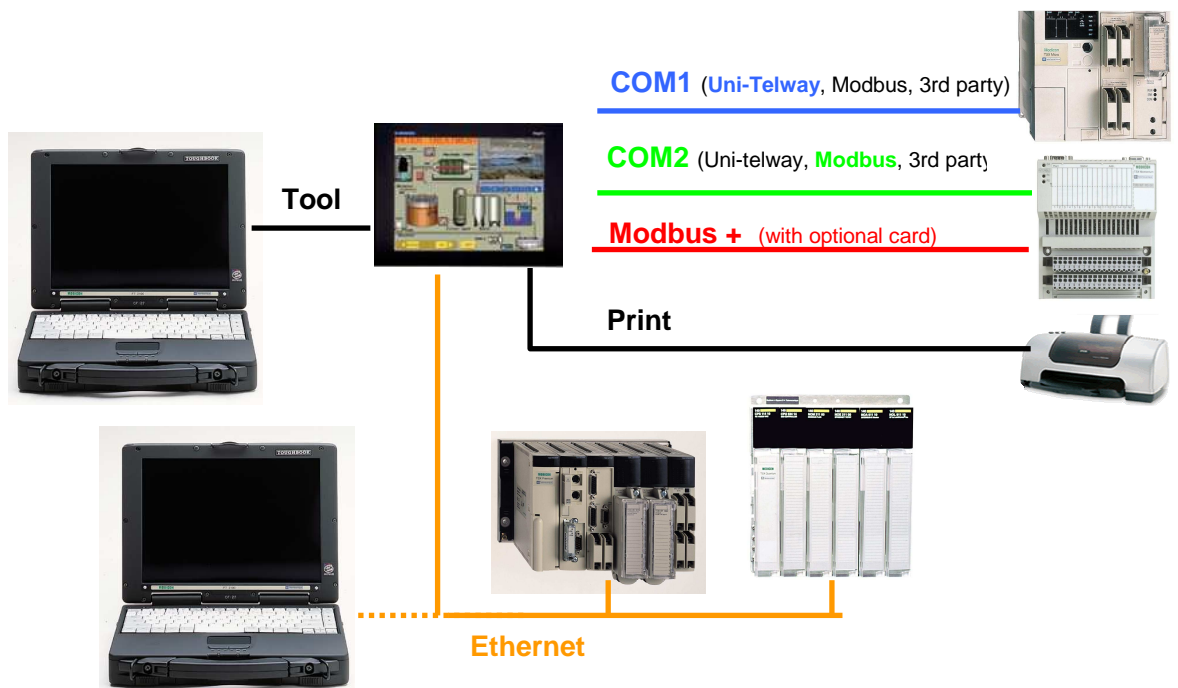


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### XBT G communication ports

XBT G terminals have the following communication ports:

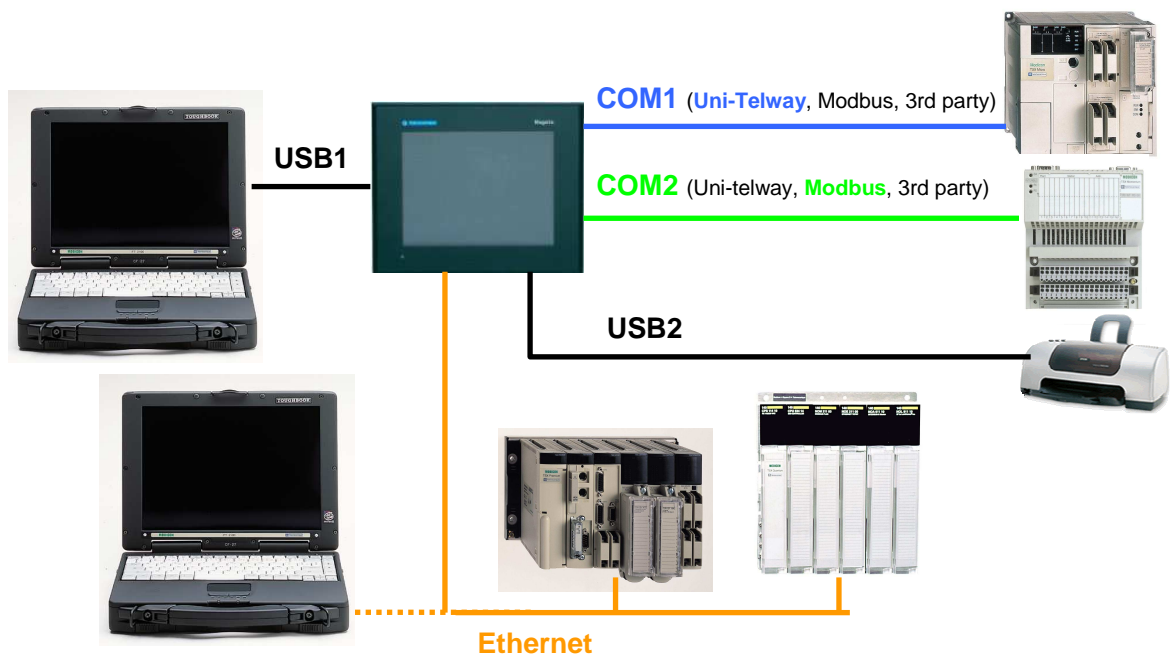
- The Tool port for transferring your application
- The Print port for a printer
- 1 or 2 serial ports for communicating with Schneider or third-party PLCs (Mitsubishi, Siemens, etc.) Modbus Plus communication is also available if you have the optional interface card installed
- 1 Ethernet port for communicating using the Modbus/TCP protocol
- You can also transfer your application via the Ethernet port



### XBT GT communication ports

XBT GT terminals have the following communication ports:

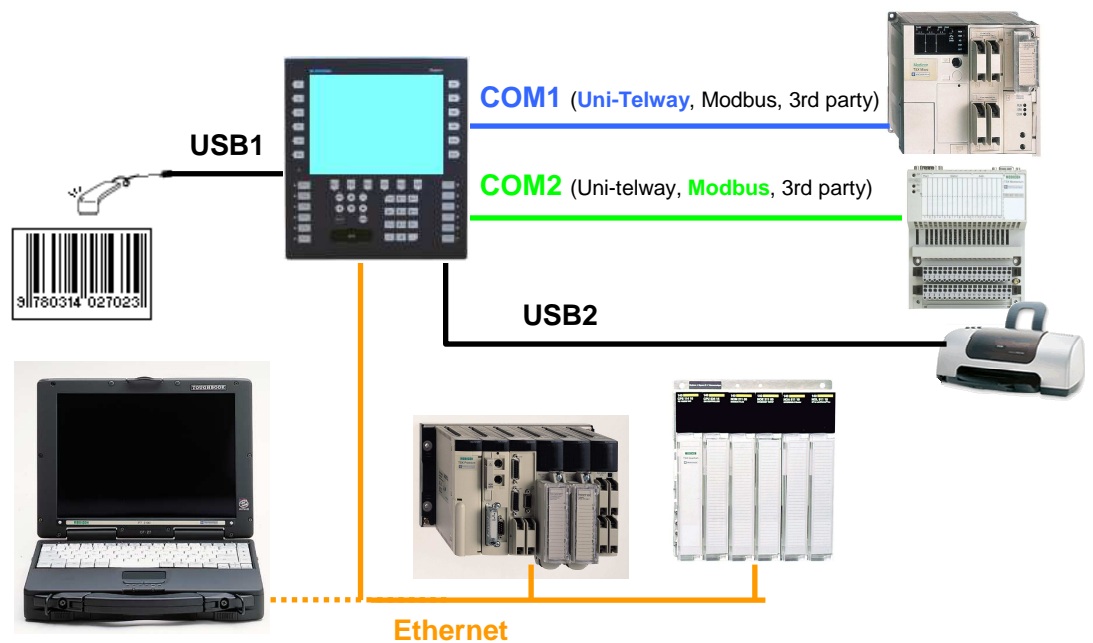
- 1 or 2 USB ports for transferring your application or connecting your terminal to USB devices, such as a printer or a barcode reader
- 1 or 2 serial ports for communicating with Schneider or third-party PLCs (Mitsubishi, Siemens, etc.)
- 1 Ethernet port for communicating using the Modbus/TCP protocol



### XBT GK communication ports

XBT GK terminals have the following communication ports:

- 1 or 2 USB ports for transferring your application or connecting your terminal to USB devices, such as a printer or a barcode reader
- 1 or 2 serial ports for communicating with Schneider or third-party PLCs (Mitsubishi, Siemens, etc.)
- 1 Ethernet port for communicating using the Modbus/TCP protocol



### XBT G main characteristics

This screen provides a summary of the main characteristics of the communication ports on XBT G terminals in terms of:

- types of connection
- protocols
- number of possible devices
- transmission speed.

Port	Connection	Protocol	Number of devices	Transmission speed
COM1 (2)	SUB-D 25 pins RS232C/RS485	Uni-TE Modbus Modbus Slave Third party (1)	15 on COM1 1 on COM2	38.4 Kbps
COM2 (2)	SUB-D 9 pins RS232C	Uni-TE Modbus Third party (1)	15 on COM1 1 on COM2	38.4 Kbps
Ethernet (3)	RJ45 10BASE-T	Modbus & Modbus Slave TCP/IP (3)	48	10 Mbps

- (1) Melsec (Mitsubishi), Sysmac (Omron), Allen-Bradley (Rockwell Automation), Simatic (Siemens), Simatic NITP/TBP 505, Profibus DP Slave
- (2) Uni-Telway: Client/server with XBT G client, Modbus: Master/slave with XBT G master
- (3) Rockwell Ethernet/IP Explicit Messaging



### XBT GT main characteristics

This screen provides a summary of the main characteristics of the communication ports on XBT GT terminals in terms of:

- types of connection
- protocols
- number of possible devices
- transmission speed.

Port	Connection	Protocol	Number of devices	Transmission speed
COM1	SUB-D 9 pins RS232C/ RS422 (RS485)	Uni-TE Modbus Modbus Slave Third party (1)	15 on COM1 15 on COM2	115.2 Kbps
COM2 (2)	RJ45 Modbus 2-wire/ RS485	Uni-TE Modbus Third party (1)	15 on COM1 15 on COM2	12 Mbps (3)
Ethernet	RJ45 10BASE-T 100BASE-TX	Modbus & Modbus Slave, UniTE TCP/IP	48	10 Mbps 100 Mbps
USB	USB Module to RJ45	Modbus Plus FIPWAY	64	1 Mbps

- (1) Melsec (Mitsubishi), Sysmac (Omron), Allen-Bradley (Rockwell Automation), Simatic (Siemens), Simatic NITP/TBP 505, Profibus DP Slave
- (2) Siemens MPI direct
- (3) 115.2 Kbps only for XBT GT2110
- (4) Ethernet - Rockwell Ethernet/IP Explicit Messaging, Modbus Slave, UniTE TCP/IP

### XBT GK main characteristics

This screen provides a summary of the main characteristics of the communication ports on XBT GK terminals in terms of:

- types of connection
- protocols
- number of possible devices
- transmission speed.

Port	Connection	Protocol	Number of devices	Transmission speed
COM1	SUB-D 9 pins RS232C/ RS422 (RS485)	Uni-TE Modbus Modbus Slave Third party (1)	15 on COM1 15 on COM2	115.2 Kbps
COM2 (2)	RJ45 Modbus 2-wire/ RS485	Uni-TE Modbus Third party (1)	15 on COM1 15 on COM2	12 Mbps
Ethernet	RJ45 10BASE-T 100BASE-TX	Modbus & Modbus Slave TCP/IP	48	10 Mbps 100 Mbps
USB	USB Module to RJ45	Modbus Plus USB FIPway	64	1 Mbps

(1) Melsec (Mitsubishi), Sysmac (Omron), Allen-Bradley (Rockwell Automation), Simatic (Siemens), Simatic NITP/TBP 505, Profibus DP Slave

(2) Siemens MPI direct

### XBT GC Main Characteristics

This screen provides a summary of the main characteristics of the communication ports on XBT GC terminals in terms of:

- types of connection
- protocols
- number of possible devices
- transmission speed.

Port	Connection	Protocol	Number of devices	Transmission speed
COM1	SUB-D 9 pins RS232C/ RS422 (RS485)	Uni-TE M Solution Designer Combo Third party (1)	15 on COM1	115.2 Kbps
Ethernet	RJ45 10BASE-T 100BASE-TX	PacDrive, M Solution Designer - Network	48	10 Mbps 100 Mbps
USB	USB Module to RJ45	Modbus Plus USB FIPway	64	1 Mbps

(1) Melsec (Mitsubishi), Sysmac (Omron), Allen-Bradley (Rockwell Automation), Simatic (Siemens), Simatic NITP/TBP 505, Profibus DP Slave

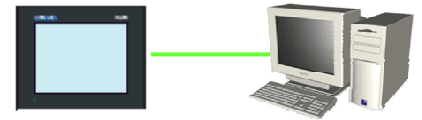
### USB port(s)

Depending on the type of terminal, you can use 1 or 2 USB ports

- For high-speed transfers of your application
- To connect one or more USB devices, such as a printer or a barcode reader (1 device per port)
- Using a USB hub allows you to connect several devices to the same USB port.
- XBT GT1000 terminals do not have USB ports: they have an 8-contact mini-DIN connector for an application transfer cable (identical to those used for the XBT G range).

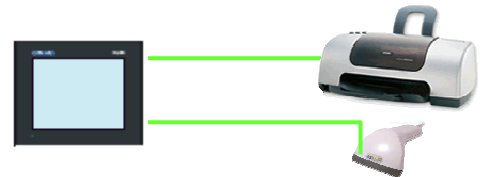
- Easy connection and high speed transfer

- "Plug and play" (no settings)
- Download/upload about 100 times faster than serial port

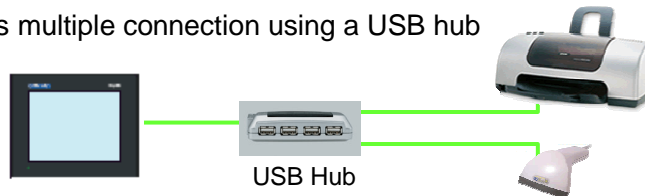


- Connection of various USB devices

- Printer, barcode reader, etc.



- Simultaneous multiple connection using a USB hub



### USB Printer Support

It is now possible to connect 80% of the HP printer range to XBTGTs, via either the USB port or Ethernet.

#### ■ USB printers support on XBTGT

##### ● Support of HP's famous printer series :

- ✓ HP DeskJet Series
- ✓ HP Business InkJet
- ✓ HP OfficeJet Pro
- ✓ HP LaserJet
- ✓ HP Photosmart Series



**USB**  
UNIVERSAL SERIAL BUS



### Serial port(s): Uni-Telway link

If you use your serial port as a Uni-Telway link (client/server protocol), the terminal is configured as a client.

This means that you can connect several terminals to the same bus, using a Schneider PLC (Premium, etc.) as a server.

A maximum of 28 clients can be used with the Uni-TE protocol.

- 1 or 2 communication ports
- Uni-TE client/server protocol
- XBT G/GT configured as client
- Master devices: Schneider PLCs

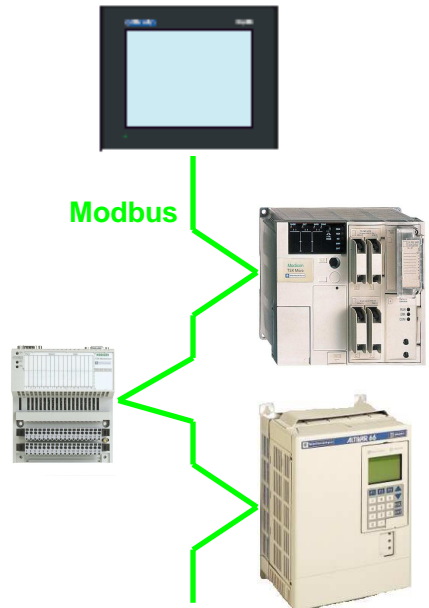


### Serial port(s): Modbus link

If you use your serial port as a Modbus link (Modbus protocol), the terminal is configured as the master, which imposes a limit of one Magelis terminal on the bus.

The number of slaves on the bus is limited to 15.

- 1 or 2 communication ports
- Modbus master/slave protocol
- XBT G/GT configured as master
- Slave devices:
  - Quantum, Premium, Micro, Twido PLCs
  - Momentum PLC & distributed I/O
  - Altivar speed drives, etc.



### Modbus Plus Link

You can add a Modbus Plus interface card to the back of an XBTG unit to allow the XBTG to communicate with Modbus Plus enabled PLCs.

The interface is an option and must be purchased separately

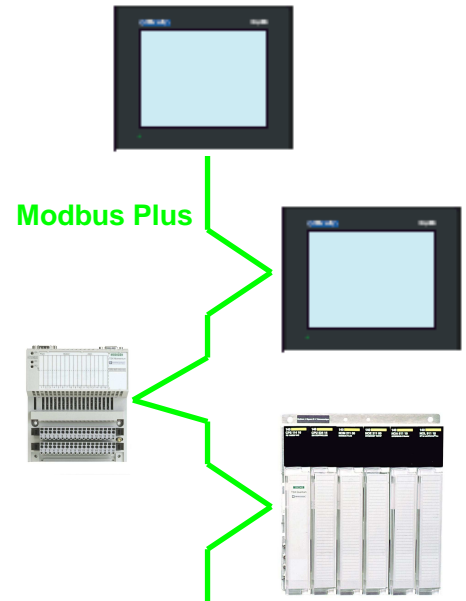
- XBTG now, XBTGT a little later
- Requires external interface (below) to be added
- Becomes another node on a Modbus plus network
- Can connect to any Modbus Plus enabled PLC



(before)



(after)



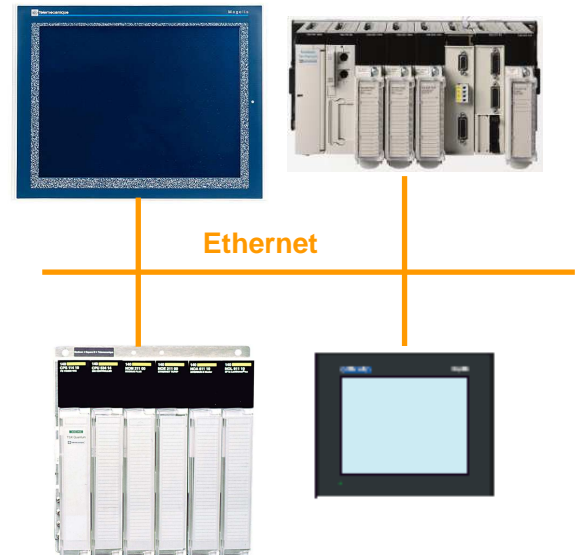


### Ethernet port

Some terminals come with a standard RJ45 connector for connecting an Ethernet 10/100 Mbps network.

The Modbus TCP/IP protocol is used for communication.

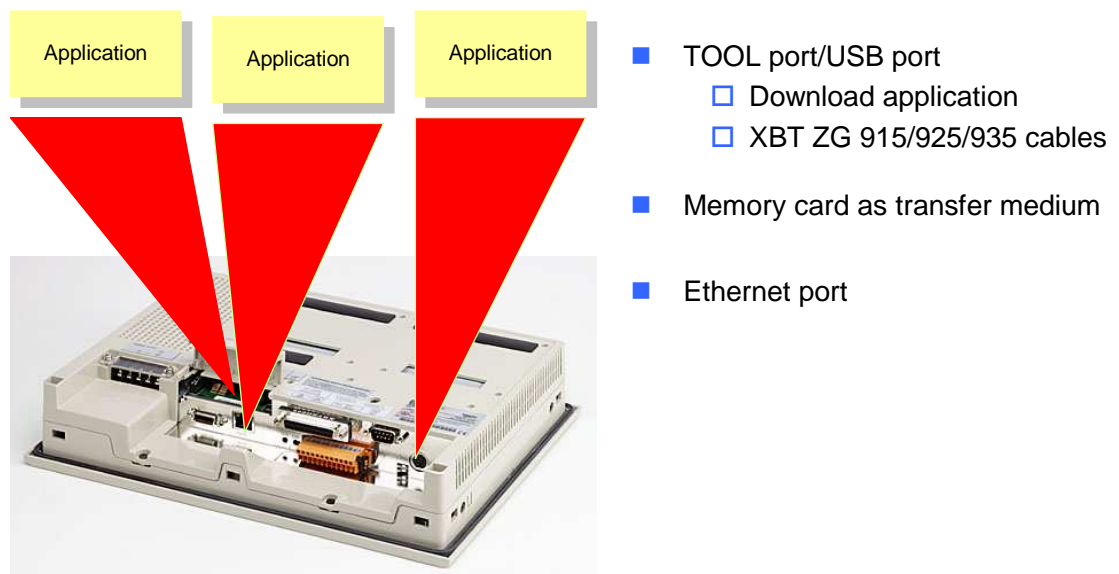
- 1 communication port
- Modbus TCP/IP protocol
- XBT G/GT manages exchanges with connected devices
- Devices: all Ethernet equipment
  - Quantum, Premium, Micro PLCs
  - Momentum PLC
  - Advantys distributed I/O, etc.



### Transferring your application

The options for transferring your application to the terminal are as follows:

- You can use the transfer cable (Tool port for XBT G or XBT GT1000 terminals, USB port for XBT GT series 2000 to 7000 terminals)
- You can use the memory card as a transfer medium:
  - The application is transferred to the memory card connected to your PC using the XBT ZG ADT adaptor.
  - The memory card is then inserted in the terminal to transfer the application to the internal memory. Don't forget to configure the memory card as a backup memory.
- You can use the Ethernet link. If several terminals are connected to the network, you can transfer the entire project.
- You cannot transfer a program using the Modbus Plus interface



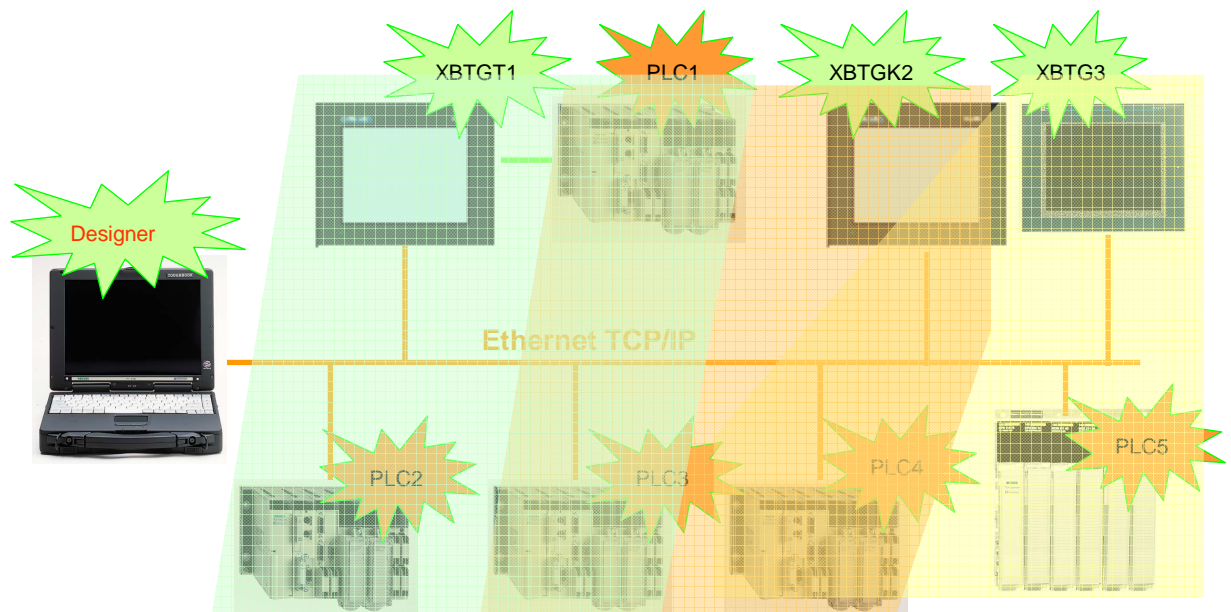
### XBT G/GT/GK within a distributed architecture

In a distributed architecture controlled via the Ethernet network, the designer can transfer the entire project (several applications) to different terminals (for example XBTGT1, XBTGT2 and XBTG3).

Each application can be linked to one or more devices.

For example:

- The application running on terminal XBTG3 can use information from PLC4 and PLC5 via Ethernet.
- Terminal XBTGK2 is linked to PLC1 (shared data) and PLC3 and PLC4 via Ethernet.
- Terminal XBTGT1 is linked to PLC1 (serial link) and PLC2 and PLC3 via Ethernet.

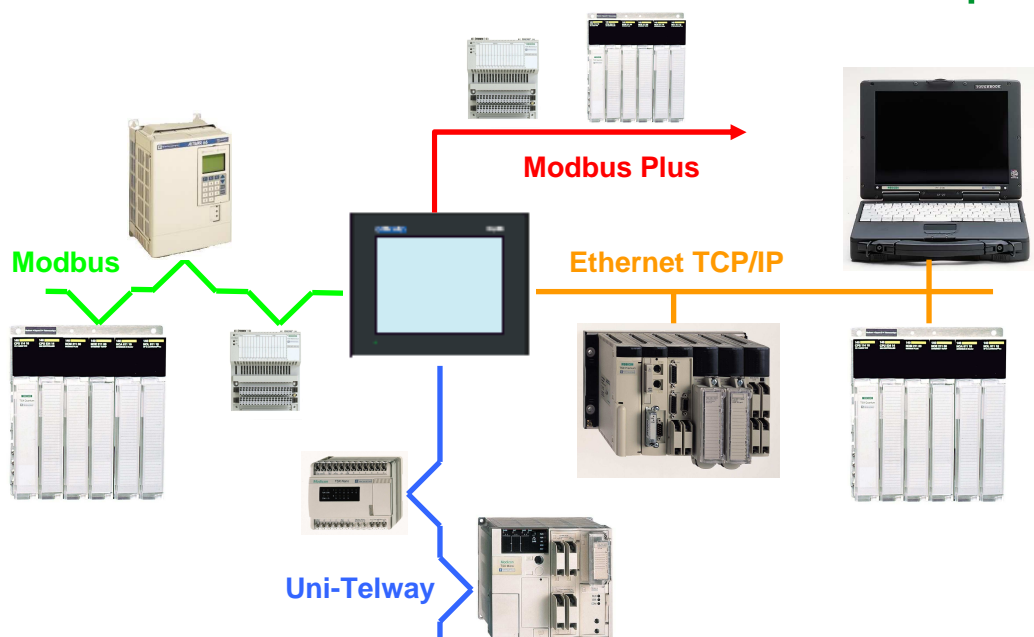


### Simultaneous use of communication ports

All the communication ports on a XBT G or XBT GT terminal can be used at the same time.

If you follow the communication rules described earlier, your HMI application can then refer to devices connected via a

- Modbus link
- Uni-Telway link
- Ethernet link
- And Modbus Plus Link , on XBTGs only



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# Module 5: Initializing a Magelis



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### Vijeo Designer RunTime System

The Runtime system installed on the terminal allows you to run the HMI application. The Runtime system must be compatible with the Vijeo Designer editor used to create the application.

The Runtime system is automatically transferred with the application.

The “Runtime installer” tool can, however, be used to install the system separately (in recovery mode for example).

Runtime can be installed using the memory card (if it is supported by the terminal) or the Runtime installer tool, via the Ethernet, Tool or USB ports on your terminal.

