INDUSTRIAL AUTOMATION

Interactive Graphical SCADA System INSIGHT AND OVERVIEW



GETTING STARTED

Table of Contents	
Table of Contents	2
About This Manual	4
IGSS User Documentation	5
Chapter 1: Welcome to IGSS	7
Overview	7
What is IGSS?	7
Overview of modules	8
Chapter 2: How to Create a Project	10
Overview	10
Section A: The Sample Project	
Overview	
The Project We Will Build	
The Project Checklist	13
Section B: Setting Up and Preconfiguring	
Overview	14
Create the New Project Using the New Project Wizard and Set It Active	15
Define the IGSS Station Type	16
Set Up the Station Configuration Parameters	17
Set Up the Data Collection Parameters	18
Set Up the Alarm and Log Printers	23
Set up the Driver Parameters	
Make the Background Drawings	
Plan the Alarm Texts	
Draw the New Symbols	27
Checklist Review - Setting Up and Preconfiguring	28
Section C: Mandatory Design Procedures	29
Overview	
Checklist Review - Mandatory Design Procedures	30
The Definition Module	30
Define Measurement Units	31
Define Areas and Diagrams	
Define Alarm Texts	
Define Digital Templates	37
Define Digital Objects	
Define Analog Objects	
Define Graph Windows	60
Install the Project	61
Define Operator Reports	64
Section D: Optional Design Procedures	68
Overview	
Using Advanced Features in IGSS	
Use Lines for Analog Objects	
Use Polygons for Analog Objects	72

Define Events	
Simple Calculations	
Refine Bar Displays	
Use Command Buttons for Counter Objects	
Use Command Fields or Combo Boxes for Digital Objects	
The Embedded Alarm List	87
Embedded Diagrams	88
Grid Control (pinnable)	
Using Animated Symbols	
Place Your Favorite Graphics in the Library Toolbar	
Property Table View	
Chapter 3: IGSS Types and Templates	
Section A: IGSS Types	
Overview	
What Is an IGSS Type?	
The Area Object Type	
The Diagram Object Type	
The Graph Object Type	
The Analog Object Type	
The Table Object Type	
The Counter Object Type	119
The Digital Object Type	
The String Object Type	
The Scaling Object Type	
The Group Object Type	125
Visual Guide to Type-specific Properties	
Section B: IGSS Templates	
What Is an IGSS Template?	131
Defining an IGSS Template	
Glossary	
Index	
Version Information	

About This Manual

Intended use

This manual is intended as a help for the system designer to get started with the creation of a project. It contains the following information:

- An introduction to the IGSS system and its components (Chapter 1)
- Step-by-step procedures for creating a new project from scratch (Chapter 2)
- Descriptions of the key object types and terminology used in IGSS (Chapter 3)

The manual deals almost exclusively with the **Definition** module. For information about the other modules in the IGSS system, refer to the Help function.

The manual is NOT a reference manual. The built-in Help function should be used for finding further details about the topics covered in this manual. References to the Help function are given throughout the manual.

Structure of this	This manual contains the following chapters:
manual	

This chapter	contains the following:
1: Welcome to IGSS	an introduction to IGSS and an overview of its components.
2: Creating a project	step-by-step procedures for creating a project. The sample project is very small and simple but all the important system types are represented.
3: Types and Templates	definition and use of each of the IGSS types: area, diagram, graph, analog, table, counter, digital, string and scaling, including an explanation of the physical counterpart of each type. The chapter gives you a thorough understanding of the different object types and provides you with the terminology required for reading Chapter 3.

Conventions

The following typographical conventions are used:

Item	Convention	Example
User interface element	Bold typeface	The Edit Mapping tab.
Menu structure	Arrow between menu items	To access Help, select Help \rightarrow Help Topics.
User input	Monospace typeface	We have now inserted the following text: The level in the basin is too low. Pour faster
IGSS module	Red bold typeface	Open the Definition module.
Reference to Help	Italic typeface	For further details about addressing, search for " <i>PLC</i> <i>addresses</i> " in the Definition Help file.

