



Slide Show 8:

Define Templates



**INSIGHT
AND
OVERVIEW**

Overview

- What is an IGSS template ?
- Purpose of a template
- Alarm indication and acknowledgment
- Settings inherited by template-based objects

What is an IGSS template ?

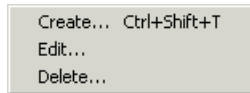
- Templates can be made for analog, table, counter and digital object types
- Use templates when a number of process components share several properties
- The real process components (IGSS objects) may be based on a template
- Template-based objects will subscribe to changes in the template

Purpose of a template

- Use templates-only functionality
 - Freely name digital states and commands
 - Define valid commands for digital objects
 - Define digital alarms on digital and analog objects
 - Reuse symbols from template for all object types
- Save time
 - Template-based objects merely need a new object name and unique PLC addresses. The remaining properties are inherited from the template.
- Ensure consistency
 - One template – many objects
- Fast updating of objects
 - Change the template once to update multiple objects in the configuration

Create, edit, delete templates

Template menu

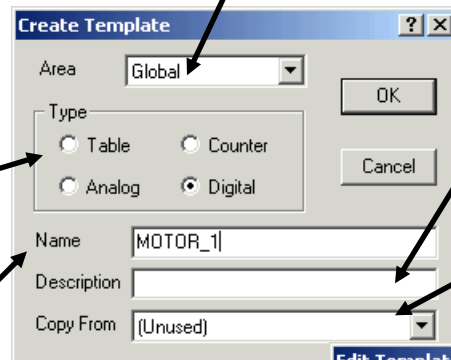


Object types supported

Template name

Recommendation is
ALL CAPS for template names
Normal case for object names

Templates defined in the "Global" area can be used in the entire configuration.
Templates defined in other areas are local.



Area: Global

Type: Table Counter Analog Digital

Name: MOTOR_1

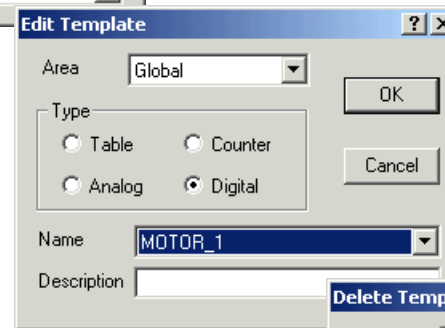
Description:

Copy From: (Unused)

Buttons: OK, Cancel

Optional description

Copy properties from another template



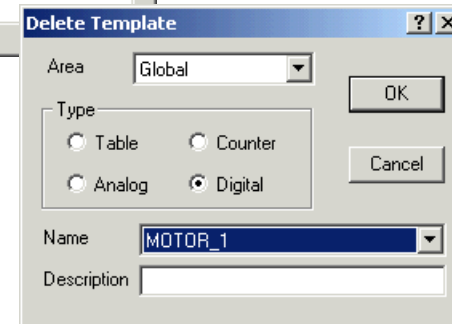
Area: Global

Type: Table Counter Analog Digital

Name: MOTOR_1

Description:

Buttons: OK, Cancel



Area: Global

Type: Table Counter Analog Digital

Name: MOTOR_1

Description:

Buttons: OK, Cancel

Digital Templates

Digital templates

Summary

- States and commands
 - Define the number of states and commands you need (*Bit Map I/O tab*)
 - Freely name the states and commands (*States and Commands tab*)
 - Define valid commands for each state (*Command/State Config tab*)
- Alarm indication and acknowledgment
 - Define the alarm bits you need (*Alarm In/Ack Bit tab*)
 - Define one or more alarms per template
 - Define the operator's acknowledgment of the alarm from IGSS
 - Send the PLC's acknowledgment bit back to IGSS
 - Define alarm inhibit bits
- Symbol definition
 - Save color and symbol selections in the template

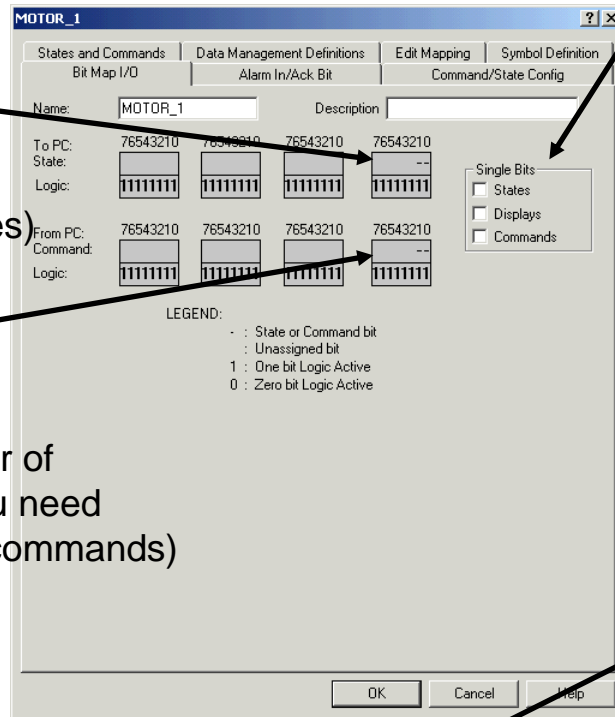
States and commands (1)

STEP 1:
Define the number of state bits you need (f.ex. 2 bits for 4 states)

STEP 2:
Define the number of command bits you need (f.ex. 2 bits for 4 commands)

