

Vijeo Designer Tutorial

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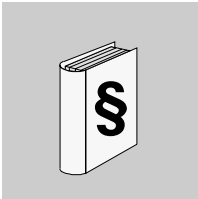
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Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death, serious injury, or equipment damage.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

CAUTION

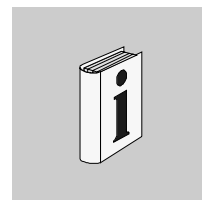
CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons.

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About the Book



At a Glance

Document Scope This manual introduces you to the fundamentals of Vijeo Designer, a software package you need to use when you develop and configure applications for the XBT G/XBT GT families of HMI panels.

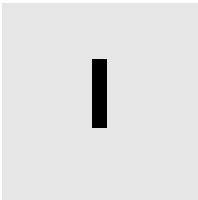
It is written to help new users get started and as a quick reference for users who are already familiar with the software. For detailed descriptions of the software's feature and functions, refer to the Vijeo Designer online help.

Related Documents

Title of Documentation	Reference Number
Vijeo Designer User Manual	included on the Vijeo Designer CDROM
Vijeo Designer Uni-Telway Driver	included on the Vijeo Designer CDROM
Magelis XBTG Modbus TCP/IP Driver	included on the Vijeo Designer CDROM
Magelis XBTG Modbus RTU Driver	included on the Vijeo Designer CDROM
Magelis XBTG Modbus Plus Driver	included on the Vijeo Designer CDROM

User Comments We welcome your comments about this document. You can reach us by e-mail at techpub@schneider-electric.com

Vijeo Designer at a Glance



At a Glance

Purpose of this section

This section describes the software’s main functions and installation.

What's in this Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	General	11
2	Project creation	19
3	Project Download	67

At a Glance

Purpose of this chapter

This chapter describes the Vijeo Designer software application.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Software Overview	12
Vijeo Designer's Main Tools	14
Installing Vijeo Designer	16
Software Version Compatibility	17
Uninstalling Vijeo Designer	18

Software Overview

About Vijeo Designer

Vijeo Designer is a state-of-the-art software application with which you can create operator panels and configure operating parameters for human machine interface (HMI) devices. It provides all the tools needed to design an HMI project, from the data acquisition to the creation and display of animated drawings.

Minimum System Requirements

Processor	Intel Celeron 566 MHz or faster (Pentium III 1GHz or faster recommended)
Memory	128 MB of RAM (512 MB or more recommended)
Available Disk Space	400 MB or more on hard disk
Operating system	Windows 2000 or XP (english, french, german, italian or spanish)
Web browser	Internet Explorer 5.0 or later

Features

Data reuse

Vijeo Designer uses two types of data:

- internal data created in the user application
- data provided by external devices such as PLCs and remote I/O modules

Graphical objects, scripts, and panels created with Vijeo Designer can be saved in the Toolchest (See *Vijeo Designer's Main Tools*, p. 14) so that they can be reused in other projects. The ability to reuse this data can help you optimize the development of new applications and standardize screens in applications that are co-developed.

Multi-PLC connectivity

With Vijeo Designer you can configure your HMI panel to simultaneously communicate with several different Telemecanique and third-party devices.

HMI screen creation

Vijeo Designer enables you to create dynamic screens for the HMI panel. It combines various functions such as moving objects, zooms, level indicators, on/off indicators, and switches in a simple application. Animated symbols can be used to build and edit a graphical screen very simply.

Scripts

Vijeo Designer provides a script feature so that you can reuse building blocks or full sequences from one application in other projects.

Reports

Vijeo Designer incorporates an advanced function that simplifies the management of variables used in the animation screens. Working in a Property Inspector window (See *Vijeo Designer's Main Tools*, p. 14), you can configure or modify the variables and characteristics of objects.

Multi-language messaging

Vijeo Designer can store the alarm messages or text objects for the same application in more than 10 different languages. A simple selection from the animation screen switches the display to the selected language.

Editing variables from other applications

Vijeo Designer can import/export variables and recipes as CSV files. Similarly, variables created in Vijeo Designer can be exported to other applications.

Target Terminal Models

The following HMI units are designed and configured with Vijeo Designer:

- XBT G2000 Series
 - XBT G4000 Series
 - XBT G5000 Series
 - XBT G6000 Series
 - XBT GT1000 Series
 - XBT GT2000 Series
-

Vijeo Designer's Main Tools

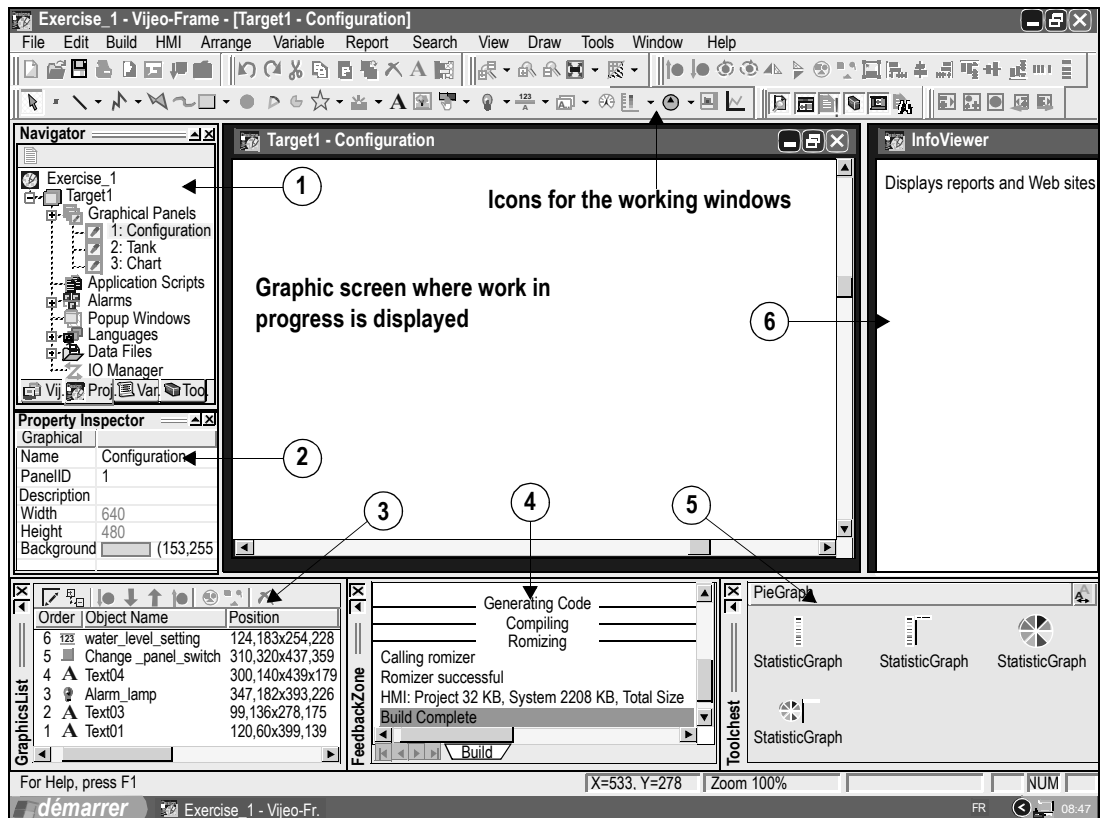
At a Glance

Vijeo Designer's main tools can be accessed from the program's main screen. Six tool windows enable you to develop your project quickly and easily. Each window provides information pertaining to a specific object or to the project.

You can customize your work environment by resizing or moving the windows. Icons associated with the windows are located in the toolbar.

The Main Screen

The Vijeo Designer environment looks like this:



Note: Vijeo Designer appearance may be different, because all the windows can be configured by user.

Working Window Icons The tool window icons (identified in the illustration above by the numbers 1-6) act as toggle switches to display or hide the working windows:

Item	Screen/Icon name	Description
1	Navigator 	Used to create applications. Information about each project is listed hierarchically in a document explorer.
2	Property Inspector 	Displays the selected object's parameters. When more than one object is selected, only those parameters common to all objects are displayed.
3	Graphics list 	Lists all the objects appearing in the drawing, giving their: ● creation order ● name ● position ● animations ● other associated variables The highlighted object in the list is selected in the drawing. Information is displayed similarly for a group of objects (i.e., order, name, position). To display a list of the objects in a group, click +. Each object can be selected separately.
4	Feedback Zone 	Displays the progress and results of the error check, compilation, and load. When an error occurs, the system displays an error message or warning message. To view the error location, double-click the error message.
5	Toolchest 	A library of components (bar chart, timers, etc.) provided by the manufacturer and/or created by you. To place a component in the drawing, select the component in the Toolchest and drag it into the drawing. Your own components can be exported and/or imported.
6	InfoViewer 	Displays the online Help or the contents of a report

Installing Vijeo Designer

Prerequisites

Vijeo Designer software should be installed by a system administrator.

Installation Procedure

Step	Action	Result
1	Close any applications running on the desktop.	
2	Insert the CD-ROM in the computer's CD drive.	Vijeo Designer's Autorun program should automatically start the installation program. If the installation does not begin automatically, click Start → Run , enter <code>x:\SETUP.EXE</code> in the Open box, and click OK (where x represents your CD-ROM's drive letter).
3	Select an installation language and click the Vijeo Designer button.	The InstallShield Wizard Welcome screen appears.
4	Click the Next button.	The terms of the license agreement are displayed.
5	Click the Yes button to accept the terms.	The Customer Information screen appears.
6	Enter your name, your company name, your reference, and your serial number in the Customer Information screen. Then click the Next button.	You are prompted to enter choose an installation folder on your computer. By default, this folder is <code>c:\Program Files\Schneider Electric</code> .
7	Specify an installation folder (and click the Next button.	
8	Select Program Folder and click the Next button.	
9	If you want to create a shortcut on the desktop click the Yes button.	InstallShield installs Vijeo Designer or one of its components.
10	Click the Finish button when the installation is complete. Then click the Exit button to return to your desktop.	

Note: At the end of the installation process, the program may ask you to restart your computer. You must restart to update all newly installed components in the system.

Software Version Compatibility

Title of Overview Block

Once the software has been installed (See *Installing Vijeo Designer*, p. 16), you as a user need to understand how this version of Vijeo Designer works with previous versions of the software.

Note: Before starting Vijeo Designer for the first time, read the Readme.chm file, which can be accessed from the **Start** → **Run** → **Program Files** → **Schneider Electric** → **Vijeo Designer** menu.

Compatibility with Older Versions of the Software

Projects created in this version of Vijeo Designer are not backward-compatible with previous versions of the software. A new project created and opened with this version of Vijeo Designer cannot be opened with an earlier version.

Projects created with an earlier version of Vijeo Designer are forward-compatible with this version. However, before opening an application that was created with an earlier version of Vijeo Designer, you should perform a complete backup of the initial project using the **export** feature.