IGSS User Documentation

Documentation overview

With the IGSS system you receive the following documentation items:

This documentation item	includes the following
Getting Started	See the "About This Manual" section.
Igssmaster.chm	Generel help on how to use the IGSS Master module and how to perform the fundamental tasks with IGSS.
Igss module Help	Step-by-step procedures, reference information and context- sensitive help for the specific module you are currently working with.

IGSS Help

The figure below shows a typical window from the IGSS Help system:

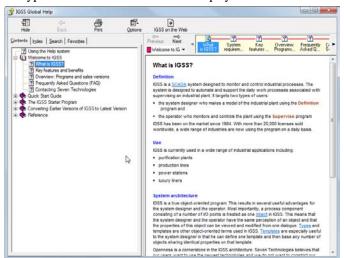


Figure 1 A typical window from the IGSS Help system.

Types of Help
topicsWe have tried to design our Help so that you can easily distinguish the different types of information being
presented. The most important types are:

Торіс Туре	Description
Step-by-step procedure	Includes numbered steps for performing a specific task. This type of topic is presented in a small card-like window in the upper right corner of the screen so that you can read the procedure and perform the task at hand at the same time.
Reference information	Describes user interface details or conceptual information. For example, there are topics describing the different object types.
What's This? Help	Describes an individual item in a dialog, that is a button or a field.

Accessing Help

There are several ways to access Help dependent on what type of Help you want:

To access this type of Help	do the following
Step-by-step procedure or reference information	Select Help \rightarrow Help Topics and find the requested topic on the Contents tab or search for it from the Index or Find tabs (see " <i>Searching in Help</i> " below).
What's This? Help	In a dialog, do one of the following:
	• Click the ? in the upper right corner, then click the item you want information about.
	• Move the focus to the desired item by pressing TAB , then press F1 .

Searching in Help Most often you will search for a specific piece of information in Help. The easiest way to do this is by using the built-in search facilities:

Use the	when you are searching for
Index	Step-by-step procedures, reference or conceptual information or user interface details.
Search	Specific words or phrases that you cannot find in the Index.

The Help function also contains a **Contents** tab which provides a hierarchical view of the Help topics.

Help on Help If you are in doubt as to how to use the Help function, just press F1 to get Help.

Updated Help files New updated Help files will be available for download on our Web site on <u>www.igss.com</u>. To get the help files the easy way use the IGSS Update module. In each Help file you will find a Version Information topic in the **Reference Information** book on the **Contents** tab. That topic tells you when the Help file was created and which software version it describes.

Webhelp IGSS now offer its users to access entire online help documentation with just a few clicks.

You can find a **help file** for each IGSS module plus some additional **thematic help-files**. All help files are available on: <u>www.igss.com/support/help-and-manuals</u>.

IGSS also provides **training videos** which helps you to get started with a project and gives you a basic knowledge about the program. IGSS training videos are available at: <u>www.igss.com/training/scada-training-videos</u>.

For a fast guide to IGSS, you can also download the IGSS Quick Start Guide as a pdf on the Web site.

Chapter 1: Welcome to IGSS

Overview

About this chapter	This chapter gives you an introduction to the IGSS system.	
Contents	This chapter contains the following topics. What is IGSS? Overview of programs	.7 .8

What is IGSS?

Introduction	IGSS is a SCADA system used for monitoring and controlling industrial processes. Used in a wide range of industries, IGSS has sold more than 25,000 licenses since first coming on the market in 1984.	
IGSS reference list	IGSS is currently in operation in many different industries, including: Food and Beverage Oil and Gas Education Pharmaceutical & Health Energy Marine Traffic Wastewater Treatment Water Supply Please visit our website to view the full reference list and application notes about running IGSS	
Operating systems supported	IGSS V9.0 runs under Windows 7, Windows Vista and Windows XP.	
User types	 The system targets two types of users: system designers who construct a model of the industrial plant and operators who monitor and control the plant via PCs 	
Object-orientation	IGSS is a true object-oriented program. This results in several useful advantages for the system designer and the operator. Most importantly, a process component consisting of a number of I/O points is treated as one object in IGSS. This means that the system designer and the operator have the same perception of an object and that the properties of this object can be viewed and modified from one dialog box. Object types and templates are other object-oriented terms used in IGSS. Templates are especially useful to the system designer because he can define one template and then base any number of objects sharing identical properties on that template.	
Data exchange interfaces	Openness is a cornerstone in the IGSS architecture. 7-Technologies believe that our users want the freedom to use the newest technologies. Therefore IGSS supports a variety of standards and interfaces including ODBC, SQL, OPC, OLE, VBA/Automation and ActiveX. These interfaces allow you to exchange IGSS data with 3 rd party programs. If you are about to create a huge project, you may want to define the process components in an external database and then import the data into IGSS.	