In addition, IPC’s can also use CD Roms or floppy drives if they have them

- Runtime resides on the target machine and runs the user-created application
- The Vijeo Designer Editor and Runtime system must be compatible
- The Runtime system is automatically installed when you download your application
- Installation methods for installing the Runtime system

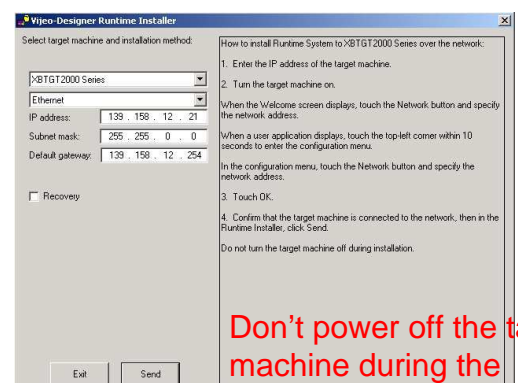
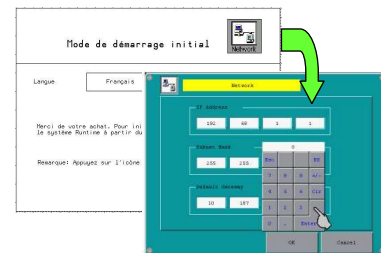
Target machine	Runtime installer			CF card
	Ethernet	Tool port	USB port	
XBT G XX30	Yes	Yes	No	Yes
XBT GT 1130	Yes	Yes	No	No
XBT GT 2110/2120/2220	No	No	Yes	No
XBT GT 2130, 2330 to 7000 XBT GTK 2120 to 5330	Yes	No	Yes	Yes
XBT GC 1100	No	No	Yes	No
XBT GC 2110	No	No	Yes	NO
XBT GC 2230	Yes	No	Yes	NO
iPC	Yes	No	Yes	CF, CD-R, Floppy

### Installing the Runtime system using Ethernet

To transfer the Runtime system via an Ethernet network:

- Configure the terminal's Ethernet parameters (IP address, subnet mask, etc.)
- Connect the terminal to your PC via the Ethernet network
- Launch the Runtime installer tool, accessed from *Programs/Schneider Electric/Vijeo Designer/Tools*
  - Select the target machine (XBT G or XBT GT) and the installation method (Ethernet)
  - Define the communication parameters (terminal IP address, subnet mask, etc.)
  - Click Send to start the transfer

N.B.: The terminal must remain powered on throughout the transfer.



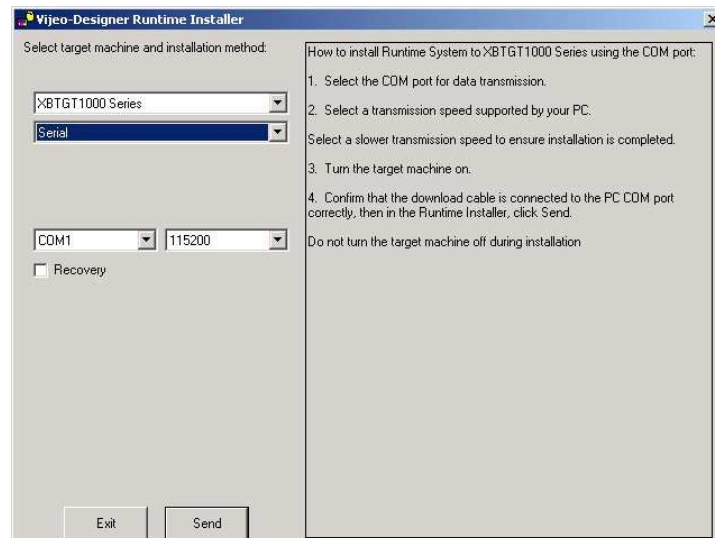
Don't power off the target machine during the transfer

### Installing the Runtime system using the Tool port

To transfer the Runtime system via the terminal's Tool port:

- Connect the terminal to your PC using the XBTZG915 or 925 cable
- Launch the Runtime installer tool:
  - Select the target machine (XBT G or XBT GT) and the installation method (Serial)
  - Define the communication parameters (port and transmission speed)
  - Click Send to start the transfer

N.B.: The terminal must remain powered on throughout the transfer.



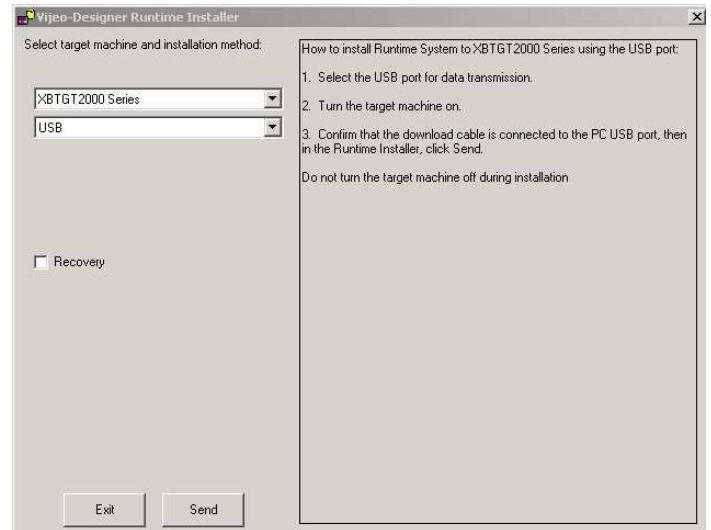


### Installing the Runtime system using a USB port

To transfer the Runtime system via a USB port on the terminal:

- Connect the terminal to your PC using the XBTZG935 cable
- Launch the Runtime installer tool:
  - Select the target machine (XBT GT) and the installation method (USB)
  - Click Send to start the transfer

N.B.: The terminal must remain powered on throughout the transfer.



### Runtime system in Recovery mode

The Runtime system is transferred in recovery mode when the terminal's Runtime system is damaged or when you cannot access the password on the terminal.

N.B.: This operation deletes the project and any data on the terminal.

The procedure depends on the type of terminal:

- Using the memory card. Contact Schneider technical support to perform this operation when using an XBT GT2110 terminal.
- Using the Runtime installer tool in recovery mode

Irrespective of the type of communication selected, the PC must be connected to the terminal via an XBTZG915 cable.

- **Methods for recovering the Runtime system depend on type of target machine**

Target machine	Recovery method
<b>XBT G series</b> (except XBT G2110) <b>XBT GT2000 to 7000 series</b> (except XBT GT2110 and XBT GT1000 series)	CF card
<b>XBT G series, iPC</b> <b>XBT GT1000 series</b>	Recovery mode of Runtime installer

- **Runtime installer needs to connect your PC to the terminal**

Target machine	Download	Cable
<b>XBT G series</b> <b>XBT GT1000 series</b>	Serial	XBTZG915 cable
	Ethernet	XBTZG915 and Ethernet cables

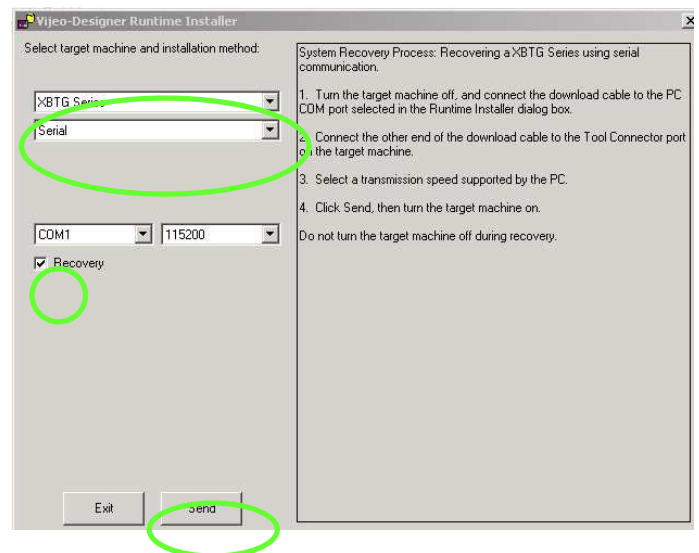
### Transferring the Runtime system in Recovery mode

In Recovery mode you must first launch the transfer of the Runtime system, then power on the terminal.

To do this, follow the procedure below:

- Power off the terminal
- Connect the terminal to your PC using the transfer cable
- Launch the Runtime installer tool
- Define the communication parameters such as type of machine, transfer method, communication port and transmission speed, as well as the IP parameters if you have selected Ethernet
- Check the Recovery checkbox
- Click Send
- Power on the terminal

Note: Do not power off the target during the transfer.



### Adjusting the terminal

**The terminal settings can only be accessed if an HMI application is loaded in the terminal.**

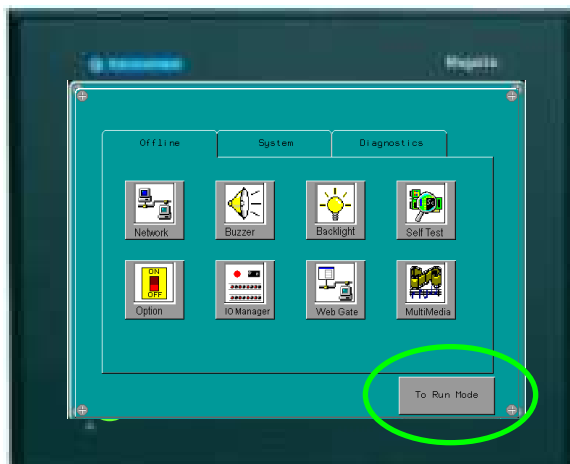
There are three methods of displaying your terminal's configuration screens:

- Press the top-left corner of the screen and/or
- Press more than one corner of the touch-sensitive screen simultaneously, depending on the option selected for your application
- You can also animate a screen area or a button to access the terminal configuration screens

There are two tabs for accessing the:

- offline configuration screens
- system configuration screens

The *To Run mode* key allows you to return to your application's normal operating mode.



### Offline configuration screens

This screen provides access to 8 icons which are used to:

**Network** - Define or redefine the Ethernet communication parameters, such as IP address, subnet mask and default gateway address. This function is only accessible on terminals which have an Ethernet link.

**Buzzer** - Enable or disable the buzzer function on your terminal. If the function is enabled, touching an object causes a beep to sound.

**Backlight** - Configure the terminal to switch to standby mode after a certain period, from 15 seconds to 30 minutes. The keys are inactive in standby mode and only an alarm will reactivate the backlight.

You can also keep the keys active in this mode: we recommend this option.

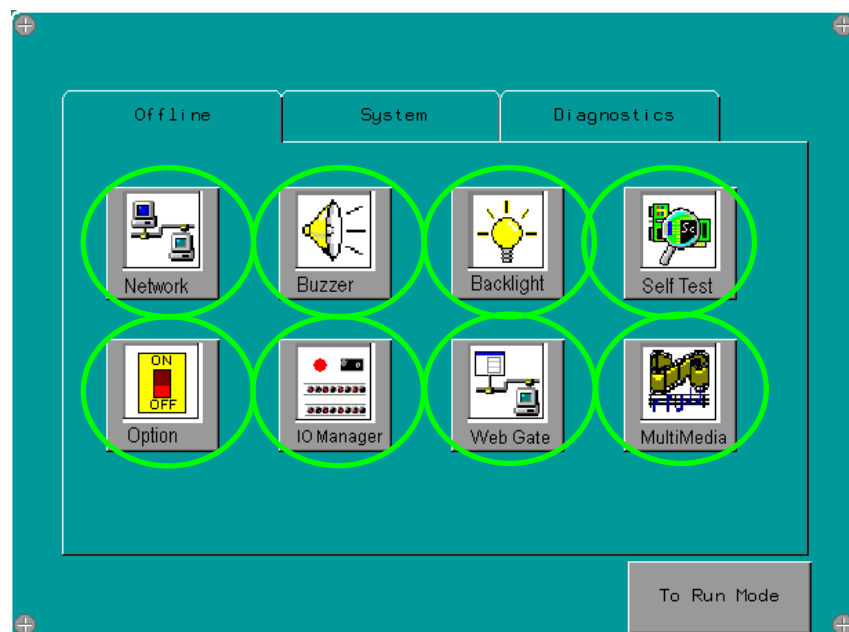
**Self Test** - Launch terminal self-tests, such as testing the fonts, screen, touch panel, serial ports and video memory.

**Option** - Enable power supply to the COM1 port (power/no power to connector pin 9). This function is not accessible with the XBT G and XBT GT1000 terminals.

**I/O Manager** –Allows you to view or modify driver configuration and equipment configurations from the panel

**Webgate** - Allows you to configure the Web Gate option from the panel

**Multimedia** –Allows you to adjust the multimedia configuration from the panel



### System configuration screens

This screen provides access to 8 icons which are used to:

**Stylus:** Calibrate your terminal. Press all of the crosses to complete calibration.

**Date/Time:** Update the date and time on the terminal

**Restart:** Restart your HMI application

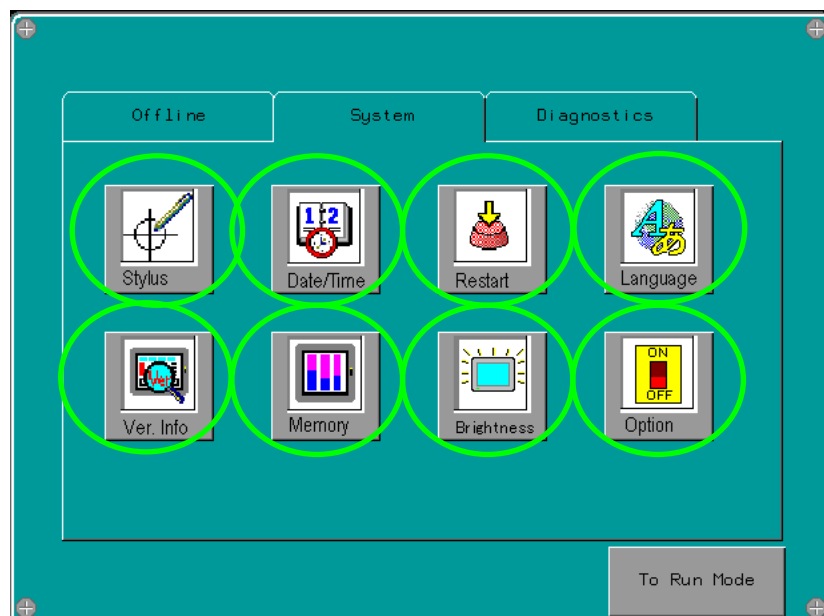
**Language:** Change the system language and user language

**Ver. Info:** Display the Runtime system and application versions (version of Vijeo Designer editor used to create the application and Build number)

**Memory:** Display the memory used and memory available: dynamic memory (DRAM), internal user memory (Main Flash) and memory card

**Brightness:** Adjust the screen brightness and contrast.  
Color screens with an active TFT matrix only allow the brightness to be adjusted.

**Option:** Display data in video or reverse video mode if using a monochrome screen

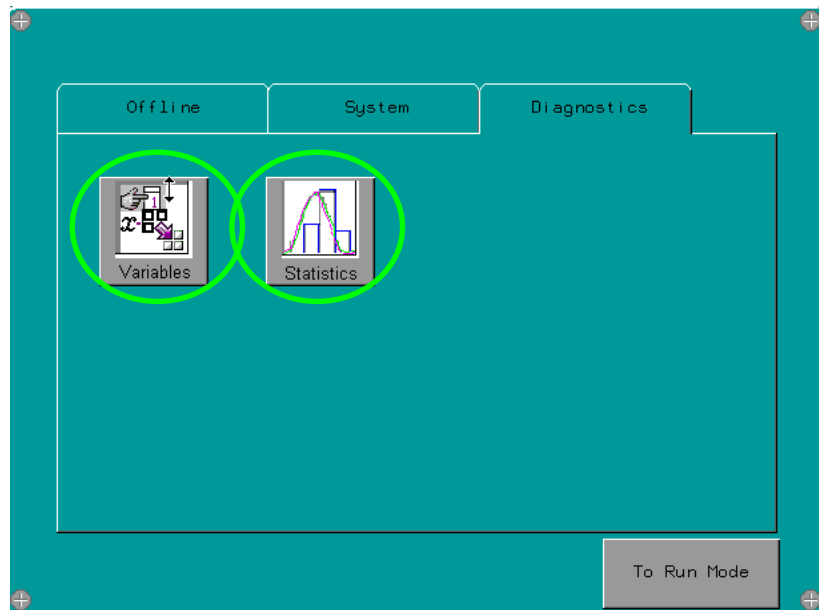


### System diagnostics screens

This screen provides access to 2 icons which are used to:

**Variables:** used to test communications between the target and the PLC. It also traps communication errors

**Statistics:** shows communication statistics between target and PLC



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# **Module 6: Introduction to process control**

**10**



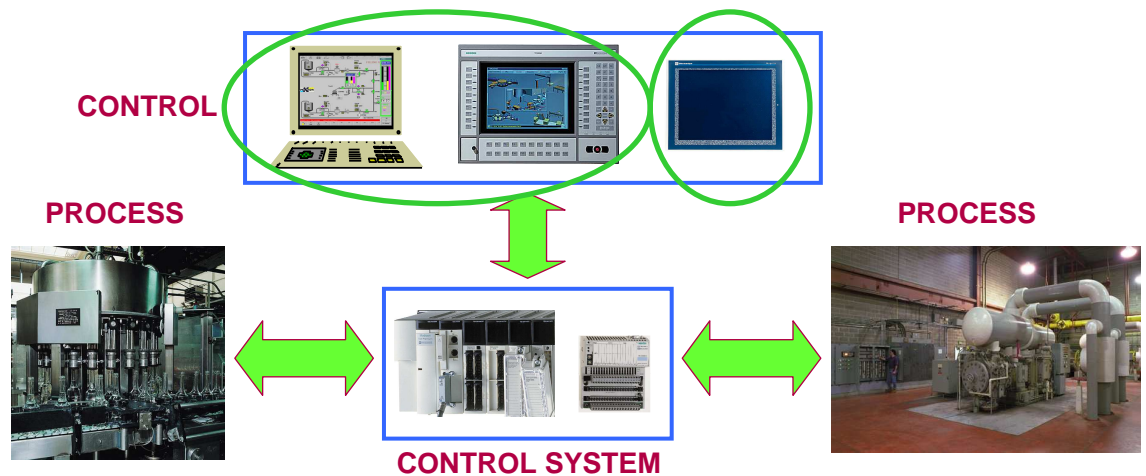
### Introduction to process control

In a **system control architecture** the **control** element involves providing an operator with an interface that can be used to visualize and control the **process** remotely.

In general, this is achieved using either of the following:

- a screen/keypad
- a touch screen

- Graphic interface: Screen/keypad or touch screen



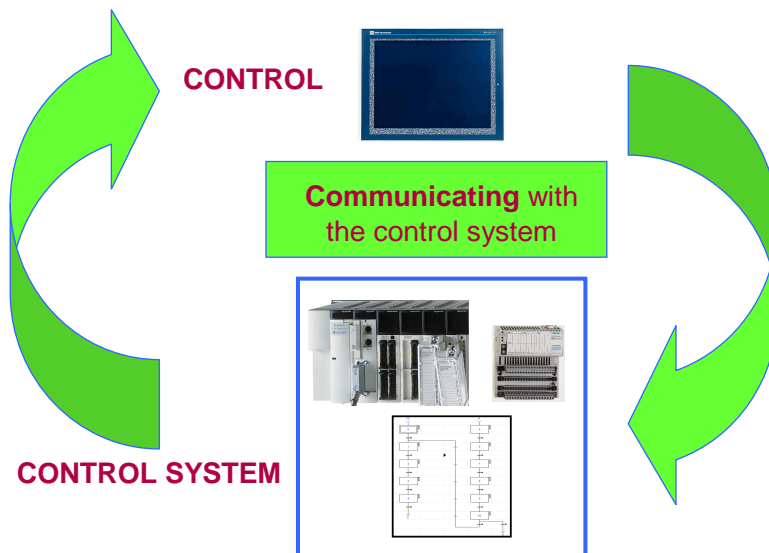
### Limits of control

This control should not extend to the processing handled by the control system . It is limited to:

- Reading data from the PLC with the aim of informing the operator about the process via panels, popup windows and other elements
- Writing data to the PLC with the aim of controlling the process via the program, a keypad or touch panel, etc.

**Control is only about communicating with the control system.**

- **No involvement** in the processing handled by the control system



### Operator dialog software

Now we will look at the operator dialog software.

This Vijeo Designer software is installed on your PC and uses the Windows user interface.

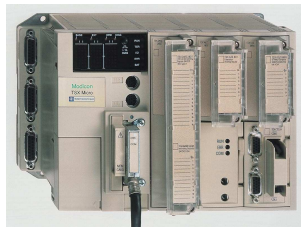
You can use it to create your application, providing a graphic representation of the automated process. A graphic editor is supplied to help you draw the process. It also provides you with dialog boxes that make it simple for you to configure the animations.

The software also manages the standard functions an HMI application offers, such as alarms, trend charts, whether in real time or historical, as well as data storage, recipes and other items.

And finally, variables (or tags) are used for communication with the PLC, exchanged via networks or buses.



**CONTROL**



**PLC**

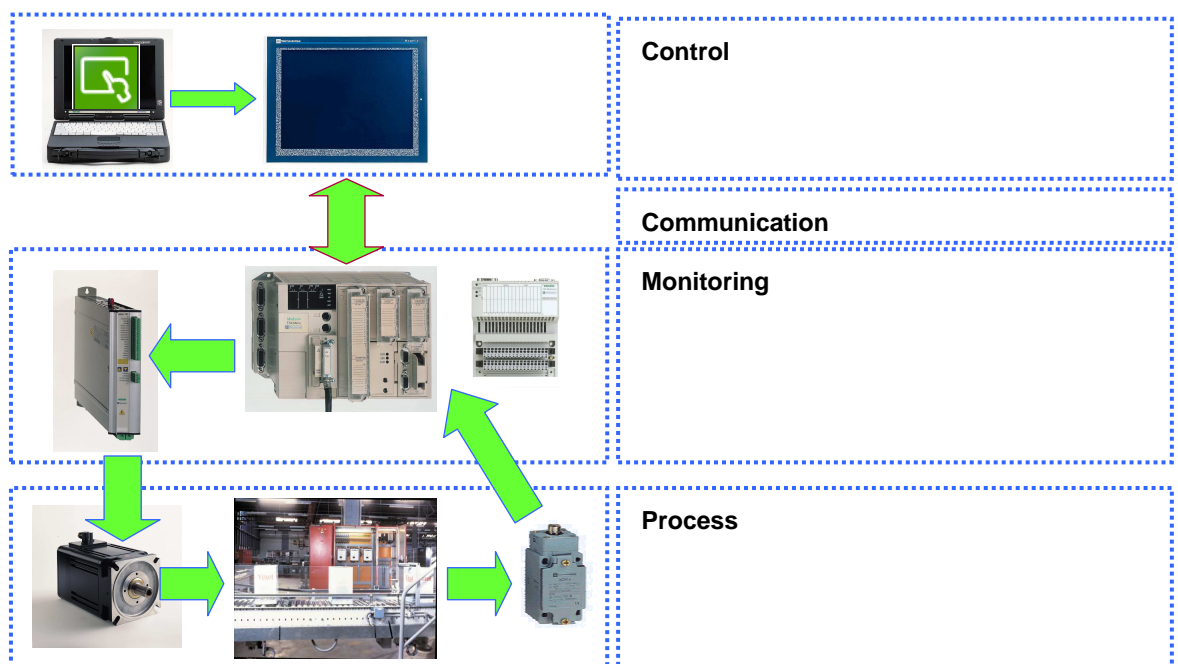
- **Operator dialog software**

- Installed on the PC
- Used to create a graphic application
- Manages functions
- Communicates with the PLC

### Links between the control and the process

Links between control and process are established at several levels.

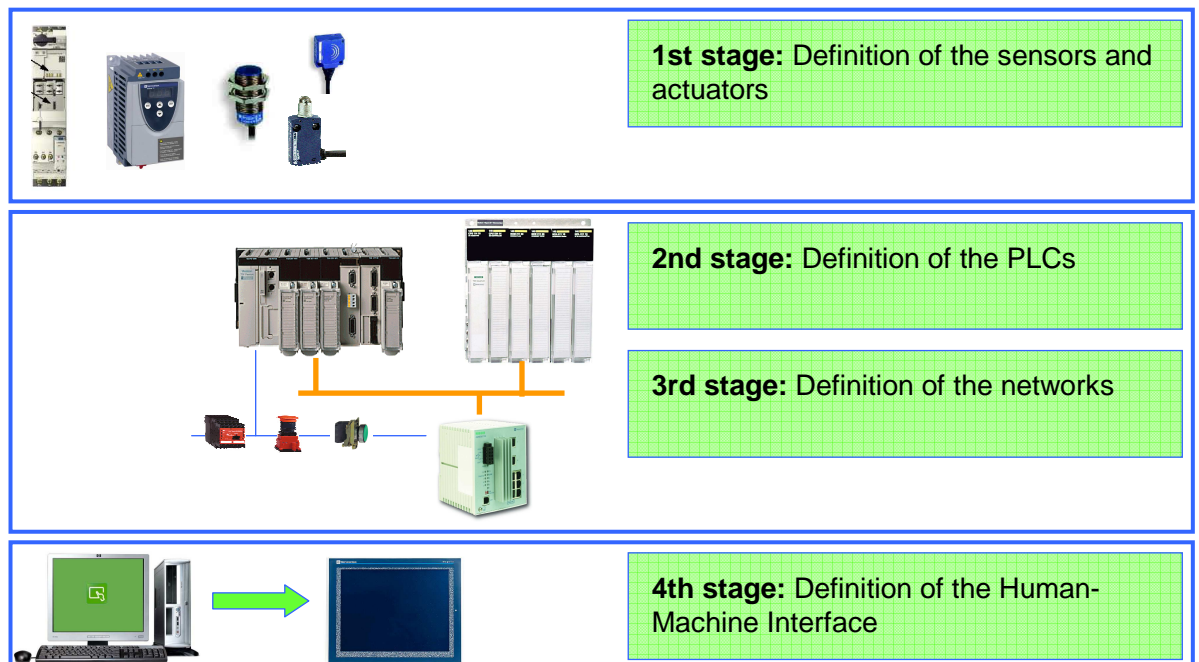
- There is the control level where:  
the HMI application developed using Vijeo Designer can be used to monitor and control the process, based on a set of views.
- There is communication with the control level.  
This is done via the terminal's communication interfaces, such as COM ports or Ethernet links, and standard cabling devices, such as cables, hubs or switches.
- There is the monitoring level, which applies to:
  - Process control devices, such as PLCs with their I/O, expert modules like counter or axis control modules or their communication modules for networks or buses, such as Modbus, CANopen or As-i
  - Electrical power equipment, such as motor starters or drives
- There is the process level with:
  - Sensors and actuators that have a direct effect on process devices, such as pressure or temperature sensors, motors and limit switches
  - Process devices, such as conveyors, tanks or hoppers, valves and, of course, all the piping required to connect these various devices



### Building a project

There are 4 distinct stages involved in building control-command projects.

- In stage 1, you need to analyze the process you want to automate and define the sensors and actuators you need in this process in terms of type and number of devices.
- In stage 2, you need to define the PLCs you need to automate your project, which means selecting:
  - the processor, in terms of its processing capacity, memory size, etc.
  - the type of inputs/outputs, such as discrete, analog, rack or remote I/O
  - the expert modules, such as counter, axis control or weighing modules
- In stage 3, you need to define the networks and fieldbuses you are going to use to establish communication between your devices, such as between process and PLC, between PLCs, between PLC and supervisor, for instance.
- In stage 4, you need to define the Human Machine Interface, such as a screen or keypad, touch screen, etc.