Uninstalling Vijeo Designer

Two Ways to Uninstall the Software

Vijeo Designer may be uninstalled in either of two ways:

- using the **Uninstall** utility in the software
 - with the **Add/Remove** utility on your computer's Control Panel
-

Using the Uninstall Utility

Step	Action
1	Close any applications running on the desktop.
2	Click Start → Run , and enter the path to the Uninstall utility in the installation folder for Vijeo Designer (for example, c:\Program Files\Schneider Electric\Vijeo designer\Uninstall).
3	Click the OK button.
4	At the end of the uninstall process, restart your computer to update the system.

Using the Add/Remove Programs Utility

Step	Action
1	Close any applications running on the desktop.
2	Click Start → Settings → Control Panel .
3	Select Vijeo Designer from the list of programs and click the Remove button.
4	At the end of the uninstall process, restart your computer to update the system.

Project creation

2

At a Glance

Purpose of this Chapter

This chapter gives some procedures that describe how to produce a simple application using Vijeo Designer's main functions.

What's in this Chapter?

This chapter contains the following sections:

Section	Topic	Page
2.1	Creation of Panels	21

2.1 Creation of Panels

At a Glance

Subject of this Section

This section describes the procedure to be followed to create the project screens.

What's in this Section?

This section contains the following topics:

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Description of Requirement

At a Glance

In order to discover some of the things you can do with Vijeo Designer, we are going to develop a project. To do this, we need to describe our requirement or specifications.

The application must satisfy the following criteria:

- manage the filling of a **tank** according to a filling setpoint and an alarm level. The setpoint and alarm level are selected by the user from a range of presets. We will use the **recipes** function for selection of presets,
 - empty the tank by opening/closing the bottom valve when a **button** is pressed,
 - **view** the setpoint values in a **numeric display** and as a **trend graph**,
 - have an overview of the variation in level over time. To do this, we use a **trend graph**,
 - inform the user when a threshold is exceeded via a **lamp** and an **alarm page**.
-

Project Construction Steps

At a Glance

The following steps must be taken and the following points addressed to create the project manual:

- launch Vijeo-Designer,
 - create the project manual,
 - configure the project,
 - declare the variables,
 - create the different panels and screen jumps,
 - create the numeric and textual displays,
 - use the graphical objects from the toolchest,
 - create the recipe,
 - create the trend graphs,
 - create alarm management,
 - create a script,
 - generate and simulate the project.
-

The Application at a Glance

At a Glance

The project to be designed is called "manual".

It consists of three screen pages:

- "Tank",
- "Curves",
- "Alarms".

The "Tank" (See *The "Tank" Panel, p. 25*) panel consists of:

- a tank taken from the animation **toolchest**,
- two **numeric displays** (the level value and the alarm setpoint),
- two types of **recipe** command which can be used to define the fill values and tank level alarms,
- a tank emptying valve controlled by a **button**,
- an upper threshold alarm **lamp**,
- and a set of **buttons** used to switch from one screen to another.

The "Curves" (See *The "Curves" Panel, p. 26*) panel consists of:

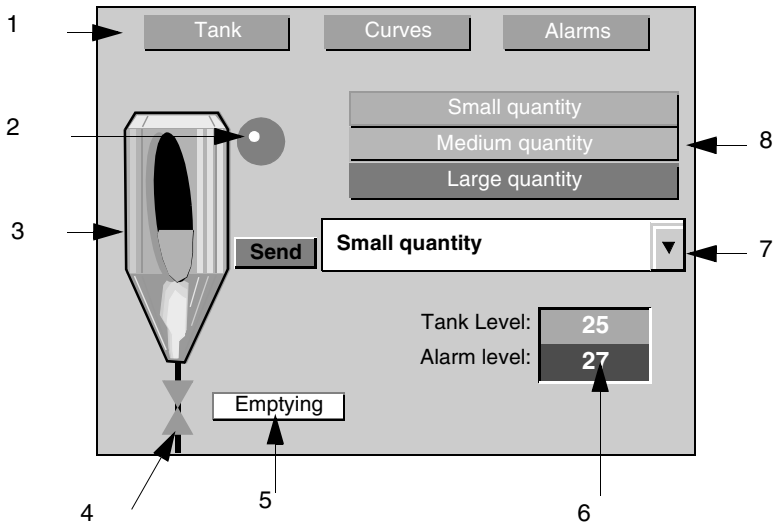
- the **trend graphs** object in which the tank level and alarm setpoint are animated,
- and a set of buttons used to switch from one screen to another.

The "Alarms" (See *The "Alarms" Panel, p. 27*) panel consists of:

- the **alarm** object which displays the high level alarm if the tank level is higher than the alarm setpoint,
 - and a set of buttons used to switch from one screen to another.
-

The "Tank" Panel The tank is filled to a selected product quantity (small quantity and large quantity). The quantity is managed by a **recipe**. The recipe also manages the threshold not to be exceeded depending on the desired quantity (alarm setpoint). You can modify the alarm setpoint by clicking (for a simulation) or by touching the **numerical display** for the "level of alarm" (on the XBTG's tactile screen). The high level alarm is activated if the tank level is higher than the alarm setpoint. Activation of the alarm causes a **lamp** to light up (red if threshold exceeded). The level changes in the tank. An emptying **button** enables you to empty the tank via the bottom valve. The bottom valve is animated when you press the "emptying" button. When closed the valve is shown in gray. When it is open it is shown in red.

The following diagram shows the "Tank" page:

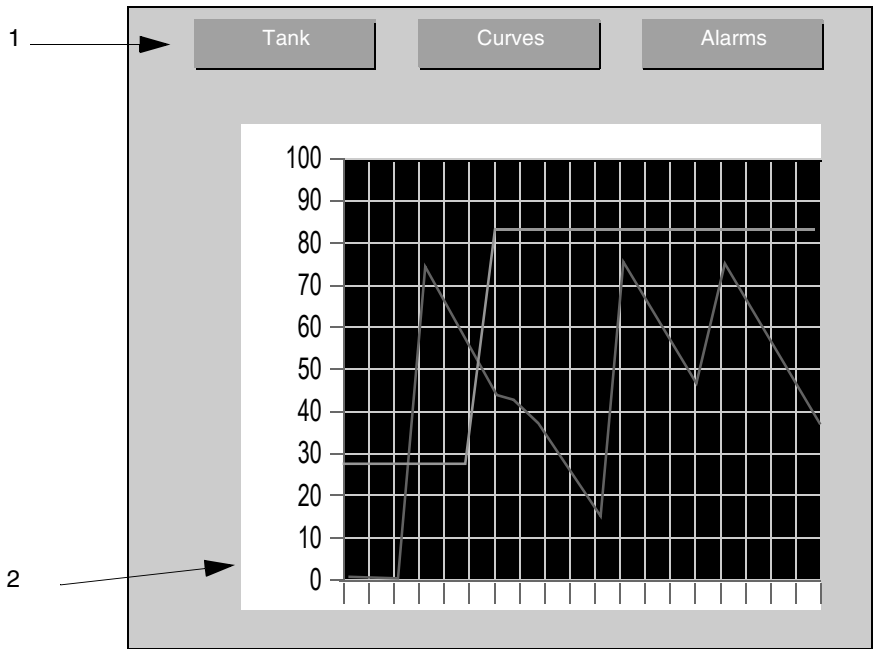


Number	Description
1	Screen browser button
2	High level lamp
3	Tank with animated level
4	Tank bottom valve
5	Tank emptying button
6	Data entry zone for setpoint using numerical keypad
7	Recipe selector
8	Recipe command buttons

The "Curves" Panel

In this screen, the variation in the tank level and the alarm setpoint is represented in graphic form.

Illustration of the "Curves" panel:

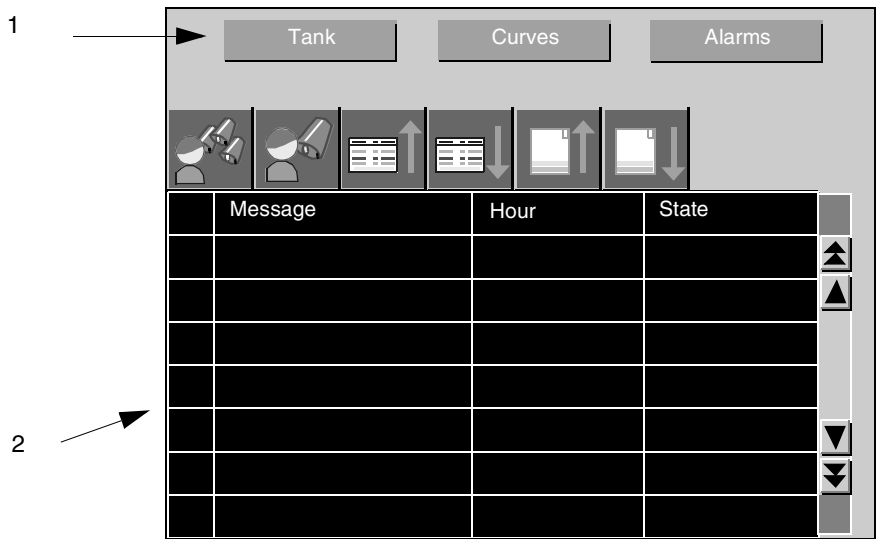


Number	Description
1	Screen browser button
2	Trend graph showing the tank level and setpoint

The "Alarms" Panel

This screen enables you to view the state of the level alarm.

Illustration of the "Alarms" panel:



Number	Description
1	Screen browser button
2	Alarm table for viewing active, acknowledged or elapsed/resolved alarms

Starting Vijeo Designer

Procedure

To start Vijeo Designer, select **Start \ Programs \ Vijeo Designer** or double-click the Vijeo Designer icon on the desktop.

Basic Settings

At a Glance

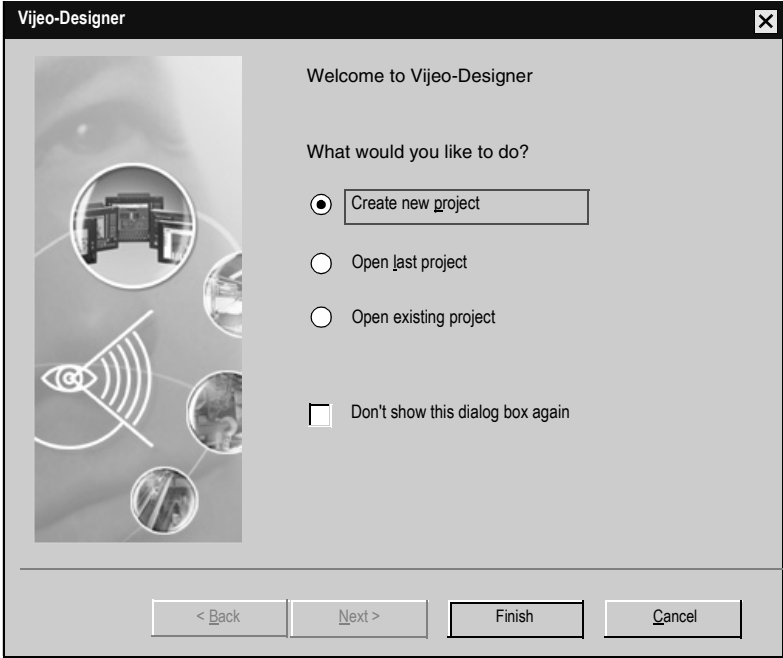
Configuring your project correctly is essential before you begin to create a drawing. This project uses internal and external variables.

