



**Slide Show 5:**

**Define Objects**



**INSIGHT  
AND  
OVERVIEW**

# IGSS Objects



## Contents:

- What is an IGSS object ?
- Which object types exist in IGSS ?
- How do you create IGSS objects

**The Definition module is where objects are created and their properties are defined.**



Definition

# About objects in IGSS



- Representation of a process component for instance a pump, a valve, etc.
- A way to determine the size of the IGSS system
  - The more objects, the larger the process
- Must have a unique name within the configuration
- Must belong to one of the ten IGSS object types
- May (but need not) be based on a template that ensures accuracy and consistency

# Predefined IGSS objects (1)



## PLC-related objects

**Driver**

→ Monitors PLC communication at the driver level

**DIALSUSPEND**

→ Connect to and disconnect from a remote PLC, fetch historical data and suspend/resume.

**DIALUP**

→ Connect to and disconnect from a remote PLC, fetch historical data.

All predefined objects are present in the IGSS software installation. When you create a new project, these are copied to the folder for the new project from one of the installation subfolders called **\Gssorg**

# Predefined IGSS objects (2)



## User Administration

**PROTECT** → Template for Protect objects

**Protect** → Used to secure IGSS objects against unauthorized access

## Definition/Supervise

**Global** → The topmost area where system wide parameters are created

**Graph** → Used in Supervise for creating dynamic graphs

**LogUser  
Login** → Used to log user login and logout to the system's log files.

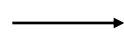
**System** → Monitors hard disk space and report folder accessibility

# Object Types



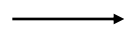
## Non-process objects = Container objects

**Area**



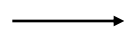
Used to divide an IGSS configuration into logical parts.  
An area is a collection of diagrams, graphs and objects.

**Diagram**



The individual pictures in the configuration.

**Graph**



Representation of process states and values  
in the form of curves.

**Group**



A collection of related objects and descriptors to be treated  
as one entity. Used for copy/paste and export/import.

## Process objects = Process components

**Analog**

**Table**

**Counter**

**Digital**

**String**

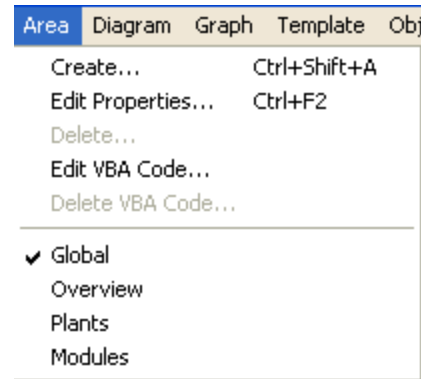
**Scaling**

# Container objects

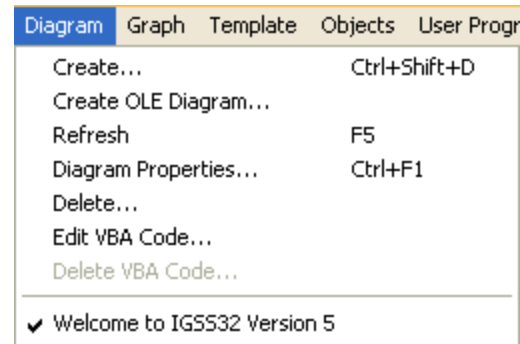


*... are defined from their own menus*

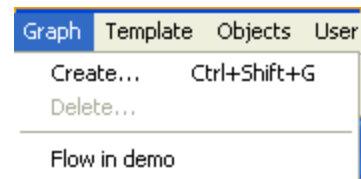
**Area**



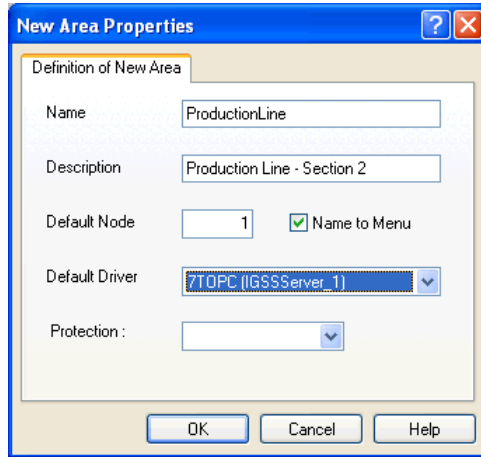
**Diagram**



**Graph**



# Create an Area



**New Area Properties**

Definition of New Area

Name: ProductionLine

Description: Production Line - Section 2

Default Node: 1  Name to Menu

Default Driver: 7TOPC (IGSSServer\_1)

Protection:

OK Cancel Help

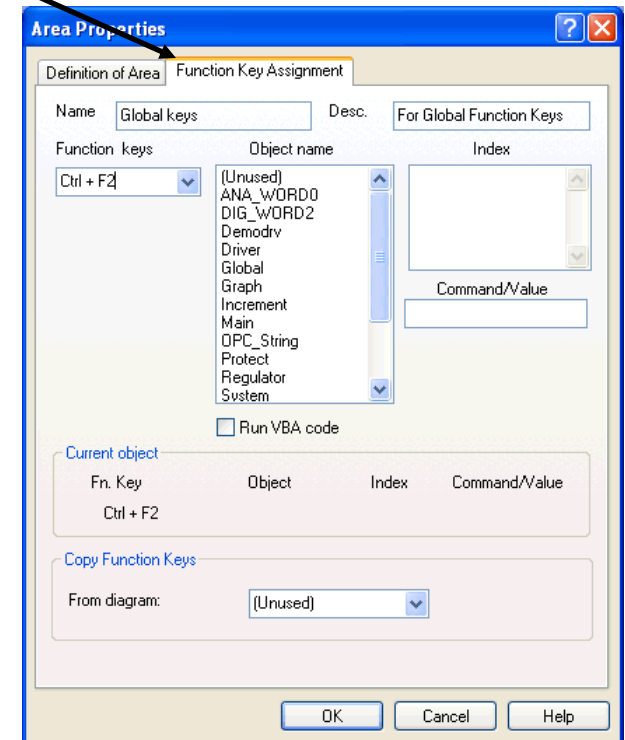
## Global function keys

Go the **Global** area and select **Edit Properties** in the **Area** menu.

Global function keys can now be assigned.

## Area Properties

Note that you can assign a default driver and a default node. These will be suggested for each new object in the area.