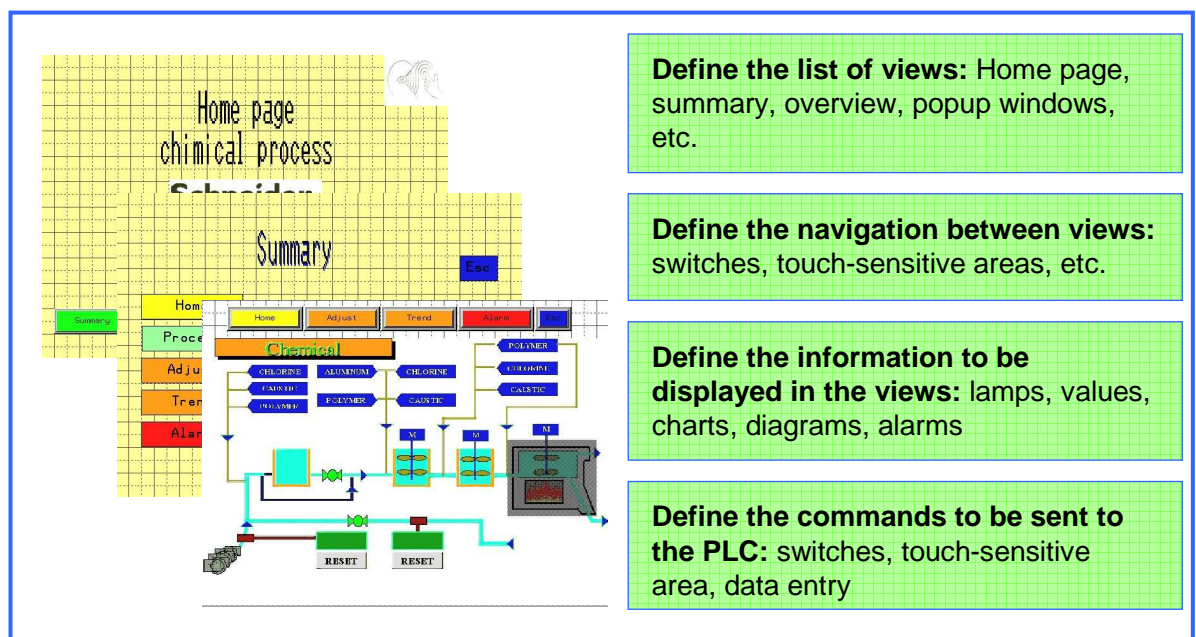


### Control-command project

Defining your control-command project basically involves analyzing the process with the aim of preparing the development of your HMI application. In order to perform this operation, you need to carry out the following stages that will be described in detail later.

- You need to define the complete list of views and popup windows.
- You need to define how to navigate between the different views.
- You need to define the information that has to be displayed or logged for possible display later.
- Finally, you need to define the operator commands, which is the information written to the PLC.

If you carry out this analysis at the start of developing your HMI application, it will help you when you come to define the content of the views.



### Defining the list of views

This first stage involves defining the complete list of views required by your HMI application.

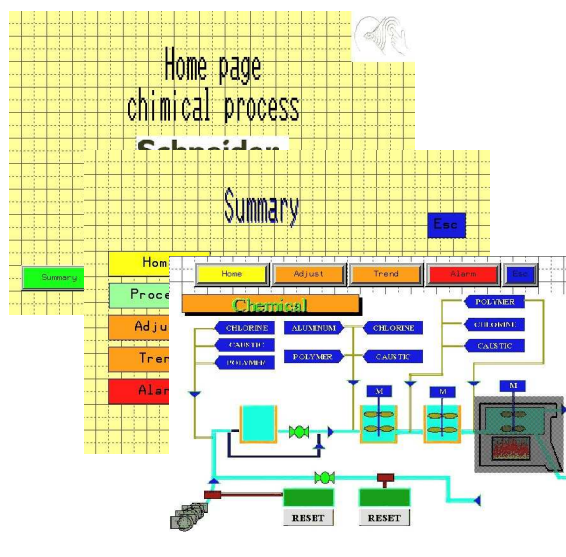
Each view is a window used to provide an interface between the process and operator. It may take the form of a panel, a popup window, displayed automatically or when the operator performs a particular action, or of a banner, for instance.

Usually, an application has a home page

one or more summary pages

a general overview of the process

and detailed views, adjustment or maintenance pages, an alarms page and/or banner and trend charts, for instance.



#### • Work through the views required

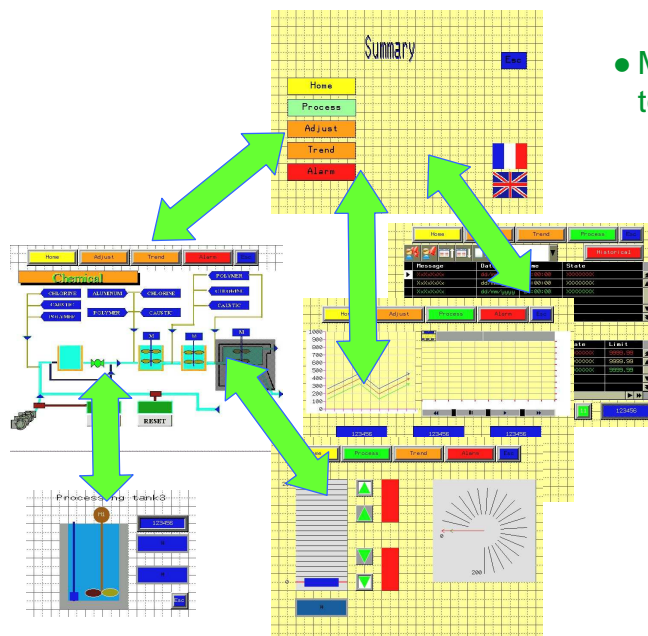
- In collaboration with the end user
- Before developing the HMI application
- Home page with the name of process, logo of end user, etc.
- Summary page, which lists and classes the views available
- Overview of the process
- Adjustment/maintenance pages
- Alarms page
- Trend charts, etc.

### Defining the navigation between views

This operation involves defining how to navigate between the different views, based on the end-users' expectations.

You need to define which views are used most often by users and take this as the basis for trying to minimize the number of actions the user requires to switch from one view to another.

For example, if you wanted to optimize maintenance operations you would make it possible to switch directly between adjustment views, without needing to go via the summary view.



- Minimize the number of actions required to switch between views

- Most commonly used views
- Summary page
- Use of popup windows
- Direct switch between 2 views (adjustment)



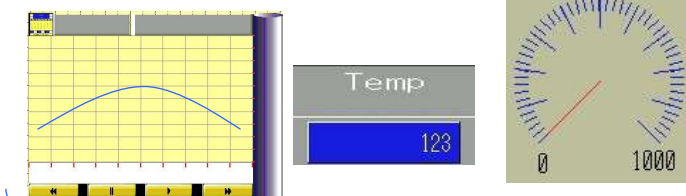
Apart from a few static graphic objects, like logos or pictures, most of the objects you will use in your views are animated graphic objects. This means that they are associated with a type of animation and a variable read from the PLC. These are based on:

- Remote signaling, which associates a discrete variable with an animated object, like a lamp, for instance
- Remote measurement, which associates an analog (or integer) variable with an animated object, like a trend chart, for example



- Remote signaling
- Remote measurement

## Remote signaling



## Remote measurement

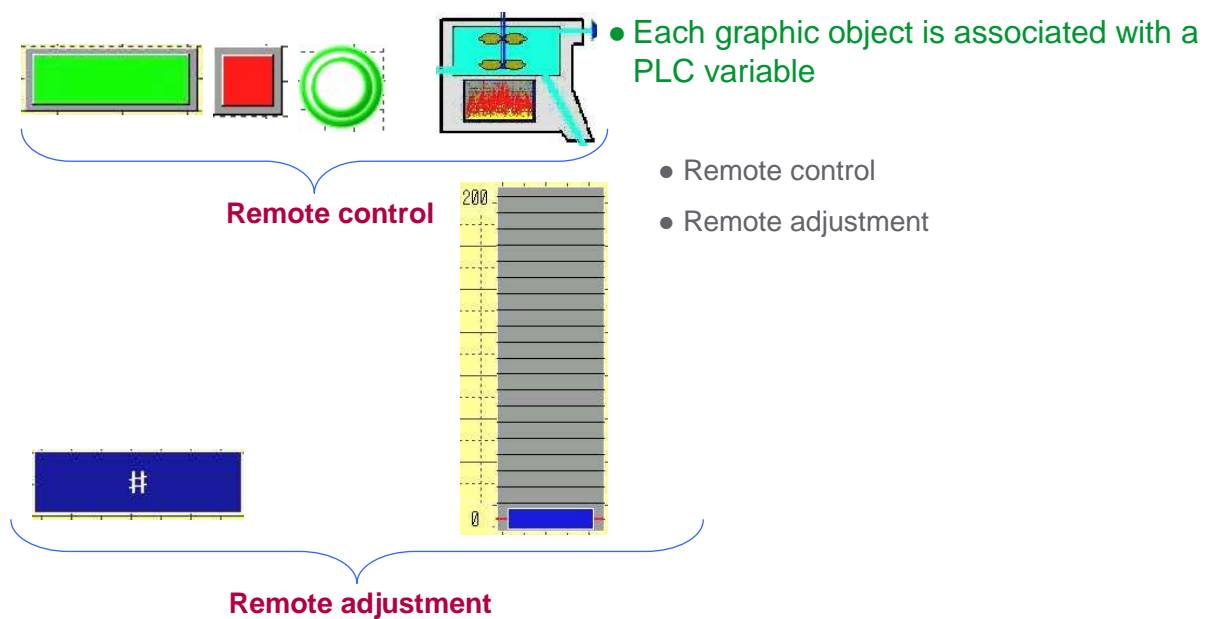
### Defining the commands

This stage involves formally defining the graphic objects that the operator needs to control the process, using the tools offered by Vijeo Designer.

Each object is associated with one of the following PLC variables:

- Remote control, which associates a discrete variable with an animated object, such as a switch
- Remote adjustment, which associates an analog variable with an animated object, like a potentiometer

A command can be transmitted via a pulse (touching a switch, for example), continuously (by pressing the cursor), or by simply inputting a value using a keypad.



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# Module 7: Vijeo Designer 5.0

11

### Running Vijeo Designer

To run Vijeo Designer V5.0 you need a PC with a Pentium IV processor and Windows XP or Windows Vista Business operating system.

Launch Vijeo Designer from the Start menu



- Minimum hardware configuration
  - PC: *Pentium 4 - 2 Ghz or more recommended*
  - Memory: *1 GB or more recommended*
  - Hard disk space required: 1 GB or more
  - SVGA monitor and pointing device
- Operating system
  - Windows XP (*Home, Professional and Server editions*)
  - Windows XP SP2
  - Windows Vista (*Business*)
- Once installation is complete, Vijeo Designer can be launched from the **Start** menu

### User interface

Vijeo Designer uses the Windows interface with its multi-window display. As with all other Schneider software applications, it features:

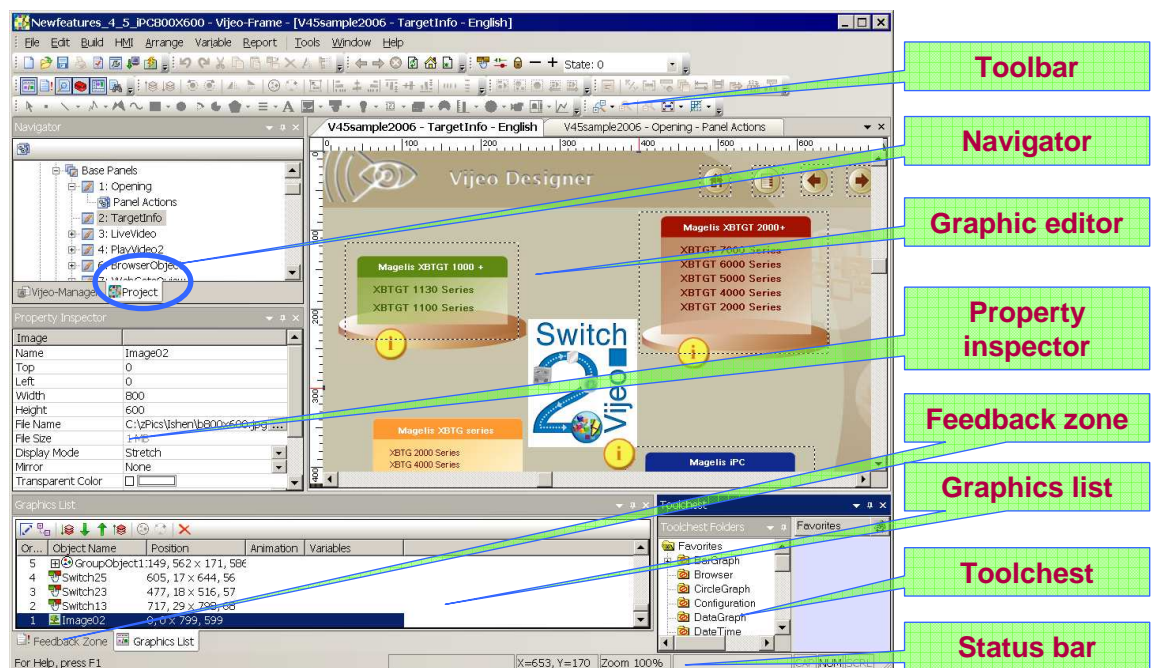
- The Menu bar and Toolbar, which you can use to access all the menus and tools you need to develop your HMI application
- The Status bar, which advises you about your software's status, such as the current zoom and the position of the selected window
- The Navigator, which you can use to create and access all the elements in your application such as panels, Java scripts, alarms and popup windows
- The Graphic editor, which you can use to create your application
- The Feedback zone, which indicates any faults that occur during your applications' validation or build process.

You can also use the following windows:

- The Toolchest of predefined graphic objects
- The Property inspector, which you can use to configure the selected object
- The Graphics list, which provides an exhaustive list of the objects that feature in the active window
- The variables window, which you can use to enter the application's variables

You can close, resize or move any of these windows.

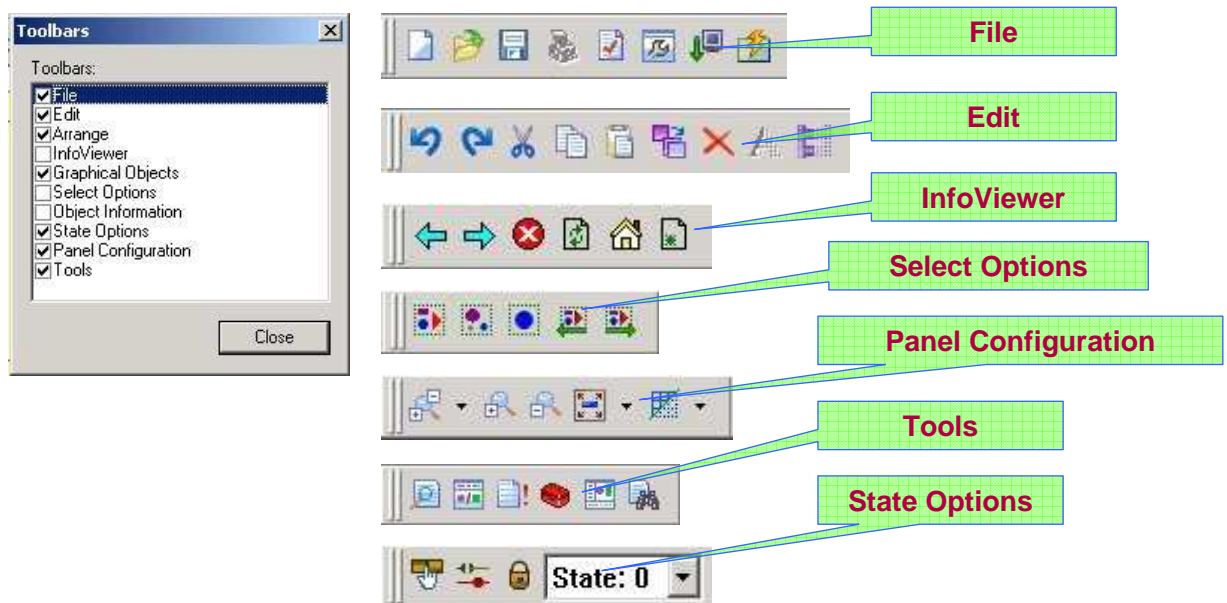
A lot of the objects in Vijeo Designer have right click menus (quick way to access settings)



### Toolbars

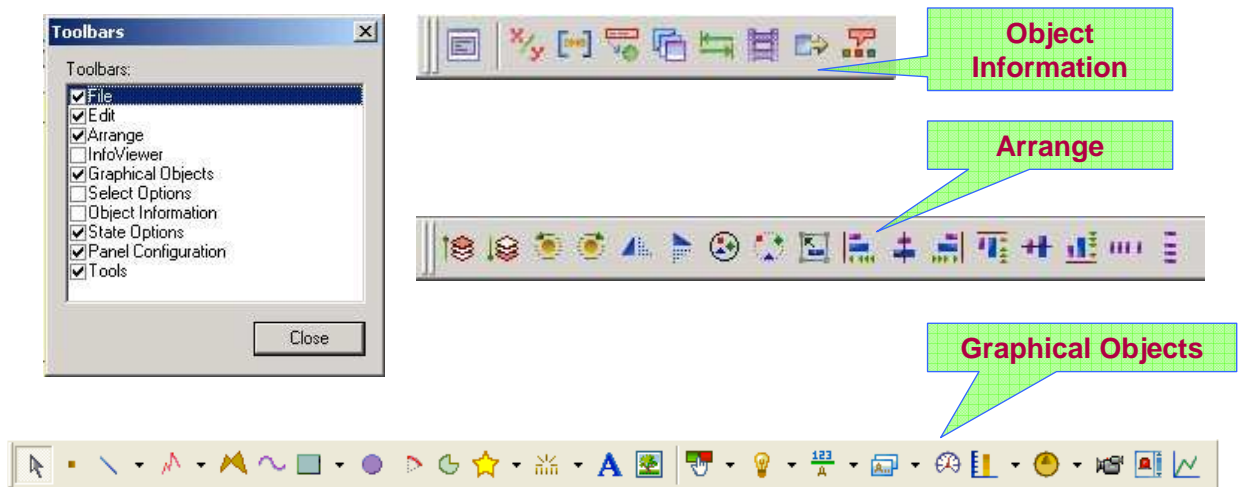
Vijeo Designer comes with 10 contextual toolbars.

- You can use the File toolbar for managing projects, which includes creating new projects, opening an existing project, saving, printing, validating or compiling projects.
- You can use the Edit toolbar for editing projects, which offers such functions as Undo, Redo, Cut, Copy, Paste, Duplicate and Delete.
- You can use the InfoViewer toolbar to manage the InfoViewer window, which offers such functions as Back, Forward, Stop, Refresh, Home, New address (URL).
- You can use the Select options toolbar to select objects, by selecting all objects, selecting objects by type, selecting one object, selecting the previous or next object.
- The Panel configuration toolbar accesses the zoom and grid functions, so that you can zoom in or out or select snap to matrix or grid and display the grid.
- You can use the Tools toolbar to display or hide different tools such as the Properties inspector window, List of objects or Report window.
- You can use the State options toolbar to preview the different states of an animated object, such as a switch or lamp. This includes, for example, touching a switch, turning a switch on and off, locking a switch, as well as up to 32 states for a lamp.



### Toolbars (continued)

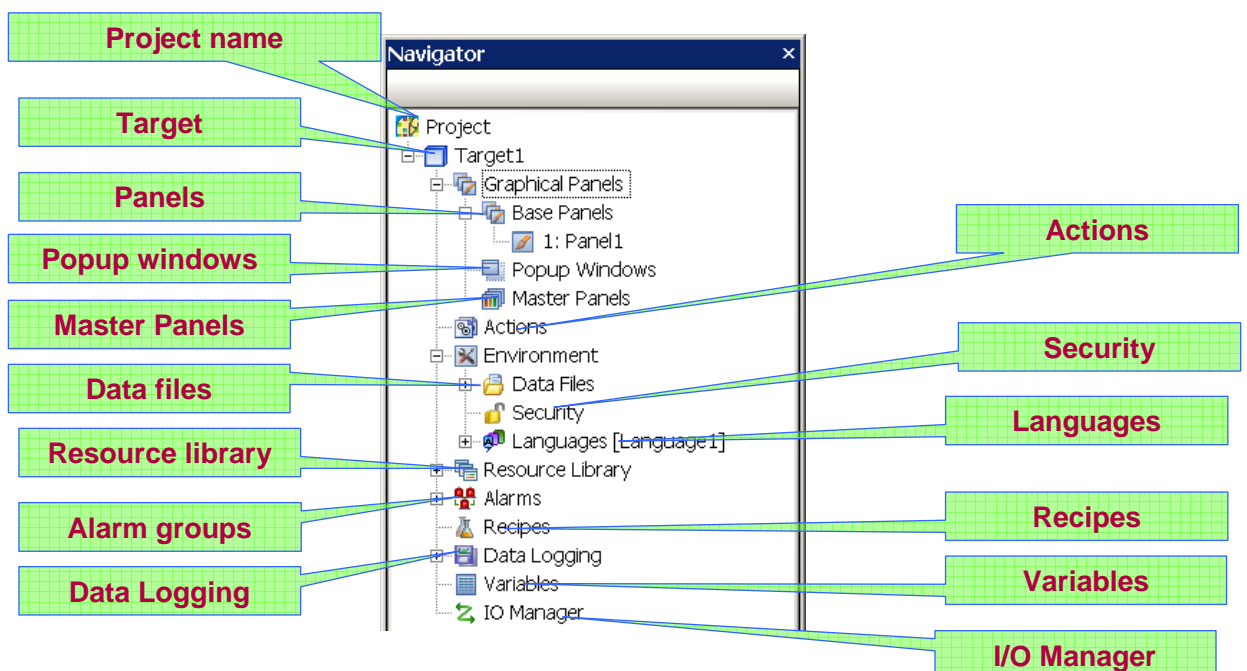
- The Object Information toolbar accesses information about an object, which involves validating the information displayed, the name of the associated variable, the associated address, the object's name, the object's order in the panel, the name of the group and its order in the panel, any animation, the name of the panel associated with the object, etc.
- You can use the Arrange toolbar to arrange objects, such as bringing objects to the front, moving them to the back, rotating them to the left or right, making them horizontally or vertically symmetrical, grouping and ungrouping them, as well as snapping to grid.
- You can use the Graphical objects toolbar to draw the panels, by selecting an object, point, line, polyline, polygon, Bezier curves, a rectangle, ellipsis, arc of a circle, switch, lamp, data display, message display, meter, bargraph, selector, **video display**, alarm summary, trend graph, etc.



### Navigator

The Navigator is used to access all the components making up your HMI application. It gives:

- the name of the project.
- The name of your project's HMI. A project can have many HMIs, including several XBT G / XBT GT terminals.
- the list of graphic panels
- the list of popup windows
- The list of Master Panels
- The Actions, which supports HMI operations and application scripts written in Java
- the data files, whether text or audio
- The security
- the languages
- the resource library for objects (color animation, switch, lamp, data display, message display, meter, bargraph and selector)
- the alarm groups and categories
- the recipe groups
- Data Logging
- The Variables
- the I/O managers





### Graphical Panels

The Graphical Panels node in the Navigator window provides the following types of panels:

#### Base Panels

Place switches and lamps, or draw other objects on a base panel. The panel you create becomes the display screen on terminals.

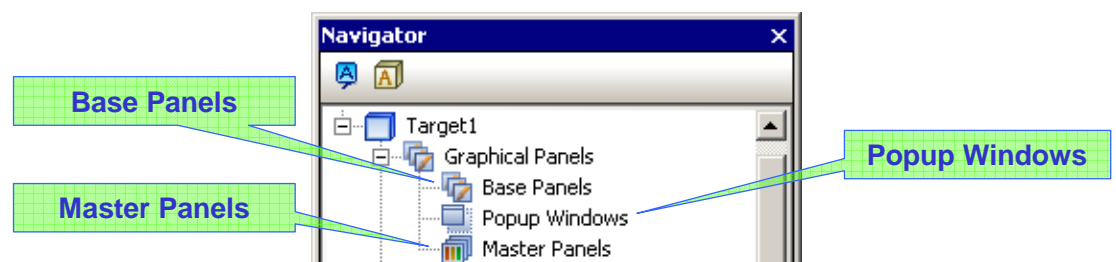
#### Master Panels

Master panels are panel templates you can apply to any base panel in your project. On a master panel, you can draw objects and place Toolchest parts, to create a panel of common objects that can be used for all base panels in a project.

#### Popup Window Panels

On a popup window panel, you can draw objects and place Toolchest parts. At Runtime, you can open the popup window panel over the current panel using a variety of methods.

- The Graphical Panels node provides three types of panels:

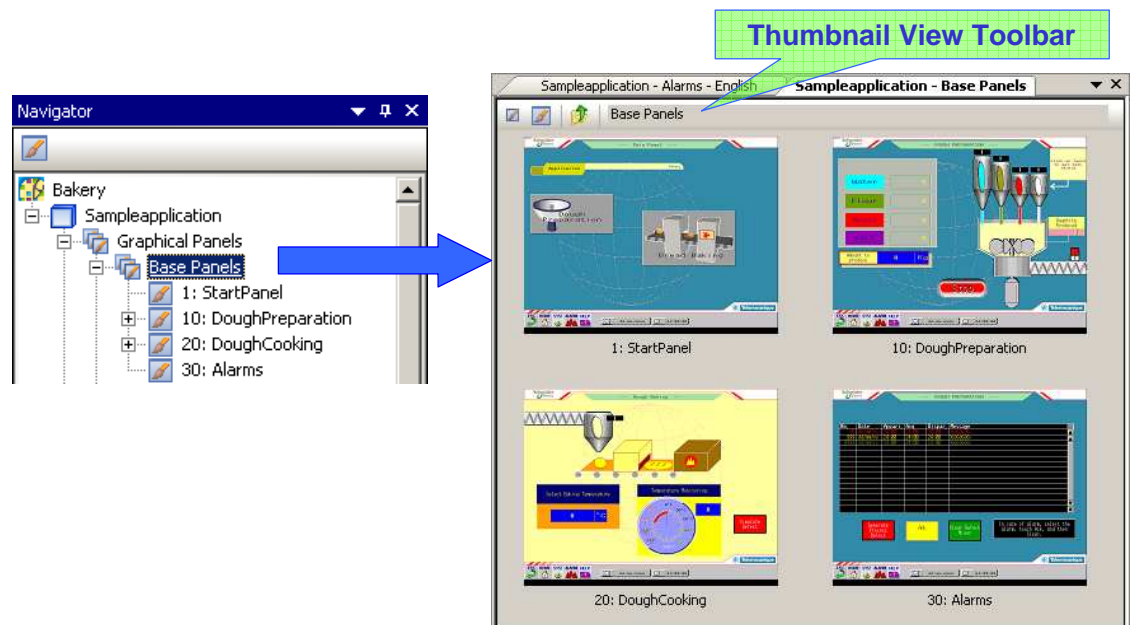


### Base Panels – Thumbnail View

In a project, when you click Base Panels, the thumbnail view opens, displaying the thumbnails for panels and panel folders.

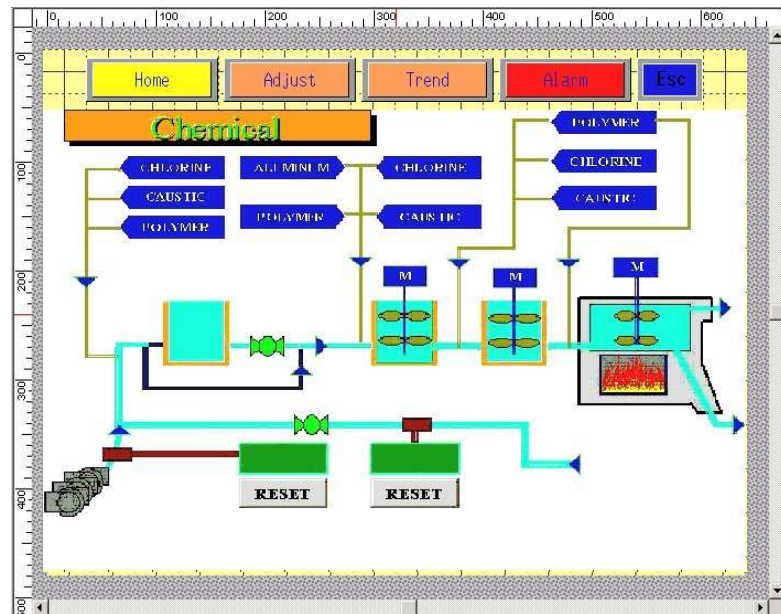
The thumbnail view toolbar allows you to:

- Display the current path in the base panel folder.
- Change the thumbnail size to large or small.
- Move up one folder level, if you have a folder structure.



### Graphic editor

You can use the Graphic editor to draw the different panels you have included in your application, such as the general or detailed panels.