Scalability is another key feature of IGSS. Based on true client/server architecture, you can easily expand the number of operator stations or the number of objects in your project. If you have a distributed plant, you can even connect remote operator stations, if required.

Sales versions	When you buy IGSS, you only purchase the number of objects, operator stations and communication drivers that you need. The system can be expanded at any time as your needs grow. Several redundancy solutions are also available to minimize system downtime. Please contact the IGSS Sales Department for further information.
Further details	For a more detailed overview of system features, search for "key features and benefits" in the Igssmaster.chm file.
What's new in this version	For an overview of the new features in this version, search for "what's new in this version?" in the Igssmaster.chm file.

Overview of modules

Introduction IGSS consists of a number of modules each with its own specific purpose. The following list of modules is divided into the two main user types: System designers and operators.

System designer
modulesSome modules are not part of the standard version. In that case, it is noted against the module name.
For further details about any of the modules, use its associated Help function.

Module name	Summary of use	Module type				
Master	Access all the IGSS modules and system tools. Change the system to Design mode or Runtime mode. Main module					
Waster		~				
	Build a model of the physical process being monitored and connect to the PLC addresses of the physical process components. Prepare					
Definition	process diagrams for the operators.					
	Specify global settings for the system and set up the appropriate communication drivers to enable communication with the PLCs.	Setup module				
System Configuration						
24	Schedule jobs for automatic execution at regular intervals or based on events.	Utility				
Job Scheduler						
Maintenance	Create maintenance jobs which define a maintenance interval for specific process components. When the interval is exceeded, the operator gets a maintenance reminder.	Utility				
20	Define user names and passwords, user groups and user privileges.					
User Administration						

Set up duty periods and calendars during which critical alarms will be sent to the mobile phones of the duty personnel. Specify commands which can be activated from operators mobile phones.	Utility
---	---------

Operator modules

Module name	Summary of use	Module type					
K Alarm	Easily view alarms either directly on process diagrams, in the Alarm List (active alarms) or the Alarm Log (historical alarms). Handle alarms based on recommended operator action and document irregularities using operator notes.	Main module					
Audit Trail	Record all actions done by system operators. For a quick look at the Audit Trail help file click <u>here</u> .	Utility					
Dashboard	Create your own customized overview of process data from multiple processes - all in one view. For more information click <u>here</u> .	Utility					
Maintenance	Get maintenance reminders in the maintenance or alarm list and perform the related maintenance jobs.	Utility					
Reports	 View or print reports. Two main types of reports are available: standard reports (daily, weekly etc.) custom reports (use MS Excel to create flexible report contents and layouts) 	Report module					
Supervise	Monitor and control the plant. Alarm handling is an integrated part of Supervise . Main module						

Overview	
About this chapter	 This chapter contains the following information: A presentation of the sample project we are going to build Step-by-step procedures for setting up and preconfiguring the project Step-by-step procedures for building the project and installing it Step-by-step procedures for refining the project with some of the more advanced features in the system
About the project	The sample project shows how you create objects of the different object types. The procedures describe the most basic and typical ways of defining these objects. If you are interested in more advanced ways of creating objects, refer to "Section D: Optional Design Procedures" in this chapter.
Contents	This chapter contains the following sections. Section A: The Sample Project Section B: Setting Up and Preconfiguring 14 Section C: Mandatory Design Procedures 29 Section D: Optional Design Procedures