**Area Properties**

Definition of Area | Function Key Assignment

Name: Global keys Desc: For Global Function Keys

Function keys	Object name	Index
Ctrl + F2	(Unused)	
	ANA_WORD0	
	DIG_WORD2	
	Demodrv	
	Driver	
	Global	
	Graph	
	Increment	
	Main	
	OPC_String	
	Protect	
	Regulator	
	System	

Run VBA code

Current object

Fn. Key	Object	Index	Command/Value
Ctrl + F2			

Copy Function Keys

From diagram: (Unused)

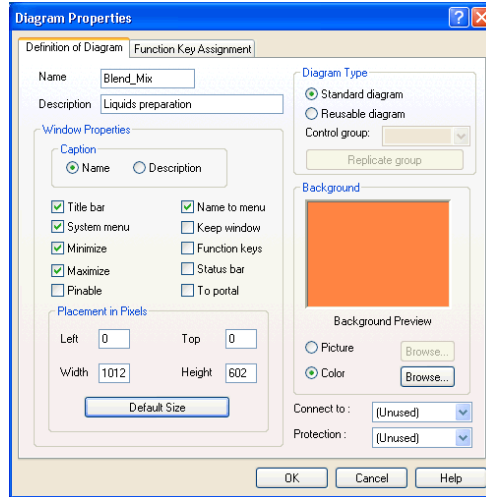
OK Cancel Help



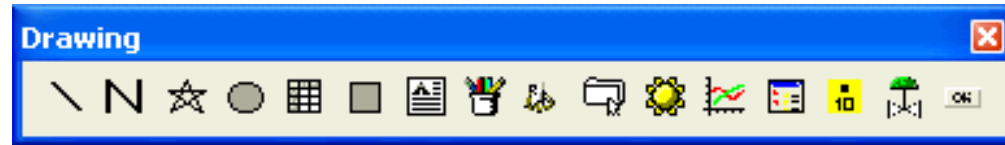
# Create a Diagram



**Step 1:**  
Select a background color or insert an already existing graphic file

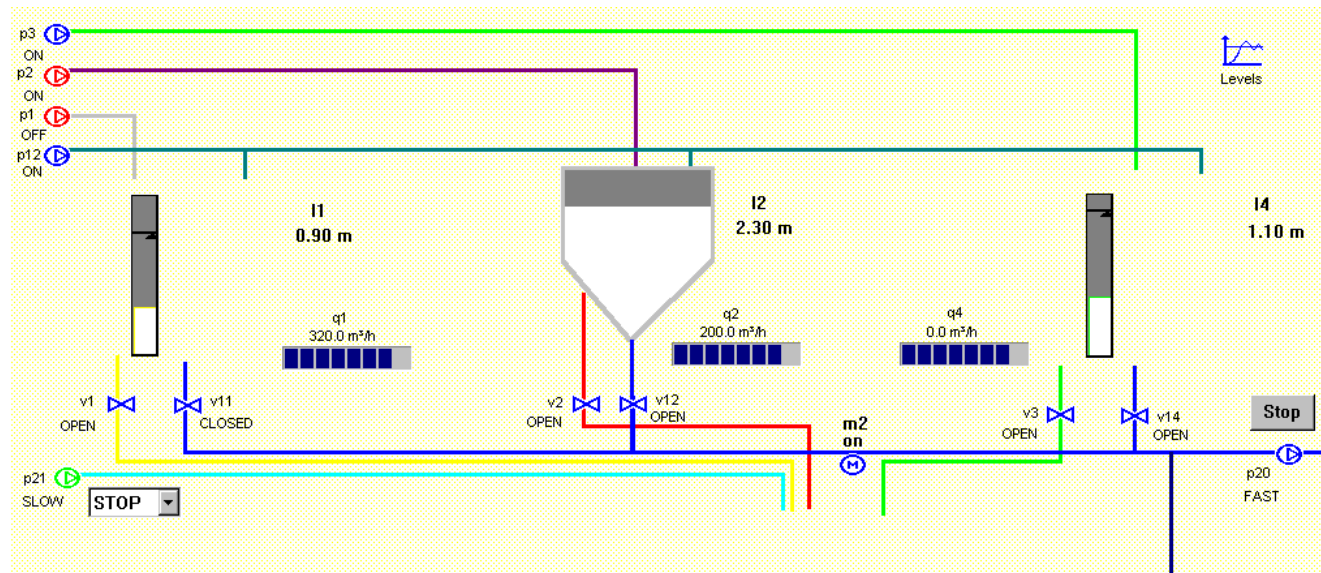


**Step 2:** Draw static parts of the diagram from the tools to the left in Drawing Toolbar.



**Step 3:** Select process component descriptors from the icons on the right in the Drawing Toolbar

**Step 4:**  
Insert dynamic process objects like Windows progress bar or .GIF



# Background pictures



- IGSS supports many standard graphics file formats, including \*.bmp, \*.wmf, \*.emf \*.gif and \*.jpeg
- It is strongly recommended that all the graphics files used in the visualizations be saved in a sub-folder under the root IGSS configuration folder with a folder name like “Images” or “Graphics”
- In the case where a background color is used for a process diagram, then of course, the mimic is built up from scratch with various equipment drawn directly on the background color chosen.

## Two types of container objects to create:

- **Area**
- **Diagram**

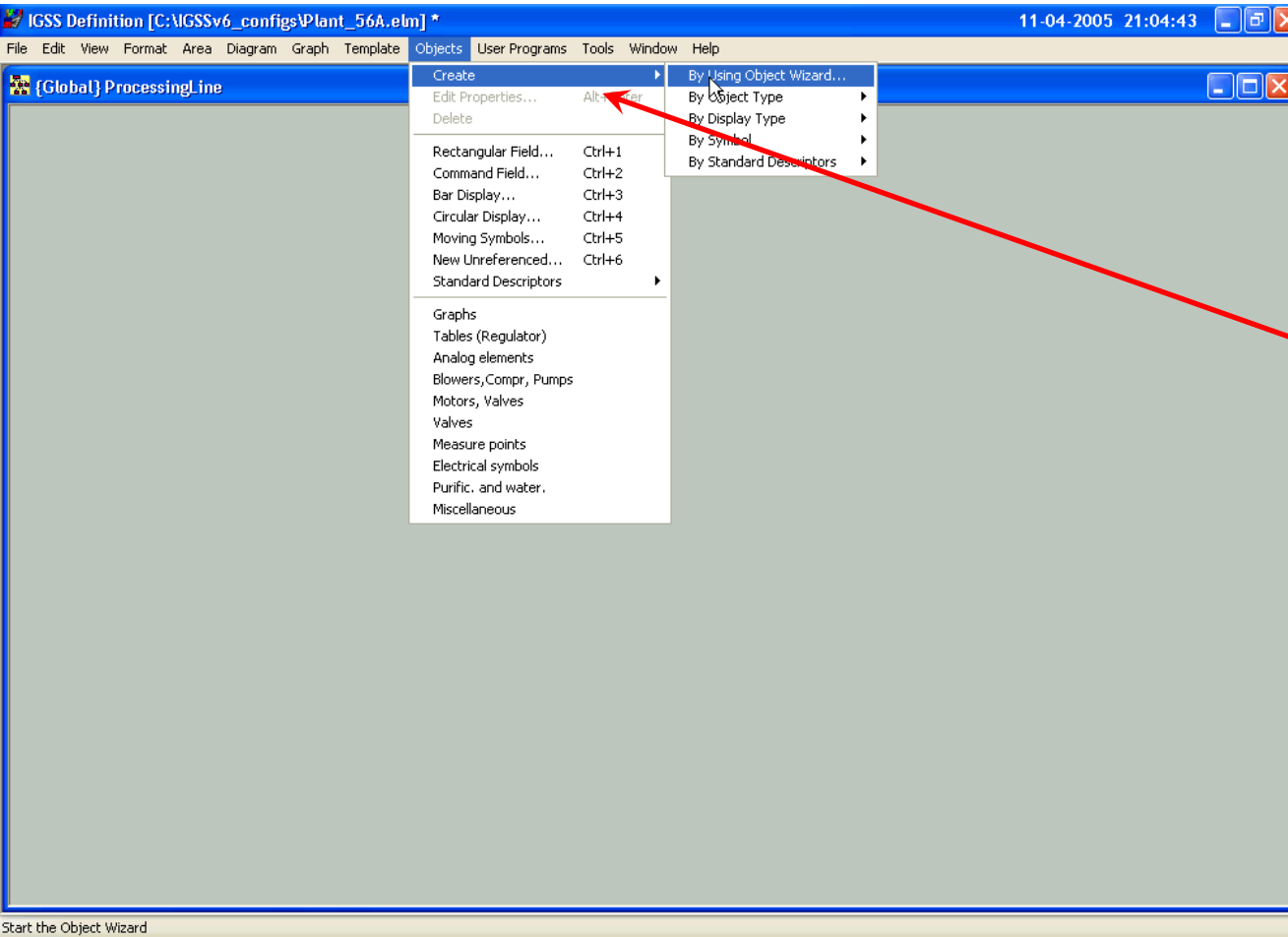
Do Exercise 3 in the Exercises booklet  
after the instructor demo