Note

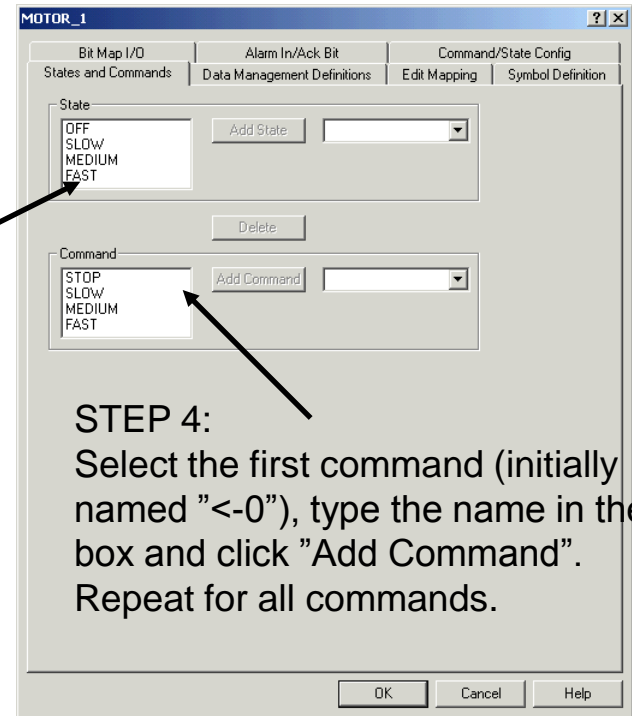
This tab is only visible in the template, not on the object.



Single bits

Normally two bits will give four states (00, 01, 10, 11). But using "Single Bits" IGSS will read the bits from left to right. The first bit set is registered, the remaining ones ignored. Single bits for displays is used to show the state of the individual bit, f.ex. a panel of lamps that are on or off.

STEP 3:
Select the first state (initially named "<-0"), type the name in the box and click "Add State". Repeat for all states.

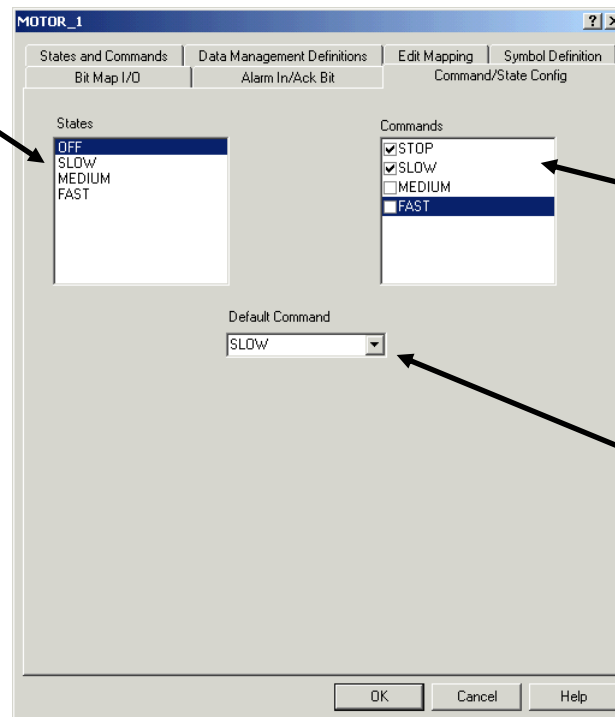


STEP 4:
Select the first command (initially named "<-0"), type the name in the box and click "Add Command". Repeat for all commands.

States and commands (2)

Configuration of valid commands

STEP 1:
Choose a state



STEP 2:
Select the valid
command(s) for that state.
Only valid commands will be
available during supervision.

STEP 3:
Choose the default
command for the state.
The default command
will be **emphasized** for
the operator in the
Supervise program.

PLC addressing – General rules

- **General rules**
 - Plan the PLC memory layout from the start
 - Separate input (f.ex. analog values or digital states) from output (f.ex. analog setpoints or digital commands)
 - In case of address conflicts, output takes priority over input
- **Polled communication**
 - Locate process components with the same scan interval in the same memory block of the PLC to optimize data communication between IGSS and the PLC. The fewer fetches or scan records, the more effective PLC communication.
- **Event-oriented communication**
 - Values from the PLC are only sent to IGSS in case of changes. The event-oriented communication must be programmed in the PLC. On the Data Management Definitions tab, select "None" under "Scan interval".
A few drivers, f.ex. the OPC Client-Side Driver, will force the setting "None" under "Scan interval".

PLC addressing – Commands

- Do not place commands from different objects in the same word !!
- In most cases, a digital command will take up 16 bits (one word)
- Some PLC drivers/communication protocols support 1-bit or 8-bit addressing (examples: COMLI, MODBUS and SIMATIC)

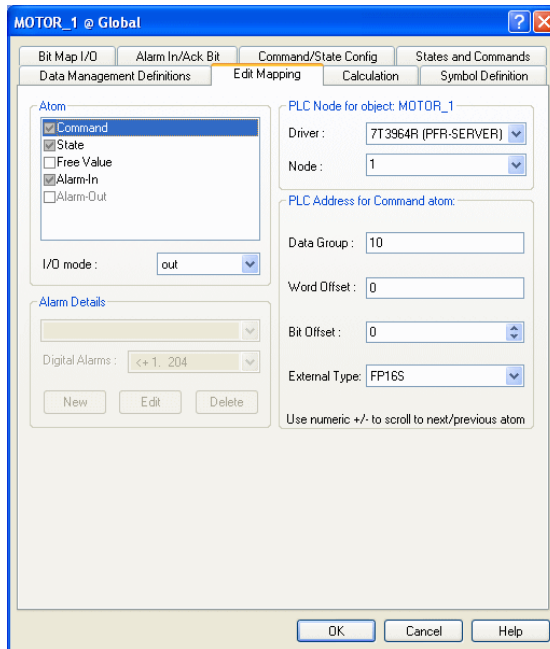
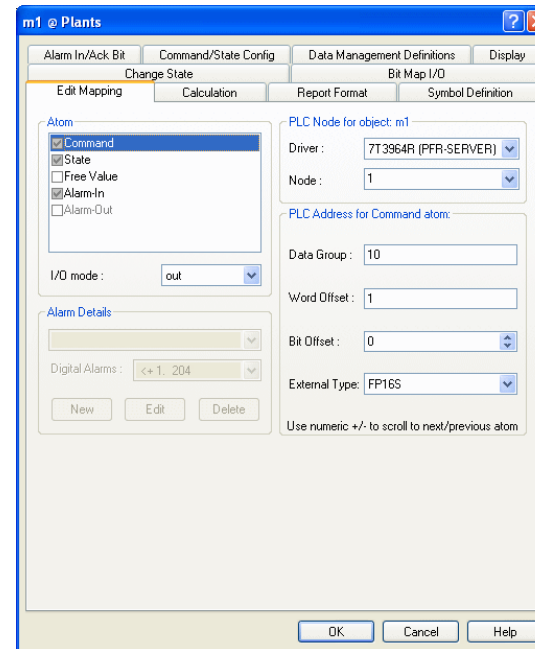
PLC addressing – Commands