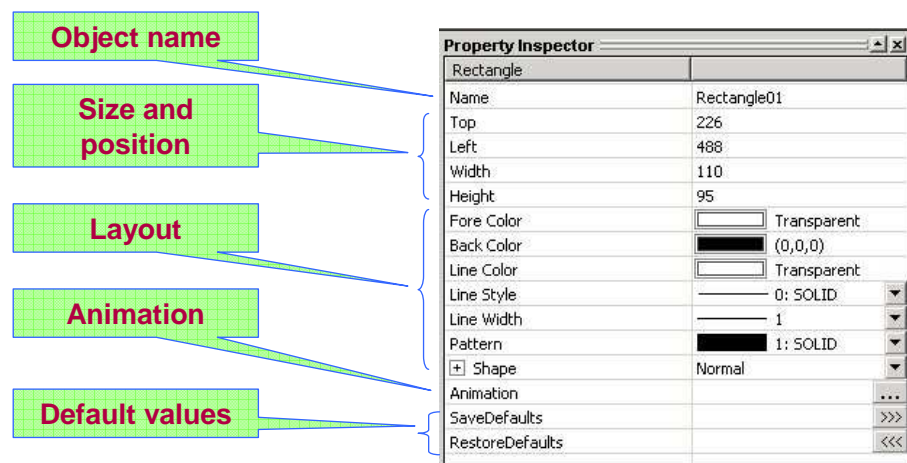


### Property inspector

In this window you can access the properties of the selected object, specifically:

- the object's name
- the object's size and position in the panel
- its layout, including lines and colors
- animations associated with the object relating to value, position and size, for instance
- default values

You can modify the object's settings from this window.



### Graphics list

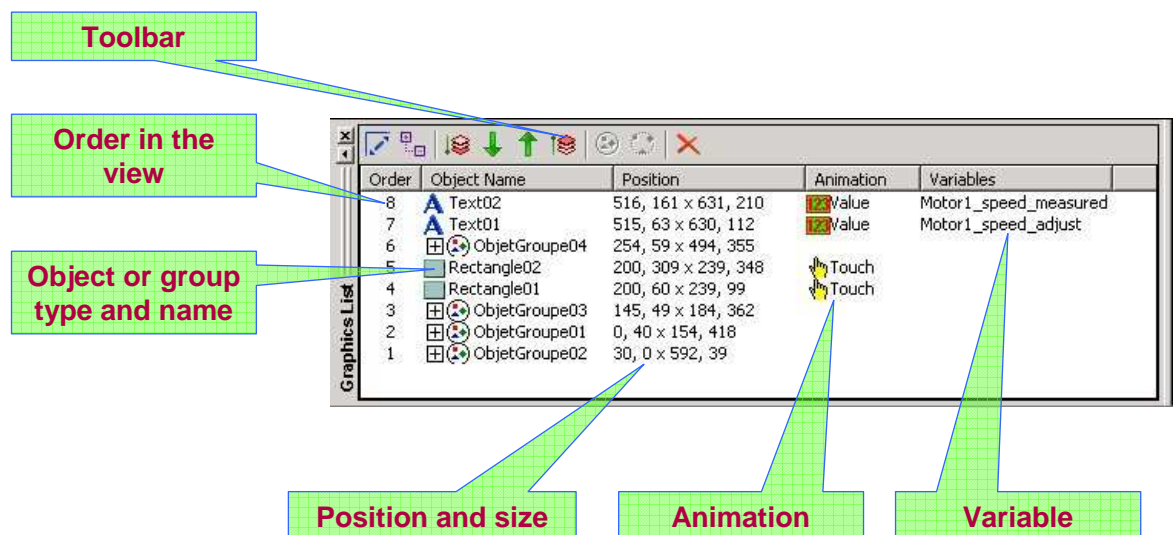
This window provides you with an exhaustive list of objects featuring in the active window.

For instance, you can use the toolbar to arrange the selected object or objects, by bringing them to the front or moving them to the back, as well as grouping and ungrouping them.

It displays the following information for each object or group of objects:

- its order in the panel
- the type of object involved, such as line or rectangle, and its name
- its size and position in the panel
- the associated animation or animations
- the variable activated by the object or animation

You can also use this window to select an object and access its properties directly, by double-clicking on the relevant line or right click to bring up context menu.



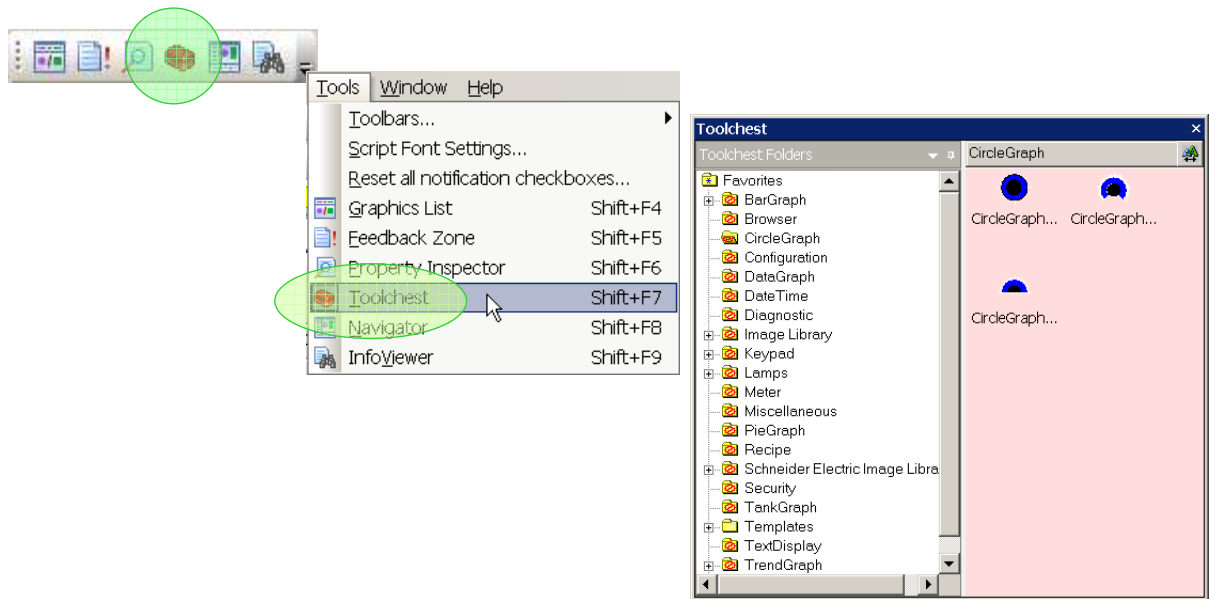
### Toolchest

You can access the Toolchest from the toolbar.

Or by selecting Toolchest from the Tools menu

This accesses the static objects, like tanks, motors or piping, and the animated objects, such as lamps or historical trends, already predefined by Schneider.

You can use these objects easily in your graphic panels by simply dragging and dropping them in. You can also use the **User** directory to save your own objects, scripts or all your panels in the library.

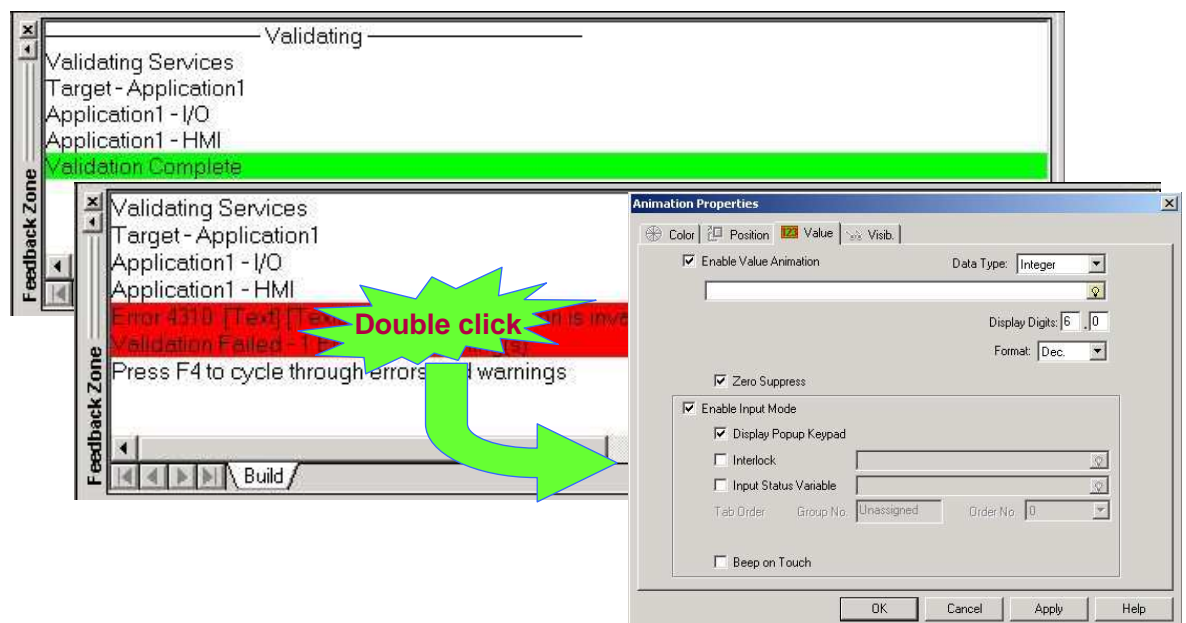


### Feedback zone

The Feedback zone displays the result from validating or building your application. If one or more faults are detected during these operations they are highlighted in red. The build process stops and you need to correct these faults. You do this by double-clicking on the line containing the fault. This will allow you to access the cause of this fault.

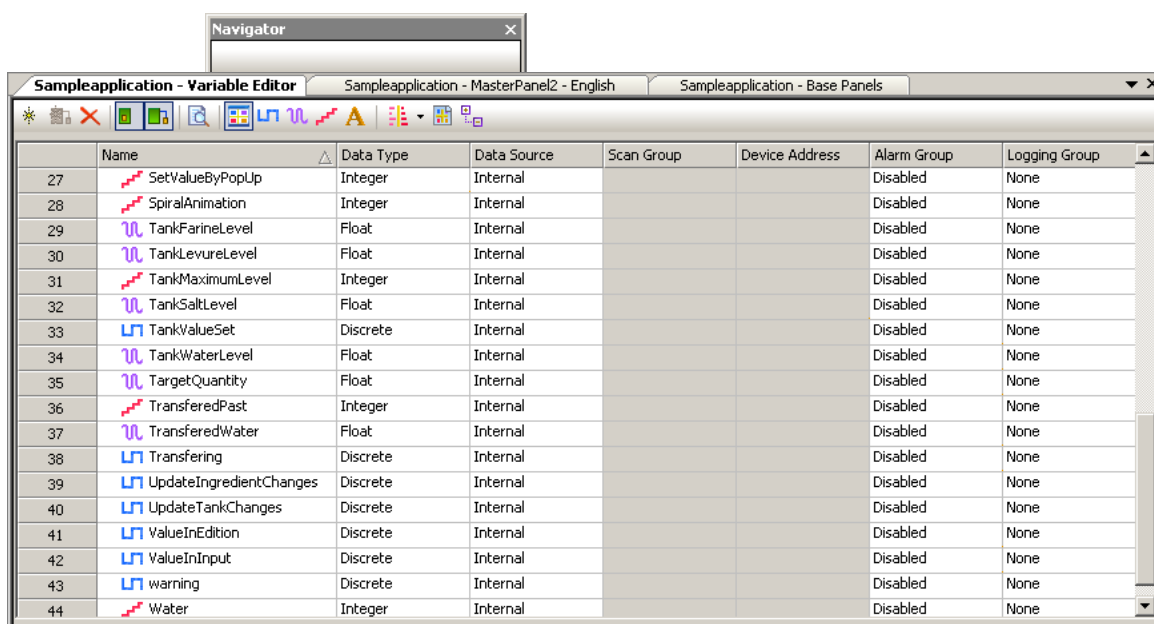
You then correct the fault and restart your build operation.

You should be aware that when you start the simulation for your application, the build operation is carried out first.



### Variable Editor

The Variable Editor displays variables in a spreadsheet format, displaying the variable's name, data type, data source, scan group, device address, alarm group, and logging group. You can update variable information directly in the spreadsheet.



	Name	Data Type	Data Source	Scan Group	Device Address	Alarm Group	Logging Group
27	SetValueByPopUp	Integer	Internal			Disabled	None
28	SpiralAnimation	Integer	Internal			Disabled	None
29	TankFarineLevel	Float	Internal			Disabled	None
30	TankLevureLevel	Float	Internal			Disabled	None
31	TankMaximumLevel	Integer	Internal			Disabled	None
32	TankSaltLevel	Float	Internal			Disabled	None
33	TankValueSet	Discrete	Internal			Disabled	None
34	TankWaterLevel	Float	Internal			Disabled	None
35	TargetQuantity	Float	Internal			Disabled	None
36	TransferredPast	Integer	Internal			Disabled	None
37	TransferredWater	Float	Internal			Disabled	None
38	Transferring	Discrete	Internal			Disabled	None
39	UpdateIngredientChanges	Discrete	Internal			Disabled	None
40	UpdateTankChanges	Discrete	Internal			Disabled	None
41	ValueInEdition	Discrete	Internal			Disabled	None
42	ValueInInput	Discrete	Internal			Disabled	None
43	warning	Discrete	Internal			Disabled	None
44	Water	Integer	Internal			Disabled	None



### USB Port

Vijeo-Designer has added support for USB input devices, storage and download capability.

The USB keyboard and USB mouse are supported for terminals that have a USB port. You can connect a USB keyboard and USB mouse to a supported terminal's USB port. This feature has been provided so that you can input data when you cannot access the terminal's touch capability.

You can use a USB drive to store user application data, such as logged data, alarm messages, recipes, screen snapshot, and video at runtime.

You can use the File System download method to download the user application and runtime system files to a USB drive

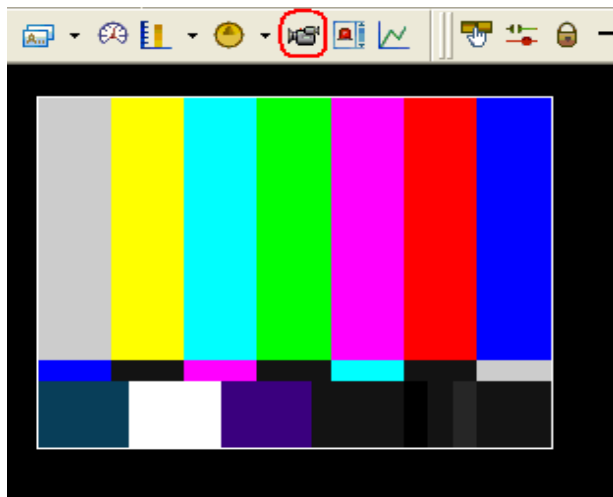
- USB keyboard and USB mouse support
- USB as an optional drive to store data
- File System download method downloads to USB drive

### Multimedia - Video

The multimedia targets now have video capability.

By attaching a video camera to your target, you can view or record live video from the camera, playback previously recorded video, take a snapshot from the camera, and print the snapshot

A maximum of two video displays are allowed per panel



#### Live video/Record live video

- Play video files
- Video Snapshot and Print for Live and Playback
- Video Control Variable
- Video Display Object
- Build-in Video operation control
- Switch – Video operation support
- Video (Data Files)
- XBTGT & iPC

### Web Gate

Web Gate allows a target machine to act as a web server. When Web Gate is enabled on a target, a user can connect to the target through a web browser on a remote PC.

Depending on the Web Gate setup, you can read and write data on the target machine from the remote PC

There are some features that are not supported by web gate such as video or the browser



### Web Gate

Enhancements have been made to improve the performance of Web Gate.

Web Gate now uses ActiveX. ActiveX increases the versatility and performance of Web Gate.

Web Gate now allows:

More than one Web Gate connection at a time, up to 4 connections.

Improved data sharing, such as recipe data and trend graph support.

The ability to playback sounds.

### ■ Web Gate ActiveX Control



- Multiple connections
- Data sharing
- Sound support

### Security

The Security Editor allows you to create security groups and users. Permissions for the users are set at the group level

You can configure security users with the following types of security:

- Target Operation Security
- Project Download Security
- Data Manager Security
- Web Gate Security

Users are then created and added to a group

Multiple groups and users are possible

The screenshot displays the Vijeo Designer 5.0 Security Editor interface. The Navigator window on the left shows a project tree with 'Security' highlighted. The Security Editor window in the center shows a table for creating security groups and users. The Property Inspector window on the right shows the configuration for the selected security group.

• Create security groups, set permissions for group

• Create users, set password and assign to group

• Multiple groups and users are possible

Group	Security Level	Download	Data Manager	Web Gate
SecurityGroup01	1	Allowed	Denied	Read Only

User Name	Password	Group
John	*****	1:SecurityGroup01
Susan	*****	1:SecurityGroup01

Group	User Name	Password	Group
SecurityGroup01	a	*****	1:SecurityGroup01
SecurityGroup02	aa	*****	1:SecurityGroup01
SecurityGroup03	aaa	*****	1:SecurityGroup01
SecurityGroup04	aaaa	*****	1:SecurityGroup01
SecurityGroup05			

### Data Logging

Data logging allows you to collect and store variable values.

With data logging, you can specify what variables you want to log, determine the frequency of data sampling, and specify where the data will be stored.

Data logging supports discrete, float, integer, and string variables. The number of variables that you can log in one project depends on the target machine. Variable data is used by the Trend Graph function. You should not exceed the recommended maximum number of variable values listed here

Data logging enables you to keep a history of particular elements in a production process, which you can use, for example, to analyze, audit, and track performance.

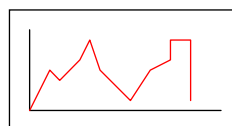
There are two different types of triggering available for data logging that allow you to determine how often you want your data to be sampled. They are the periodic and the triggered log methods. The periodic method takes a snapshot of the data at regular time intervals. The trigger method gives you a snapshot of the data when the trigger is activated

You can display your logged data in Real-Time Trend Graphs or Historical Trend Graphs

You can convert a data logging file into a .csv or .txt file, using Data Manager



- Periodic or triggered logging
- Manage how much and where data is stored
- Display data in real time or historical trend graphs

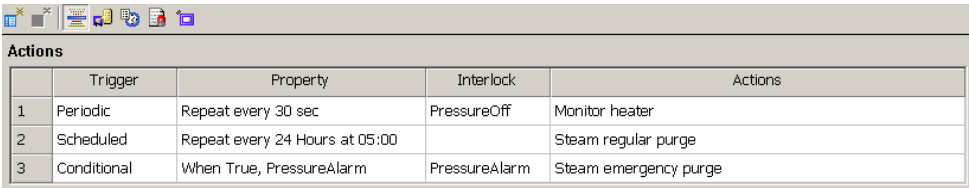


Trend

Action table

The action table allows the creation of up to 100 entries of 16 commands (including Java Scripts calls), whose trigger can be periodic, scheduled, conditional or event driven.

- Action table
  - Up to 100 actions of 16 command each
    - ✓ Periodical, scheduled, Conditional or event driven

The screenshot shows a software window titled 'Actions' with a standard Windows-style toolbar at the top. Below the toolbar is a table with five columns: an index column, 'Trigger', 'Property', 'Interlock', and 'Actions'. The table contains three rows of data.

	Trigger	Property	Interlock	Actions
1	Periodic	Repeat every 30 sec	PressureOff	Monitor heater
2	Scheduled	Repeat every 24 Hours at 05:00		Steam regular purge
3	Conditional	When True, PressureAlarm	PressureAlarm	Steam emergency purge

### Browser Object

The Browser can display documents that reside locally on the iPC and documents that reside remotely on the internet or a network. You can also use the Browser to connect to web sites such as a FactoryCast Web server.

You can open different documents in the Browser using a String Operation and entering the URL to a website or path to a document to be opened



- Smart part that allows viewing of PDF, HTML, .DOC .XLS .pdf, .video files
- Can also view websites
- iPC feature only



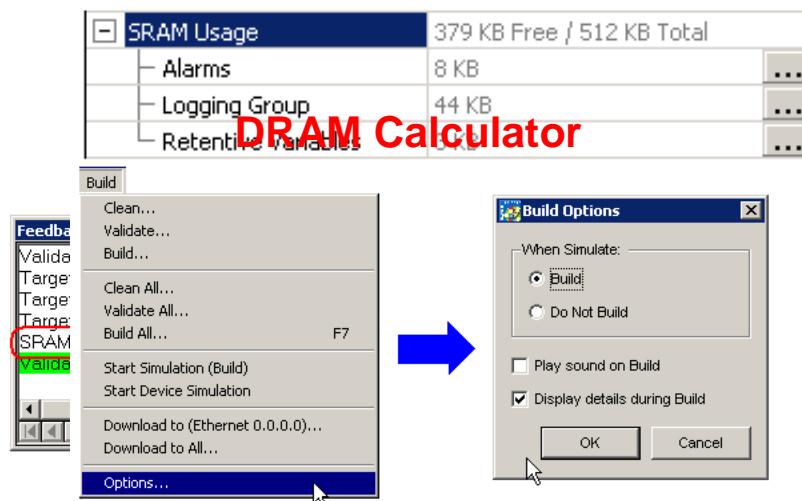
### SRAM/DRAM Calculator

The SRAM Usage property shows the amount of SRAM that is available, as well as the total amount of SRAM.

If you expand the SRAM usage line as shown, you can see exactly how your application's memory is being used.

SRAM usage is also displayed in the Feedback zone when you validate your project

The DRAM calculator is used to make sure the user application will run properly on the target machine. When you use too much of the available memory on a target machine, the user application will not run. You can view how much memory is required by building the project.



- SRAM calculator shows current memory usage
- Located in Inspector when target is selected
- DRAM must be activated and displays DRAM usage at the end of the build process

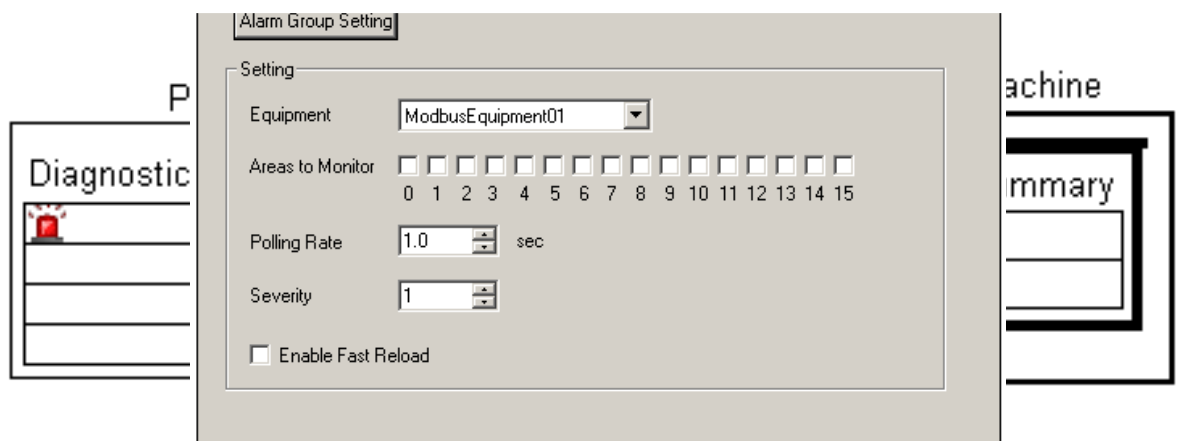
### Diagnostic Buffer

The target's Diagnostic Buffer stores alarms that are centrally located in the PLC. You can use the diagnostic buffer to display, on the target machine, alarms generated and stored on the PLC

Since the alarm generated by the PLC is closest to the sensors and other equipment, the diagnostic buffer in the PLC stores the exact date and time of an alarm, in addition to the exact sequence in which the primary and secondary alarms occurred. Vijeo Designer now has a tool that can directly access and display this information

In larger applications, with multiple target machines, you can monitor and interact with the same alarms in the PLC's diagnostic buffer. A target machine can acknowledge alarms in the diagnostic buffer, and the acknowledgement is signaled to other viewers connected to the PLC when each viewer next polls the PLC's diagnostic buffer. Date/time stamps are exactly the same from one viewer (target machine) to another.

To display alarms in a PLC's diagnostic buffer on the target machine, add a diagnostic alarm group and then assign the diagnostic alarm group to an alarm summary. The PLC's configuration software divides the diagnostic buffer alarms into different areas. Select the check boxes of areas in the diagnostic buffer you want to display on the target machine.



- A Direct link to the PLC's diagnostic buffer
- Displays diagnostic information and timestamps from the PLC
- Select the areas to monitor from the PLC
- PLC/PLC Software must support diagnostic buffers

### I/O Manager

Enhancements to the I/O manager now provide even more ways of interacting with PLCs.

Modbus drivers in Vijeo-Designer have been updated to support variable addressing compliant with IEC 1131 specifications for direct I/O access. You can access these memory areas by referencing addresses associated with the I/O device's physical location on a rack. For example, you can specify

the Rack number,

the Module number,

and the Channel number to uniquely identify an I/O address.

String Encoding on all drivers now supports the ANSI-extended ASCII code table in addition to standard ASCII and Unicode.

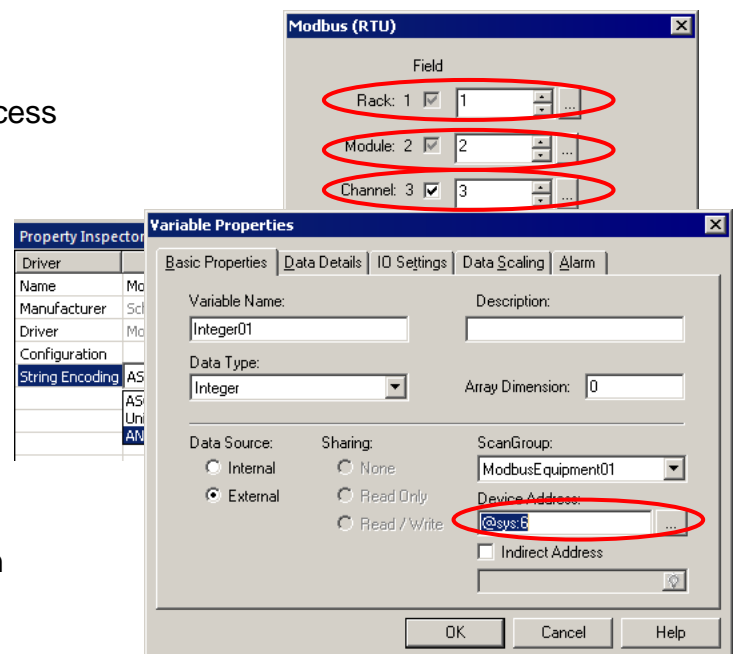
Demand scan allows you to force a PLC to perform an immediate scan of all its variables.

#### ■ Addressing Support

- Direct I/O Access

- ANSI Support

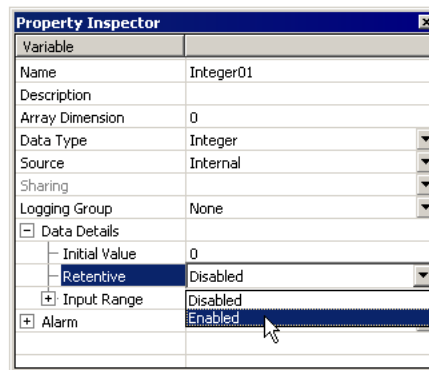
- Demand Scan



### Ease of Use

Vijeo Designer now supports retentive variables. You can set up variables so that their values are stored in SRAM and are restored when the target powers up or restarts. The number of retentive variable values that can be stored are restricted by the amount of available SRAM. In the Target properties, you can check how much SRAM is available or used in the Retentive Variable property under SRAM Usage

Vijeo Designer now supports PNG, JPEG and BMP picture formats



- Retentive variable
- Image format supported – PNG, JPEG, PMP

### Other Things

There are multiple new script methods added to this version that support the Video and diagnostic buffer features as well as new System methods

Multi-target install allows you to install a user application and runtime to multiple targets using a single compact flash card

Runtime communications allows you to configure driver communication settings on the target machine during run time. There is a new configuration menu item called I/O Manager where you can change equipment IP addresses, transmission speeds, target and equipment ID numbers, and so on.