# Process Component Objects



Now we've laid the foundation for our project and now we'll see how to create mimics of process components in the IGSS software.

# Object Wizard (1)



The Object Wizard is a helpful tool for getting started.


Activate it from the **Objects** menu.


# Object Wizard (2)





Object Wizard - Selection of object type


Which type of object do you want to create ?

  Analog

  Digital

  Counter

  Table

  String

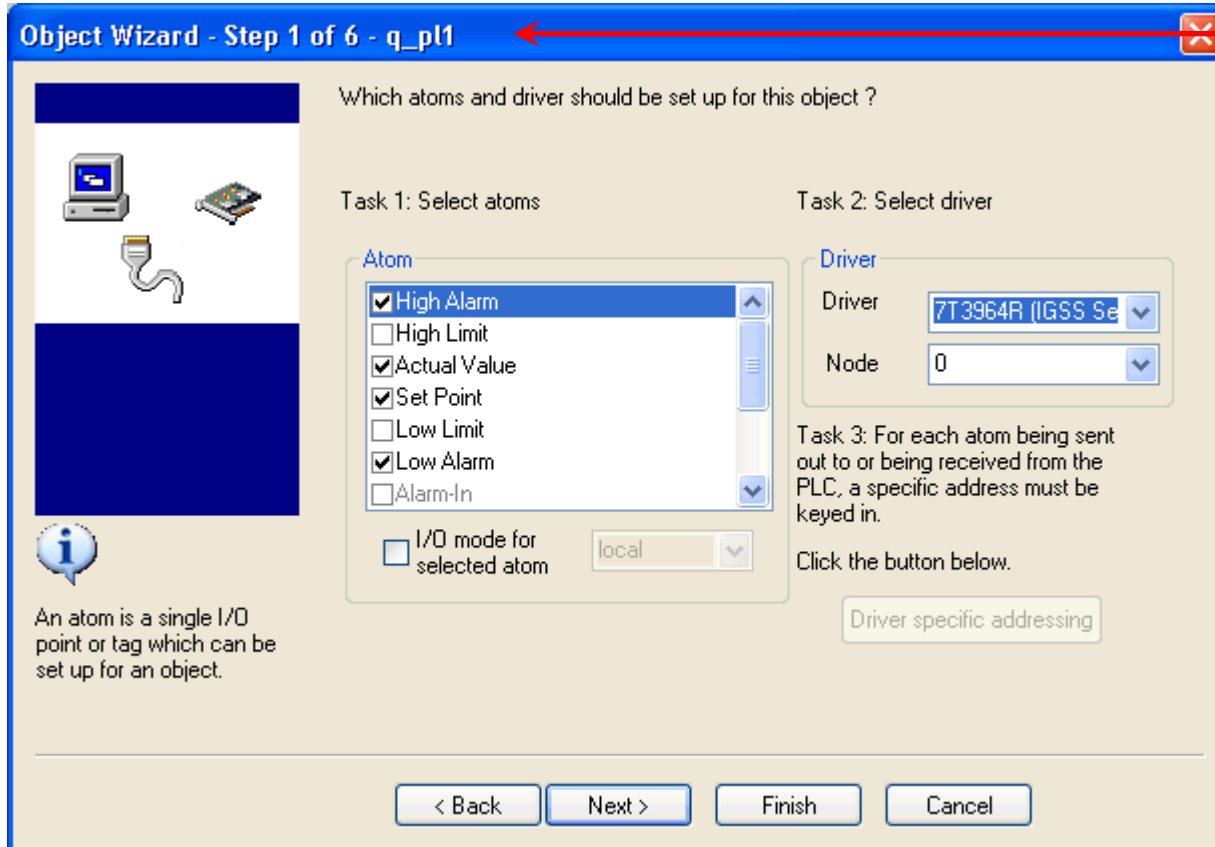
What should the object be named ?

What is the description of the object ? (optional)

< Back   Next >   Finish   Cancel

Decide which type of object you want to create, in this case an analog object called **q\_pl1**.

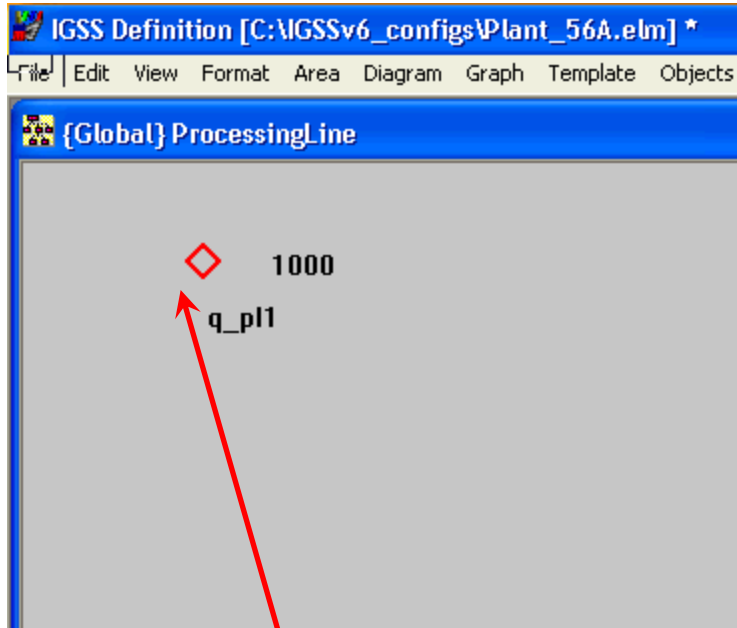
# Object Wizard (3)



Notice the title bar at the top telling you how many steps are left.