Template = MOTOR_1

- Choose atom and I/O mode="Out"
- Choose driver and node number
- Choose data group and external type
- Leave word offset and bit offset as is

Object = m1, m2, m3, m4

- Type relevant word offset

PLC addresses

Obj.	DG	Word	Bit
m1	10	1	0
m2	10	2	0
m3	10	3	0
m4	10	4	0

PLC addressing – States

- Different states for the same object cannot be placed in different data registers
- Digital states can be packed inside a data register to optimize the use of PLC memory and to make communication more effective

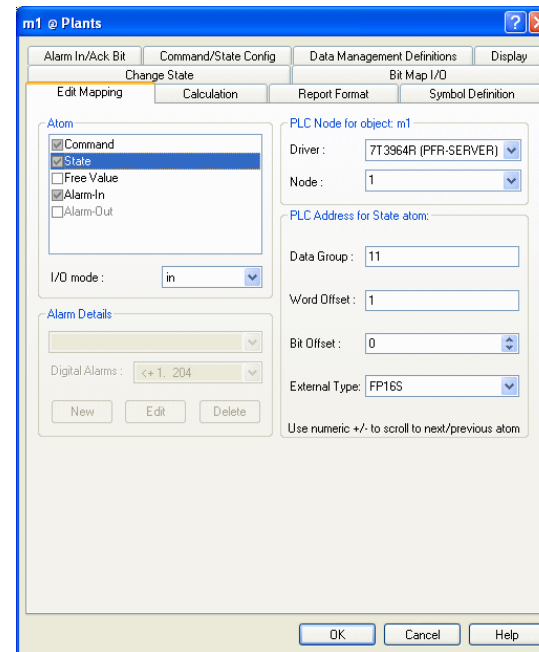
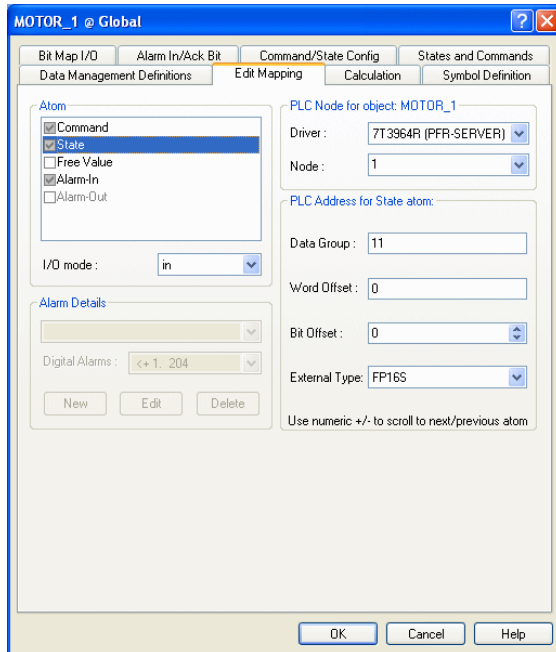
PLC addressing – States

Template = MOTOR_1

- Choose atom and I/O mode="In"
- Choose driver and node number
- Choose data group and external type
- Leave word offset and bit offset as is

Object = m1, m2, m3, m4

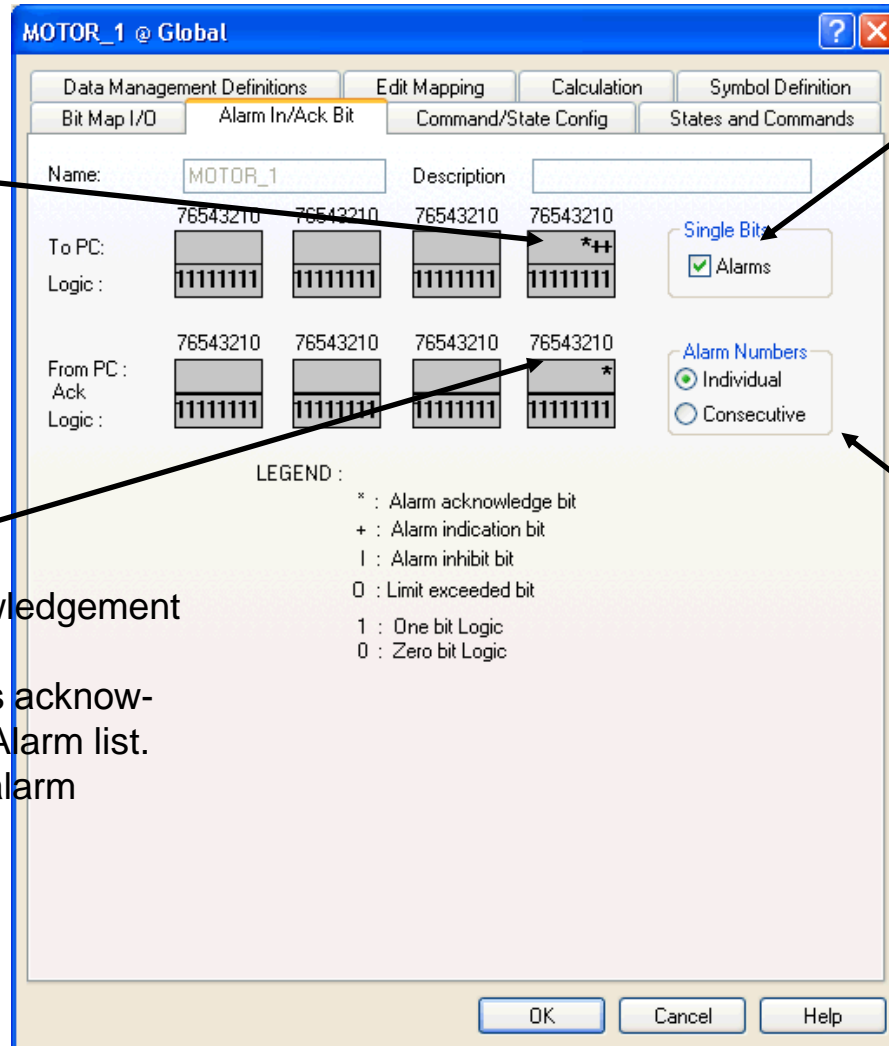
- Type relevant word offset
- Type relevant bit offset