Testing communications can now be done from the run-time configuration menu. You can test the communication link between the target machine and connected equipment from this location.

The Data Manager has been enhanced to support video and snapshot files, and to support editing recipe files.

The variable editor now allows you to create your own custom variable filter for controlling what variables you wish to view

You can have more than one Vijeo-Designer project open at a time by starting another instance of Vijeo-Designer. Certain objects can be shared between projects, and the variables associated with the objects are also copied over.

In Vijeo-Designer, you can define up to 15 languages for a single project.

The Schneider Electric Image Library provides you with many useful images that you can drag and drop on to your panel.

- Script Methods
- Multi-target install
- Runtime communications
- Testing communications
- Data Manager
- Custom variable filter
- Multiple Vijeo-Designer projects open at a time
- Up to 15 languages supported for a single project
- Schneider Electric Image Library

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# Module 8: New V5.1 & V5.0 functions

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### New HMI

New terminals ranges are available with Vijeo Designer version 5.1

A HMI STO and HMI STU range of small terminals that provide 3.4 and 3.5 inch screens

a 5.7 inch XBT GH terminal

5.7 and 10.4 inch XBT WP terminals with high-resolution and high luminosity

new 12 inches Smart and Compact IPC



#### ■ Small Panels Magelis

- HMI STO
- HMI STU



#### ■ Advanced Panels Magelis

- Série XBT GH
- XBT GT 5.7 & 10.4 High Resolution and Light



#### ■ iPC et PC BOX

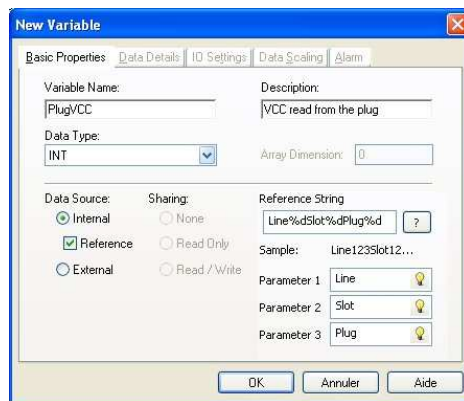
- New Smart & Compact iPC 12"
- Catalogue more simple
- Pre-installed License

### Simpler Maintenance & Development

Vijeo Designer 5.1 has functionality that simplifies development and maintenance:

Variable reference which makes it possible to re-use objects

The ability to send an e-mail at the time of an action or event in order to automatically warn the maintenance team, for example, when a fault occurs



#### ■ Variable Reference

- Re-usable objects
- Reduce application size



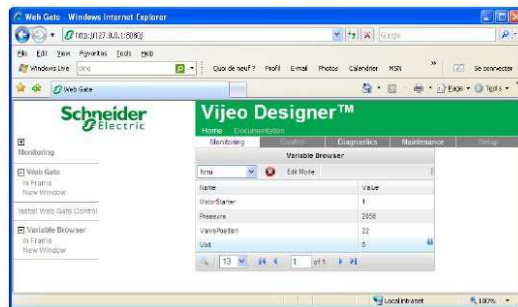
#### ■ Email management for maintenance



### Embedded Web Server

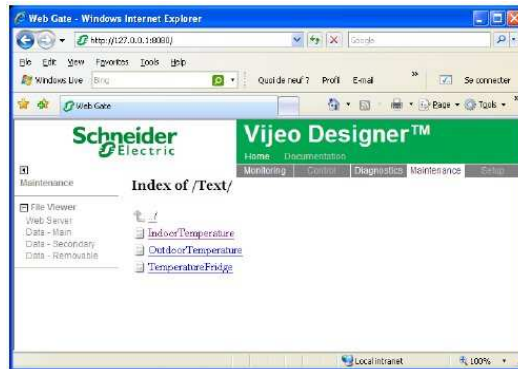
The Web server running in the terminals allows remote diagnosis of the application, using:

a navigator that allows remote access to the shared variables in the HMI application  
an interface which allows access via ftp to the files present in the terminal (recipe files, trends, etc)



#### ■ Monitoring Variables

- Can be reach remotely



#### ■ File Transfer

- All files can be accessed with FTP (recipe, history, ...)

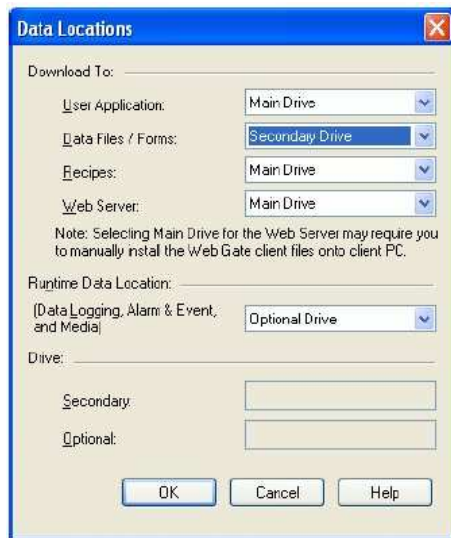
### Range Harmonization

In order to have consistency across the terminal range, it is now possible:

To contact via the Web all terminals with an Ethernet connection

To use an USB key to carry out the operations previously possible with Compact Flash a memory card.

All the terminals, including the small ones can now log data on USB key



#### ■ Web Access

- All HMI with Ethernet port can be accessed via Web

#### ■ USB Flash Disk

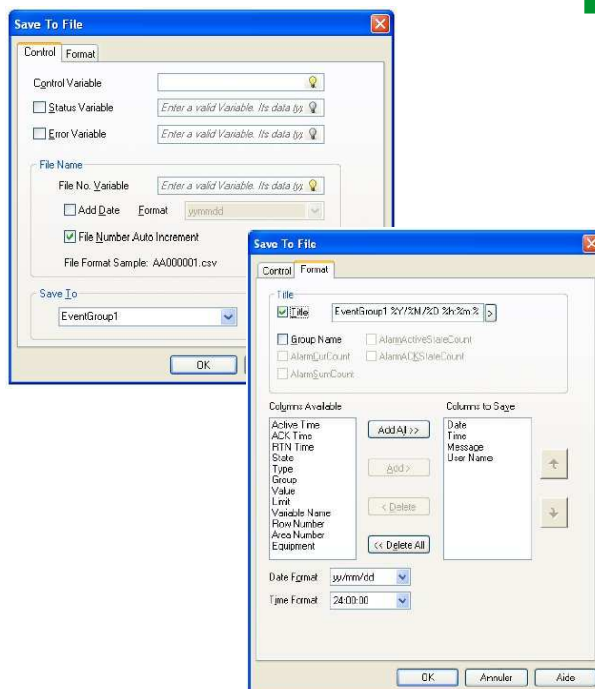
- All operation possible with CF Card can be achieved with USB
- All HMI can now manage data logging on USB

### Data Exchange with IT World

Vijeo Designer 5.1 approaches computing world IT by managing format CSV for the exchange of the data. That allows:

to make the recipes compatible with SoMachine V3.0

To retrieve the history files in Excel by using the Data Manager tool



#### ■ Better interoperability with IT

- Recipe are now in CSV format (compatibility with SoMachine)
- Data logging in CSV format. (Use Data Manager)

### Additional New Features

Vijeo Designer V5.1 responds now to the FDA 21 CFR Part 11 Norm indicating that every event done by the system or any user has to be recorded.

There is also a new policy for the Vijeo Designer Run-Time on PC: Catalog is simplified and it follow the R3 C3 rules where registration occurs only once (no need to register again when updating with a new version)

The Portuguese language in the Build Time has been added to answer to the Brazilian market.

Vijeo Designer V5.1 is now 100% compatible with Windows 7 Professional.



#### ■ FDA 21 CFR Part 11 Norm

- Event or User Logging

#### ■ New « Business model » for Vijeo Designer Run-time on PC

- Simpler Catalogue
- Schneider Electric R3 C3 Rules
- Registration occurs only once

#### ■ Vijeo Designer 5.1 Build-time in Portuguese



#### ■ Vijeo Designer 5.1 is fully compatible with Microsoft Windows 7 Professional

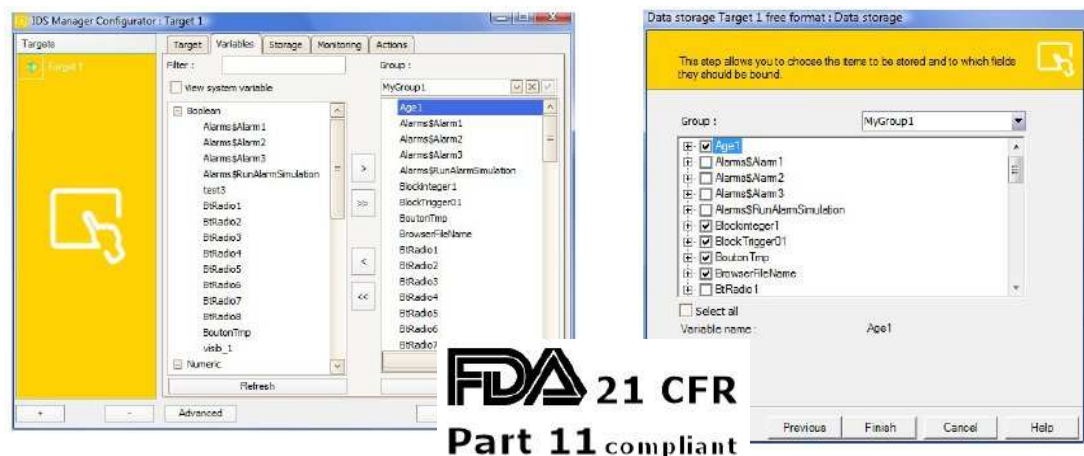
### FDA 21 CFR Data Save

Vijeo designer 5.1 is FDA 21 CFR Part 11 compatible.

This norm indicates that data logging has to comply with specific rules such as:

- Saving Data compatible with Microsoft Excel and Access (CSV, TXT and XML formats)
- Data are better protected following credentials specified in the FDA 21 CFR
- Saving data are done in a relative database such as Microsoft SQL Server, MySQL, Oracle, ...

- Saving Data in CSV, TXT and XML formats
- Better Protection
- Saving data are done in a relative database such as Microsoft SQL Server, MySQL, Oracle, ...



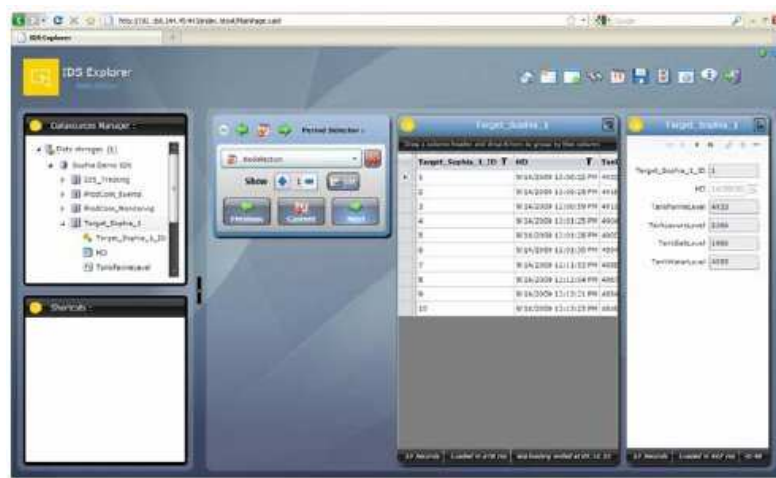
### FDA 21 CFR – Dashboard

Data table can be accessed using any Internet Navigator and uses Microsoft .net and Silverlight technologies to allow advanced functionalities such as data analyzing, trends display, access to many databases, data sorting, and display any kind of graphic or reports.

Use last web technology for display:

.Net

Silverlight



### Additional Communication Features

Vijeo Designer V5.1 also support additional communication features.

- Communication parameters can now be change while running
- Support double Ethernet port with iPC and XBTGTW HMI
- Default IP Address is defined from the MAC address
- RoHS USB cable can be used with Modbus +
- ELAU LMCxx00 protocol (using PacDrive 3 from ELAU) is now supported
- Siemens ISO-on-TCP (Profinet)
- Siemens MPI pass thru
- Mitsubishi protocol (in Q00J controllers)
- High Speed Ethernet IP

- Communication parameters can now be changed while running
- Support double Ethernet port with iPC and XBTGTW HMI
- Default IP Address is defined from the MAC address
- RoHS USB cable can be used with Modbus +
- ELAU LMCxx00 protocol (using PacDrive 3 from ELAU)
- Siemens ISO-on-TCP (Profinet)
- Siemens MPI pass thru
- Mitsubishi protocol (in Q00J controllers)
- High Speed Ethernet IP

### New terminals

New terminal series are available.

The new terminal series are:

XBTGC Series

And

iBox Series

Feature highlights for these series are:

The XBTGC has a built-in programmable logic controller.

The iBox series features the ability to use a terminal or a regular PC monitor as your display, or use both in a dual-display setup.

To learn more about the new series, take a look at module 2 which gives greater detail on the features for new and existing terminals.

■ **XBTGC**  
● PLC



■ **iBox Series**  
● SRAM





### SoMachine

SoMachine is the integrated solution for programming the XBTGC  
Which contains a built-in PLC.

SoMachine combines a control editor application

with Vijeo Designer, to provide a single solution for programming both the HMI and  
the PLC and downloading them both onto the XBTGC.



XBTGC



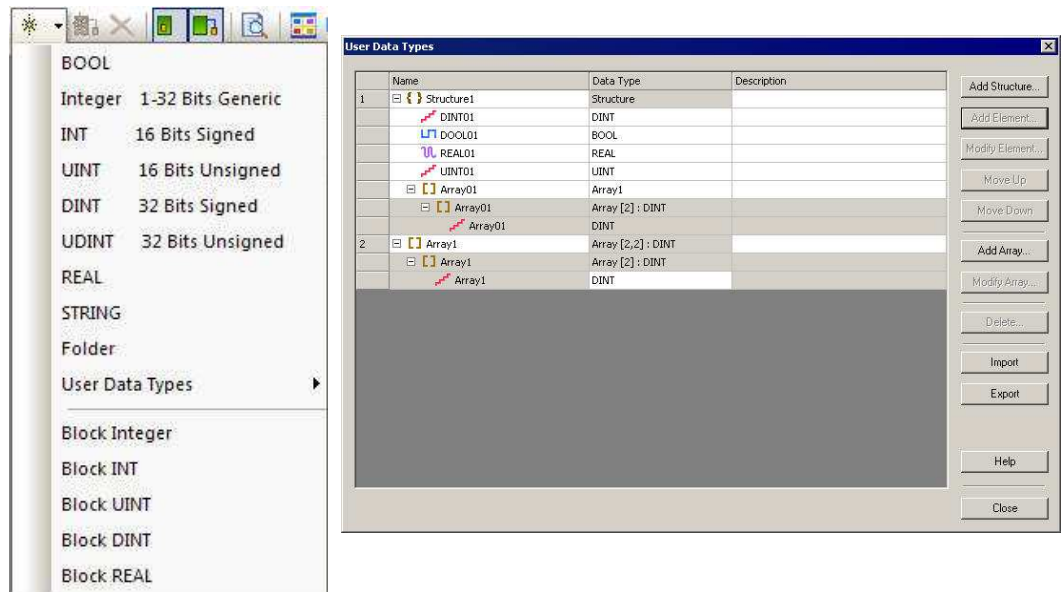
### New Variable Data Types

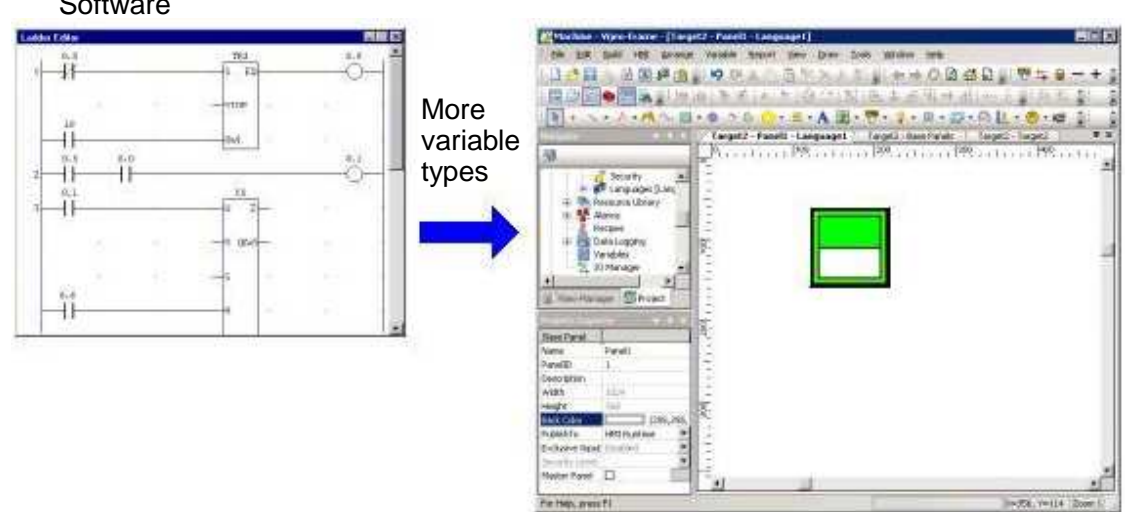
Variable support in Vijeo Designer has become much more powerful with the addition of several new data types.

New Integer and Block Integer data types have been introduced, differentiated by their data size, whether 16 bit or 32 bit, and their sign value, whether signed or unsigned. This allows for better precision when assigning integer variables to any given situation.

Also, some variables, such as BOOL, REAL, and STRING have been renamed to comply with IEC naming conventions.

The User Data Types editor allows you to create multi-dimensional arrays, arrays of structures, and multi-layer structures for organizing and dealing with large numbers of variables.

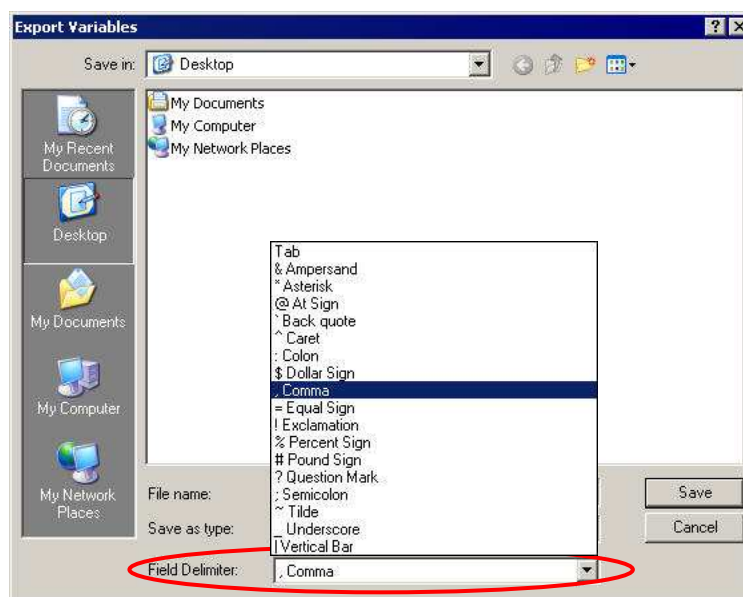




### Variable Import / Export - Field Delimiter

When you export variables into a CSV file, you now have the option of using commas as the delimiting characters, or selecting a different character from the provided list.

The same flexibility is available when importing variables.



### New Reports

You can now create reports  
to view all the actions used within a particular panel or within an entire terminal.

- Action Reports



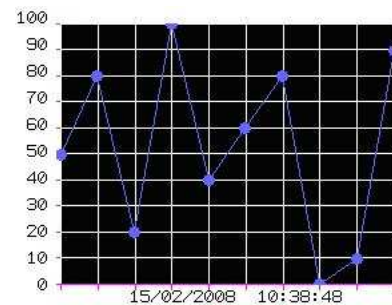
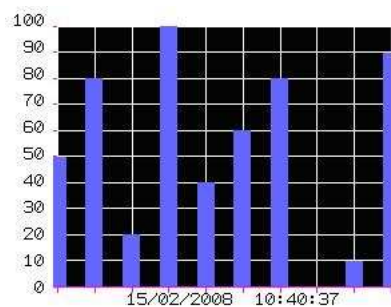
### New Trend Graph

Vijeo Designer now allows you to plot multiple data values from one or more block variables at a single point in time. A block trend graph can display up to 1024 data samples from each block variable with a maximum of eight block variables.

You can view the data in the form of:

a bar graph  
or a line graph.

■ Block Trend Graph



### Form Printing

Vijeo-Designer's form printing feature allows you to create reports, receipts, and forms that you can print at runtime.

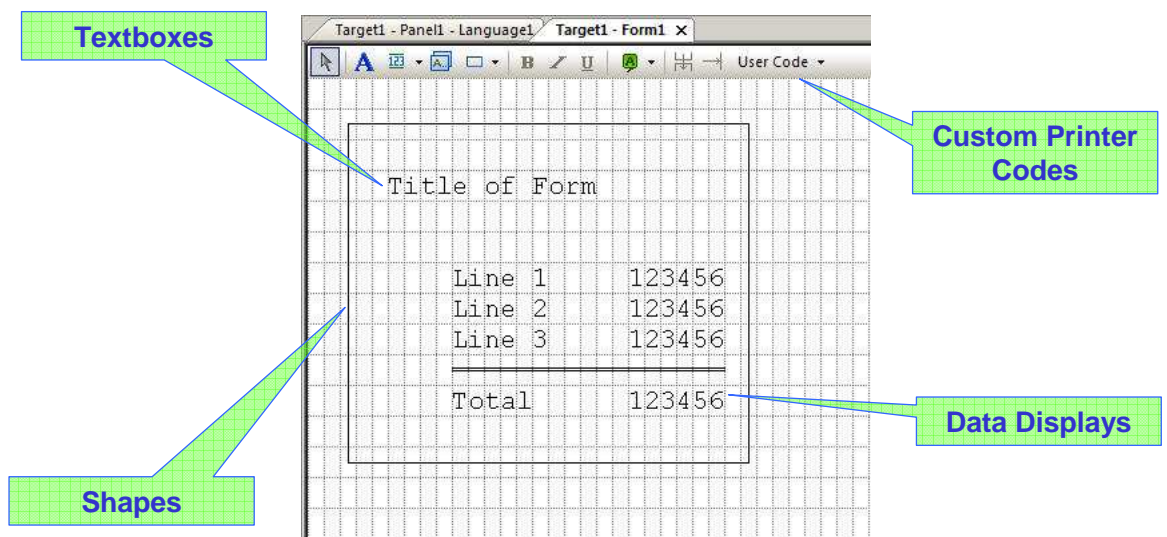
Objects you can add to the forms are

Textboxes

Data and message displays

Basic shapes, such as lines, rectangles and tables

and Custom printer codes



### New Drivers

Vijeo Designer V5.0 offers the following new communication drivers.

PacDrive Ethernet –

Provides Ethernet communication between the terminal and ELAU or CoDeSys version 2.X equipment

SoMachine – Network

Provides Ethernet communication between the terminal and SoMachine network equipment

SoMachine – Combo

Provided Serial communication between the terminal and SoMachine combo equipment

Detailed information for each driver can be found in the driver manuals. You can access these manuals from the Online Help from the Device Driver Manuals section

- PacDrive Ethernet
- SoMachine - Network
- SoMachine - Combo



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# Module 9: Standard functions

13

### Creating a new project

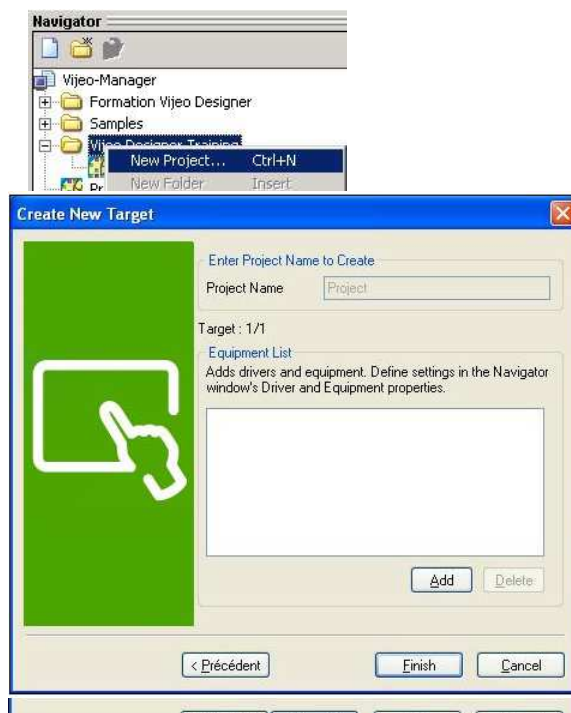
When you launch Vijeo Designer, you access the project manager.

You can create a new folder to group any projects or create a new project.

In the latter case, enter the name of the project and any comment you want. You must also specify whether the project involves one or more applications (terminals).

Enter the name of the application and select the type of terminal that it will be transferred to.

If there is an Ethernet link, define the communication parameters between Vijeo Designer and the terminal, such as the IP address and subnet mask.



- Create new project:  
*Vijeo\_Designer\_V50*
  - Enter a comment (optional)
  - Select the type (use of one or several terminals)
  - Define the project password (optional)
  - Enter the name of the first target: Application1
  - Select the terminal type
  - Define the parameters for communication between Vijeo Designer and the terminal (Ethernet address of terminal)

### Configuring PLC communication via Ethernet

If you want to configure the settings for communicating with a Schneider PLC via an Ethernet link, for example, you need to select the Modbus TCP/IP driver and a Modbus device.

Then, configure the device by entering:

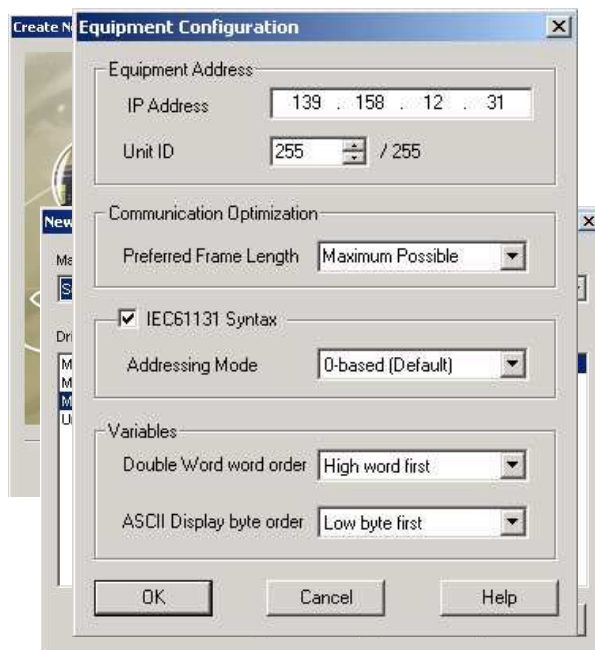
- the PLC's IP address
- the unit ID, which means leaving 255 by default

In order to ensure optimum communication, you can define the maximum or minimum possible frame length.

You can also configure the following variables:

- Depending on the controller you will be connecting to, you can either choose IEC syntax, where you will use %Mi and %MWi addresses or Modicon addressing where you will be using traditional addresses in the form of 1 + i or 40000 + i.
- the word order in a double word or the byte order in an ASCII display

If you need to, you can also configure another communication group.



- Select the communication driver
- Configure the device
- Configure another communication group if necessary

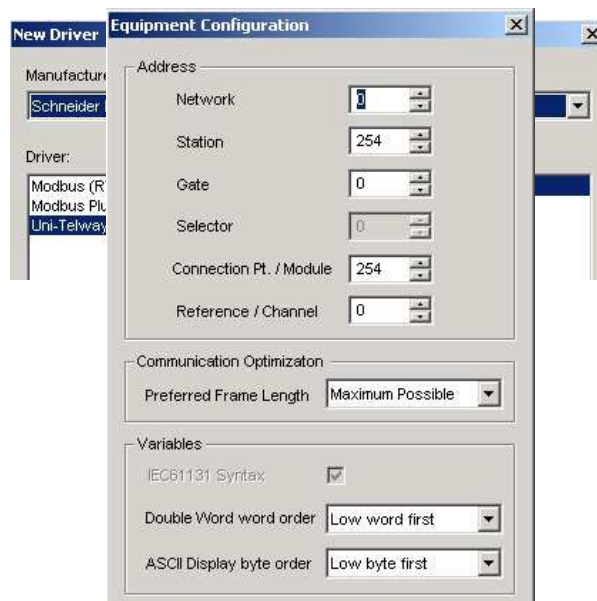
### Configuring PLC communication via serial port (Modbus, Uni-Telway)

If you want to configure the settings for communicating with a Schneider PLC via a serial port you need to select a Uni-Telway, Modbus or Modbus Plus driver and the device.