Chapter 2: How to Create a Project

Section A: The Sample Project

Overview

About this section This section contains the following information:

	A detailed presentation of the project we are going to buildA project checklist which will help us ensure that all the necessary steps are performed
Contents	This section contains the following topics.
	The Project We Will Build12The Project Checklist13

The Project We Will Build

Introduction

In this chapter we will create a small IGSS project step by step. The project consists of a tank into which water is filled and let out. The project we aim to create looks like this:

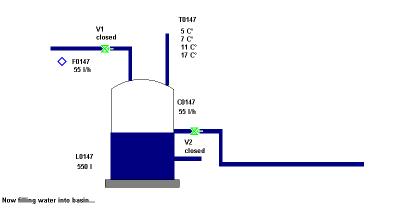


Figure 3.1 The sample project we are going to build.

Single-user system In order not to introduce too much complexity, the sample project is run on a single-user system. Once you are familiar with the basic project techniques, you can read more about setting up multi-user systems in the "Multi-User Systems" Help file in the "IGSS" program group.

The project components

The project consists of the following components (or objects in IGSS terminology):

Object name	IGSS type	Description
Overview	Diagram	The diagram showing the project. We will use the built-in area called Global .
F0147	Analog	Measures the hourly flow of the water intake.
L0147	Analog	Displays the water level in the tank.
C0147	Counter	Counts the number of liters let into the tank per hour.
T0147	Table	Monitors the temperatures at different levels in the tank.
V1	Digital	Controls the water intake.
V2	Digital	Controls the water outlet.
Fahren.toCel	Scaling	Converts temperature values from Celsius (°C) to Fahrenheit (°F).
Message	String	Describes the current state of the process. In this example, the text " Now filling water into basin " is shown.

The Project Checklist

Introduction

n Before we start setting up and building the project, let's take a look at the checklist which is divided into two phases: "Setting up and preconfiguring" and "Mandatory design procedures".

Setting up and preconfiguring

We will go through the following procedures:

Procedure	Mark when completed
Create the new project	
Define IGSS station type	
Set up the station parameters	
Set up the driver parameters	
Make background drawings	
Plan alarm texts	
Draw new symbols	

Building the project

We will go through the following procedures:

Procedure	Mark when completed
Define areas and diagrams (Overview)	
Define scaling objects (Fahren.toCel) and templates (Valve)	
Define digital objects (V1 and V2)	
Define analog objects (F0147 and L0147)	
Define table objects (T0147)	
Define counter objects (C0147)	
Define string objects (Message)	
Define alarm texts	
Define graph windows (G0147)	
Simulate process values	
Install the project and troubleshoot	
Define operator reports	

Recommended order

Note that the sequence of the project process given above is merely a recommended order and is by no means compulsory. You can always go back to the previous procedure and make any modification you like. Also, some of the procedures may or can be repeated several times - this particularly goes for "Install the project and troubleshoot", a procedure that you will typically repeat after each step in the "Building the project" phase.

Section B: Setting Up and Preconfiguring

Overview

About this section	This section takes you through the key properties in System Configuration . For information about the remaining functions and properties, refer to the System Configuration Help file.
About System Configuration	The System Configuration module is where you define the global settings for the IGSS system.
Contents	Create the New Project and Set It Active.15Define the IGSS Station Type.16Set Up Global Parameters17Set Up Data Collection Parameters18Set Up Alarm and Log Printers23Define the Driver Setup24Make Background Drawings25Plan Alarm Texts26Draw New Symbols27Checklist Review - Setting Up and Preconfiguring28