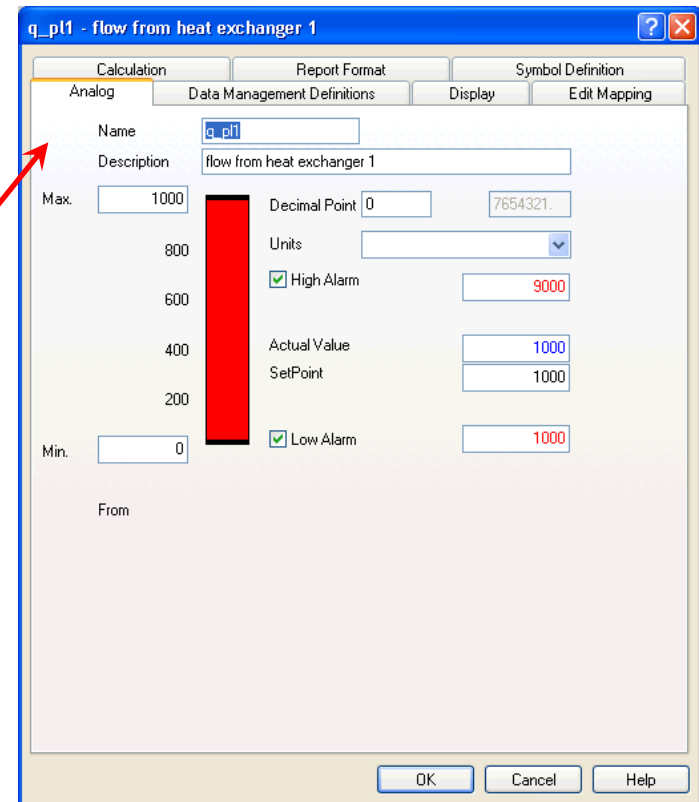
Here we select which **Atoms** (tags) to use for our valve object and which **PLC** to communicate with.

# Object Wizard (4)



We've skipped some steps to go to the end result as seen on our diagram.

If we need to return to the existing object and change something, we simply right click on the object and select the **Properties** menu, and we see all the tabs defining our object parameters.





# Object Wizard (5)



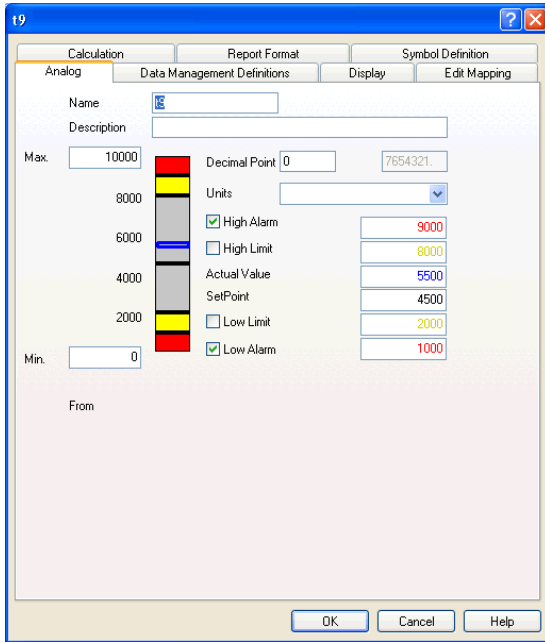
The **Object Wizard** can be used for initially creating all object types which can be used in an IGSS configuration.

Just start the Wizard and fill in the information asked for in the steps that follow.

After creation, the properties of any object can be accessed by right clicking on the object and selecting **Properties**.

# The object-specific Properties tabs

## Analog



Calculation Report Format Symbol Definition  
Analog Data Management Definitions Display Edit Mapping

Name: [ ]  
Description: [ ]

Max: 10000  
Min: 0

Decimal Point: 0  
Units: [ ]

High Alarm  
 High Limit  
Actual Value: 5500  
SetPoint: 4500  
 Low Limit  
 Low Alarm

7654321.  
9000  
8000  
6000  
4000  
2000  
1000

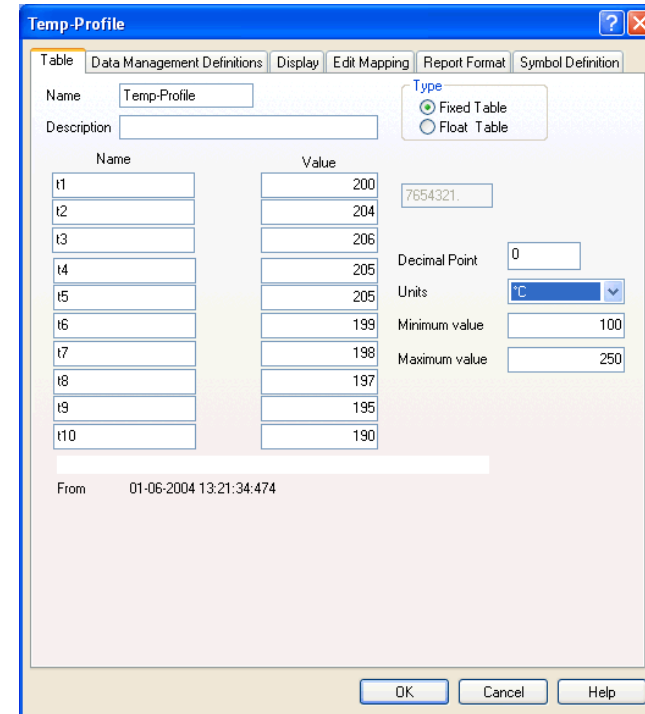
From: [ ]

OK Cancel Help

### Examples:

Level gauges, flow meters, temperature gauges

## Table



Temp-Profile

Table Data Management Definitions Display Edit Mapping Report Format Symbol Definition

Name: Temp-Profile  
Description: [ ]

Type:  
 Fixed Table  
 Float Table

Name	Value
t1	200
t2	204
t3	206
t4	205
t5	205
t6	199
t7	198
t8	197
t9	195
t10	190

Decimal Point: 0  
Units: °C  
Minimum value: 100  
Maximum value: 250

From: 01-06-2004 13:21:34:474

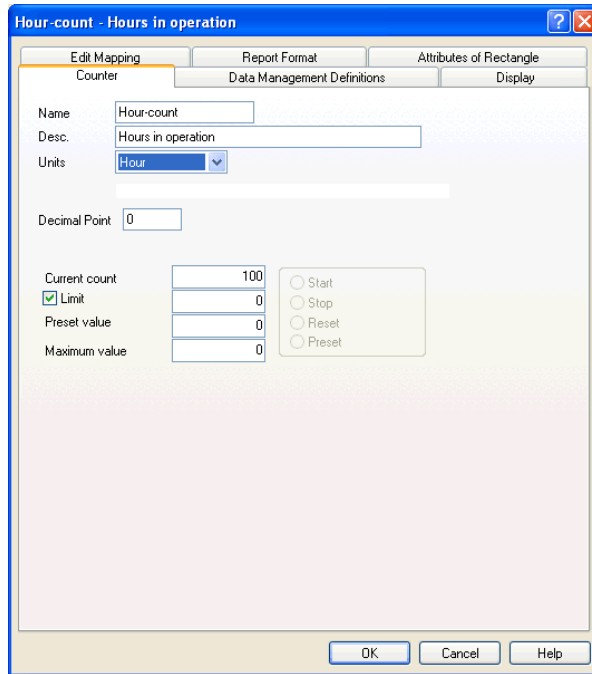
OK Cancel Help

### Examples:

Up to ten analog measurements, f.ex. T1 – T10 temperature gauges. Must have the same measuring range and share alarm limits.