PLC addresses
2 bits used per object.

Obj.	DG	Word	Bit
m1	11	1	0
m2	11	1	2
m3	11	1	4
m4	11	1	6

Alarm indication and acknowledgement (1)



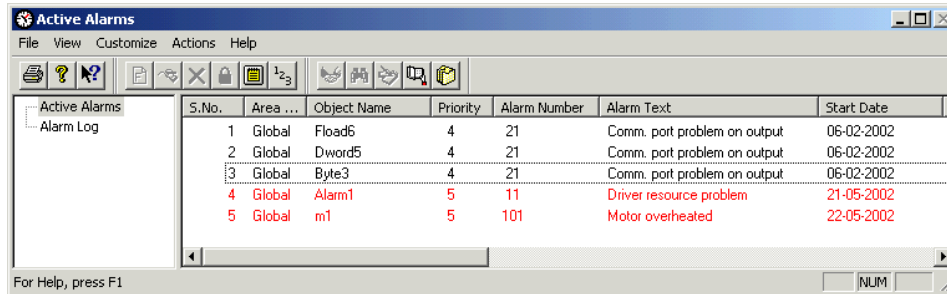
STEP 1:
Define alarm indication bits (+) and alarm acknowledgement bits (*) "To PC".

STEP 2:
Define alarm acknowledgement bits (*) "From PC".
This is the operator's acknowledgement from the Alarm list. It acknowledges all alarm indication bits set.

STEP 3:
If more than one alarm can be active at a time, select the "Alarms" check box.
If not set, only the last alarm will be visible in the Alarm List.

STEP 4:
Choose either "Individual" or "Consecutive" alarm numbers. In the latter case, only one alarm number must be chosen on the "Edit Mapping" tab.

Alarm acknowledgement



S.No.	Area ...	Object Name	Priority	Alarm Number	Alarm Text	Start Date
1	Global	Fload6	4	21	Comm. port problem on output	06-02-2002
2	Global	Dword5	4	21	Comm. port problem on output	06-02-2002
3	Global	Byte3	4	21	Comm. port problem on output	06-02-2002
4	Global	Alarm1	5	11	Driver resource problem	21-05-2002
5	Global	m1	5	101	Motor overheated	22-05-2002

①

The operator acknowledges the alarm. The bit is sent to the PLC address specified for "Alarm-Out" on the "Edit Mapping" tab.



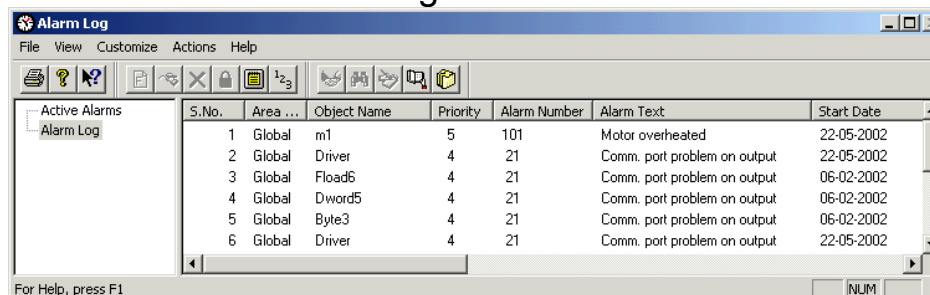
②

The PLC program registers the operator acknowledgement and returns a confirmation bit to IGSS. This the bit specified as * in the "To PC" field on the "Alarm In/Ack Bit" tab.

The PLC address is specified is the "Alarm-In" atom on the "Edit Mapping" tab.

③

When IGSS receives the PLC's acknowledgement, the alarm is acknowledged in IGSS. It typically changes color in the Alarm List and is moved to the "Alarm Log".



S.No.	Area ...	Object Name	Priority	Alarm Number	Alarm Text	Start Date
1	Global	m1	5	101	Motor overheated	22-05-2002
2	Global	Driver	4	21	Comm. port problem on output	22-05-2002
3	Global	Fload6	4	21	Comm. port problem on output	06-02-2002
4	Global	Dword5	4	21	Comm. port problem on output	06-02-2002
5	Global	Byte3	4	21	Comm. port problem on output	06-02-2002
6	Global	Driver	4	21	Comm. port problem on output	22-05-2002