A project created in Vijeo Designer is a simple chain of information (database). Within a project, the target terminals are configured and organized in a hierarchical structure.

Each target shows the hardware environment (PLC device) in which the project will be run.

Create a Project and Configure its Target

The following table describes the procedure to follow to create a project and select the remote device:

Step	Action
1	This dialog box appears when Vijeo Designer is started. Click "Next" to continue.  Note: If the above dialog box is not displayed when you start Vijeo Designer, you must select the "Vijeo-Manager" tab in the navigator, then right-click "Vijeo-Manager" and select "New Project".

Step	Action																																
2	● Enter the name of your project and click OK (in our case, type "Manual_V42"). ● Click on Next then select module type XBT G2230. ● Click on Next, select the IP address if the model uses an Ethernet port then click Next. ● Select the relevant driver for the device type using the Add button (in our example, enter Schneider Electric Industrie SAS as the Manufacturer and Uni telway as the driver) then click on Finish. New folders (panels, scripts, alarms, popup windows, languages, data files, etc.) are created. Property Inspector Target <table><tr><td>Name</td><td>Target1</td></tr><tr><td>Description</td><td></td></tr><tr><td>Type</td><td>XBTG Series</td></tr><tr><td>TargetColor</td><td>256 Colors</td></tr><tr><td>Model</td><td>XBTG2330 (320x240)</td></tr><tr><td>InitialPanelID</td><td>1: Tank</td></tr><tr><td> + Startup option</td><td></td></tr><tr><td>Buzzer</td><td>Enable</td></tr><tr><td>ToConfiguration</td><td>Top Left Corner</td></tr><tr><td> + Download</td><td>Ethernet</td></tr><tr><td> + Data Sharing</td><td>Ethernet</td></tr><tr><td> + Printer</td><td>File System</td></tr><tr><td> + Security</td><td>Serial</td></tr><tr><td> + Input Mode</td><td></td></tr><tr><td> + Alarm Banner</td><td>Disabled</td></tr><tr><td> + System keypad</td><td></td></tr></table> Note: To add another "Target" to the project, right-click "My Project" then select "New Project".	Name	Target1	Description		Type	XBTG Series	TargetColor	256 Colors	Model	XBTG2330 (320x240)	InitialPanelID	1: Tank	+ Startup option		Buzzer	Enable	ToConfiguration	Top Left Corner	+ Download	Ethernet	+ Data Sharing	Ethernet	+ Printer	File System	+ Security	Serial	+ Input Mode		+ Alarm Banner	Disabled	+ System keypad	
Name	Target1																																
Description																																	
Type	XBTG Series																																
TargetColor	256 Colors																																
Model	XBTG2330 (320x240)																																
InitialPanelID	1: Tank																																
+ Startup option																																	
Buzzer	Enable																																
ToConfiguration	Top Left Corner																																
+ Download	Ethernet																																
+ Data Sharing	Ethernet																																
+ Printer	File System																																
+ Security	Serial																																
+ Input Mode																																	
+ Alarm Banner	Disabled																																
+ System keypad																																	
3	Save your project.																																

Creating Variables

At a Glance

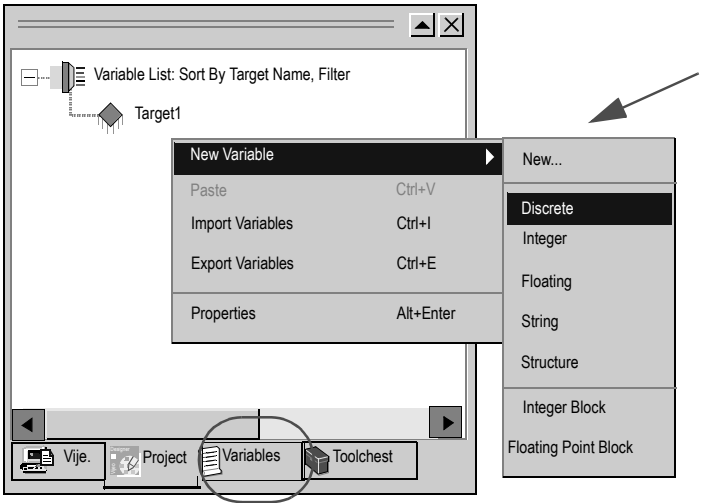
A variable is a memory address indicated by a name. Vijeo Designer handles the following types of variables:

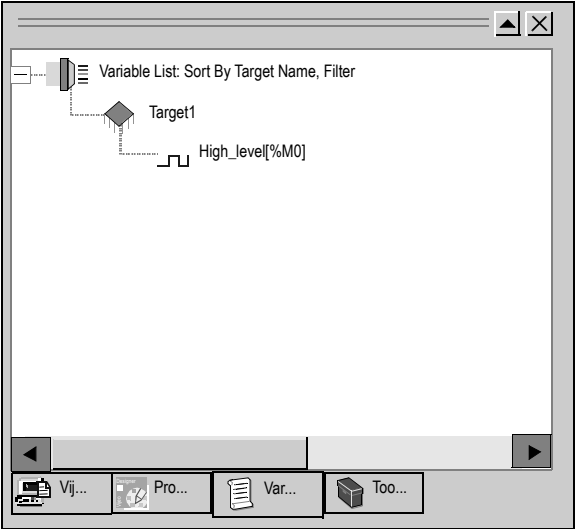
- Boolean
- Integer
- Floating
- Character string
- Structure
- Integer block
- Floating point block

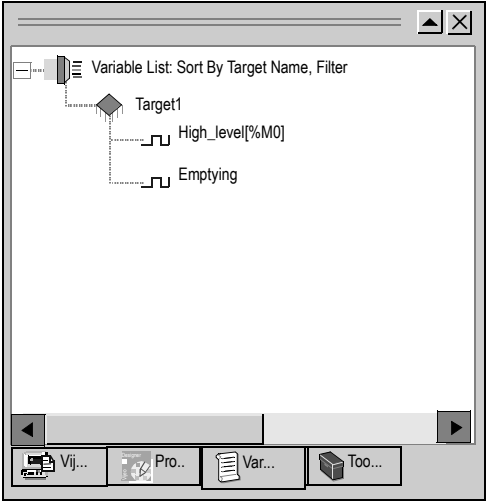
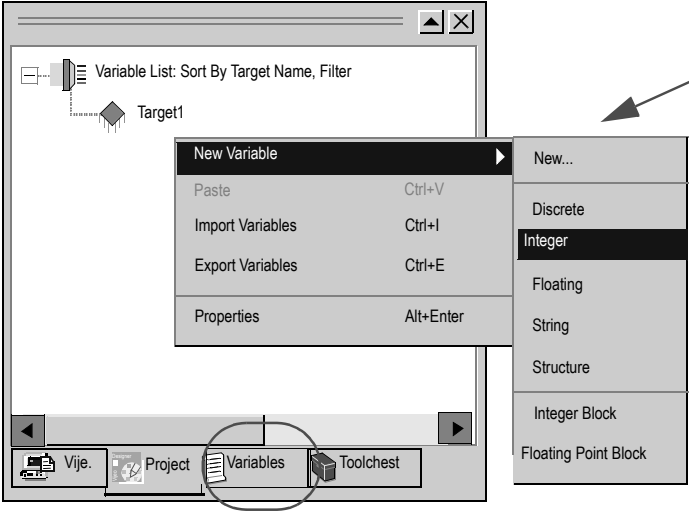
Vijeo Designer uses the variables to communicate with devices. You can also define internal variables that will only be used by Vijeo Designer.

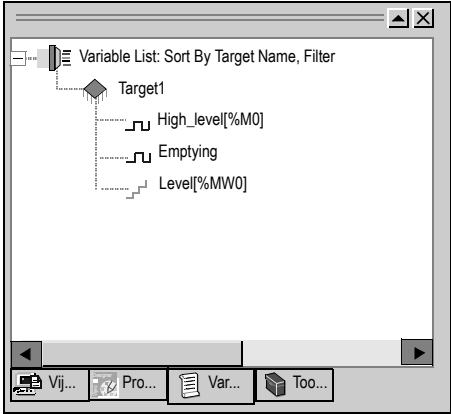
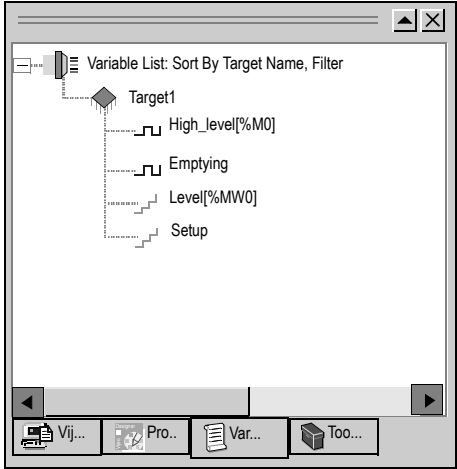
In our project, we are going to create three internal variables and one external variable which communicates with a Uni-Telway device.

The following table describes the procedure to follow for creating variables:

Step	Action
1	Click the "Variables" tab in the "Navigator" window, right-click on Target1 and select "New Variable" then the type "Discrete". 

Step	Action																						
2	You will now change the name of the Boolean-type "DISCRETE01" variable to "High_level" from the variable properties window. In this window, specify the variable source (external in this case). The variable has %M0 as its Device Address 																						
3	The "High_level" variable is an alarm. In its properties enable the Alarms function. <table><tr><td colspan="2">- Variable</td></tr><tr><td>Name</td><td>High_level</td></tr><tr><td>Description</td><td></td></tr><tr><td>ArrayDimension</td><td>0</td></tr><tr><td>Data Type</td><td>Discrete</td></tr><tr><td>Source</td><td>External</td></tr><tr><td>Scan Group</td><td>UniTelway01Device</td></tr><tr><td>Device Address</td><td>%M0</td></tr><tr><td>Indirect Address</td><td>☐</td></tr><tr><td>+ KeepHistory</td><td>Enabled</td></tr><tr><td>+ Alarm</td><td>Enabled</td></tr></table>	- Variable		Name	High_level	Description		ArrayDimension	0	Data Type	Discrete	Source	External	Scan Group	UniTelway01Device	Device Address	%M0	Indirect Address	☐	+ KeepHistory	Enabled	+ Alarm	Enabled
- Variable																							
Name	High_level																						
Description																							
ArrayDimension	0																						
Data Type	Discrete																						
Source	External																						
Scan Group	UniTelway01Device																						
Device Address	%M0																						
Indirect Address	☐																						
+ KeepHistory	Enabled																						
+ Alarm	Enabled																						

Step	Action
4	Repeat steps 1 and 2 to create the following internal variable of Discrete (Boolean) type: "Emptying". You have now created two Boolean variables.  The screenshot shows a window titled "Variable List: Sort By Target Name, Filter". Inside, there is a tree structure with "Target1" as the root. Under "Target1", there are two sub-items: "High_level[%M0]" and "Emptying". Both sub-items have a small square icon next to them, indicating they are Boolean variables. The window has a toolbar at the bottom with buttons labeled "Vij...", "Pro...", "Var...", and "Too...".
5	Click the "Variables" tab in the "Navigator" window, right-click on Target1 and select "New Variable" then the type "Integer".  The screenshot shows the "Navigator" window with the "Variables" tab selected. The "Variables" tab is circled in red. A right-click context menu is open over "Target1". The menu options are: "New Variable", "Paste", "Import Variables", "Export Variables", and "Properties". The "New Variable" option is selected, and a sub-menu is open showing the following options: "New...", "Discrete", "Integer", "Floating", "String", "Structure", "Integer Block", and "Floating Point Block". The "Integer" option is highlighted. An arrow points to the "Integer" option in the sub-menu.