# The object-specific Properties tabs

## Counter

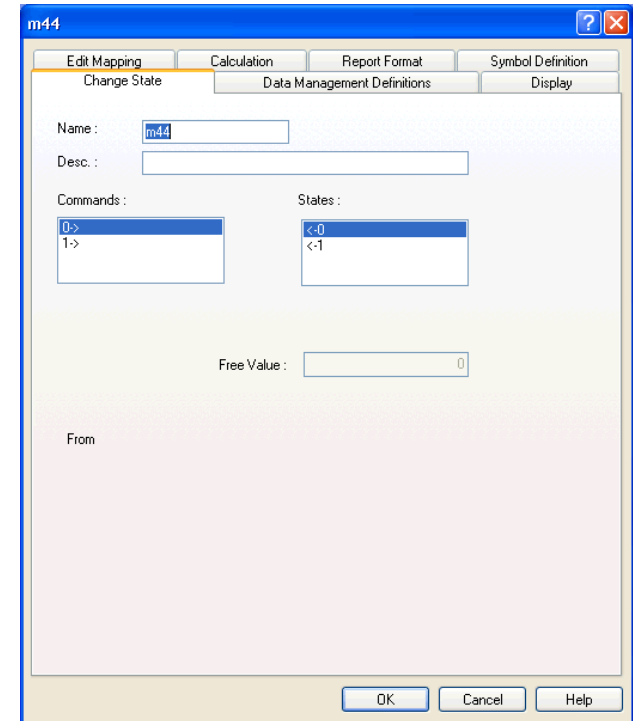


The screenshot shows the 'Hour-count - Hours in operation' dialog box. It has tabs for 'Edit Mapping', 'Report Format', and 'Attributes of Rectangle'. Under 'Edit Mapping', there are sub-tabs for 'Counter', 'Data Management Definitions', and 'Display'. The 'Counter' sub-tab is active, showing fields for Name ('Hour-count'), Desc ('Hours in operation'), and Units ('Hour'). There is a 'Decimal Point' field set to '0'. Below that, there are input fields for 'Current count' (100), 'Limit' (checked, 0), 'Preset value' (0), and 'Maximum value' (0). On the right, there are radio buttons for 'Start', 'Stop', 'Reset', and 'Preset'.

## Examples:

Hour, minute and second count.  
Start/stop registration.  
No. of revolutions per minute.

## Digital (standard)

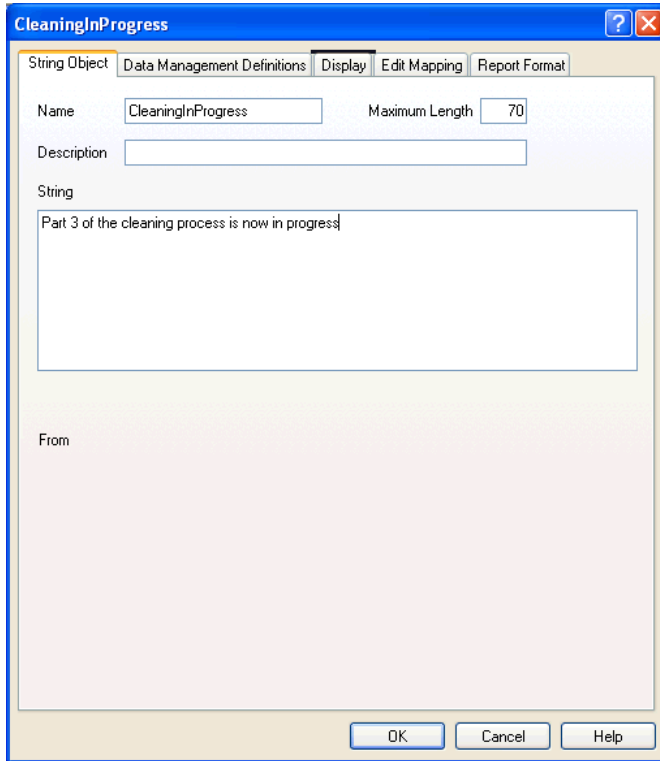


The screenshot shows the 'm44' dialog box. It has tabs for 'Edit Mapping', 'Calculation', 'Report Format', and 'Symbol Definition'. Under 'Edit Mapping', there are sub-tabs for 'Change State', 'Data Management Definitions', and 'Display'. The 'Change State' sub-tab is active, showing fields for Name ('m44') and Desc. Below that, there are two columns of input fields: 'Commands' with '0->' and '1->', and 'States' with '<0' and '<-1'. There is a 'Free Value' field set to '0' and a 'From' label.

NEVER use the standard digital object to create digital objects.  
ALWAYS use a digital template.  
Further details in "IGSS Templates" presentation.

# The object-specific Properties tabs

## String



CleaningInProgress

String Object | Data Management Definitions | Display | Edit Mapping | Report Format

Name: CleaningInProgress Maximum Length: 70

Description: Part 3 of the cleaning process is now in progress

String

From

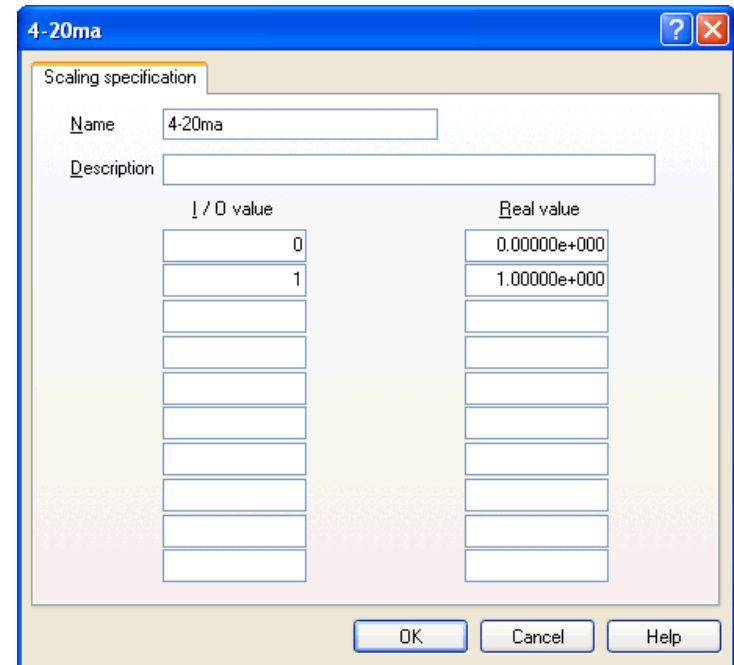
OK Cancel Help

A text field displaying a process-related message.

### Example:

“Part three of the cleaning process is now in progress”

## Scaling



4-20ma

Scaling specification

Name: 4-20ma

Description:

I / O value	Real value
0	0.00000e+000
1	1.00000e+000

OK Cancel Help

A scaling object maps one set of values received from the PLC to another set of values to be presented for the operator.

### Example:

Fahrenheit to Celsius

# The three common Properties tabs .. IGSS



## Data Management Definitions

**p1 - Pump water**

Change State | Calculation | Report Format | Symbol Definition

Alarm In/Ack Bit | Command/State Config | Data Management Definitions | Display

Scan interval:  2000  10000  5000  30000  None In milliseconds.