PLC addressing – Summary

Commands

Obj.	DG	Word	Bit
m1	10	1	0
m2	10	2	0
m3	10	3	0
m4	10	4	0

States

Obj.	DG	Word	Bit
m1	11	1	0
m2	11	1	2
m3	11	1	4
m4	11	1	6

Alarm-out

Obj.	DG	Word	Bit
m1	10	101	0
m2	10	102	0
m3	10	103	0
m4	10	104	0

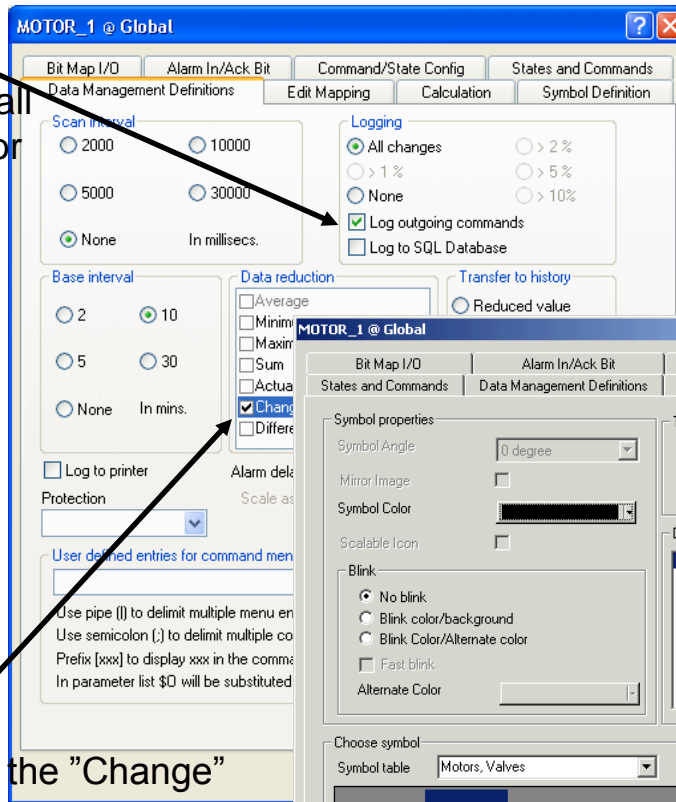
Alarm-in (one alarm defined)

Obj.	DG	Word	Bit
m1	11	101	0
m2	11	101	1
m3	11	101	2
m4	11	101	3

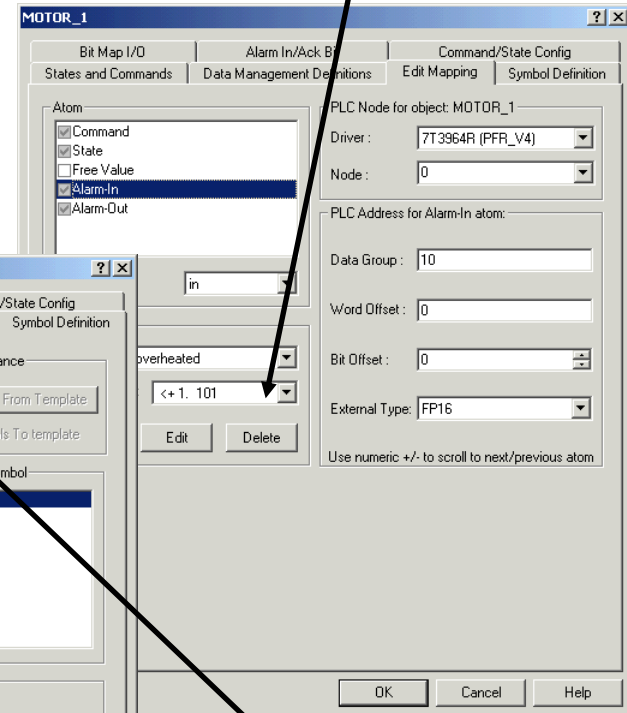
The three general tabs

Remember that if you have several alarm indication bits, you must create or choose the corresponding number of alarm texts.

“Log outgoing commands” enabled will log all outgoing operator commands like start/stop pump. This setting also logs changes activated by the calculation function or by VBA.



Choosing the “Change” reduction method will register all state changes



Checking the “Copy symbols to template” box will include the symbols in the template. Template-based objects can then inherit the symbols and symbol colors.

Analog Templates

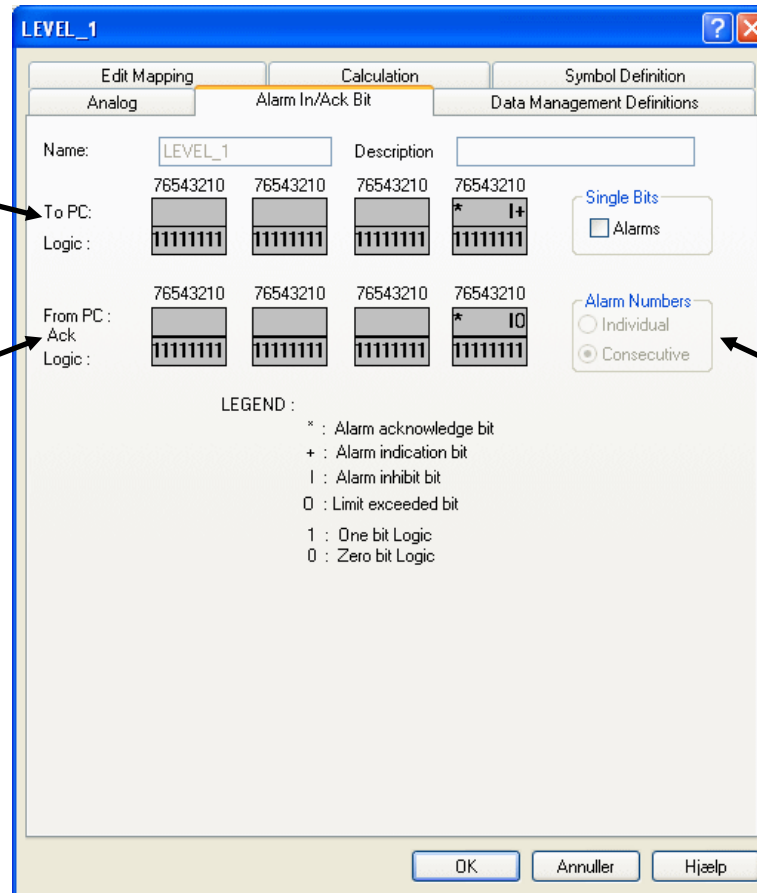
Analog templates (alarm bits)

To PC

- Alarm indication (+)
- Alarm inhibit (I)
- Alarm ack. (*)

From PC

- Alarm inhibit (I)
- Limit exceeded (0)
- Alarm ack. (*)



The screenshot shows the 'LEVEL_1' configuration window with the 'Alarm In/Ack Bit' tab selected. It displays settings for 'To PC' and 'From PC' across four channels (76543210). The 'To PC' section shows logic values of '11111111' for all channels. The 'From PC' section shows logic values of '11111111' for all channels. The 'Alarm Numbers' section is set to 'Consecutive'.