Create the New Project Using the New Project Wizard and Set It Active

Purpose		first thing you must do is to create a new project and give it a descriptive name. We will name our oject, Getting Started.
To create a new project	Step	Action
	1.	Start IGSS Master.
		Select Start \rightarrow Programs \rightarrow IGSS 9.0 \rightarrow IGSS.
	2.	Switch to Design Mode
		Click on the drop down menu (bird) and choose Design Mode .
	3.	Start the Project Wizard
		In IGSS Master select the Design and Setup tab. Then choose Project Wizard . The Project Wizard dialog appears.
		Project Wizard
		Welcome to the Project Wizard, which will guide you through the process of either creating a new IGSS project or modifying the active project. Click Next to continue. Click Cancel to exit.
		< Back Finish Cancel
	4.	Select Create a new IGSS project and click Next.
	5.	Choose a project name and select a project folder
	6.	Select a Single User (Standalone) station type
		There are three main station types: Single User, Server and Operator. When running as Single User, the project is only available on the station from which it is run, the station is both server and operator. When running as Server, the project is available for all defined operators. When running as Operator station the project can be downloaded from the server by any of the defined operators.
	7.	 Select the station name: IGSSStation1 and add the three following components: Driver: Siemens S7 TCP/IP Interface: IP Network Node: Node 0 For a more detailed description of the driver setup refer to the "Set up the Driver Parameters" in this section.
	8.	Click Finish, to end the Project Wizard.

Data folders IGSS uses two key data folders:

• one for the project data (**Project root folder**), for example, project file (*<MyConfig.elm*), project database (*<MyConfig* >.mdb), etc.

• one for the data files (**Report folder**), for example, base class files (.bcl), log files (.log), alarm files (.alm), etc.

For details about project folders and files, search for "*configurations; folders and files*" in the **Definition** Help file.

Define the IGSS Station Type

 Purpose
 If you haven't done this in the project wizard, you can manually add a new station in the System

 Configuration
 module To open this module, open IGSS Master and select Design and Setup → System

 Configuration.

Before you start using an IGSS station, you must specify the station type (single-user, operator or server) and assign a unique station name to it.

, in the tree view.

To define IGSS Perform the following steps: station type

3.

Step Action

- 1. Select Edit \rightarrow New Station, a new station is added.
- 2. Click the station icon, IGSSStation1

Click the Station tab.

Project name: Getting Started	Station	Configuration	Files	Access Control	Alam	Supervise & Lang.	age Startup	Applications	Data Collection	Reports
B Kössstation1			Statio	n 3. Station type		gle Usera k.a. Star	daluna			
			IGS	S station name a	100m		uaione			
			IGS	S station name:	IGS	SStation1			ID: 0	
				dress(es)						
				address:	4					
			Statis		87	2 1 Sub nod	ns: 0			
			Notes							
			10	Enter a sho	d descri	ption of this station i	needed			

Figure 3.2 On this tab you select the Station type and assign a unique name to it.

- 4. In the Station type group, select the appropriate station type. In this case, we select Single User a.k.a Standalone.
- 5. Type IgssStation1 in the IGSS Station name box.

When you choose a project in IGSS Master, it automatically becomes the active project. Selecting the active project

Set Up the Station Configuration Parameters

Purpose

We will now go through a further setup of the station. We will go through the following tabs:

- Configuration •
- Data Collection
- Alarm

- Access Control
- Supervise •

Review the project parameters to verify that they are set as described in this section

To set up
configuration
parameters

Perform the following steps:

IGSS - System Configuration D/Progra File Edit View Tools Help	mData\7t\igss32\V9.0\	Getting S	itarted\Getting 5	itarted					
Project name: Getting Started	Station Configuration	Files	Access Control	Nom	Supervise & Language	Startup A	pplications	Data Collection	Report
B ISSStation1 Siemens S7 TCP/IP protocol dre Siemens S7 TCP/IP protocol dre		Proje	ect oject file:	0	1999 - 1997 -				
Node 0		D	:\ProgramData\7t	Vgss32\	32/V9.0%Getting Started/Getting Started.elm				
			sport folder:						
			D\ProgramData\7tigss32(V3.0)Getting Started\Getting Started\R + Browse Note: You must use UNC path to server on operator stations.						
		Sea	Scan intervals (maec.)		Log changes (%)		Base intervals (min)		
		1	0000		1	1 2 2 5 5 10			
		5	000		2				
		1	0000		5				
		3	0000		10		30		
		Max	number of object		Historical values to BCL files (sec.)				
		Max	50015		Online: 100000	Offline: 0			

Figure 3.3 On this tab you specify the key data management settings.