Base interval:  2  10  5  30  None In mins.

Data reduction:  Average  Minimum  Maximum  Sum  Actual  Change  Difference

Log to printer:  Alarm delay:  3 Scale as: [ ]

Protection: Protect

User defined entries for command menu: [ ]

Use pipe (|) to delimit multiple menu entries  
Use semicolon (;) to delimit multiple commands  
Prefix [xxx] to display xxx in the command menu otherwise  
In parameter list \$Q will be substituted with object name and

OK

## Edit Mapping (PLC addressing)

**p1 - Pump water**

Change State | Calculation | Report Format | Symbol Definition

Alarm In/Ack Bit | Command/State Config | Data Management Definitions | Display

PLC Node for object: p1  
Driver: 7TS7 (Demo Station)  
Node: 0

PLC Address for State atom:  
Data Area: DB (Data Block)  
Data Block Number: 20  
Addressing: Word (16-bit)  
Offset: 6 Bit 0  
Simatic Mnemonic: DB20.DBW12  
Bit Offset: 0  
External type: FP16  
Use numeric +/- to scroll to next/previous atom

Atom mode: in

Alarm Details: [ ]

Digital Alarms: <+1. 206

New Edit Delete

## Display tab

Texts to show on the process diagram and alarm indication setup.

**CleaningInProgress**

Edit Mapping | Report Format | Attributes of Edit

String Object | Data Management Definitions | Display

Object Name: CleaningInProgress

Show:  Enable  Description  Atoms in OPC Server

Align:  Left  Right

State / Value:  Enable  Units  Atom Timestamp  Table Texts

Atom: [ ]

Format: Decimal

Field width: 13

Prefix Zero:  Prefix Format info:

Font: Current: Verdana Change Font

Symbol:  Selectable

Alarm indication:  On Symbol  On Name  On Value  No display in referencing diagram

OK Cancel Help

# The Calculation tab: only on analog and digital objects



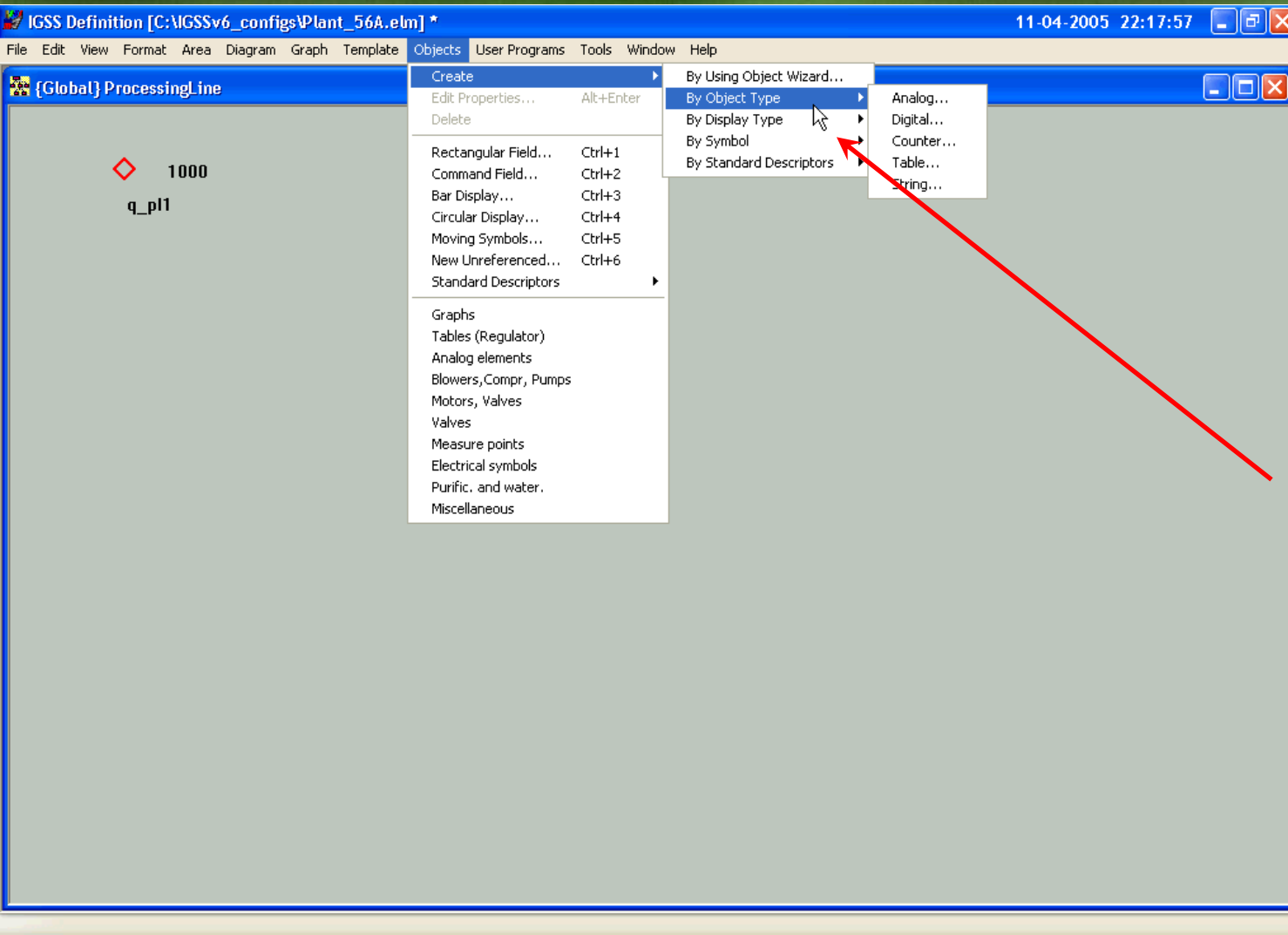
The screenshot shows the 'Calculation' tab of a software interface. The window title is 'Tank\_FR2 @ TankFarm'. The 'Calculation' tab is selected, and a mouse cursor is pointing at it. The interface is divided into several sections:

- Atom:** A list of checkboxes for 'High Alarm', 'High Limit', 'Actual Value', 'Set Point', 'Low Limit', 'Low Alarm', and 'Alarm-In'. 'High Alarm' is currently selected.
- Execution trigger:** Two radio buttons: 'On object changes in expression' (selected) and 'On timer.'. Below the second radio button is a text box for 'Timer value (in mSecs.)' with the value '0' and a spin button.
- Expression:** A text box for 'Object.Atom =' with a 'Test Expression...' button to its left. Below it is a checkbox for 'Only execute expression if this condition is true' with an empty text box for the condition.
- Comment:** A large empty text box for entering a comment.

At the bottom of the window are three buttons: 'OK', 'Cancel', and 'Help'.