Channel	To PC	From PC
76543210	11111111	11111111
76543210	11111111	11111111
76543210	11111111	11111111
76543210	11111111	11111111

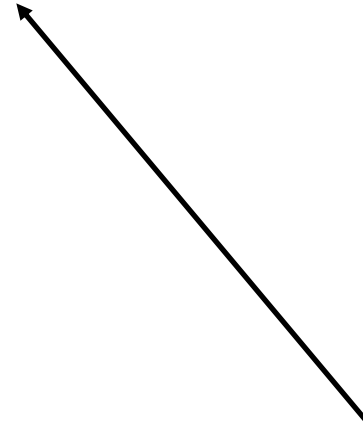
LEGEND :

- * : Alarm acknowledge bit
- + : Alarm indication bit
- I : Alarm inhibit bit
- 0 : Limit exceeded bit
- 1 : One bit Logic
- 0 : Zero bit Logic

Alarm numbers

Alarm numbers must be "Consecutive". First alarm number is specified.

Analog template (Symbol Def.)



Symbol Definition tab

"Copy symbols to template"
can be chosen for the tem-
plate.

"Copy Symbols from Template"
can be chosen for template-
based objects.

Table and Counter Templates

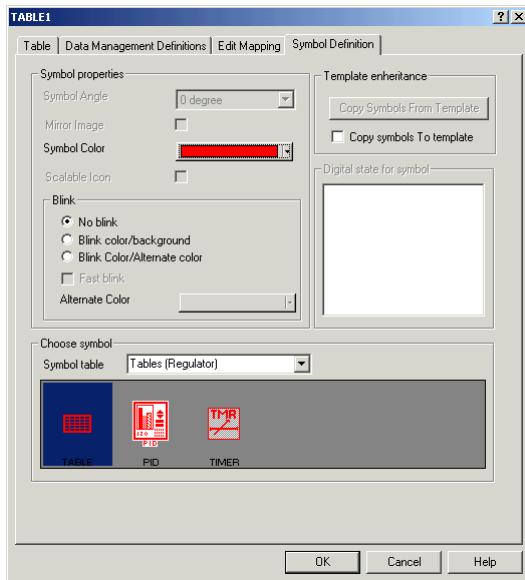
Copy symbols to template

Symbol Definition tab

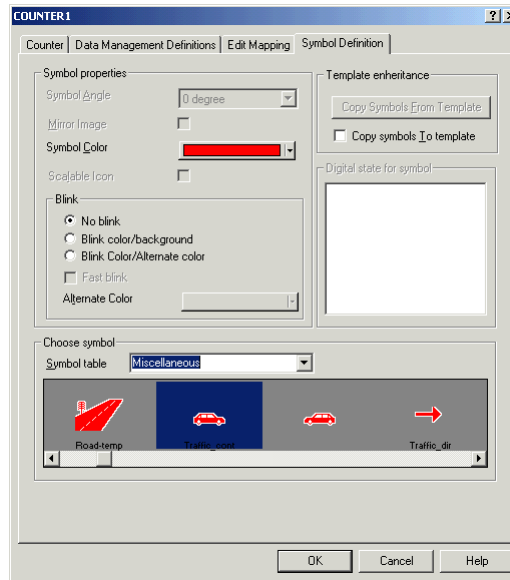
"Copy symbols to template" can be chosen in the template.

"Copy Symbols from Template" button will be active on template-based objects.

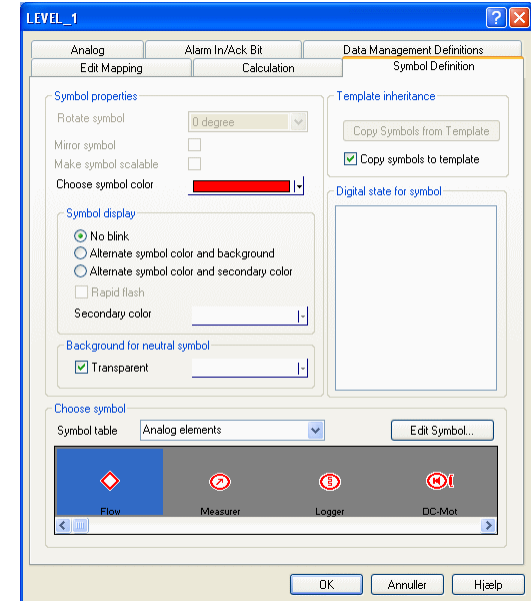
Table



Counter



Analog

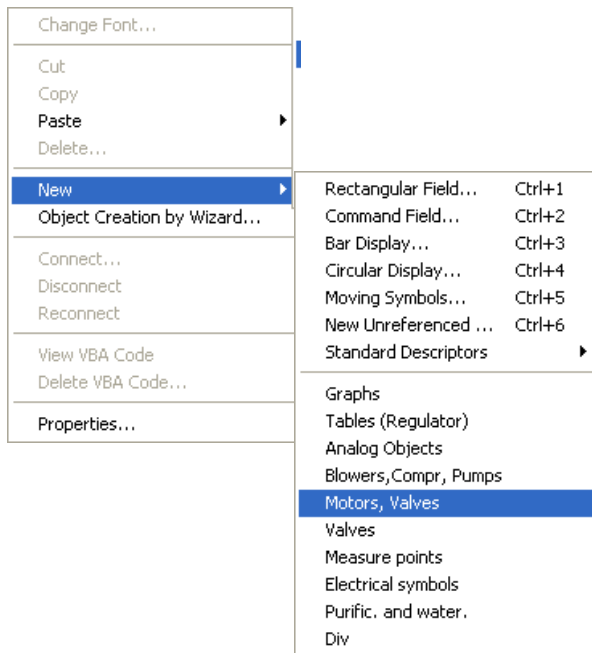


Create Template-Based Objects

Create template-based objects (1)