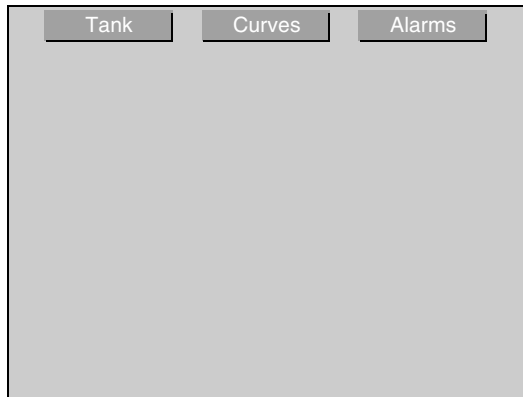
Step	Action
6	You will now change the name of the "Integer01" variable of "integer" type to "Level" from the variable properties window. In this window, specify the variable source (external in this case). The variable has %MW0 as its Device Address 
7	Repeat steps 5 and 6 to create the following internal variables of Integer type: "Setup". Now, in the Variable tab, you will see this list. 

Note: It is possible to access the variable properties by double-clicking on the variable. A window with five tabs is displayed, making variable configuration easier to access and understand.

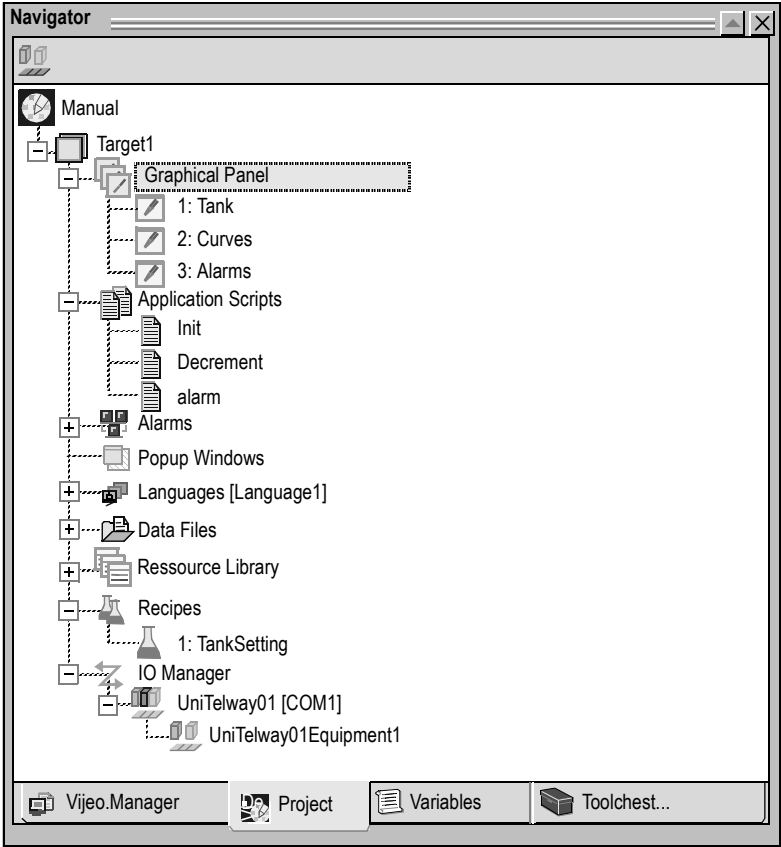
Creation of 'Tank' Panel

Illustration

The graphic below shows the panels to be created in this phase:

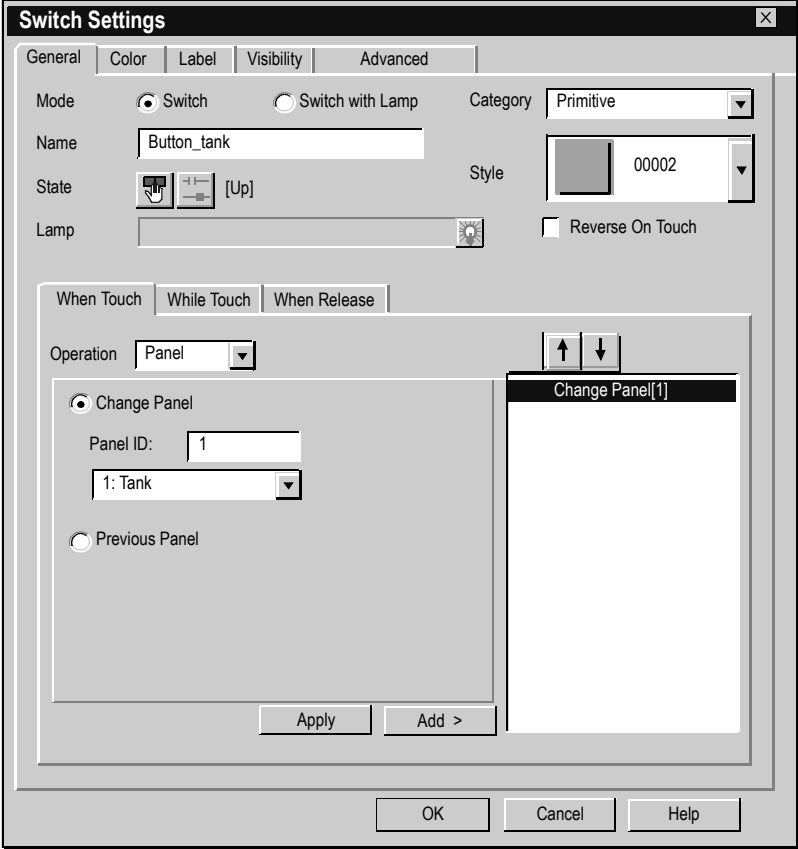


Procedure The following table describes the procedure to follow to create the panels:

Step	Action
1	Click the "Project" tab in the navigator.
2	Double-click "Graphical Panels" to open the folder.
3	- Click on "1:Panel1", - Rename "1:Panel1" as "1:Tank". 
4	In the "Properties" window, change the background color to light gray, which gives a color code of "192,192,192" .
5	Create two other panels using the same background colour as the Tank panel. Right-click on Graphical Panels and select New Panel Panel 2 is called Curves and panel 3 is called Alarms.

Create a Panel The following table describes the procedure to be followed to create a button used
Browser Button to jump between pages:

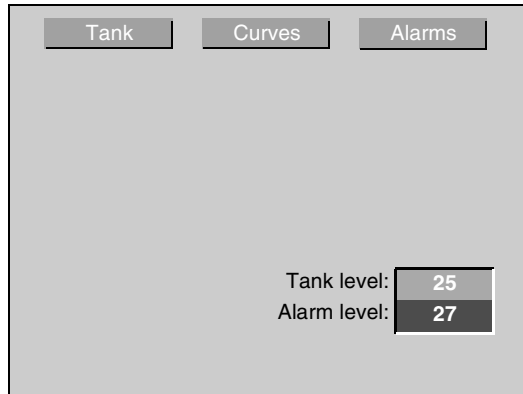
Step	Action
1	Select the "Switch" icon in the toolbar and draw an area on the panel where the button will be placed.  To define an area where the object is to be placed, simply: ● left-click in the screen where you wish to position your object, ● release the left mouse button, ● drag the mouse to obtain the desired size of your object on the screen, ● left-click in the screen a second time once you are happy with the object size,

Step	Action
2	When the "Switch Settings" window is displayed, in the General tab: • enter the name "Button_tank", • select the category primitive and the button style 00002, • When Touch , select Panel in Operation, select Change Panel for Tank (Id=1) then click on Add.
	
3	In the Color tab, select a dark green (code 0.128.0) for the foreground color.
4	In the Label tab, the label type must be static and you must enter Tank in the free text field.
5	Click on OK to confirm the configuration.
6	Repeat the operation for the buttons for the Curves panel (Id=2) and the Alarms panel (Id=3).
7	At this stage, in the current panel you will now have 3 buttons enabling you to jump between pages. Select these 3 buttons to copy (Ctrl+C) and paste (Ctrl+V) them into the two other panels.

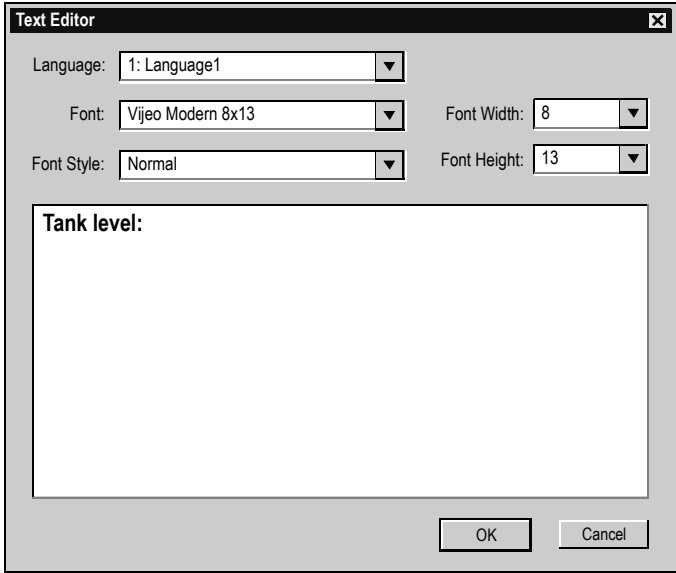
Numeric and Textual Display

Illustration

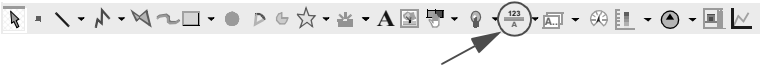
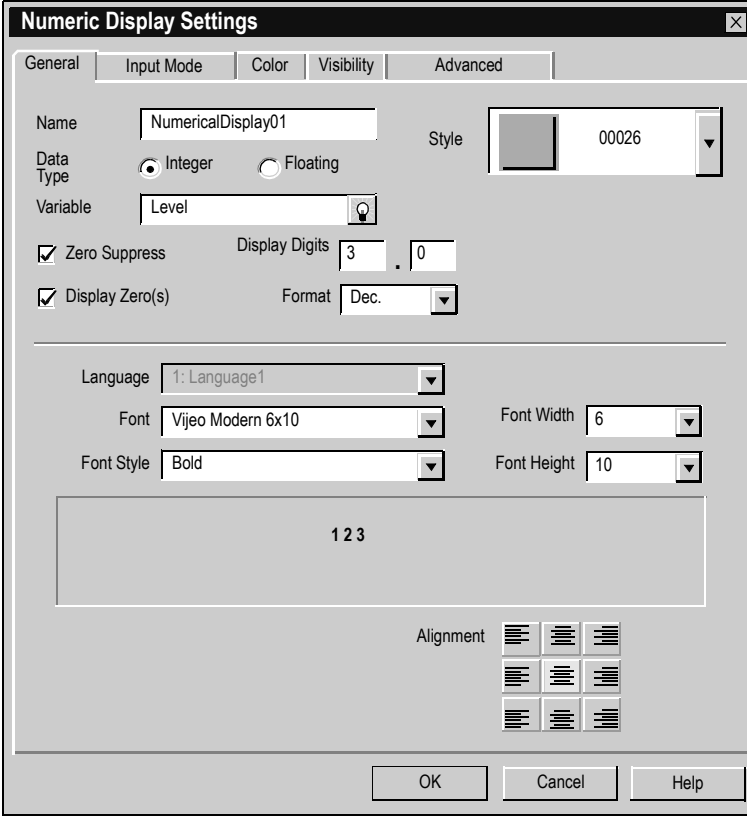
The graphic below represents the Tank screen phase to be created:



Create Text The following table describes the procedure to be followed to create text:

Step	Action
1	Select the "Text" icon in the toolbar and draw an area on the screen where the text will be placed. 
2	The Text Editor window is displayed. Configure the text properties as shown in the screen below and click on OK : 
3	In the "Properties" window, change the Text Color to black 0,0,0 .
4	Do the same for the text Alarm level.

Create a Numeric Indicator The following table describes the procedure to follow to create a numeric display:

Step	Action
1	Select the " Data Display " icon in the toolbar and draw an area on the screen where the numeric window will be placed. 
2	The Numeric Display Settings window is displayed. Configure the properties as shown in the screen below: 
3	In this window, from the " General " tab: Click the  icon then: ● double-click on the "Level" variable then on OK in the expression editor, ● enter 3.0 in the "Display Digits" field, ● Click OK.

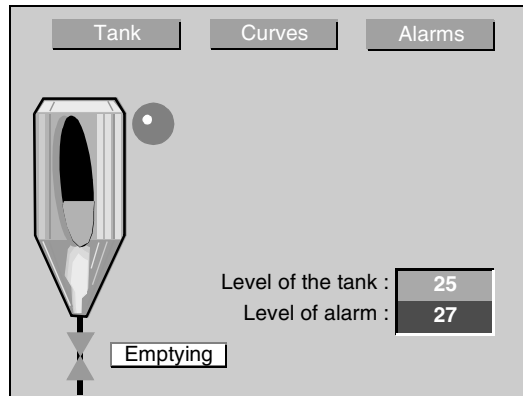
Step	Action
4	In the " Color " tab: ● select the color dark blue 0,128,128 for the "Back Color".
5	Click OK .
6	Repeat these steps for the 'Setup' variable. For the 'Setup' variable, you must authorize the user to change its value. To do this, check Enable Input Mode in the Input Mode tab. The option Display Popup Keypad is automatically selected. It enables a numerical keypad to be displayed on the product screen when the user enters Edit variable mode.
7	Save your project.

Note: You can access and modify an object's settings in the "**Properties**" window.

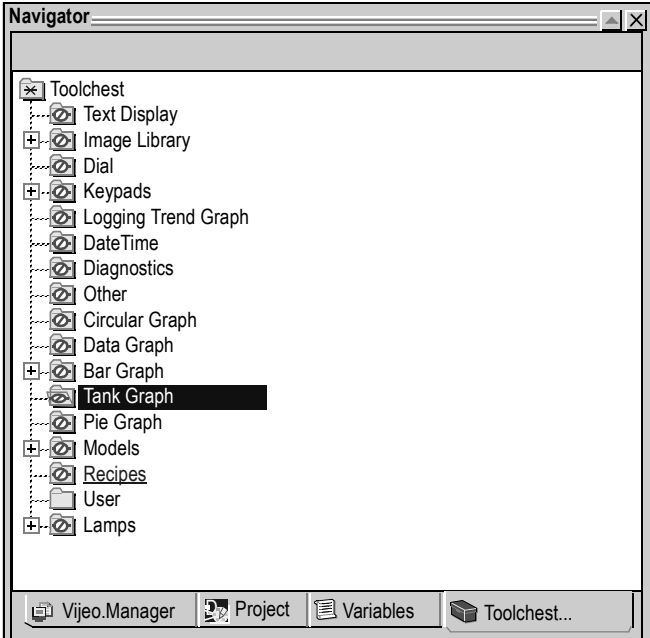
Graphical Object

Illustration

In this section, the user adds the tank, the bottom valve, the valve piping, and the valve command button and high level indicator. After performing the steps below, the screen looks like this:

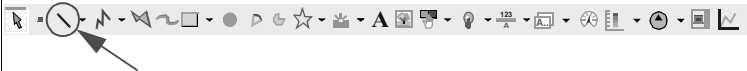


Import an Object from the Toolchest The following table describes the procedure to be followed to use an object from the toolchest which provides a schematic representation of the tank:

Step	Action
1	The tank can be found in the toolchest tab. It is located in the Tank Graph directory. Take the object TankGraph_0001 and drag-and-drop it into the Tank panel. Resize the object as required by dragging any of the points that appear around the object when you select it.  The screenshot shows a 'Navigator' window with a tree view of toolchest items. The items are: Toolchest (expanded), Text Display, Image Library, Dial, Keypads, Logging Trend Graph, DateTime, Diagnostics, Other, Circular Graph, Data Graph, Bar Graph, Tank Graph (highlighted), Pie Graph, Models, Recipes, User, and Lamps. At the bottom of the window are icons for 'Vijeo.Manager', 'Project', 'Variables', and 'Toolchest...'.
2	In the "Properties" window click on the icon. The Variable List window is displayed. Double-click on the 'Level' variable to animate the tank level.

Create a Line

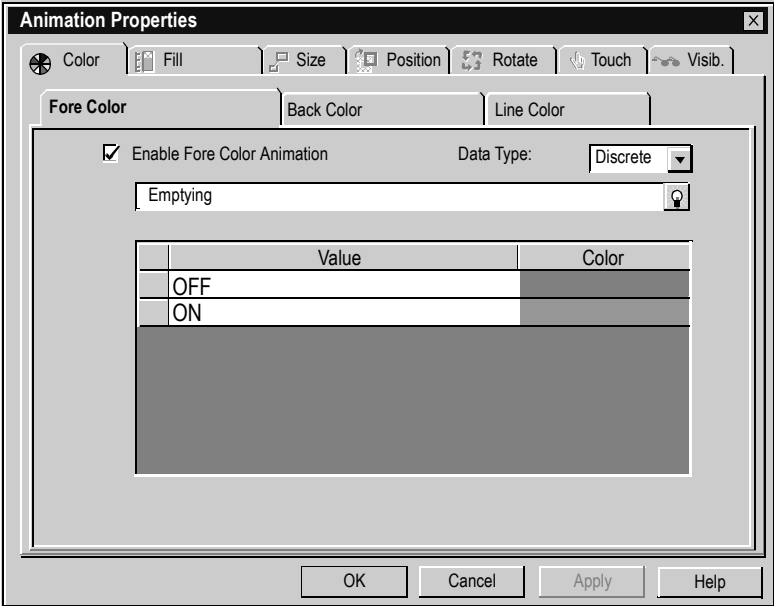
The following table describes the procedure to be followed to create a line representing the piping of the bottom valve:

Step	Action
1	Select the "line" icon from the tool bar and draw an area on the screen where the line will be placed (in our example, it starts at the bottom of the tank and ends at the bottom of the screen). Adjust the position of the line (or object) using the arrow keys on your keyboard. 
2	In the "Properties" window, enter: ● "0,0,0" black as the line color, ● "4" as the line thickness.

Create Valve

In this project a **polygon** shape is used to represent the **valve**. It is animated differently according to whether it is open (green) or closed (gray).

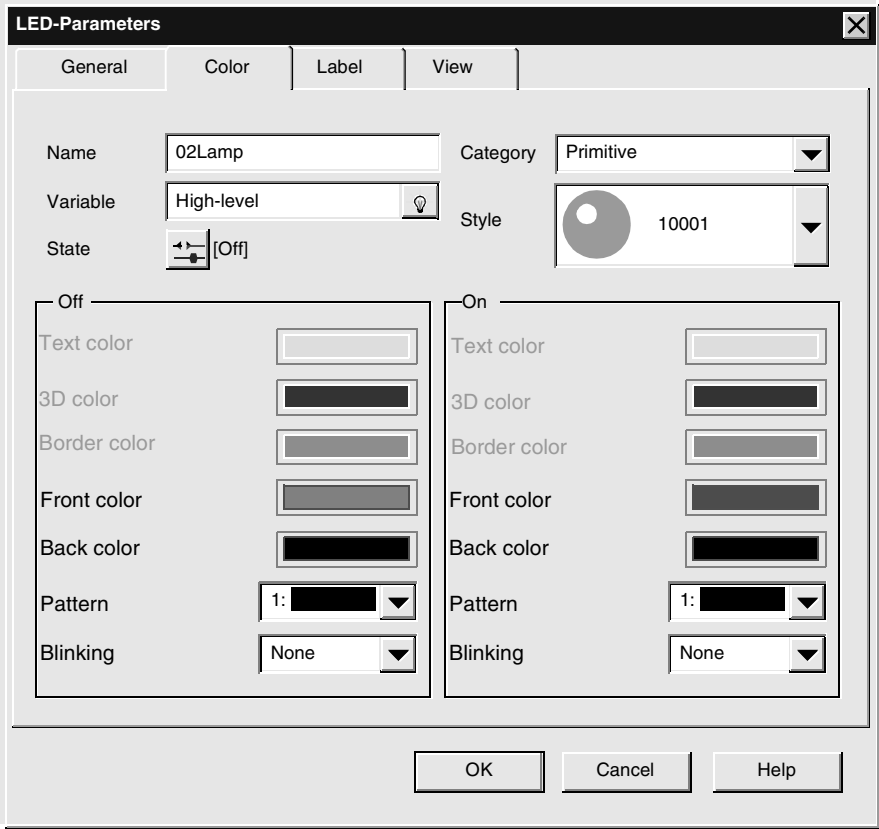
The following table describes the procedure to be followed to create the valve:

Step	Action
1	Select the "Polygon" icon in the toolbar and use it to draw a valve, defining an area on the screen where the valve will be placed. 
2	The Animation Properties window is displayed. Configure the properties as shown in the screen below: 
3	In this window, in the "Color" tab: ● check Enable Fore Color Animation, Click the  icon then: ● double-click on the Discrete "Emptying" variable then on "OK", ● change the OFF and ON colors (OFF in gray and ON in green).
4	Click OK.