- Used for manipulation of process components
- Handy and quick method instead of VBA
- Parameters and examples in the Definition help file

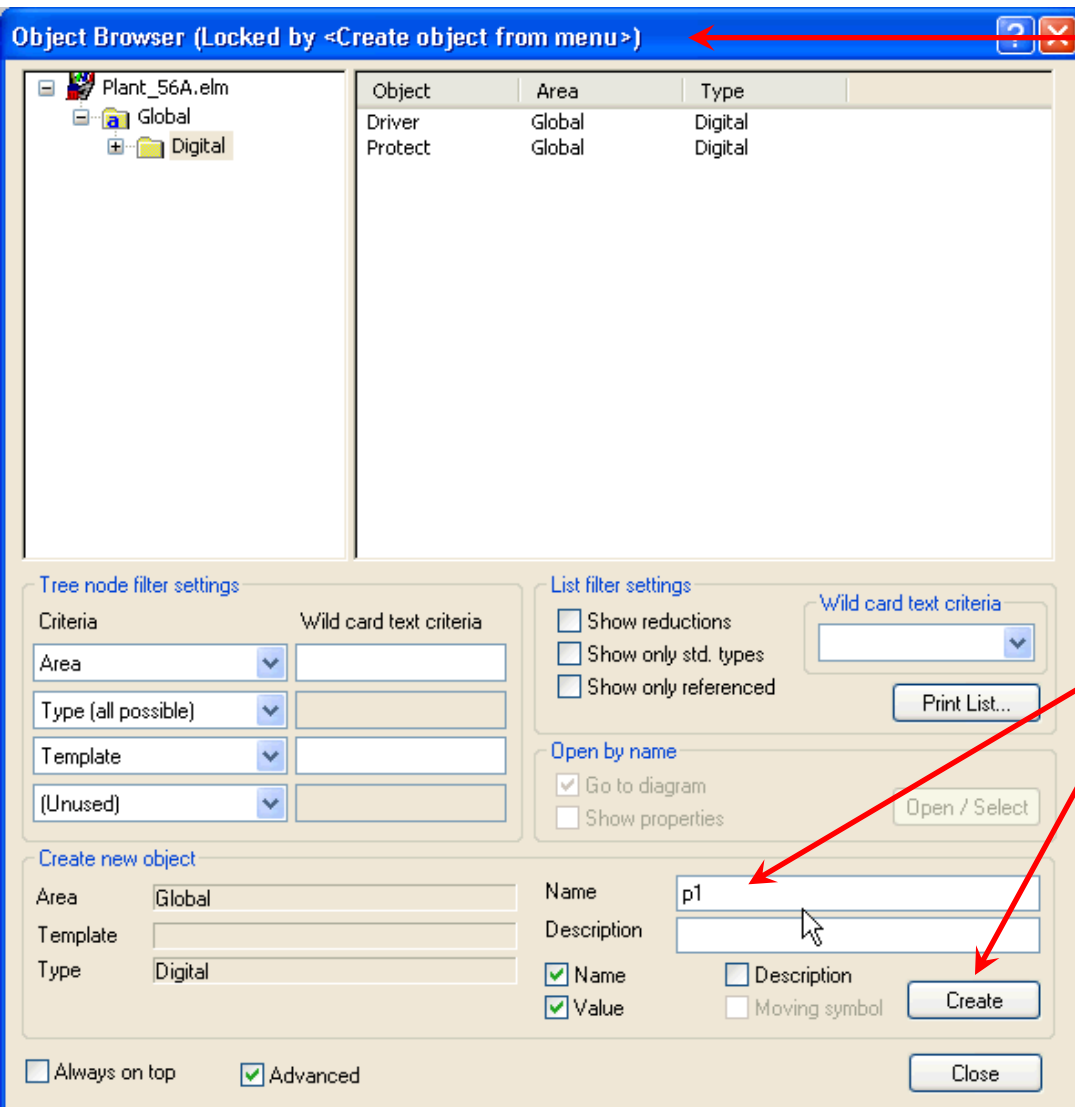
# Object creation without the Wizard



The alternatives to creating objects without the Wizard are found in the menu after **By Using Object Wizard**.

Using any one of these methods brings up the **Object Browser** dialog box.

# Object Browser



In the title bar we see that **Object Browser** has been activated in connection with object creation.

Upon filling in the new name to be given to the object and clicking the create button, the object **Properties** collection of tabs is called up.



# Properties tabs for the object p1



The screenshot shows a software window titled "p1 - Pump water" with a blue title bar. The window contains several tabs: "Edit Mapping", "Calculation", "Report Format", and "Symbol Definition". The "Data Management Definitions" tab is currently selected and highlighted in orange. This tab is divided into sub-sections: "Change State" (with "Alarm In/Ack Bit" and "Command/State Config" sub-tabs), "Bit Map I/O", "Scan interval" (radio buttons for 2000, 5000, 10000, 30000, and None), "Logging" (radio buttons for All changes, > 1%, > 2%, > 5%, > 10%, and None; checkboxes for Log outgoing commands and Log to SQL Database), "Base interval" (radio buttons for 2, 5, 10, 30, and None), "Data reduction" (checkboxes for Average, Minimum, Maximum, Sum, Actual, Change, and Difference), "Transfer to history" (radio buttons for Reduced value, Actual total value, Idealized total value, and None), "Log to printer" (checkbox), "Alarm delay" (checkbox and input field with value 3), "Delete" button, "Protection" (dropdown menu set to Protect), "Scale as" (input field), and "Connect to" (dropdown menu). At the bottom, there is a "User defined entries for command menu" section with a text area and instructions: "Use pipe (|) to delimit multiple menu entries", "Use semicolon (;) to delimit multiple commands", "Prefix [xxx] to display xxx in the command menu otherwise text up till first space is used", and "In parameter list \$D will be substituted with object name and \$A with area". At the very bottom are "OK", "Cancel", and "Help" buttons.

Clicking on the various tabs brings up a sheet of specific parameters which the designer can always change.

Here we're looking at the **Data Management Definitions** tab for the object **p1** (a digital object) where parameters for data type and processing are set up.

# PLC Addressing



Now let's look at another tab called **Edit Mapping**. Here is where settings are chosen for addressing the PLC to which the process component is connected.

Select atom and I/O mode

The screenshot shows the 'Edit Mapping' dialog box for an object named 'L1'. The dialog has several tabs: 'Calculation', 'Report Format', 'Attributes Of Bar', 'Analog', 'Alarm In/Ack Bit', 'Data Management Definitions', 'Display', and 'Edit Mapping'. The 'Edit Mapping' tab is active. On the left, there is a list of 'Atom' types: 'High Alarm' (checked), 'High Limit', 'Actual Value' (checked), 'Set Point', 'Low Limit', 'Low Alarm', and 'Alarm-In'. Below this list is an 'I/O mode' dropdown menu set to 'in'. At the bottom left, there are 'New', 'Edit', and 'Delete' buttons. On the right, the 'PLC Node for object: L1' section contains a 'Driver' dropdown set to '7T3964R (Igss\_server)' and a 'Node' dropdown set to '1'. Below that, the 'PLC Address for High Alarm atom:' section includes fields for 'Data Group' (0), 'Word Offset' (0), 'Bit Offset' (0), and an 'External Type' dropdown set to 'FP16'. A note at the bottom right of this section says 'Use numeric +/- to scroll to next/previous atom'. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