Then, configure the following device parameters:

- network address
- station address
- frame length

If you need to, you can also configure another communication group.



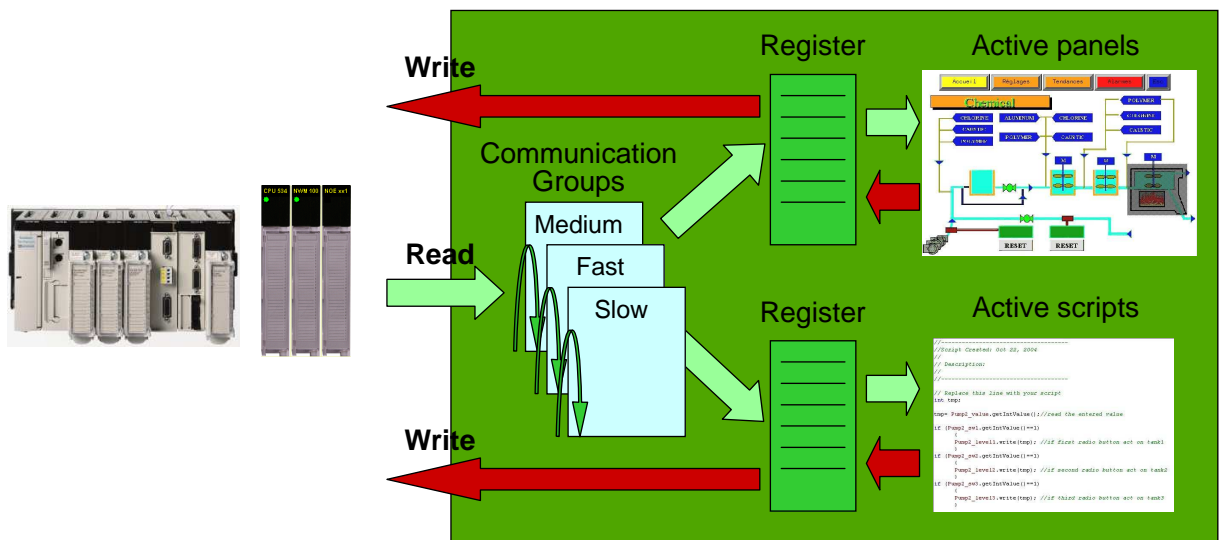
- Select the communication driver
- Configure the device
- Configure another communication group if necessary

### Communication with PLC

Only the active panels and scripts are exchanged with the PLC.

Read operations are via communication groups which define the read period: Fast (50 to 250 ms), Medium (250 to 1000 ms), Slow (1000 ms).

The write operation for variables involves changing their value.



### Statistics on communication drivers

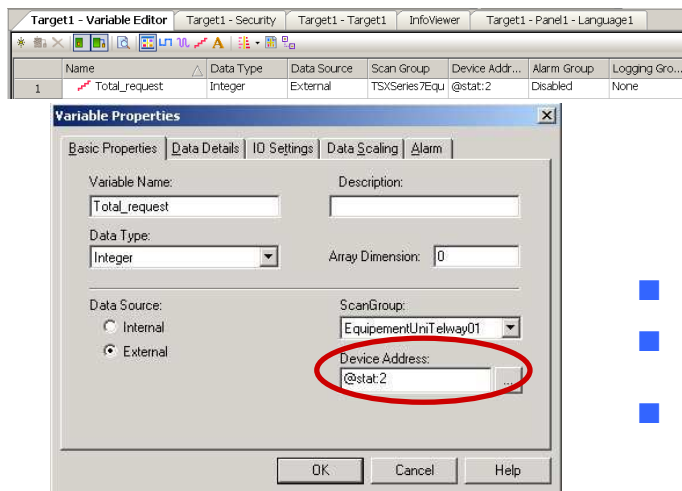
Some Schneider PLCs provide communication status. In these PLCs you can track the flow of data exchanged with PLCs in terms of numbers of requests, numbers of failed requests and other parameters. To do this, you need to create an external variable and assign it to the relevant counter.

Enter in the Device Address field:

@stat:index of the counter (from 0 to 13), if you want to access current statistics

@prevstat:index of the counter (from 0 to 13), if you want to access previous statistics

@sys:x (from 0 to 3) so that you can access system control words



- To access the statistics of a communication driver
  - ☐ Create an external variable of Integer type
  - ☐ Select the communication group
  - ☐ Associate the variable to a counter (*@stat:index*)
- Current statistics: @stat:x
- Previous statistics: @prevstat:x
- System control word: @sys:x

### Creating application panels

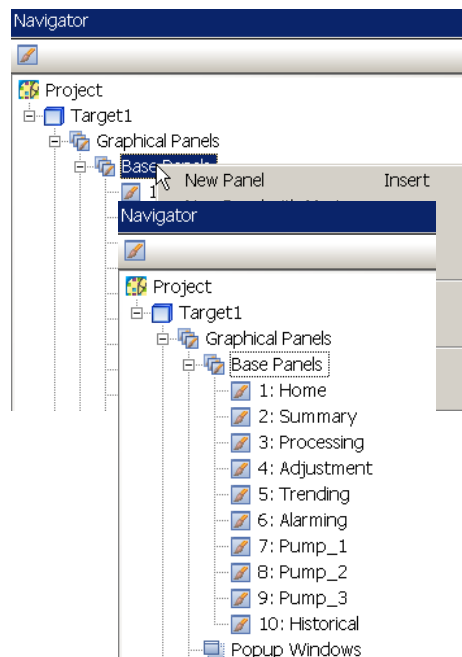
You have to declare all your application's graphic panels. This involves:

- renaming the default panel
- creating new panels

Every panel is defined in the navigator by a name and ID, such as 4:Adjustment or 61:Historical.

The size of the panels is fixed by the type of terminal selected and cannot be modified.

You can change the panels' background color via the Properties inspector window.



- Declare the graphic panels: Home, Summary, Processing, etc
  - Rename the default panel: 1:Home
  - Create a second panel: New Panel
  - Rename the second panel: 2:Summary
  - Create all the other panels: 3:Processing, 4:Adjustment, etc
- The size of the panels is fixed by the choice of terminal (eg. 640 x 480)
- The background color may be changed as required (black by default)

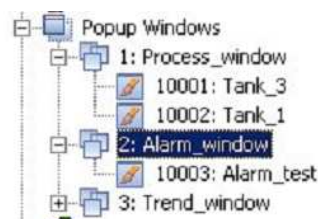
### Creating popup panels

You also need to declare all your application's popup panels. To do this, you first have to create the windows that these panels will appear in, then create the panels themselves.

A name and ID are defined for each window.

The size of the panels is determined by the size of the window that they will appear in.

You can change the popup panels' background color via the Properties inspector window.



- Create a popup window

- Rename the default window:  
*1:Process\_window*
- Size the window  
(eg. 400 x 300)
- Rename the default popup panel:  
*10001:Tank3*
- Create a second panel, ....

- Create a second popup window, ...

- The size of the popup panels is fixed by the window in which they appear
- You can change the background color as required (black by default)

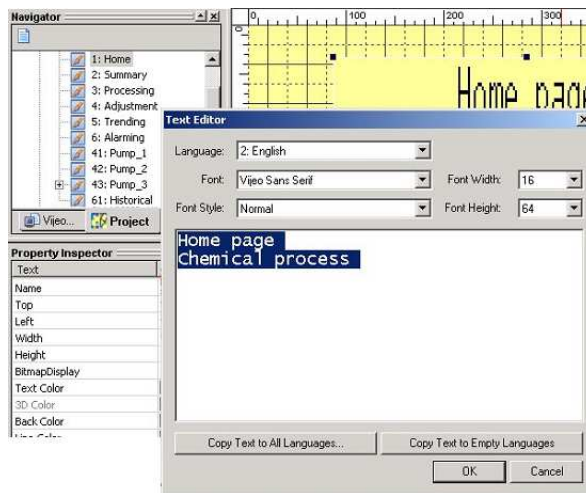


### Inserting text on a panel

If you want to insert text in a panel:

- Select the A icon to create a text object
- Position and size this object in the panel

Then, enter the text in the various languages and define the relevant parameters such as text color and font.



- **Insert a text object in the panel**
  - Select the **A** icon from the toolbar
  - Position and size the text object in the panel
- **Modify the text object parameters**
  - Change the background color
  - Enter the text
  - Define the text parameters: language, font, style, font height and width

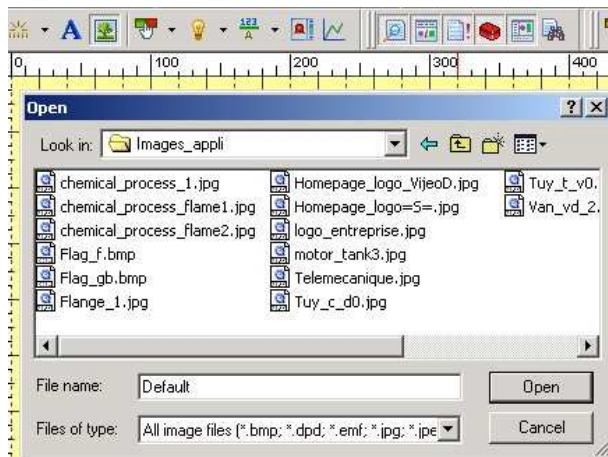
### Inserting an image on a panel

If you want to insert an image in a panel:

- Select the Image icon from the toolbar
- Position and size the image in the panel

Scroll until you reach the image file you want to insert.

If you need to, adjust the image's position and size.



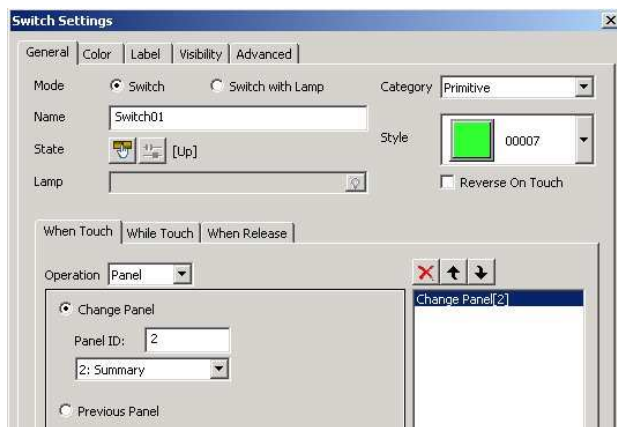
- Select the **Image** icon from the toolbar
- Select the image to be inserted
- Position and size the image in the panel

### Inserting a switch

If you want to insert a switch in a panel:

- Select the Switch icon from the toolbar and choose a normal or radio type switch
- Position and size the switch in the panel

Configure the switch's settings, including general parameters, colors and a label.



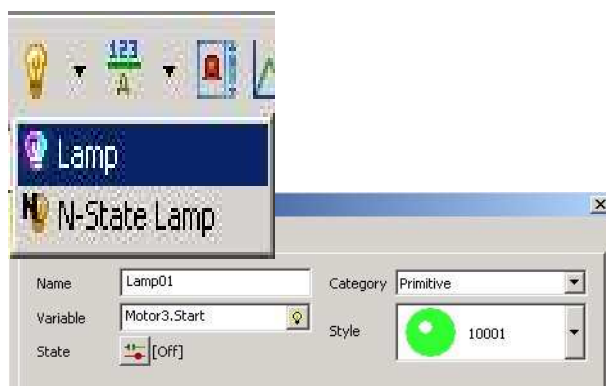
- Select the **Switch** button icon and the type of button: Switch or Radio
- Position and size the switch in the panel
- Configure the switch
  - General parameters: switch action (maximum of 32 operations), switch style, etc.
  - Define the colors: switch, text, etc.
  - Enter the switch label

### Inserting a lamp

If you want to insert a lamp in a panel:

- Select the Lamp icon from the toolbar and choose one of the two types available, which are Lamp or N-State Lamp
- Position and size the lamp in the panel.

Configure the lamp's settings, including general parameters, colors and a label.



- Select the **Lamp** icon and the type of lamp: 2-state lamp or N-state lamp
- Position and size the lamp in the panel
- Configure the lamp
  - General parameters: state, style, etc.
  - Define the colors
  - Enter the label

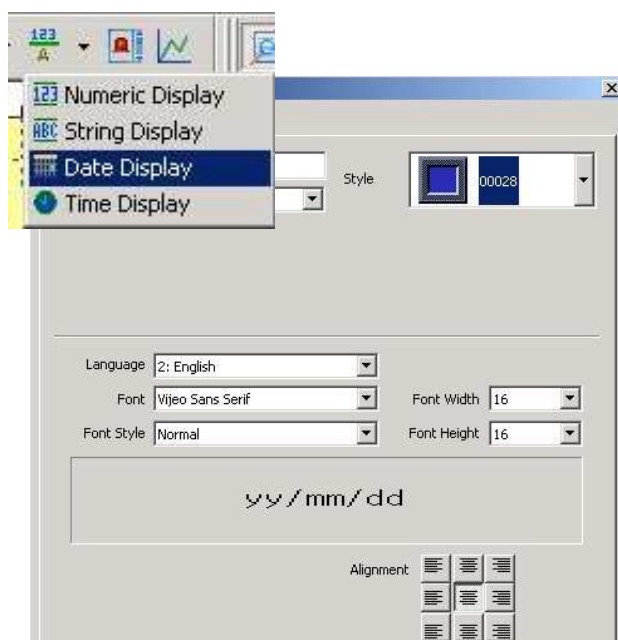
### Inserting a data display

If you want to insert a data display object in a panel:

- Select the Data display object icon from the toolbar and choose the type of data display: numeric, string, date or time
- Position and size the data display object in the panel

Configure the data display object's settings, including general parameters and colors.

If you activate input mode, the data display object also becomes an input area.



- Select the **Data display** icon and the type of data display: numeric, string, date or time
- Position and size the display zone in the panel
- Configure the display
  - General parameters: format, style, etc.
  - Define the colors: display zone, text, etc
  - Activate Input mode to create an input area

### Inserting a message/image display object

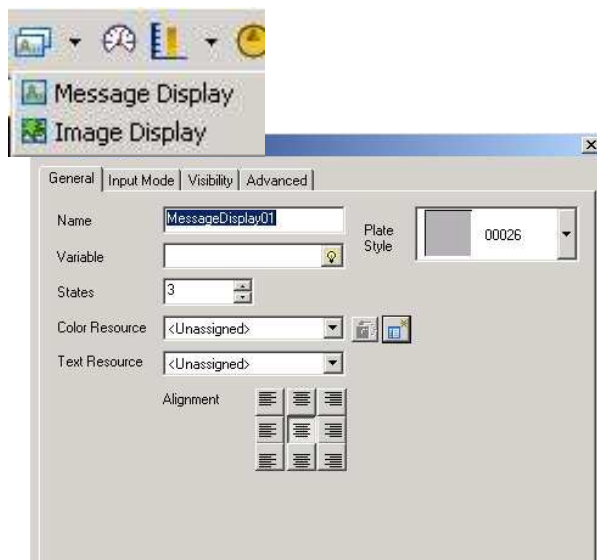
If you want to insert a display object in the panel:

- Select the display object icon from the toolbar and the type of display: message or image
- Position and size the display object in the panel

Configure the parameters in the display object, such as the associated variable or number of states (maximum of 255).

Colors, images, texts and character sets are defined by the resources library.

If you activate input mode, the display object also becomes an input area.



- Select the **Message Display** icon and the type of display: message or image
- Position and size the display object in the panel
- Configure the display
  - General parameters: variable, number of states, resources, etc.
  - Activate Input mode to create an input area

### Inserting a meter

If you want to insert a meter in the panel:

- Select the Meter icon from the toolbar
- Position and size the meter in the panel

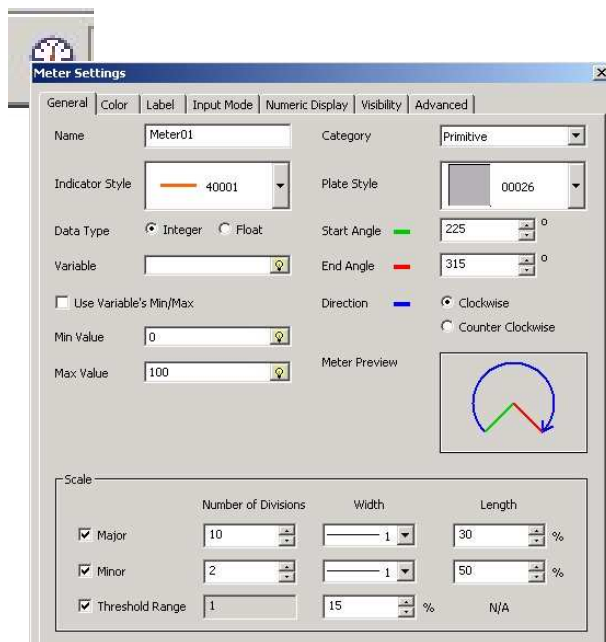
Configure the meter parameters:

- general parameters (associated variable, scale, etc.)
- colors and thresholds
- labels

You can use the resources library to define the colors and character sets.

If you activate input mode, the meter also becomes an input area.

The current value can be displayed in numeric form.



- Select the **Meter** icon
- Position and size the meter in the panel
- Configure the meter
  - General parameters: variable, style, scale, etc.
  - Define the colors
  - Enter the labels manually or automatically
  - Activate Input mode to create an input area
  - Activate numeric display to the value

### Inserting a bar graph

If you want to insert a bar graph in the panel:

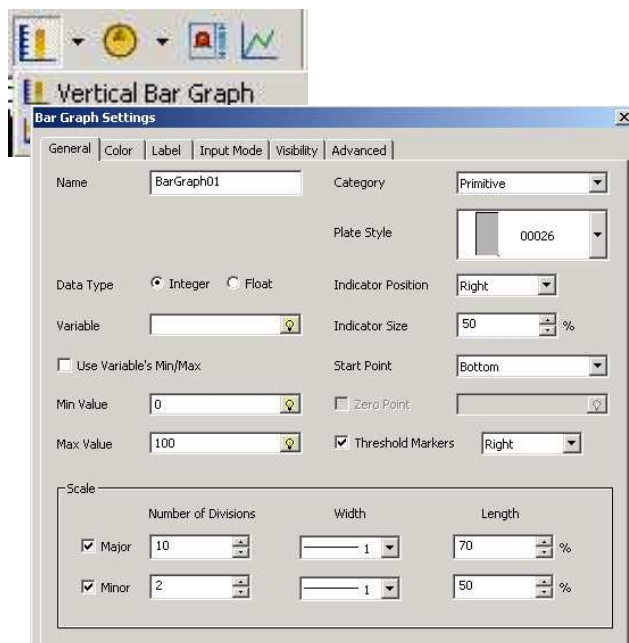
- Select the bar graph icon from the toolbar
- Position and size the bar graph in the panel

Configure the bar graph parameters:

- general parameters (associated variable, minimum and maximum values, scale, etc.)
- colors and thresholds
- labels

You can use the resources library to define the colors and character sets.

If you activate input mode, the bar graph also becomes an input area.



- Select the **Bar graph** icon and the type of bar graph: vertical or horizontal
- Position and size the bar graph in the panel
- Configure the bar graph
  - General parameters: variable, style, scale, etc.
  - Define the colors
  - Enter the labels
  - Activate Input mode to create an input area



### Inserting a selector

If you want to insert a selector in the panel:

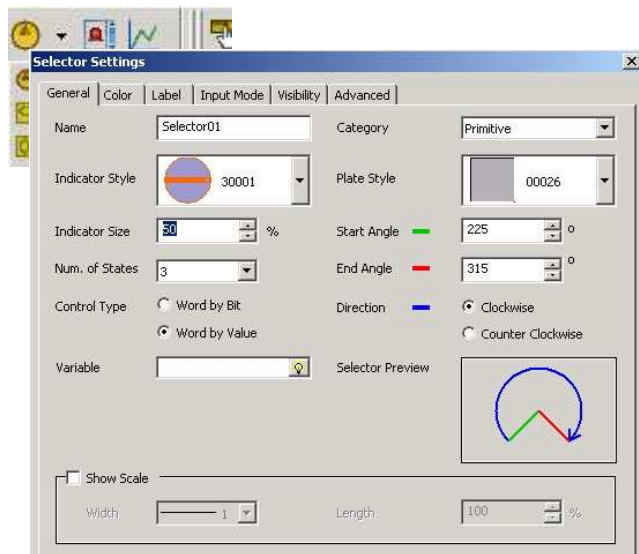
- Select the selector icon from the toolbar
- Position and size the selector in the panel

Configure the selector parameters:

- general parameters (associated variable, number of states, etc.)
- colors
- labels

You can use the resources library to define the colors, texts and character sets.

If you activate input mode, the selector also becomes an input area.



- Select the **Selector** icon
- Position and size the selector in the panel
- Configure the selector
  - General parameters: variable, style, number of states, etc.
  - Define the colors
  - Enter the labels
  - Activate Input mode to create an input area

### Adding a script

You can create and use scripts in your application when you are unable to satisfy your requirements using predefined objects, such as switches and lamps.

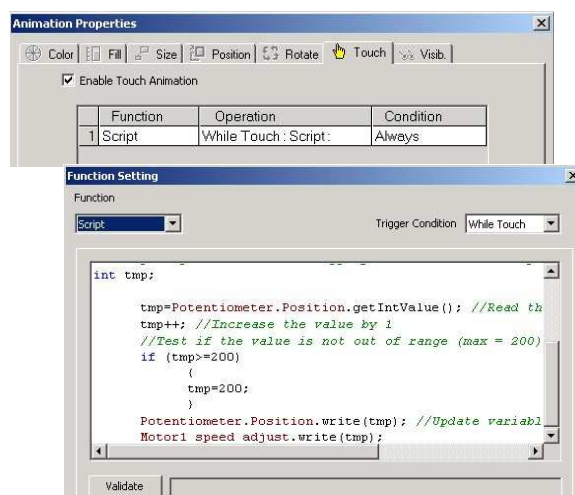
You can use Vijeo Designer to create 3 script levels, which are:

- Action scripts: These scripts can run continuously, when a definable conditions is met, or when a panel is open or closed.
- Scripts linked to a function key: These scripts are only run if the relevant function key is pressed.
- Scripts linked to an object: These scripts are linked to an action being performed on the relevant object, for instance, when a switch is activated.

The scripts are written in Java. To help you with inputting the code, the Java editor provides a list that includes the variables, operators, and methods you need.

Also, Vijeo Designer provides a script Validator so that any faults in your scripts are flagged and you are given assistance in correcting them.

Define the run conditions for your scripts, based, for example, on touching or opening a window.



● Only use the scripts if necessary

● 3 script levels

- Action Scripts
- Associated with a function Key
- Associated with an object (ie a switch)

● Java based script

● Define the script execution condition (on touch, during touch, on opening of a window, etc.)

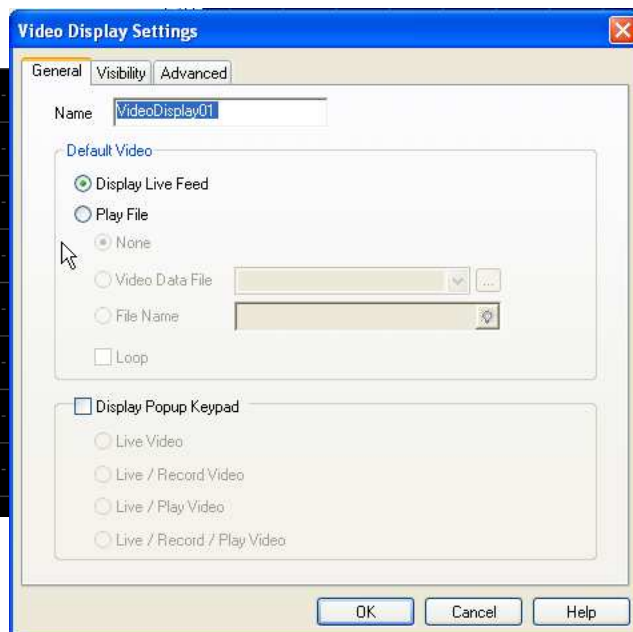
### Adding a Video Display (movie)

Video Displays have several uses. One use is to display a live video feed from a web camera or playback a previously recorded movie.

To add a video display to a panel you must select the Video Display icon and drag the control to the panel and adjust the size of the display

Set the configuration for the operation desired

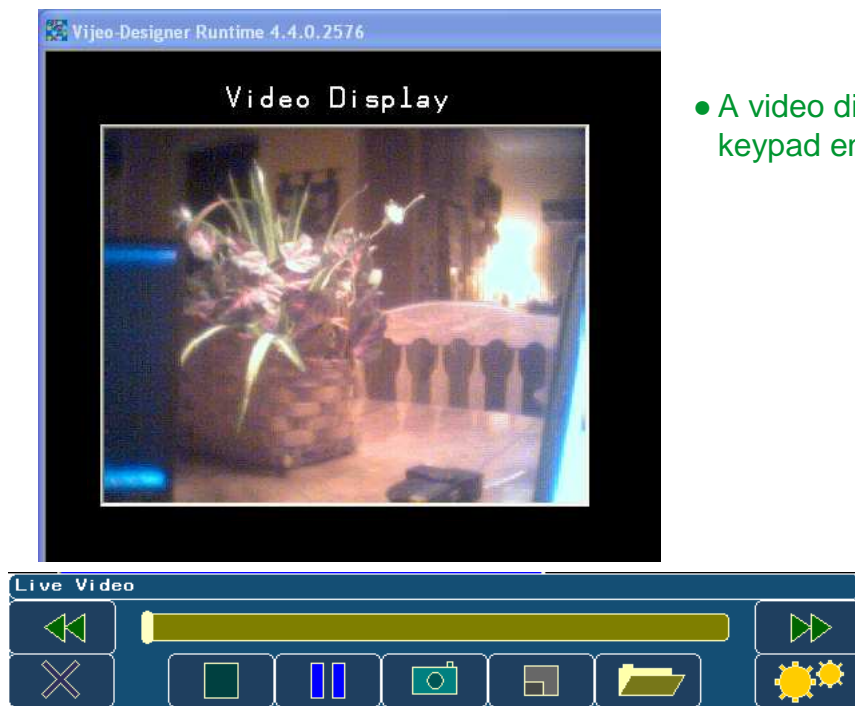
You can enable the keypad to control the display



- Select the **Video Display Icon**
- Drag to panel, size as desired
- Configure to:
  - Display a live feed
  - Play a recorded video
- Popup keypad used to control Video Display

### Video Display Example

A typical panel with a Video Display running might look as shown



- A video display with popup keypad enabled

### Data Logging

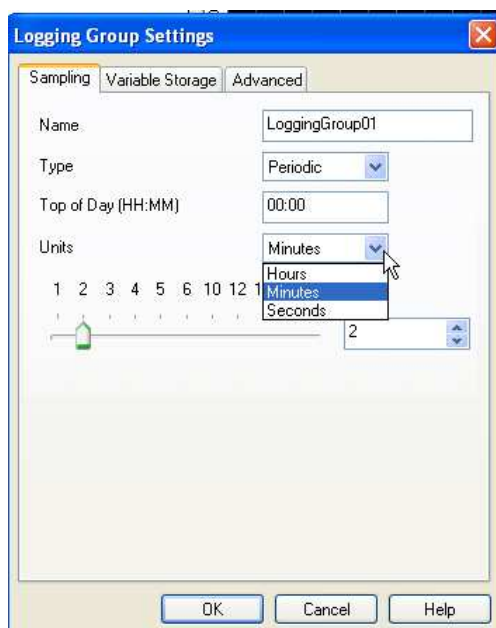
Data logging is the process of recording data over a period of time. Logging is done by groups and variables to be logged are assigned to these groups

To setup data logging:

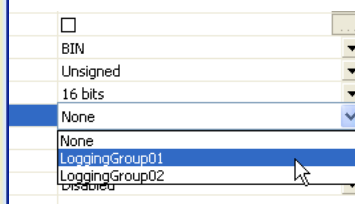
Start a new logging group by right clicking on the Data Logging Icon in the Navigator. Select the New Logging Group option. You can accept the default logging group name or create your own name.