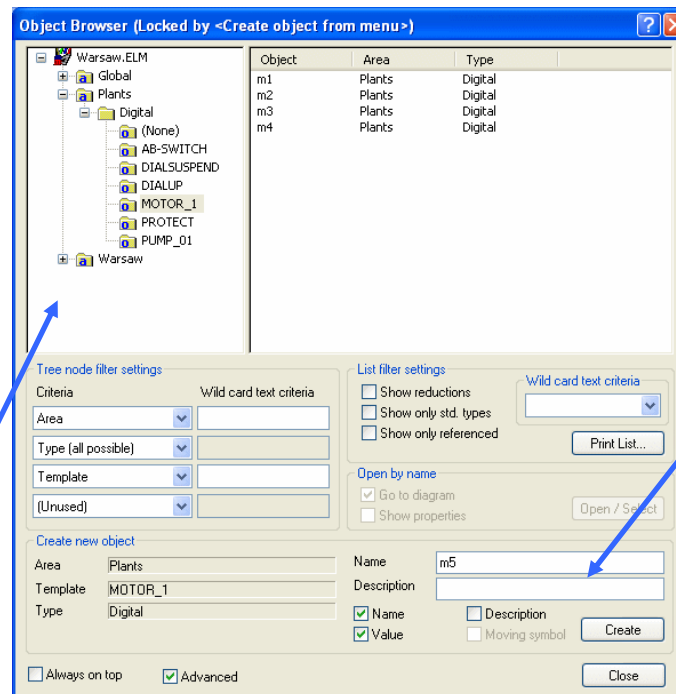
STEP 1:

Right-click the diagram and select descriptor.



STEP 2:

Select area, object type and template.

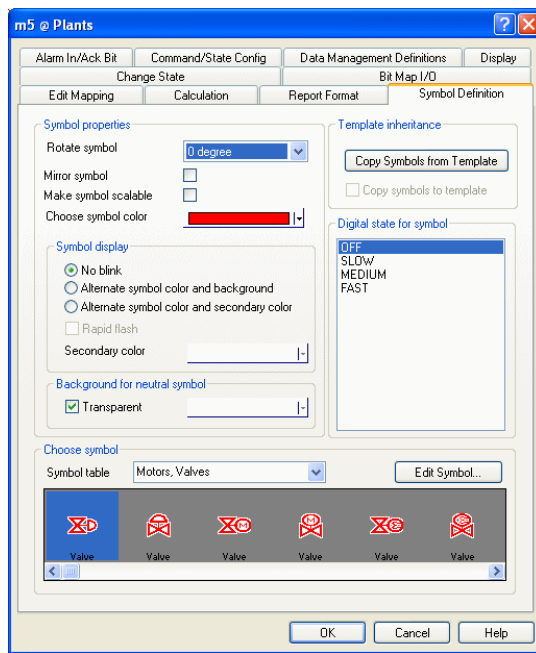


STEP 3:

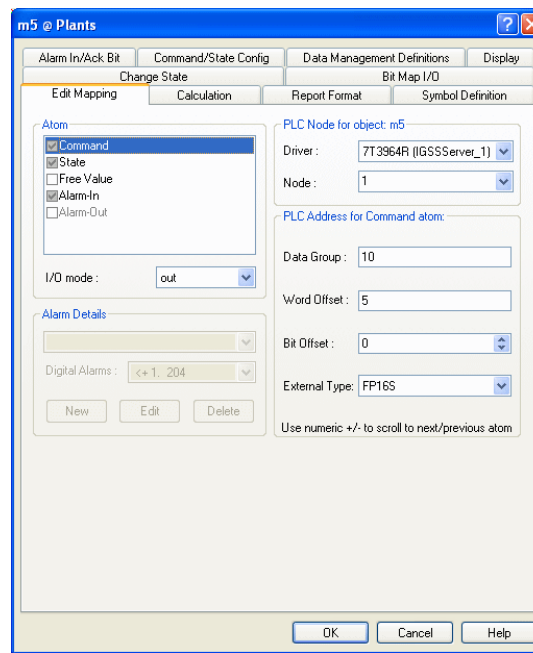
Give the object a unique name. Click **Create**.

Create template-based objects (2)

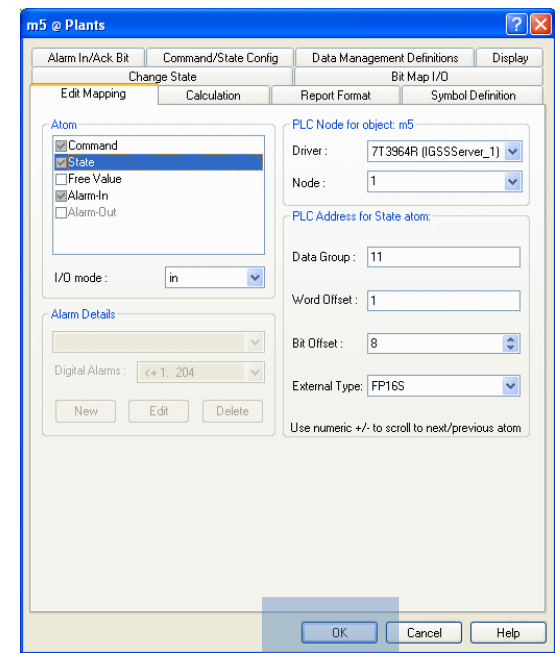
STEP 4:
Click "Copy Symbols from Template".