2. Modify the settings as shown above.

For Help, press F1

Configuration parameters tab Even though you may change these parameters, remember that:

- the system has a default setting for each parameter so you do not have to make any changes and •
- each parameter may be changed at any time later in the configuration process BUT you should be aware, that alterations will affect the entire project as well as the data collection.

The following important global parameters can be modified on the **Configuration** tab:

Parameter	Description
Max. number of objects	Shows the number of objects allowed in your project. The figure is read from the license file, Options.txt.
Scan intervals	Type the four scan intervals that you want to be able to apply to the IGSS objects in the project. The four scan intervals will be shown on the Data Management Definitions tab and you will choose one of them for each IGSS object.

Parameter	Description
Base intervals	Type the four base intervals that you want to be able to apply to the IGSS objects in the project. The base interval determines how often the scanned values are reduced to a reduced value. The data reduction method is selected in the Data reduction group.
	The four base intervals will be shown on the Data Management Definitions tab and you will choose one of them for each IGSS object.
Log changes	Type the four percentages with which you want to filter value changes. Generally, IGSS logs values only when a value has changed since the previous scan, but you may define that a change must be greater than, for example, 5 % to be registered as a change from the Data Management Definitions tab when you define a process component.
	Use this setting to prevent unnecessary logging of minor, insignificant changes to the object values.

Set Up the Data Collection Parameters

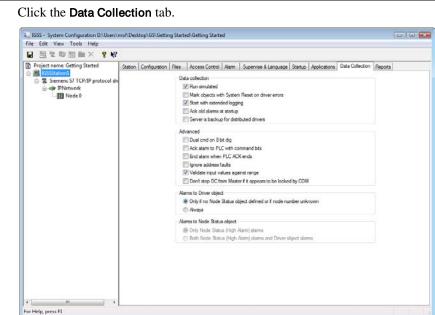
Purpose

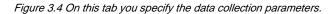
When you start an IGSS project, the data collection engine (DC) is started. DC handles many different tasks including updating of alarm, log and base class files, printing of alarm and log data. On this tab, you determine how you want DC to operate.

To set up data collection parameters

Step Action

1.





2. Modify the settings as shown above.

The most important data collection parameters are:

Parameter	Description
Start with extended logging	Check this box if you want to log all values from the PLC driver. This may be useful for troubleshooting purposes.
	<i>NOTE:</i> The values are saved in the $\langle MyConfig \rangle$.scn file in the report folder. By default, only alarm data packets are written to the file.

Run simulated	Check this box if you want to use simulated data contained in the
	<i><myconfig></myconfig></i> .sim file. See <i>"Simulate Process Values"</i> in this section.

To set up alarm parameters

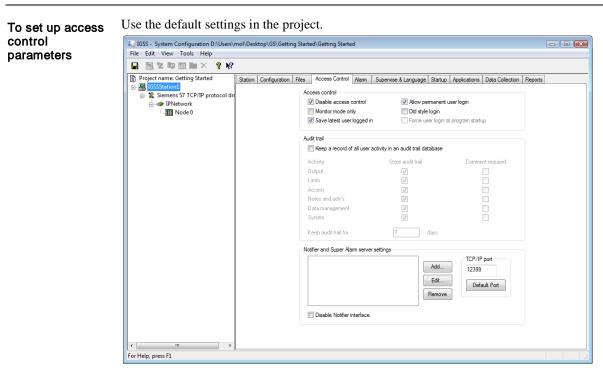
Use the default settings in the project.

👢 IGSS - System Configuration D:\Users\mol\Desktop\GS\Getting Started\Getting Started	- • 🗙
File Edit View Tools Help	
■ 29 考 巻 21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Image: Status Status Status Configuration Files Access Control Aam Supervise & Language Status Applications Data Collection Reports Image: Status Image: Status Image: Status Image: Status Image: Status Image: Status Aam Image: Status Image: Statu	
< <u> </u>	
For Help, press F1	

Alarm tab

On this tab you define the settings for the **Alarm** module, for the selected station. The most important alarm parameters are:

Parameter	Description
Full alarm count	Check this box if you want to count all alarms, this includes acknowledged alarms in the alarm count.
Use function keys to ack. alarms	<i>NOTE:</i> Check this box if you want to use function keys to acknowledge alarms. In the alarm list you simply press the function key corresponding to the number of the alarm to acknowledge it.
Lock icon position	Check this box if you want to lock the icon position. This is mainly intended for multiuser systems.
Lock window position	Check this box if you want to lock the window position. This is mainly intended for multiuser systems.