Create Warning Signal In this project the lamp is used for signaling. It is animated depending on whether the alarm is triggered (red) or untriggered (grey) for "High_level".

The following table describes the procedure to be followed to create the lamp:

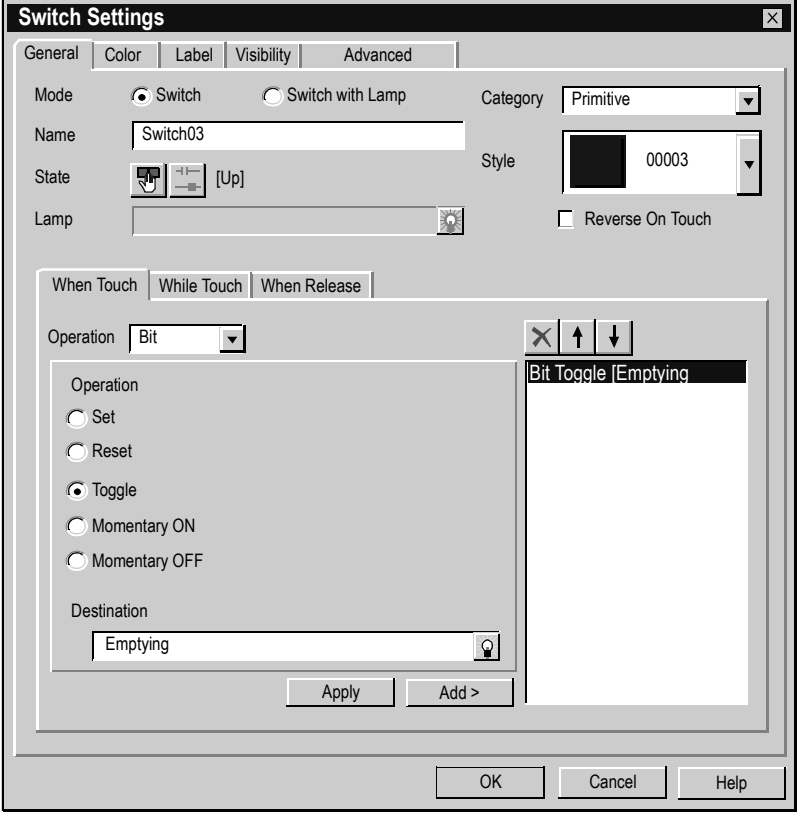
Step	Action
1	Select the "Lamp" icon in the toolbar and use it to draw a Lamp, defining an area on the screen where the lamp will be placed. 
2	In this window, from the "General" tab: Click the  icon then: ● select the "Discrete" "High_level" variable, ● retain the lamp style 10001.

Step	Action
3	In the "Color" tab: • select a dark gray '128.128.128' for the foreground color of the OFF state, • select a red '255.0.0' for the foreground color of the ON state combined with fast blink, 
4	Click OK .

Create a
Command
Button

In this project, the "emptying" button enables or disables the "emptying". It is also used to animate the bottom **valve**.

The following table describes the procedure to be followed to create a command button :

Step	Action
1	Select the "Switch" icon in the toolbar and use it to draw a rectangle, defining an area on the screen where it will be placed. 
2	The Switch Settings window is displayed. Configure the properties as shown in the screen below: 

Step	Action
3	In the General window: ● select 00003 as the switch style. in the "When Touch" tab, click on the  icon and: ● select the "Discrete" "Emptying" variable, ● select Toggle which will switch ON the Emptying bit when the button is first pressed and switch it OFF when the button is pressed again. ● click on Add to confirm the selection.
4	In the "Label" tab: ● select static for the label type, ● enter 'Emptying' in the data entry window,
5	In the "Color" tab: ● select the white '255.255.255' as the foreground color, ● select the black '0.0.0' as the text color.
6	Click OK .

Creation of a Recipe

Illustration

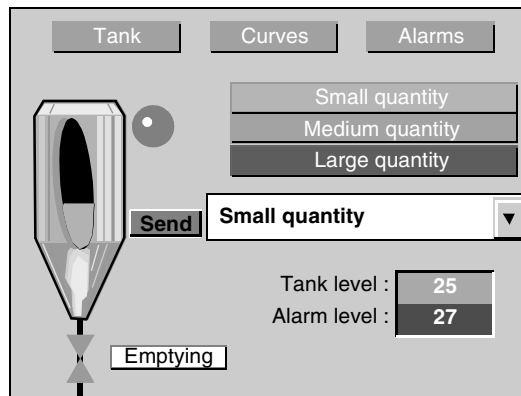
This sections explains two ways of implementing recipe commands:

- using a command button,
- using the recipe selector.

In this project, we have created 3 recipes to determine the level and alarm setpoint values according to the selected recipe:

- Small quantity is the first recipe. It is used to fill the tank to 25% of its capacity and sets an alarm level at 27%,
- Medium quantity is the second recipe. It is used to fill the tank to 50% of its capacity and sets an alarm level at 52%,
- Large quantity is the third recipe. It is used to fill the tank to 80% of its capacity and sets an alarm level at 82%.

After performing the steps below, the completed screen looks like this:



Create the Recipe

The following table describes the procedure to be followed to create the recipe:

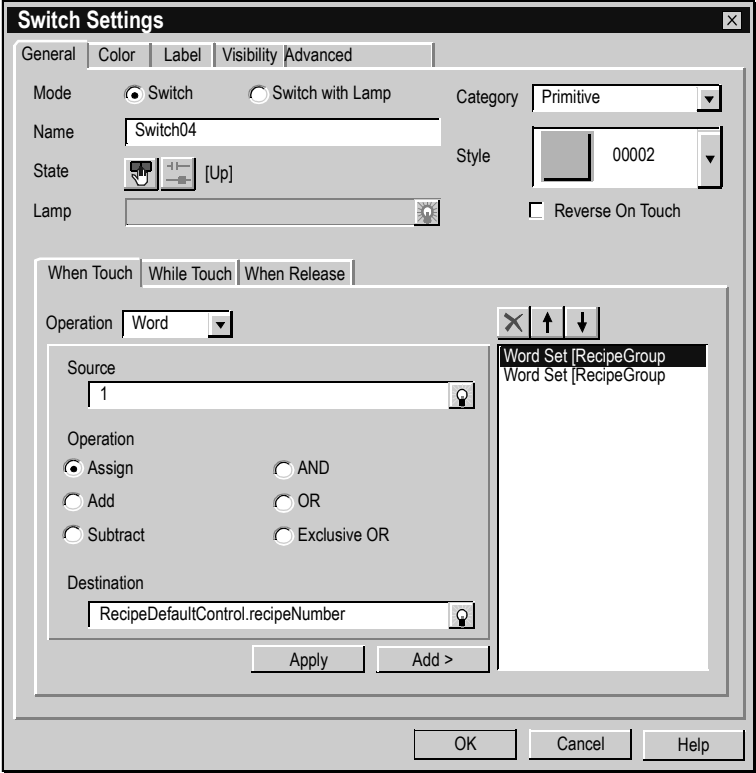
Step	Action																
1	In the project tab, right-click on "Recipe".																
2	Create a new recipe group.																
3	Rename the new recipe group 'Tanksetting'.																
4	Configure the recipe names as follows: Recipes recipe1 recipe2 recipe3 Click to resize window <table><tr><th>Recipes</th><th>ID</th><th>Access Rights</th><th>Language1</th></tr><tr><td>Small</td><td>1</td><td>0</td><td>Small quantity</td></tr><tr><td>Medium</td><td>2</td><td>0</td><td>Medium quantity</td></tr><tr><td>Large</td><td>3</td><td>0</td><td>Large quantity</td></tr></table> • Right-click on Recipes and select New Recipe to create recipe 2 • Right-click on Recipes and select New Recipe to create recipe 3 • Click on the arrow, as shown in the graphic, to expand the window, • Rename recipe 1 as Small and, in the Language 1 column, enter Small quantity, • Rename recipe 2 as Medium and, in the Language 1 column, enter Medium quantity, • Rename recipe 3 as Large and, in the Language 1 column, enter Large quantity, 3 recipes will now have been created.	Recipes	ID	Access Rights	Language1	Small	1	0	Small quantity	Medium	2	0	Medium quantity	Large	3	0	Large quantity
Recipes	ID	Access Rights	Language1														
Small	1	0	Small quantity														
Medium	2	0	Medium quantity														
Large	3	0	Large quantity														
5	Configure the recipe names as follows: Recipes Small Medium Large Click to select all recipes • Click on the arrow, as shown in the above graphic, to minimize the window, • Click on Recipes, as shown in the graphic, to select all the recipes and perform the following configuration steps,																

Step	Action																														
3	Configure the recipes as follows: <table><tr><th></th><th>Ingredients Varia...</th><th>Label</th><th></th><th>Editable</th><th>Min</th><th>Max</th><th>Small</th><th>Medium</th><th>Large</th></tr><tr><td>1</td><td>Level</td><td>Level</td><td></td><td>☒</td><td>0</td><td>100</td><td>25</td><td>50</td><td>80</td></tr><tr><td>2</td><td>Setup</td><td>Alarm setup</td><td></td><td>☒</td><td>0</td><td>100</td><td>27</td><td>52</td><td>82</td></tr></table> Fill in line 1 by double-clicking to enter data, Add an ingredient by right clicking on line 1 and selecting New Ingredient which enables you to create line 2 Fill in line 2 by double-clicking to enter data,		Ingredients Varia...	Label		Editable	Min	Max	Small	Medium	Large	1	Level	Level		☒	0	100	25	50	80	2	Setup	Alarm setup		☒	0	100	27	52	82
	Ingredients Varia...	Label		Editable	Min	Max	Small	Medium	Large																						
1	Level	Level		☒	0	100	25	50	80																						
2	Setup	Alarm setup		☒	0	100	27	52	82																						
6	Save your project.																														

Create Button-Operated Recipe Command

In this project, three recipes are declared so you need to design and configure three command buttons.

The following table describes the procedure to be followed to create a command button for a recipe:

Step	Action
1	Select the "Switch" icon in the toolbar and use it to draw a rectangle, defining an area on the screen where it will be placed. 
2	The Switch Settings window is displayed. Configure the properties as shown in the screen below: 

Step	Action
3	In the General window: ● select 00002 as the switch style. from the "When Touch" tab: ● select a Word operation, ● Enable 1 in Source. ● in Destination, click on the  icon and select RecipeDefaultControl.RecipeNumber. ● click on Add to confirm selection of recipe number 1. ● Repeat the operation, enabling for source 1 the destination RecipeDefaultControl.RecipeOperation, ● click on Add to confirm the choice to send a recipe command.
4	In the "Label" tab: ● select static for the label type, ● enter 'Small quantity' in the data entry window,
5	In the "Color" tab: ● select the yellow '255.255.0' as the foreground color,
6	Click OK .
7	Save your project.