STEP 5:
Specify unique PLC addresses (command)



STEP 6:
Specify unique PLC addresses (state) – notice bit offset



STEP 7:
Click OK and position the symbol and text.

Create template-based objects (3)

Copy/paste of objects

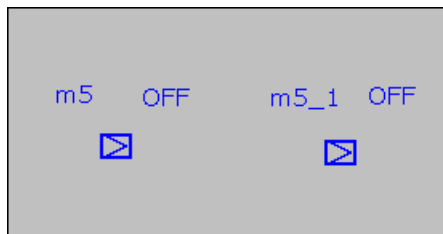
STEP 1:

Select the symbol and text on the diagram.



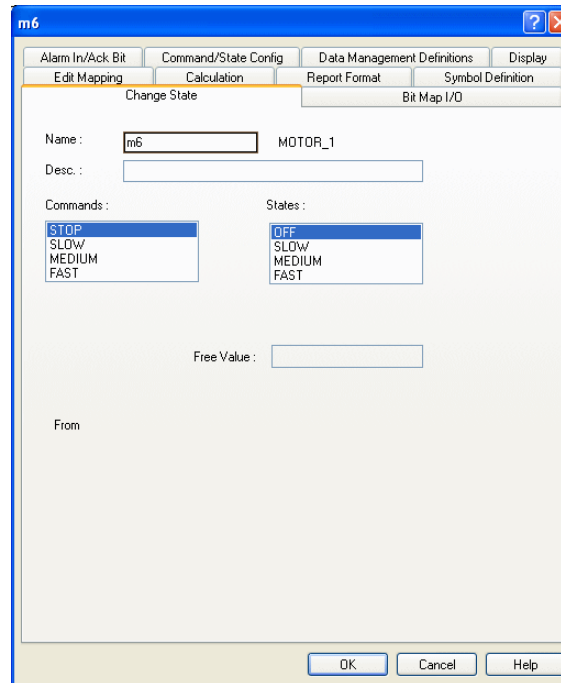
STEP 2:

Copy/Paste and position new symbol.



STEP 3:

Change object name – notice template name

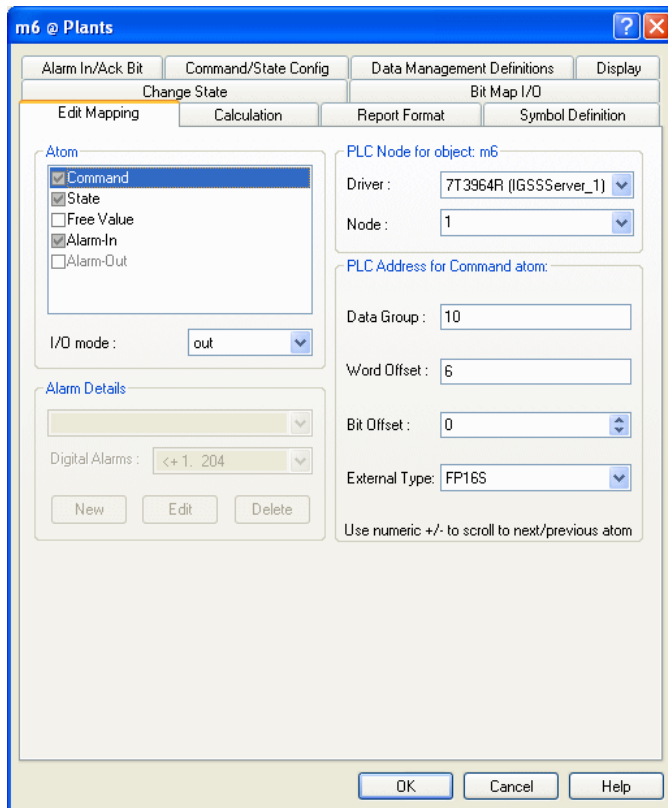


Use Property Table View to change names and PLC addresses.

Filter	Type	Object name	Area	Description	Protected by
m1 @ Plants	Digital	m1	Plants		** Unprotected
m2 @ Plants	Digital	m2	Plants		** Unprotected
m3 @ Plants	Digital	m3	Plants		** Unprotected
m4 @ Plants	Digital	m4	Plants		** Unprotected
m5 @ Plants	Digital	m5	Plants		** Unprotected
m6 @ Plants	Digital	m6	Plants		** Unprotected
m7 @ Plants	Digital	m7	Plants		** Unprotected
m6_1_1 @ Plants	Digital	m6_1_1	Plants		** Unprotected

Create template-based objects (4)

STEP 4:
Specify PLC addresses
for all active atoms on
"Edit Mapping".



STEP 5:
Click OK. The object is complete.



Settings Inherited from Template

Settings inherited

The following settings are inherited when you change the templates:

Digital templates

- The number of states and commands
- The names of states and commands
- The configuration of valid commands
- The bit map of states and commands

Digital and analog templates

- The bit map of alarm indication and acknowledgement

All templates

- Alarm texts
- Symbol definition
(Via the **Copy Symbols From Template** button)

Settings not Inherited

The following settings are not inherited when you change the templates:

- Driver and node number
- Settings on the **Data Management Definitions** tab
 - e.g. attachment of Protect objects

Solutions:

- Change the properties in the Property Table View (Diagram menu) or
- Change the properties via the ODBC interface

Online Demo

Watch while the instructor does the following:

- Create a digital template
- Define state and command bits
- Name the states and commands
- Configure the valid commands
- Define alarm indication and acknowledgment bits
- Specify PLC addresses and alarm texts

Do Exercise 5 in the Exercises booklet after the demo.