Access Control tab

On this tab you define the settings concerning access control. Access control is a security mechanism used to prevent unauthorized access to certain functions in the system. When a user is logged in, all activities such as sending of commands, acknowledging of alarms, etc. are registered with user name.

The most important access control parameters are:

Parameter	Description
Disable access control	Check this box if you want to disable access control.
Force user login at program startup	<i>NOTE:</i> Check this box if you want to force the user to login at program startup.

To set up Supervise & Language parameters Use the default settings in the project. If you select another language, you should be aware that this manual is based on the English language.

👢 IGSS - System Configuration D:\Users\	mol\Desktop\GS\Gettin	g Started\Ge	tting Started					- 0 🔀
File Edit View Tools Help								
🖬 🗟 % 🕸 🖩 🖿 🗙 💡 📢								
Project name: Getting Started	Station Configuration	Files Acc	ess Control Alar	Supervise & Lan	nguage Startup	Applications	Data Collection R	eports
IGSSStation1		Options				Ring buffer	size (KB)	
- IPNetwork		Allov	v diagram move			512	A. V	
Node 0			v diagram resize					
			v graph move and			Max open of	-	
		_	v editing of graph			5	~	
			w object descripti show command			Update del	21/	
			w full command m			100		
		C Enal	ole Inhibit alarms i	ienu				
		Shor	w active server n	me in title bar (classic	c only)	Note: Value not recomm	es below 50 are nended.	
				e in title bar (classic o	only)			
		📰 Full :	screen mode					
		Select lan	guage					
		Primary	ENG (ENGL	SH)	•			
		Secondar	y ENG (English)				
			Circi (Lingila)	/				
		Email opti	ons					
		JPEG C	ompression 30	2 = Highes				
		🔽 Enal	ole	255 = Low	vest quality			
<								
For Help, press F1								4

Supervise & Language tab

On this tab you define the settings for the **Supervise** module and choose language. The most important parameters are:

Parameter	Description
Allow diagram move	Check this box if you want the operator to be able to move the diagrams in Supervise .
Allow diagram resize	<i>NOTE:</i> Check this box if you want the operator to be able to resize the diagrams in Supervise .
Allow graph move and resize	Check this box if you want the operator to be able to move and resize graphs in Supervise .
Allow editing of graph	Check this box if you want the operator to be able to edit graphs in Supervise .
Select Language	Here you select which language you want to display in IGSS. Available languages are English, Danish, German, Czech, Spanish, French, Icelandic, Norwegian, Polish, Russian and Swedish.

Set Up the Alarm and Log Printers

Purpose

Before you can start printing alarm and log data from the system, you must set up the alarm and log printers. Note that you do not define a graphics printer as in the older versions of IGSS. When you print from **Definition** and **Supervise**, you simply select the Windows printers defined on the IGSS station.

Perform the following steps:

1. Click the **Reports** tab.

	Station	Configuration	Files	Access Con	trol Alarm	Supervise & La	anguage	Startup	Applications	Data Collection	Reports	10
Project name: Getting Started ■ The Node 0	H			Printer None Direct Windows Printer dings Line TS	Page S rechnologie 5532 Program Da	Data\7/ligss32\V9.0\GisDemo\Images\Icons\7flogr Browse				etup		
			Mai	Lart hour: 0 I delivery MTP server enders mail at	Ī	•) Excel		40		

Figure 3.5 On this tab you set up the alarm and log printers.