Double click on your logging group to configure the group. Select Periodic to have the logging group record data on a fixed interval

Select Trigger to have the logging group record data based on a trigger variable



- Right click on Data Logging and select New Logging Group
- Configure the logging group. Select Periodic for logging at fixed intervals
- Select Trigger for triggered logging



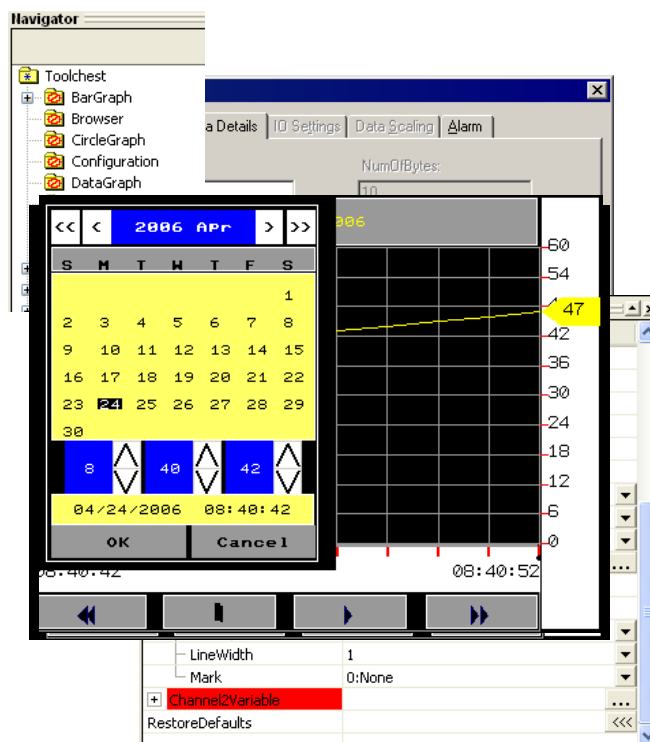
### Data Logging (Cont)

After the trend groups have been created and configured, you must assign your variables to a Data Logging group. This is done as a property of the variables.

Data will be collected and saved to SRAM. To view the data, you must add a historical trend graph to the panel. Select a historical trend graph from the Historical Trend folder in the Toolchest and drag it to the panel. Size it as desired

At runtime, the chart shows realtime data

When you click on the calendar, you can pick the time that your wish to display data. Data is retrieved from the SRAM and displayed by the graph



- Assign variables to the Logging groups
- Add a Historical Trend graph from the toolchest and configure it
- The trend chart displays real-time data
- The Trend graph displays historical data (date and time requested picked on a calendar)

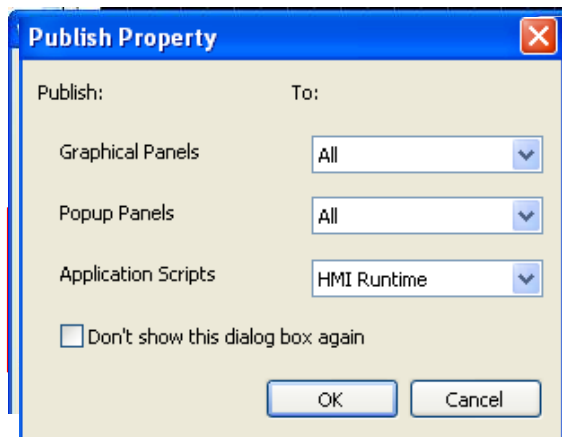
### Web Gate

There are no graphical elements to set for Web Gate. With your target selected, enable Web Gate in the Property Inspector (at the target level)

Expand the Access Control option for configuration. You can configure Web Gate in three different ways. You can allow any PC to connect to it, allow only PCs whose IP addresses are in the list to connect or reject only the PCs whose IP addresses are in the list

The Publish Property window defines how, on a global level, the panels, the application scripts and the popup window panels will or won't be accessed from the remote PC. However, you can also set these access properties individually for each popup window panel.

The final option is to set the initial panel the remote client will see



- Select your target and enable Web Gate from the Property Inspector
- Configure the Access Control
- Configure the Publish Property
- Set the initial panel

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# Module 10: Animations

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### Creating a touch animation (to change panel, for example)

If you use a **Touch** animation you can trigger an action when you touch part of the panel or an object in a touch-sensitive area. This can result in:

- an action on a bit or word
- running a script
- changing panel or language
- opening or closing a popup

This type of animation is not compatible with Text objects.

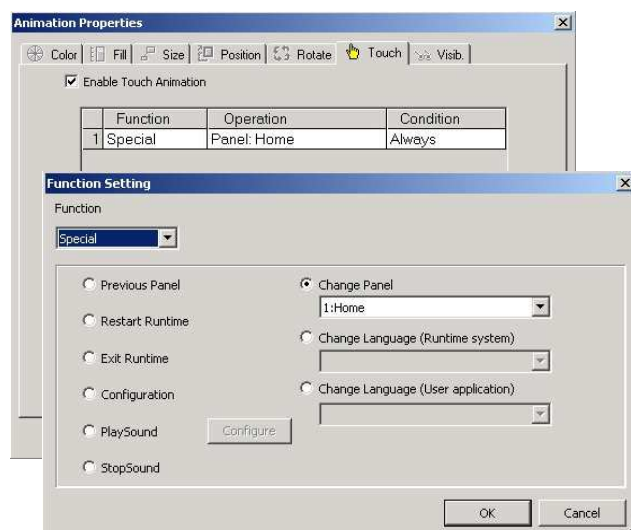
To create this type of animation, you need to:

Define the touch-sensitive area

Access the object's properties and define the animation parameters by:

- activating the animation
- selecting the function, for example Special functions
- configuring the function, to display the home page, for instance

To create this type of animation, we recommend using a switch-type object offering several operations (change panel, bit, word, etc.)



- Define the touch-sensitive area (a rectangle, for example)
- Access the **Animation** properties for this object
  - Open the **Touch** tab
  - Enable the touch animation (checkbox)
  - Set the animation parameters: *Function*, etc.

### Creating a fill animation (to update a barchart, for example)

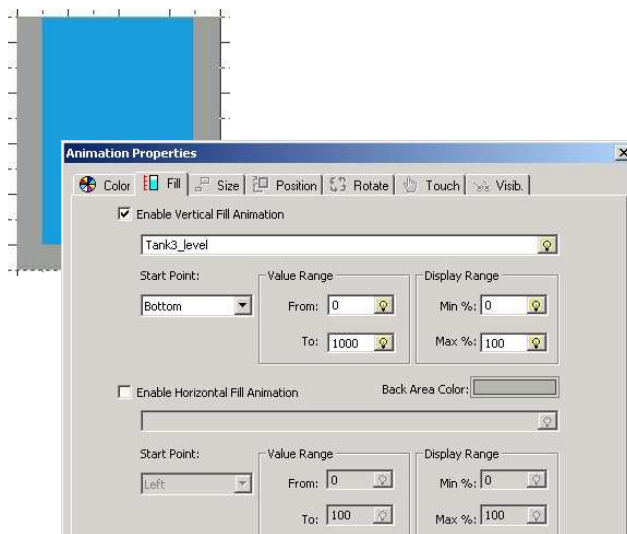
You can use **Fill** to create an animated bar chart in a panel.

To create this type of animation, you need to:

Draw the object you want to animate, usually in the shape of a rectangle

Access the object's properties and define the animation parameters by:

- activating the animation
- selecting the variable
- defining the animation's start point, for instance, at the bottom
- entering the relevant value and display ranges
- defining the back area color



- Draw the object to be animated (a rectangle, for example)

- Animate the object fill

- Open the **Fill** tab and select the enable checkbox
- Set the animation parameters

### Creating a color animation (to manage thresholds, for example)

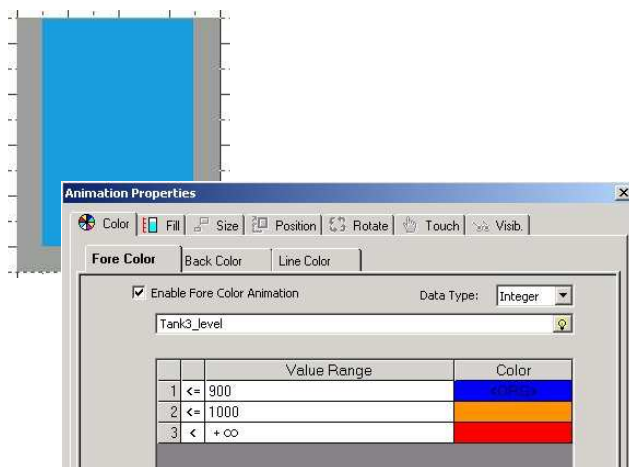
You can use a Color animation to change the color of an object according to the values of a particular variable.

To create this type of animation, you need to:

Draw the object you want to animate

Access the object's properties and define the animation parameters by:

- activating the animation for the part you want to animate, which can be the fore color, back color or line color
- selecting the relevant variable and its type
- defining the values or range of values along with the relevant colors



- Select the object to be animated
- Animate the change of color of the object
  - Open the **Fore Color** tab and select the enable checkbox
  - Set the animation parameters

### Creating a position animation (to move a part, for example)

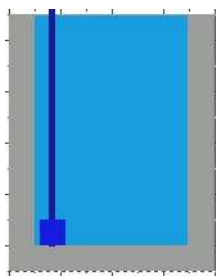
You can use a Position animation to move an object in the panel according to the values of a particular variable.

To create this type of animation, you need to:

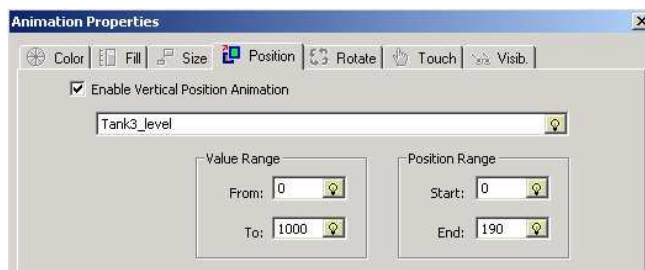
Select the object you want to animate, which will be moving

Access the object's properties and define the animation parameters by:

- activating the animation
- selecting the variable
- defining the value range and the relevant position range



- Select the object to be animated
- Animate the position of the object
  - Open the **Position** tab and select the enable checkbox
  - Set the animation parameters



### Creating a size animation (to simulate the movement of a helix, for example)

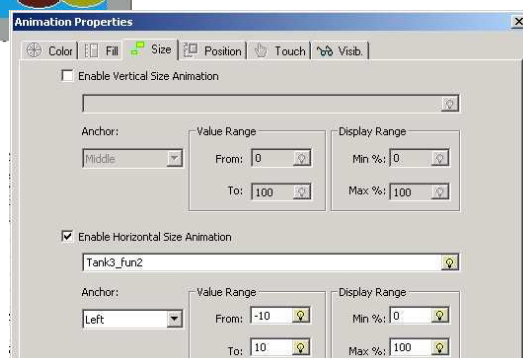
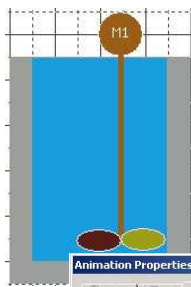
You can use a Size animation to change an object's size according to the values of a particular variable.

To create this type of animation, you need to:

Select the object you want to animate

Access the object's properties and define the animation parameters by:

- activating the vertical or horizontal size animation
- selecting the variable
- choosing the anchor type, for example, left
- defining the value range and the relevant display range



- Select the object to be animated
- Animate the size of the object
  - Open the **Size** tab and select the enable checkbox
  - Set the animation parameters

### Creating a rotation animation (to simulate the movement of a needle on a dial, for example)

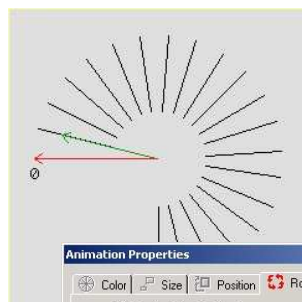
You can use a Rotation animation to rotate an object according to the values of a particular variable.

To create this type of animation, you need to:

Select the object you want to animate

Access the object's properties and define the animation parameters by:

- activating the animation
- selecting the variable
- defining the value range and the relevant angle of rotation, in degrees
- defining the object's center of rotation. The default position is in the middle of the object, which is height/2 and width/2.



- Select the object to be animated
- Animate the object rotation
  - Open the **Rotate** tab and select the enable checkbox
  - Set the animation parameters

### Creating a visibility animation

You can use a Visibility animation to display or hide an object according to the value of a Boolean variable.

To create this type of animation, you need to:

Select the object you want to animate

Access the object's properties and define the animation parameters by:

- activating the animation
- selecting the variable



- Select the object to be animated

- Animate the object visibility

- Open the **Visibility** tab and select the enable checkbox
- Set the animation parameters

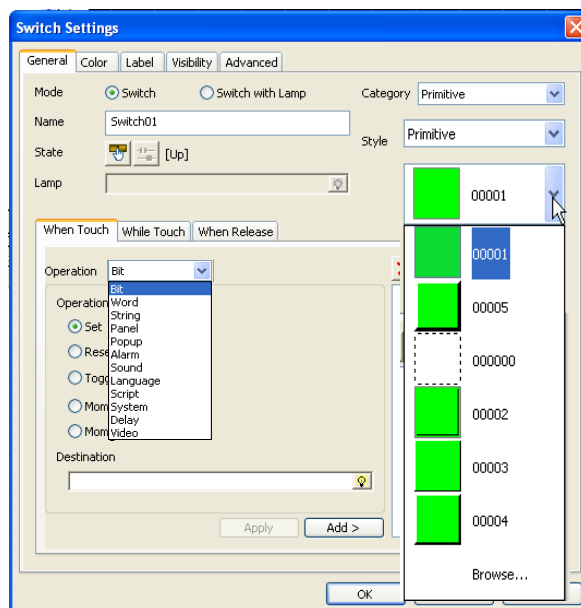
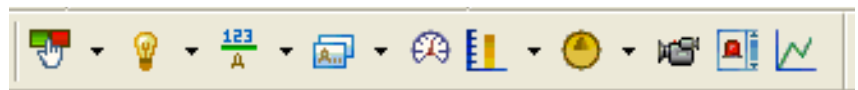
### Native Part Example

Native parts added to a panel by clicking on the toolbar icons.

A native switch may be used in many different ways. The available options are displayed and selected from the operations. Typical uses include bit, word, and string variable operations, navigation to other panels, open or close a pop up panel, play a sound, change language, run a script, enter the system area, delay before the next operation, and video control

A switch can be made to have a variety of looks. You can pick the look you like in the style field. Once you have selected a switch, you can change any of it's colors from the color tab. Labels for the switch can be created on the Label tab.

Other native parts configure in a similar manner and you should choose these tools over tool chest objects whenever possible.



- Native Parts are added using icons in the toolbar
- The configuration of a switch
  - Many operations are possible
- Appearance and colors are programmable



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# Module 11: Trends - Alarms

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### Trend chart displays

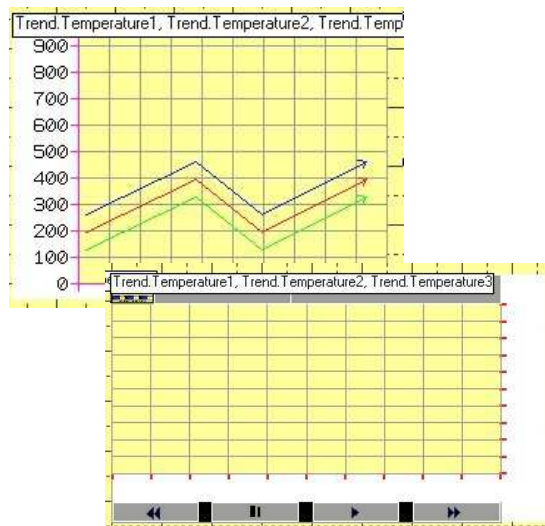
Vijeo Designer offers 2 types of trend chart display:

- A real-time display that you can access from the toolbar
- A real-time/historical display that you can access from the object library

Each display can accommodate up to 8 trend charts.

You are advised not to exceed a limit of 80 variables for the application.

If you want to log any charts you must use a memory card, which excludes you from logging charts if you have an XBT G2110, XBT GT1000 series or XBT GT2110 terminal.



- Real-time or Real-time/Historical display
- Maximum of 8 charts per display
- Memory card is necessary
- No trend charts with XBT G2110, XBT GT1000 series and XBT GT2110

### Inserting a trend chart display in the panel

If you want to display trend charts in a panel you need to:

Insert a trend chart display in the panel, whether real-time or real-time/historical

Configure the trend chart display by:

- defining features such as the axes, scales and colors
- defining the number of stylets or channels
- defining for each channel the relevant variable, colors and other parameters

For each variable you want to display, you also need to enable the historical function and define the number of days you want the log to cover and the logging interval.

For instance, if you set the number of days to be logged as 3 a log file in DAT format will be created every day, covering 3 days. After 3 days, the oldest file will be deleted and replaced by the new file.

Only changes in values are logged. The maximum size of file per variable is defined by the following formula:

*Maximum size per variable = (Number of days to be logged + 1) \* (Number of seconds Runtime per day/logging period) \* 12 bytes*



- Insert a trend chart display in the panel
  - Select the Trend icon from the toolbar
  - Retrieve a trend chart object from the toolchest
- Set the object parameters
- Configure each channel
- Enable the historical property for each of the variables

### Alarm viewer or banner

If you want to display alarms in a panel you need to use a viewer that can be accessed from the toolbar.

You can also configure a banner that will be displayed in a panel or all the panels

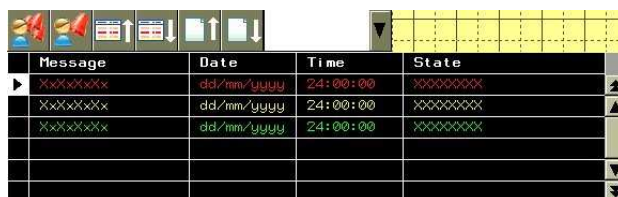
The following 3 types of viewer are available for you to configure:

- Active: In this viewer all the alarms present are displayed, whether they are acknowledged or not.
- Historical: In this viewer a line is created for each new alarm and it displays all the configuration information such as the time it occurs, the time of acknowledgment and the time it disappears.
- Log: In this viewer a line is created for each event, in other words, occurrence, acknowledgment and disappearance.

The alarms are classified by group or category, comprising several groups, which means that you can filter them.

An alarm can be linked to a bit or a word on thresholds and can trigger an action such as changing panel, for instance.

You can also print out alarms or save them in a dat format file.



Message	Date	Time	State
XXXXXXXX	dd/mm/yyyy	24:00:00	XXXXXXXX
XXXXXXXX	dd/mm/yyyy	24:00:00	XXXXXXXX
XXXXXXXX	dd/mm/yyyy	24:00:00	XXXXXXXX

- Alarm viewer or alarm banner (active alarms)
  - Active
  - Historical
  - Log
- Alarm filtering
- Threshold alarms
- Actions on alarms
- Alarm printout
- Option to save alarms (dat file)

### Inserting an alarm viewer in the panel

In order to manage the alarms in your HMI application, you need to:

Use the navigator to create groups or categories, then configure their settings, which includes the number in each mode, whether to print them or save them, etc.

Define the alarm bits and words, which involves activating the function, choosing the group or defining thresholds, etc.

Insert an alarm viewer in your panel and configure it, which means, for instance, defining the group or category displayed, the display mode, date and time format as well as selecting the columns displayed.



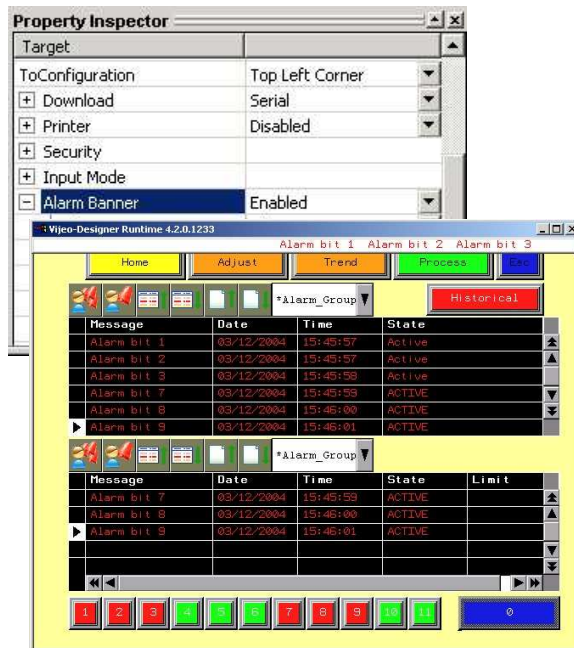
- Create and configure the alarm groups
- Define the alarm bits and words
- Insert an alarm viewer in the panel: **Alarms**
- Set the alarm viewer parameters

### Inserting an alarm banner

If you want to display an alarm banner you need to select the application in the navigator and enable the banner function in its properties. This banner will present the alarm messages in a scrolling display.

You then need to configure the banner's settings, such as defining the group whose alarms will be displayed, the banner's position in the panels, the color used for the messages and the scroll speed.

The alarm banner will always be visible, whatever panel is displayed.



- Enable the Alarm banner function
- Configure the banner parameters
- The alarm banner is visible in all panels

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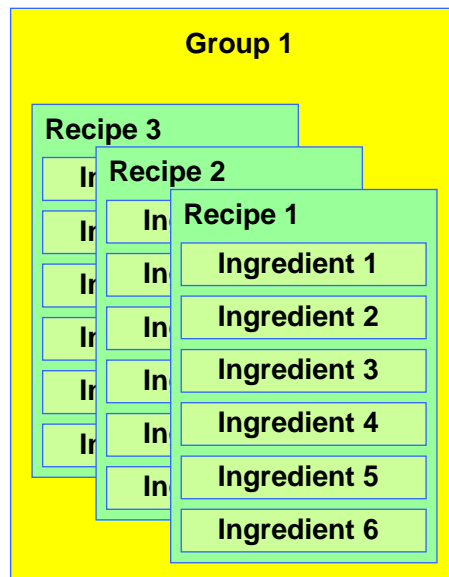
# Module 12: Recipes

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### Recipes

A recipe group is a set of recipes. Each recipe is made up of the same ingredients. Each ingredient has a label, an associated variable and a minimum and maximum value. It also has a current value relevant to each of the recipes

To simplify their use, Vijeo Designer uses a **RecipeControl** structure, which is generated automatically. This control structure has variables associated with it, which you can use to manage the recipes, for instance, to choose the relevant group and recipe and send it to the PLC.



- **Ingredient:** element of a recipe. Define by label, associated variable, minimum and maximum values
- **Recipe:** set of ingredients with current values
- **Group:** set of recipes
- **RecipeControl** variable: recipe group control structure.



### Commands on the recipes

The **Download/Upload** commands allow you to transfer recipes between the Vijeo Designer editor and terminal, using either the internal memory or a memory card.

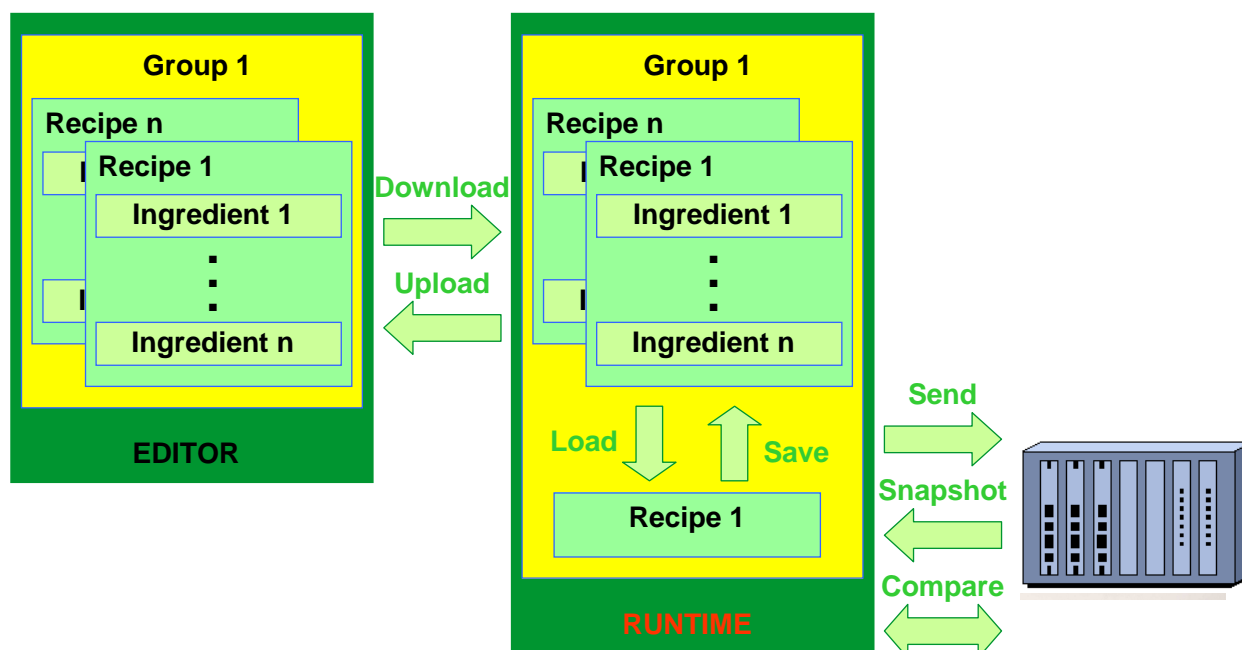
During runtime, you can use the **Load/Save** commands to load a recipe from memory into the ingredient list, modify the ingredient value and save the modified ingredient value back to panel memory. Of course this feature is optional and you do not have to use this feature if you don't want to

The **Send** command sends the selected recipe to the PLC

The **Snapshot** command reads the current ingredient value from the PLC and displays it in the ingredient list. If you want to save this value to the panel's memory, you may use the **SAVE** button to do so.

You can also use the **Compare** command to compare the recipe's values with the PLC's values. The compare function will tell you if the ingredient values are the same or different

There are many options for the recipe controls and you can customize the control to your specification

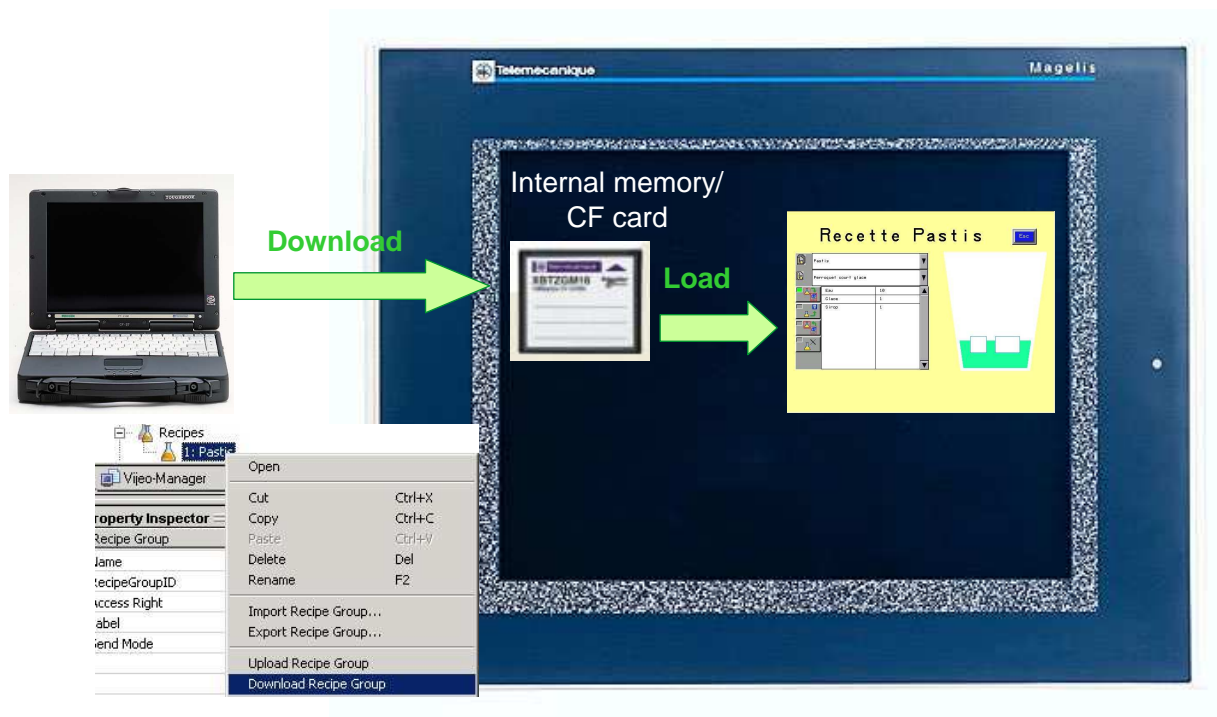


### Transferring a recipe group /Loading a recipe

Once you have created a recipe group, you need to transfer it to the terminal's internal memory or memory card. You can select the target memory from the Recipes function properties.