Repeat all these steps to create each of the command buttons for the Medium and Large recipes using this assignment table:

	Small	Medium	Large
RecipeDefaultControl.RecipeNumber (Recipe number)	1	2	3
RecipeDefaultControl.operation (recipe operation)	1	1	1
Button color and color code	yellow 255.255.0	salmon pink 255.128.64	brown 128.128.0
Button label	Small quantity	Medium quantity	Large quantity

Create a Recipe Selector

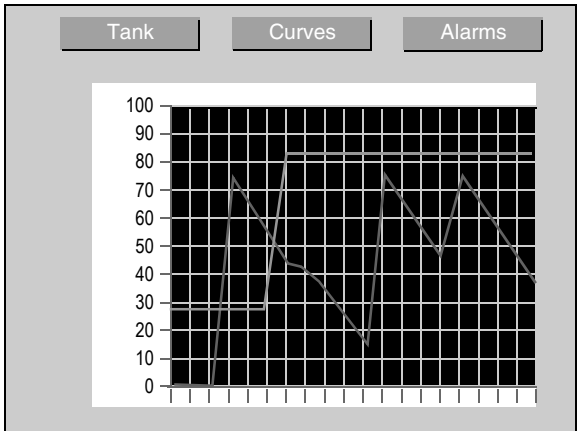
The recipe selector can be found in the toolchest. It is located in the recipe directory. In the "Tank" panel, drag in the "Recipeselect" object and the "send" object.

Creation of "Curves" Panel

Illustration

The 'Curves' panel and the 'page jump' button group have already been created in (See *Create a Panel Browser Button*, p. 37). The purpose of this section is to import the **trend graph** object and to configure the "Level" and "Setup" variables to be able to view their values as graphs.

The graphic below represents the screen to be created:



Create Trend Graph

The following table describes the procedure to be followed to create the trend graph for the 'Curves' panel:

Step	Action
1	Select the "Trend Graph" icon in the toolbar and draw an area on the panel where the object will be placed.

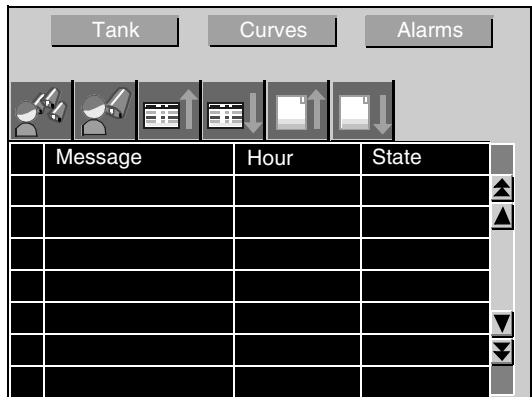
Step	Action																																																																												
2	Configure the trend graphs in the properties window: • enter the "Level" variable for channel1, • Enable channel2 and select the "Setup" variable. Properties <table><thead><tr><th colspan="2">Trend_Graph</th></tr></thead><tbody><tr><td>Name</td><td>Trend_Graph</td></tr><tr><td>Hi</td><td>40</td></tr><tr><td>Left</td><td>41</td></tr><tr><td>Width</td><td>259</td></tr><tr><td>Height</td><td>180</td></tr><tr><td>Description</td><td></td></tr><tr><td>PlateColor</td><td>(0,0,0)</td></tr><tr><td>BorderColor</td><td>(255,255,255)</td></tr><tr><td> GraphSettings</td><td></td></tr><tr><td> RangeSettings</td><td></td></tr><tr><td> DataAxisLabel</td><td>Enabled</td></tr><tr><td> DataAxisScale</td><td>Enabled</td></tr><tr><td> DataGridLine</td><td>Enabled</td></tr><tr><td> TimeAxisScale</td><td>Enabled</td></tr><tr><td> TimeAxisGridLine</td><td>Enabled</td></tr><tr><td> Channel1</td><td>Enabled</td></tr><tr><td> Variable</td><td>Level</td></tr><tr><td> DisplayFormat</td><td>Line</td></tr><tr><td> Track</td><td>Disabled</td></tr><tr><td> Mark</td><td>Disabled</td></tr><tr><td> Color</td><td></td></tr><tr><td> OutOfRangeColor</td><td>Disabled</td></tr><tr><td> Channel2</td><td>Enabled</td></tr><tr><td> Variable</td><td>Setup</td></tr><tr><td> DisplayFormat</td><td>Line</td></tr><tr><td> Track</td><td>Disabled</td></tr><tr><td> Mark</td><td>Disabled</td></tr><tr><td> Color</td><td></td></tr><tr><td> OutOfRangeColor</td><td>Disabled</td></tr><tr><td> Channel3</td><td>Disabled</td></tr><tr><td> Channel4</td><td>Disabled</td></tr><tr><td> Channel5</td><td>Disabled</td></tr><tr><td> Channel6</td><td>Disabled</td></tr><tr><td> Channel7</td><td>Disabled</td></tr><tr><td> Channel8</td><td>Disabled</td></tr><tr><td>SaveDefaults</td><td>>>></td></tr><tr><td>RestoreDefaults</td><td><<<</td></tr></tbody></table>	Trend_Graph		Name	Trend_Graph	Hi	40	Left	41	Width	259	Height	180	Description		PlateColor	(0,0,0)	BorderColor	(255,255,255)	GraphSettings		RangeSettings		DataAxisLabel	Enabled	DataAxisScale	Enabled	DataGridLine	Enabled	TimeAxisScale	Enabled	TimeAxisGridLine	Enabled	Channel1	Enabled	Variable	Level	DisplayFormat	Line	Track	Disabled	Mark	Disabled	Color		OutOfRangeColor	Disabled	Channel2	Enabled	Variable	Setup	DisplayFormat	Line	Track	Disabled	Mark	Disabled	Color		OutOfRangeColor	Disabled	Channel3	Disabled	Channel4	Disabled	Channel5	Disabled	Channel6	Disabled	Channel7	Disabled	Channel8	Disabled	SaveDefaults	>>>	RestoreDefaults	<<<
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OutOfRangeColor	Disabled																																																																												
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Variable	Setup																																																																												
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SaveDefaults	>>>																																																																												
RestoreDefaults	<<<																																																																												
3	Save your project.																																																																												

Creation of "Alarms" Panel

Illustration

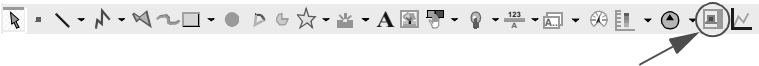
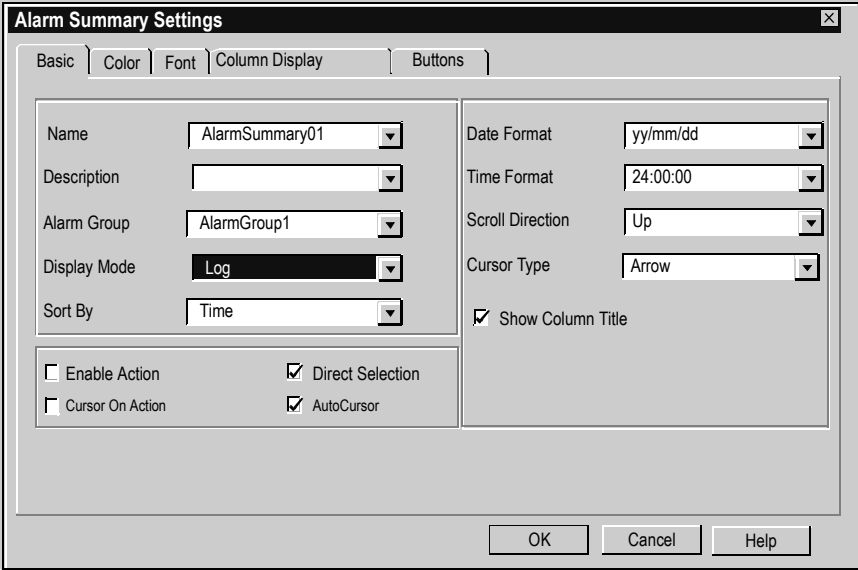
The Alarms panel and the 'page jump' button group have already been created in (See *Create a Panel Browser Button*, p. 37). The purpose of this section is to demonstrate how to use the **alarm** object and configure it to view alarms on this screen.

The graphic below represents the Alarms screen page to be finalized:



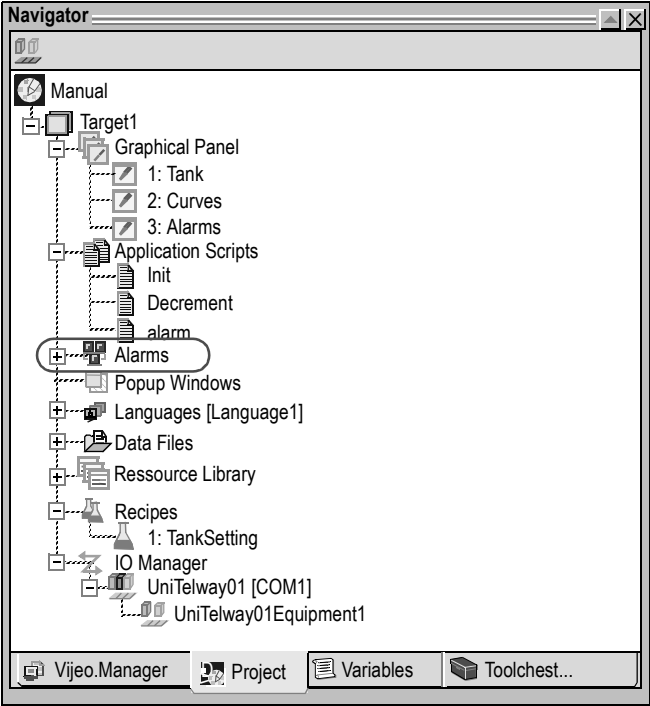
**Import and
Configure Alarm
Object**

The following table describes the procedure to be followed to use the alarm table:

Step	Action
1	Select the "Alarm Summaries" icon in the toolbar and draw an area on the screen where the object will be placed. 
2	Double-click on the object to configure in the Alarm Summary Parameters window. In the Basic tab: • select the Log display mode to display changes in alarm state (active, acknowledged, elapsed). 

Note: The column display may be configured as required. In this Alarms page, we have chosen to display the message with a column width of 120, and the alarm date and time with column widths of 80.

Configure Alarm Group The following table describes the procedure to be followed to configure the alarm group:

Step	Action
1	Click the " Project " tab in the navigator. 
2	Double-click " Alarms " to open the folder.
3	Click on " AlarmGroup1 " to open the alarm group configuration window.

Step	Action										
4	To the High_level alarm, add the message "Tank in high level" as shown in the following screen: Alarm Group Setting <table><tr><th>Variable</th><th>Alarm Group</th><th>Data Source</th><th>Device Address</th><th>Message</th></tr><tr><td>High_level</td><td>AlarmGroup1</td><td>External</td><td>%M0</td><td>Tank in high level</td></tr></table> Configuration Variable AlarmSummary01 Language 1: language1 Alarm Groups AlarmGroup1 Message Tank in high level Device Address %M0 When the alarm is triggered, "Tank in high level" will be displayed in the message column.	Variable	Alarm Group	Data Source	Device Address	Message	High_level	AlarmGroup1	External	%M0	Tank in high level
Variable	Alarm Group	Data Source	Device Address	Message							
High_level	AlarmGroup1	External	%M0	Tank in high level							
5	Save your project.										