Select driver and node

Specify PLC address and data type

# Symbols for objects

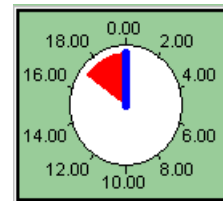
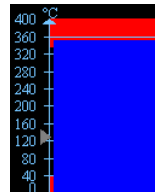


A symbol is a graphical representation of a process component bound to an IGSS object type

Symbols.v20



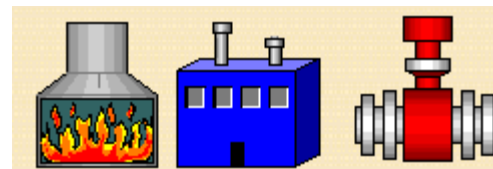
Standard Display Types



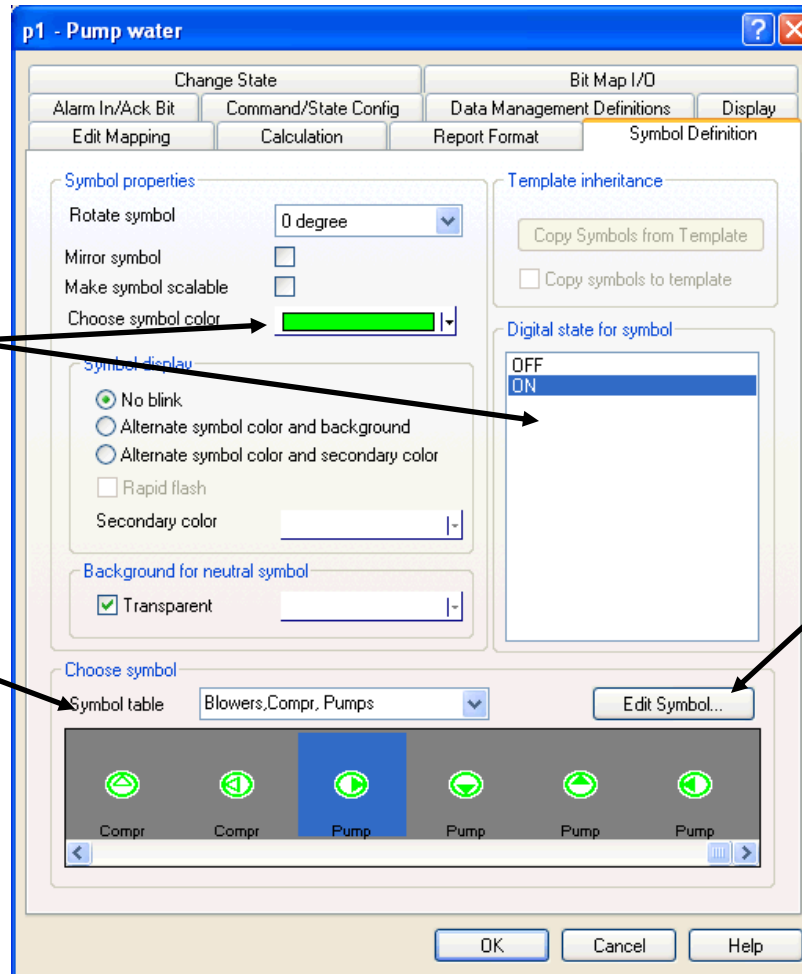
Standard Descriptors



Animated Symbols



# Symbol selection



**Symbol and color**  
One symbol and color  
for each state

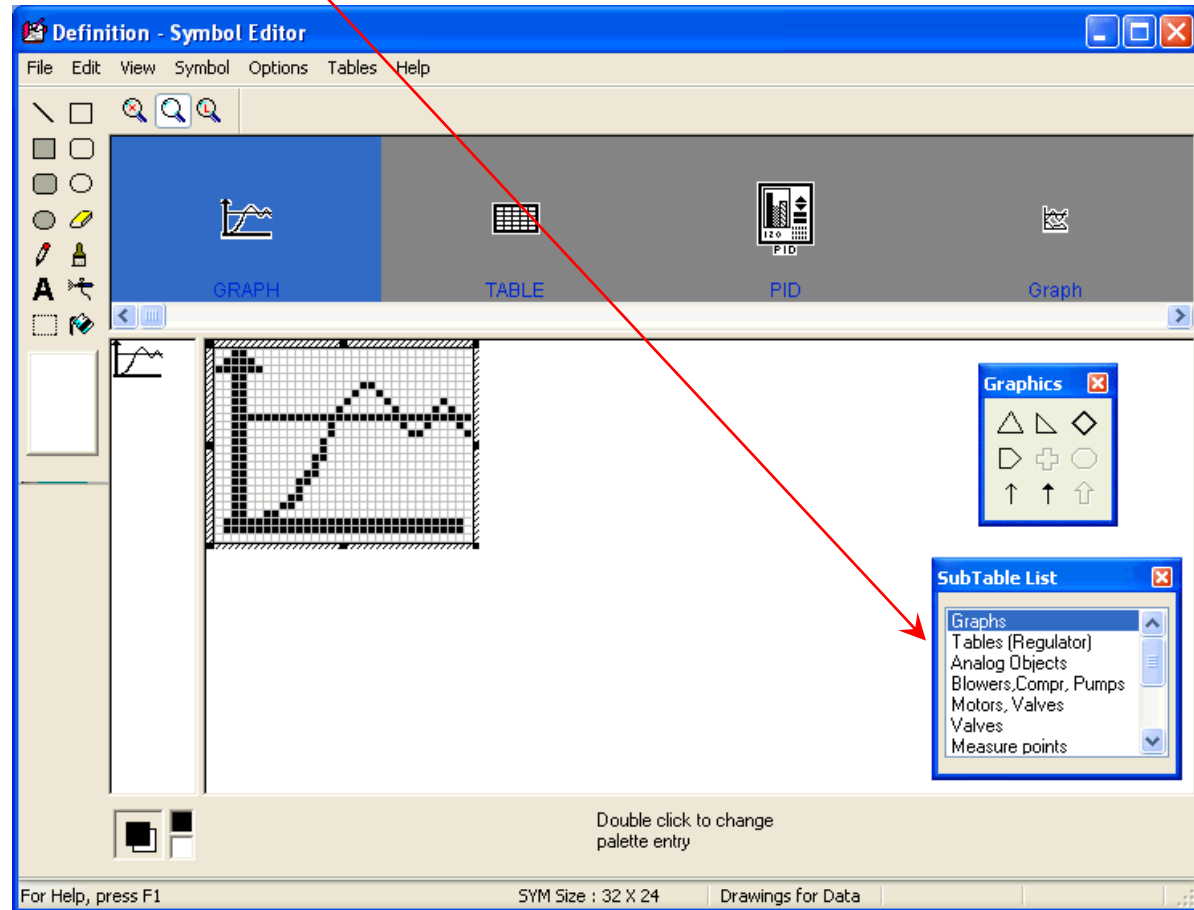
**Symbol tables**  
Symbols are tied to  
specific object types  
(symbol tables)

**Edit Symbol**  
Click here to  
edit the  
symbol  
in the Symbol  
Editor.

# Symbol Editor



The symbol table names are shown in the **Objects** menu in the Definition program.



# Instructor demo



- Creating an analog object
- Using the Calculation function

Do Exercise 4 in the Exercises booklet after the instructor demo.