You do this by selecting the group you want to transfer and right-clicking on the **Download Recipe Group** command. You can also transfer all the groups using the **Download All Recipe Groups** command, which is accessible under the Recipes function.

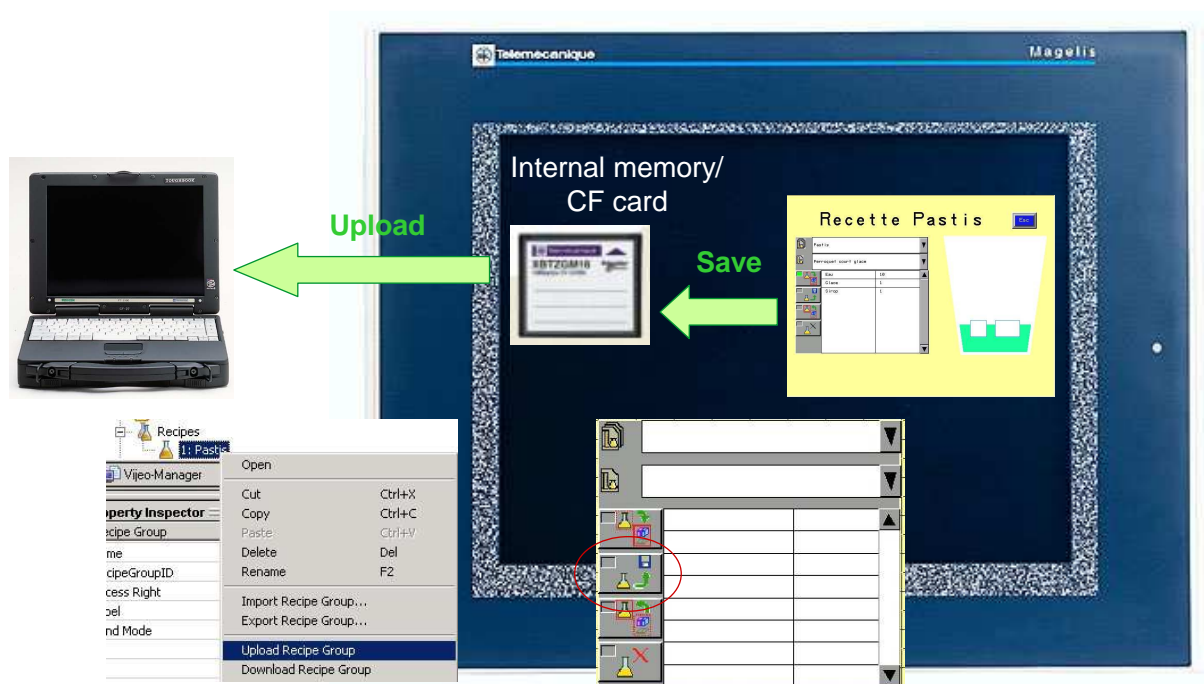
During operation, you can use the **Load** command to load a recipe in the panel. You can access this from the recipe manager or by inserting the **Operation** word in the **RecipeControl** variable.



### Uploading a recipe group / Saving a recipe

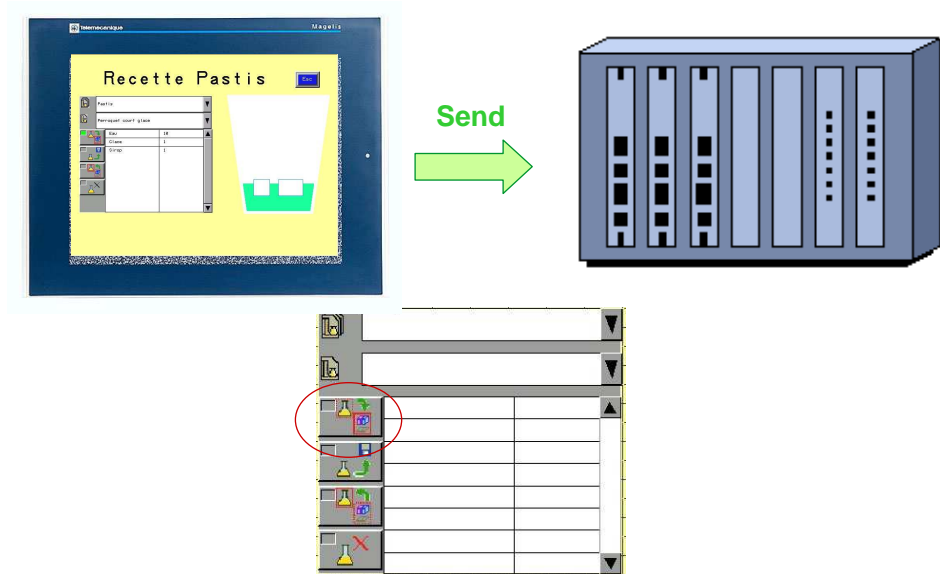
Use the **Save** command if you want to save the current recipe in the internal memory or on the memory card. You can access this from the recipe manager or by inserting the **Operation** word in the **RecipeControl** variable.

If you want to transfer a group whose name features in Vijeo Designer, you need to select the group you want to replace and right-click on the **Upload Recipe Control** command. You can also retrieve all the groups stored in the terminal using the **Upload All Recipe Groups** command, which is accessible under the Recipes function.



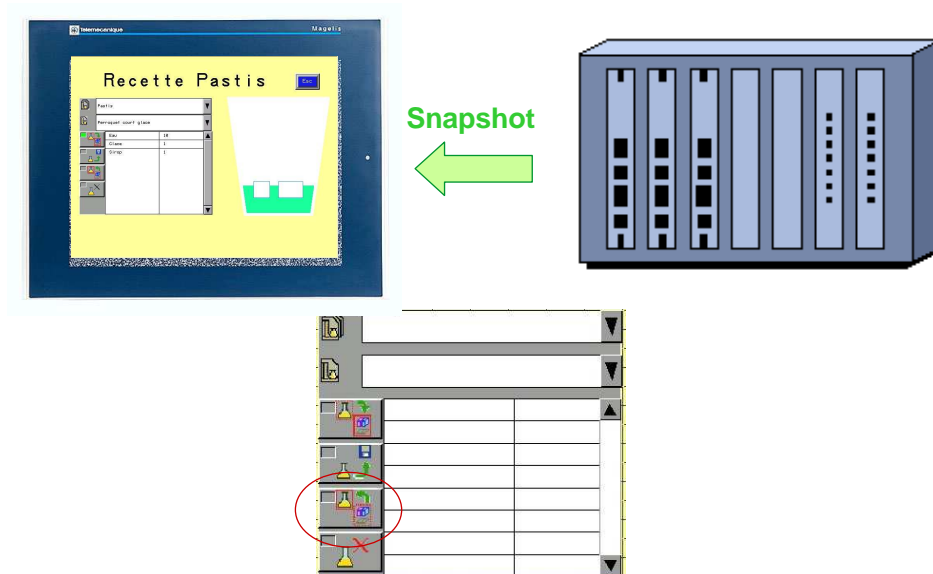
### Writing a recipe to the PLC

To transfer a recipe to the PLC, use the **Send** command, which you can select by clicking on the relevant button in the recipe manager or by inserting the **Operation** word in the **RecipeControl** variable.



### Reading a recipe from the PLC

The **Snapshot** command allows you to read a recipe from the PLC. You can select this command by clicking on the relevant button in the recipe manager or by inserting the **Operation** word in the **RecipeControl** variable.



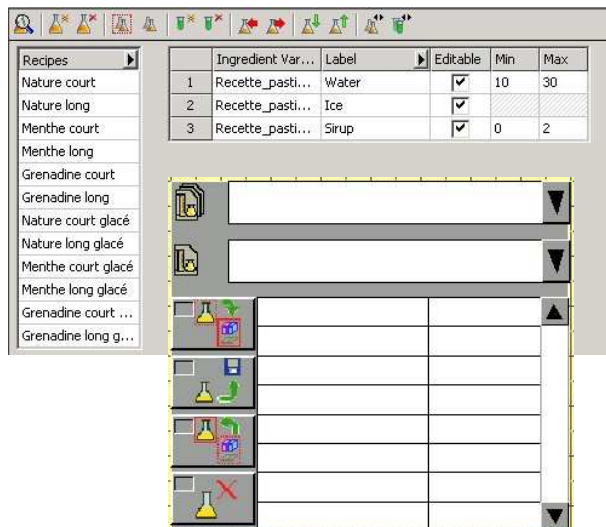
### Creating and managing the recipes of your application

If you want to use recipes in your application you need to:

- Create recipe groups
- Create recipes for each group, define labels for each recipe, define the list of ingredients for each recipe and their associated values

You then need to create a panel, add the objects you want to use to manage your recipes. You can use predefined recipe managers or build your own from the recipe parts in the tool chest.

Finally, you need to establish the link between the **RecipeControlDefault** structure variable created automatically when you are using these objects and your HMI application's variables.



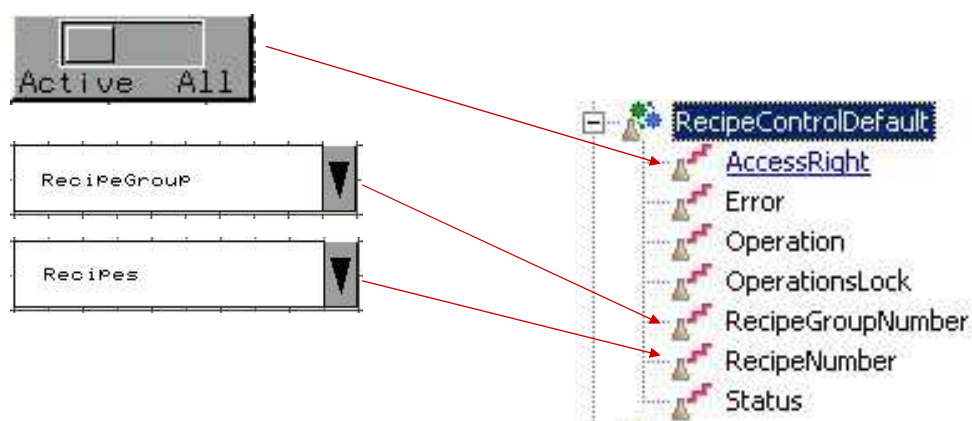
- Create and configure the recipe group:
  - Create the recipes
  - Configure the recipes
- Insert the recipe manager or control buttons in the panel
- Define the group control variables

### Link between the recipe manager and the RecipeControlDefault variable

The **access right** button is linked to the word *AccessRight* in the control variable.

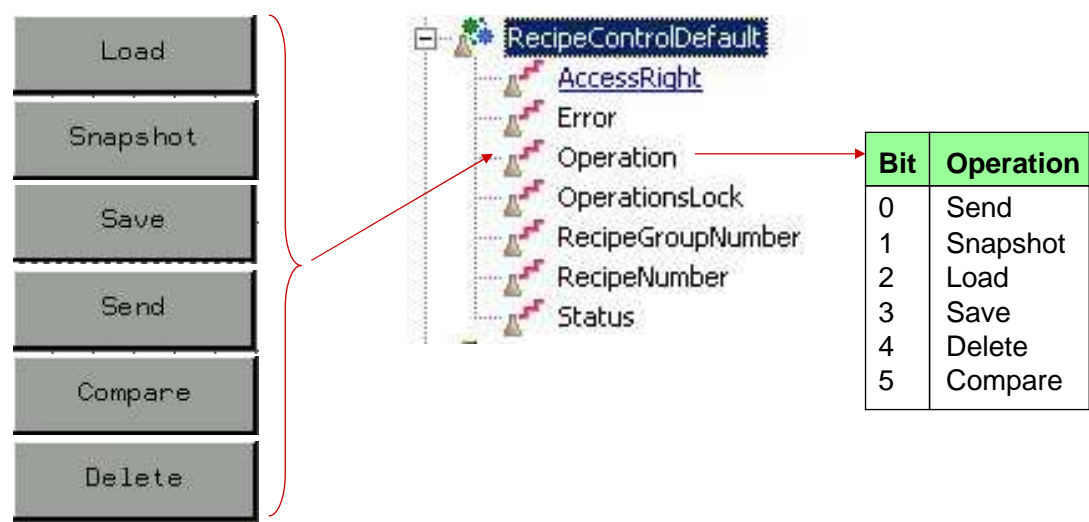
The **recipe group** object is linked to the word *RecipeGroupName* in the control variable. You can use it to select a recipe group from a drop-down list.

The **recipes** object is linked to the word *RecipeNumber* in the control variable. You can use it to select a group recipe from a drop-down list.



Link between the recipe manager and the RecipeControlDefault variable (Operation)

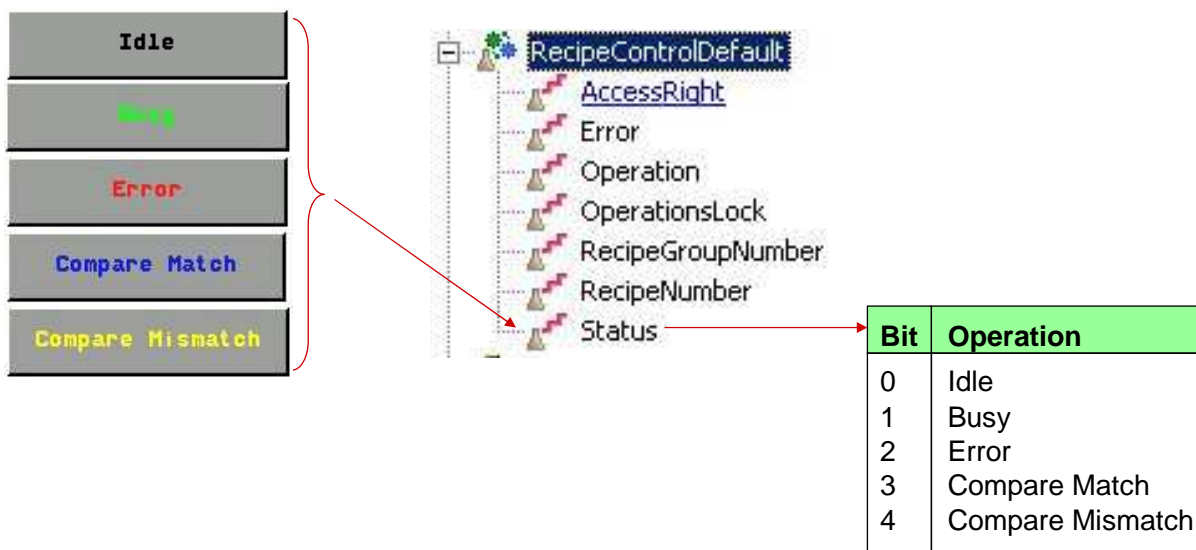
The command **buttons** are linked to the word *Operation* in the control variable. They can be used to trigger one of the following recipe operations: loading, taking a snapshot, saving, sending, comparing or deleting a recipe.





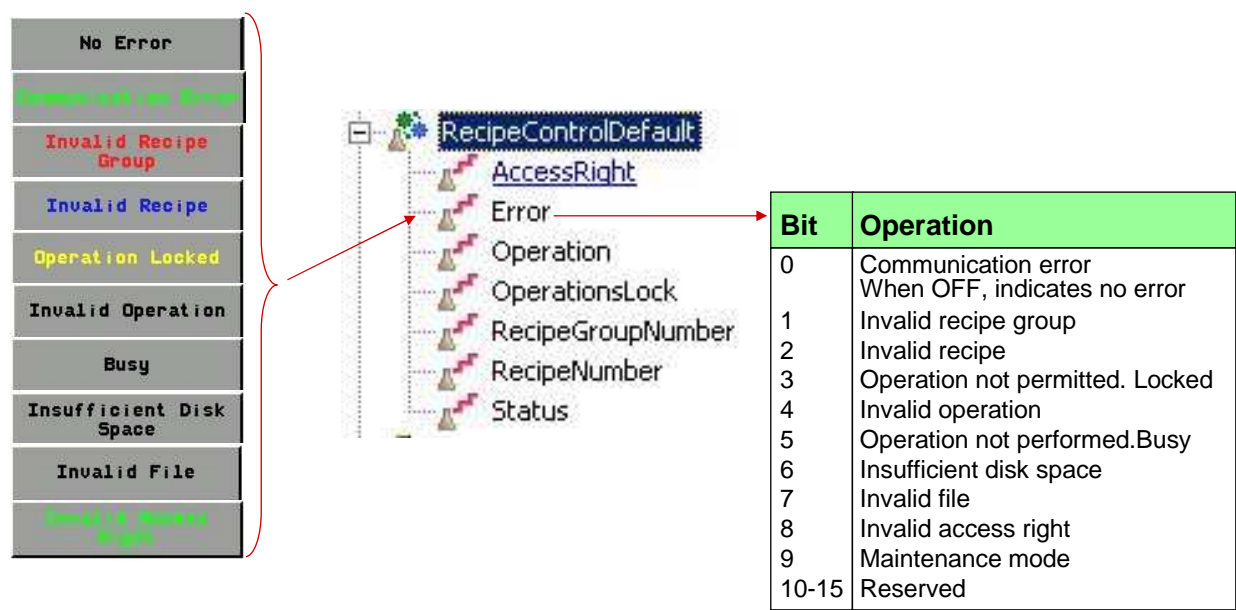
Link between the recipe manager and the RecipeControlDefault variable (Status)

**Status displays** are linked to the word *Status* in the control variable. They can be used to display the current status of recipe operations via a lamp, which can have 5 colors defined by the user, or via one of the following text messages: Idle, Busy, Error, Compare Match or Compare Mismatch.



Link between the recipe manager and the RecipeControlDefault variable (Error)

**Error displays** are linked to the word *Error* in the control variable. They can be used to indicate errors in recipe operations via the following text messages: No error, Communication error, Invalid recipe group, Invalid recipe, Operation locked, Invalid operation, Busy, etc.

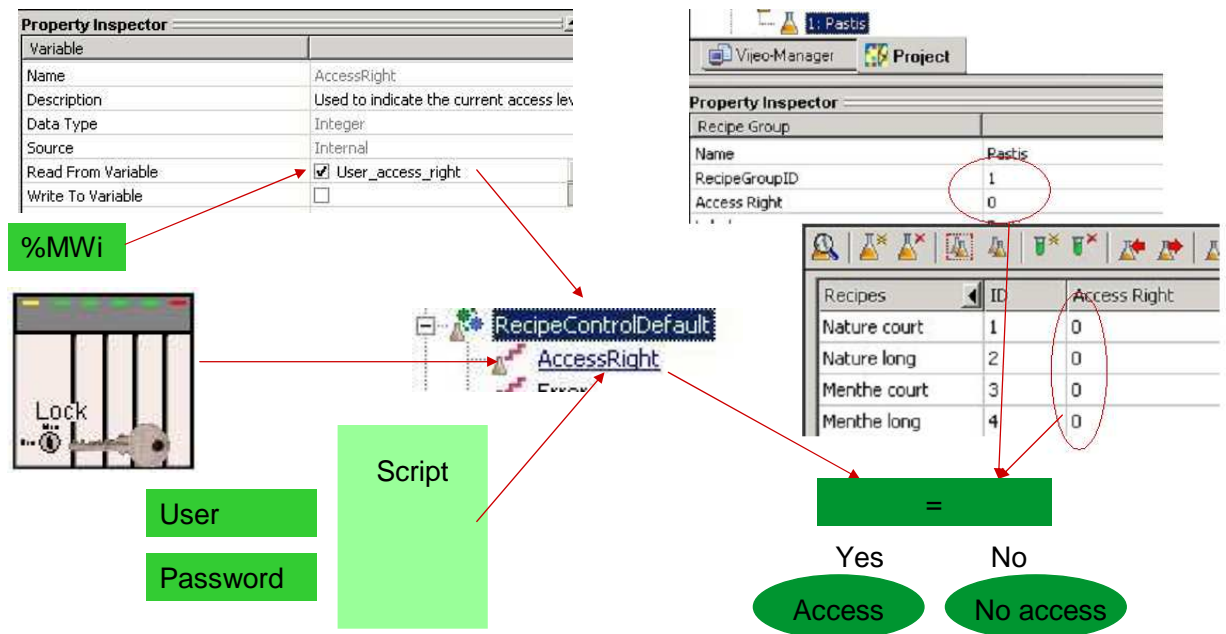


### Managing the access right

The user's access rights are managed via the word *AccessRight* in the control variable. This word can be written by a PLC variable, a key or a Java script.

When you are creating a recipe group or recipe you can assign it an access right, which is 0 by default.

If the access right management function is active the user's right is compared to the recipe's right and if they both match, the user can access the recipe.



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# Module 13: Runtime

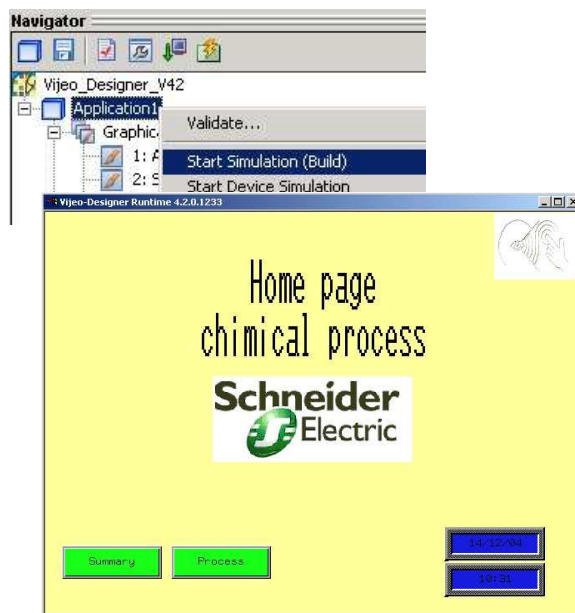
17

### Simulation (connected mode)

To start the simulator in “connected” mode, select the application followed by the **Start Simulation** command. This operation starts by building the application, then starts the simulation. If an error is detected during the build process the simulation stops and you will have to fix the application before being able to continue. If the application is correct you can then access it in Runtime.

During the simulation process you can test your application without using a terminal. For instance, you can navigate between panels, activate popup windows, display data or activate switches.

You can also test external variables during this type of simulation process. If a PLC driver is configured and reachable by the simulator (the computer running the simulation in Vijeo Designer), it will connect to the PLC just as a terminal would connect.



- Start simulation
- Test your application
  - ☐ Navigation between panels
  - ☐ Popup windows
  - ☐ Data displays

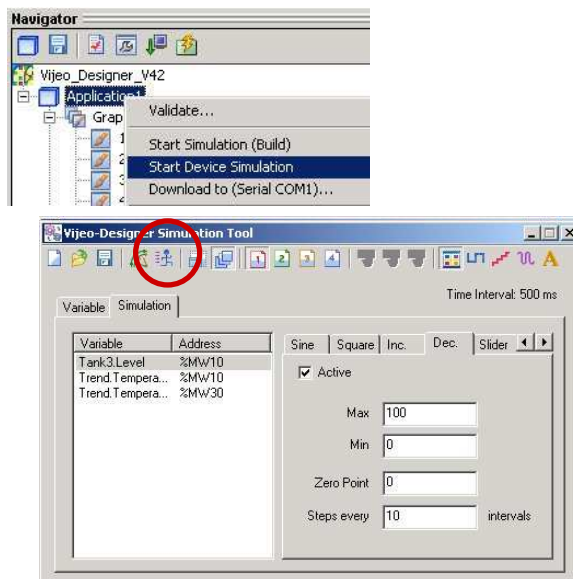
### Simulation of external variables (local mode)

With this type of simulation, which you can access via the **Start Device Simulation** command, you can test your HMI application without a real connection to the external variables.

If your application builds correctly you can access it in Runtime and a window appears allowing you to select the type of simulation you want for the external variables.

If you select the **Simulation** tab you can define and configure the type of simulation that you want to apply to each variable selected, such as incremental or random.

You can now finally start the simulation and test your application.



- Start device simulation
- Select the external variables to simulate
- For each variable, select and configure a type of simulation
- Activate the simulation function
- Test your application

Specifications

The number of panels in your application is limited by the size of your flash memory and the size of each panel. A typical application allows you to create more than 1,000 panels or popup panels.

We recommend limiting each panel to 800 objects and 30 switches. If you require more switches, limit the number of objects, e.g. 235 objects and 235 switches.

You can display up to 3 popup panels simultaneously including the popup keypad.

If you use Java scripts, we recommend limiting their size to 50 program lines.

Panels	
Number of panels / popup panels (allowed)	Limited by internal memory (flash memory) available on the target and the size of each panel More than 1000 panels and popup panels for a typical project
Number of objects on a panel (recommended)	For best performance, typical usage of: 800 objects and 30 switches or 235 objects and 235 switches
Popup windows (allowed)	In run time 3 popup panels active at same time (including the popup keypad)
Scripts	
Maximum length of each script (recommended)	50 lines

Specifications (cont)

You can create up to 32 alarm groups and 32 alarm categories, which can each contain up to 10,000 History or Log alarms. The number of alarms in your application depends on the backup option. If this is disabled, the number of History or Log alarms is limited to 80,000; otherwise, the number depends on the size of the terminal SRAM.

The size of each record depends on the type of alarm: 20 bytes for Active, 24 bytes for History and 16 bytes for Log.

Alarms	
Number of alarm groups/ categories (allowed)	32 alarm groups max 32 alarm categories max
Number of alarms in alarm groups (allowed)	10000 log and history alarm records max for each alarm group If Backup Alarm Group is set to No: 80000 log and history alarms max for all the application If Backup Alarm Group is set to Yes: the number of alarms is limited by the space available on SRAM memory
Alarm backup	The size required for each alarm depends on the alarm type: Active: 20 bytes per record History: 24 bytes per record Log: 16 bytes per record



Specifications (cont)

Your application can have up to 15 user languages.

The number of variables authorized (including system variables) is limited to 2500 per panel on the iPC Series and 800 per panel on all other terminals. You create up to 12,000 variables for each iPC terminal and up to 8,000 variables for all other terminals

Languages		
Number of user languages (allowed)	15 max	
Variables		
Number of variables (allowed)	iPC Series	All other terminals
	2500 variables per/panel	800 Variables/per/panel
	12000 max per target	8000 max per target
	400 max variables shared per target	300 max variables shared per target

### Specifications (cont)

The maximum number of devices per communication port is 48 with an Ethernet link: you can configure up to 20 communication groups per device.

The recipes allow you to create up to 32 groups of 256 recipes.

The number of ingredients in a recipe is limited to 1024.

Communication	
Number of equipments (allowed)	48 max
Number of scan groups per equipment (allowed)	20 max
Recipes	
Number of recipe groups (allowed)	32 max
Number of recipes in a recipe groups (allowed)	256 max
Number of ingredients in a recipe group (allowed)	1024 max