Creating a Script

At a Glance

In Vijeo Designer, a script can be used to automate some of a communication program's tasks. You can use a script to define a procedure that runs when a condition is met.

You can then add a function that is not available in a drawing's properties.

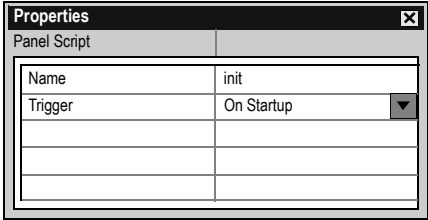
In this project, we create three scripts:

- Init, which is triggered when the product is powered up. It is used to select recipe number 1.
- Decrement, which is triggered on activation of the "Emptying" variable at a frequency of 0.3 seconds. It is used to simulate emptying of the tank.
- Alarm, a periodic script which manages the 'High_level', alarm. The condition which triggers the alarm is normally a condition written to the PLC. For the purposes of this tutorial, this variable is animated internally.

Create the Init Script

The following script is executed once (on startup).

The following table describes the procedure to be followed to create the "Init" script:

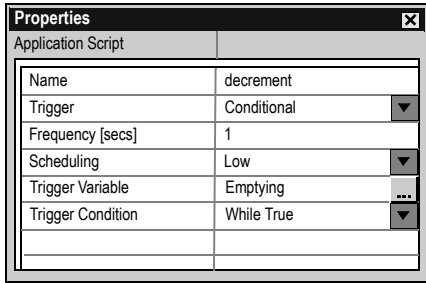
Step	Action
1	In the navigator window, click on the "Project" tab , then right-click on "Application Script" and select "New Script"
2	Select "On Startup" in the "Trigger" field of the "Properties" window:  • rename "script_1" as "Init".
3	Click on "Init" to open the script editor window and enter the following program: <code>//Set Recipegroup RecipeControlDefault.RecipeGroupNumber.write(1);</code>

Note: To insert a variable in a script, you can right-click and select **Insert, Variable** then the command **element** associated with the variable

Create the Decrement Script

The following script is executed every 0.3 seconds if the "Emptying" variable is enabled. It is used to simulate emptying of the tank.

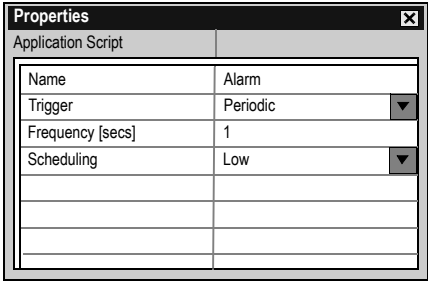
The following table describes the procedure to be followed to create the "Decrement" script:

Step	Action
1	In the navigator window, click on the "Project" tab , then right-click on "Application Script" and select "New Script"
2	Select "Conditional" in the "Trigger" field of the "Properties" window. In the Trigger Condition field, select While True, for the Frequency enter 1 and for the Trigger Variable "Emptying":  ● rename "script_2" as "Decrement".
3	Enter the following program: <pre>//creating temporary variable int tmp; int tmp; //Set value of Level in tmp tmp = Level.getIntValue (); //If value of level>0 if (tmp>0) { //then decrement tmp tmp --; //Then write tmp's value in Level variable Level.write (tmp); }</pre>

Create the Alarm Script

The following script is executed periodically every second. It manages the "High_level" alarm. The condition which triggers the alarm is normally a condition written to the PLC. For the purposes of this tutorial, the "High_level" variable is animated internally.

The following table describes the procedure to be followed to create the "Alarm" script:

Step	Action
1	In the navigator window, click on the "Project" tab , then right-click on "Application Script" and select "New Script"
2	Select "Periodic" in the "Trigger" field of the "Properties" window, specifying a Frequency of 1.0 second:  ● rename "script_3" as "Alarm".
3	Enter the following program: <pre>//If Level > Setup of alarm if (Level.getIntValue() > Setup.getIntValue()) //Then Alarm (High_level) actived else alarm desactived High_level.write(1); else High_level.write(0);</pre>
4	Save your project.

Simulation

Simulating your Project

The simulation function can be used to display your project without downloading it to an XBT G terminal. It is a good way to check and validate your project, and make sure things are the way you want.

Start Simulation

Use the following procedure to run the simulation and check your project:

Step	Action	Result
1	Click the Project tab in the Navigator window.	
2	Right-click Target 1 .	
3	Select Start Device Simulation .	The main screen of your project appear
4	Test your project as it is so far.	It should behave like the Exercice_1 project presented at the beginning of the Tutorial. For example: ● Choose a recipe. Does the value appear on the tank graphically and in the numeric display? ● Click on the numeric display (level of alarm) and enter number 10 with the keypad that pops up. When the alarm appears, does the light blink? ● Click the navigation button to move to the second screen. Do the values appear on the curve? ● Click on the alarms button to move to the third screen. Do you get there? ● Return to the first screen. Click on emptying button. Does the tank empty?
5	To stop the simulation, press either CTRL+Z or ALT+F4 or click on the Close icon of the simulation windows.	If you find that some elements are not working properly, go back to the appropriate panel, select the element(s) and review the properties.
6	When everything is fine, go to the next procedure to trigger the alarm. Note: When re-testing your project after making corrections, you must close the simulation before running a new one.	

Project Download



At a Glance

Purpose of this Chapter	This chapter describes the different project build types and the various project download modes.						
What's in this Chapter?	This chapter contains the following topics: <table><tr><th>Topic</th><th>Page</th></tr><tr><td>Validating, Building, and Correcting Errors</td><td>68</td></tr><tr><td>Downloading a Project</td><td>70</td></tr></table>	Topic	Page	Validating, Building, and Correcting Errors	68	Downloading a Project	70
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Validating, Building, and Correcting Errors

Types of Data Transfer

Use one of the following methods to transfer a customer application to a terminal (or perform a local simulation):

Type	Procedure
Ethernet	The application produced by the built project* is transferred to products equipped with an Ethernet port over the network.
Tool port	Data produced by the built project* is transferred to the device connected to the PC using XBT ZG915 or XBT ZG925 cables.
CompactFlash card	Data produced by the built project* (on a PC equipped with a PCMCIA card reader) is transferred by copying to a CompactFlash card. The card is then inserted in the terminals.
Local simulation	Data produced by the built project* is stored locally for simulating the application during its fine-tuning phase.

* Data created using the Build function.

Validating the Target

To make sure that all the parameters of the project you want to build are present and correct, use the **Build** → **Validate all** command from the main menu.

Building the Target

The objective is to build a program that can be run directly by the XBT G panel from the project created with the Vijeo Designer graphical editor.

Before starting the build, use the **Build** → **Clean All** command. This command cleans the project folder for each target and/or project so that they are free of unnecessary files.

After cleaning the target folders, use the **Build** → **Build All** command to build your target.

Vijeo Designer can build a program in any of four possible ways:

Type	Procedure
Build	Rebuilds the project completely and optimizes the results file. Although creation is quicker than when using the Build function.
Quick Build	Builds only the data updated since the previous version was built, and optimizes the results file.
Start simulation	Rebuilds the project completely and refreshes the resulting file. When the build is complete, the simulation starts.
Download	Before download, the target is validated and built. If no errors are detected, the user application files are transferred to the target machine.

Error Correction When the build process completes, the **Feedback zone** window opens automatically, and all detected errors and warnings are displayed. Errors are displayed in red, and warnings are displayed in yellow. When there are no errors or warnings, the result is displayed in green.

To view detailed information on a specific error or warning, double-click on that error or warning message.

Downloading a Project

Data Download Types

When you send an application to its target, you use a download method. Several download methods may be used:

- downloading over an Ethernet network
- a file system method, where data is downloaded to a CF card
- using the unit's serial port to download directly to the target.

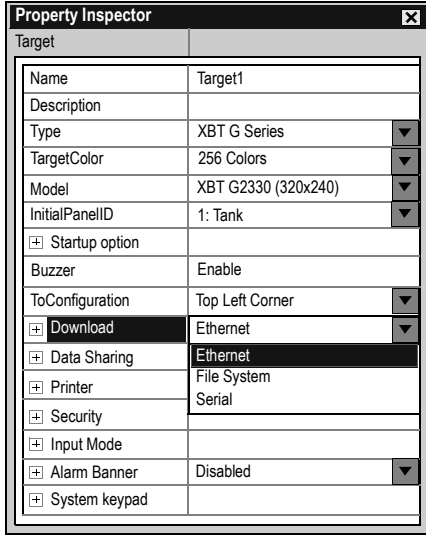
Select the method you want to use in the **Target** area of the **Property Inspector** window.

For more information, see the online help.

Note: At this stage, you can test your project on an XBT G panel. Keep in mind that the project will behave just as it did when it was simulated on the PC (See *Simulating your Project*, p. 65). To implement a real application, the input value should come from a field sensor, not from the keyboard.

Download Procedure

Use the following procedure to download an application to an XBT G target:

Step	Action
1	Connect one end of the download cable to the XBT G tool connector or to an Ethernet cable connector and the other end to the COM1 or Ethernet port on your computer. XBT G2110/2120/2220/4320: only tool connector (serial) Other XBT G units allow you to choose an Ethernet or tool connector connection.
2	Click the Project tab in the Navigator window, and click Target1 .
3	In the Download field of the Property Inspector window, select either Ethernet or Serial .  The screenshot shows the 'Property Inspector' window with a 'Target' tab. The 'Name' field is 'Target1'. The 'Type' is 'XBT G Series'. The 'TargetColor' is '256 Colors'. The 'Model' is 'XBT G2330 (320x240)'. The 'InitialPanelID' is '1: Tank'. The 'Startup option' is expanded. The 'Buzzer' is 'Enable'. The 'ToConfiguration' is 'Top Left Corner'. The 'Download' field is set to 'Ethernet'. The 'Data Sharing' field is set to 'Ethernet'. The 'Printer' field is set to 'File System'. The 'Security' field is set to 'Serial'. The 'Input Mode' is expanded. The 'Alarm Banner' is 'Disabled'. The 'System keypad' is expanded.
4	a. For an Ethernet download, be sure to enter your: ● IPAddress ● SubnetMask ● DefaultGateway b. For a serial download, be sure to enter a: ● COM port ● baud rate
5	In the Navigator window, and click Target1 . then click right to select Download .
6	Check your XBT G unit to see if the application is displayed correctly. Note: If an error message appears in the Feedback zone , the download has failed. You need to solve the problem before trying to download data again. Double-click on an error displayed in the Feedback zone to locate the error position.

Exit Vijeo Designer

Before you exit Vijeo Designer, save your project. Then select **File** → **Exit** from the main menu.

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