- 2. In the Alarm printer group, select the printer type (Direct or Windows).
- Click the Printer button and select the printer you want to use for alarm 3. printouts.
- 4. In the Log printer group, select the printer type (Direct or Windows).
- Click the Printer button and select the printer you want to use for log 5. printouts.
- In the Headings group, you can type the information you want to show on all 6. printouts from the system. This would typically be the plant name.
- 7. In Output engine, you choose the output format for the report as HTML or Excel.

Mail delivery allows you to send a report per mail. You must enter an SMTP server and mail address from which it will be sent.

To set up alarm and log printers	NOTE: If you are using the Direct option, only 1 line will be printed at a time, typically on a matrix printer. If you are using the Windows option, you will be using the Windows printer driver which will print one page at a time.TIP: Use the Page Setup button to specify paper size, paper orientation, margins, etc.
The remaining tabs	For our sample project, we will keep the default settings for the remaining tabs in System Configuration.

Set up the Driver Parameters

Purpose This is a more detailed description of defining the driver. Before we start defining the process components in **Definition**, we must set up the PLC driver(s) we want to use.

This example For our small project, we use the **Siemens S7 TCP/IP driver**. We define one node (PLC) to which all the process components are connected.

To define the driver

 Step
 Action

 1.
 Make sure that you are on the station level

 System Configuration



Select Edit \rightarrow New driver or click and double-click the Siemens S7 TCP/IP driver.

elect Communicati	on D	Driver	? 🗾
Select a cor	nmur	nication driver to be installed from the list below. Then click OK.	
Driver	ID	Description	
37TMODTCP	64	MODBUS/TCP driver	
37TTP5	65	Interface to TP 5-tone Radio	
37TDHFILE	66	DDHC Data File Driver	
🗐 7ТТСОММ	67	Techno Trade TComm serial protocol driver	
3711СОММТСР	68	Techno Trade TComm MODBUS/TCP driver	
🔜 7ТАСОМ	69	FLYGT AquaCom driver	
🗐 7TGESNP	70	GE Fanuc SNP Protocol driver	
🗏 7TUNI32ECOM	71	UNICONTROLS ECOM Driver	
🖳 7TS7TCP		Siemens S7 TCP/IP protocol driver	
🛃 7TUNI1	73	Driver 1 for UniControl	
🔜 7TUNI2	74	Driver 2 for UniControl	
🗐 7TCMLTCP	75	General Comli TCP protocol driver	
🗐 7TMODEXT	76	Modicon Modbus protocol driver with extended functions	
🔜 7TELCOM	77	ElCom90	
🔜 7TS7tSA	78	Siemens S7 TS adapter interface driver	-
🔜 7TMELSQ	79	Mitsubishi Melsec-Q Serial protocol driver	
🖳 7TFUJI	80	Fuji Electric Serial protocol driver	
🖳 7TMODGPRS	81	MODBUS/GPRS driver	-
			OK Cancel

Figure 3.6 Double-click the driver you want to include in the driver profile.

2. Make sure that you are on the driver level

Select Edit \rightarrow New Interface or click \blacksquare . An IP Network interface is automatically added in the tree view. NOTE: 3. Click the + sign beside IP Network and notice that IGSS has automatically added the first node (PLC). Select the node icon to view the node properties. As you can see, node number **0** is suggested and we will keep this setting.

IGSS - System Configuration d:\users\mi File Edit View Tools Help	ol\desktop\gs\g	etting started	getting started				
	Node Properties	identification	Advanced Connection Properties Connection Properties In rank and corn ISSS node number Processor type: IP address for PLC node (e.g. CPU alst number in PLC typics Communication timeout in mS. Protocol Properties: Incomes talgrams Incomes talgra	nunication timeou 172, 16, 18, 20) : ally 2 or 3) Advanced or retries F driver ge	ormedian properties a	v v n n n n n n n n n n n n n n n n n n	
For Help, press F1							

Figure 3.7 The tree view shows all the components of the driver profile. You can expand or collapse the view using the + and - signs.

Subnodes	If you need to communicate with PLCs that do not have a direct connection to an IGSS server or operator station, you can communicate with those PLCs (called subnodes in IGSS) through a manager node (gateway PLC). This may be the case if you have two separate networks in a plant, a LAN network and a dedicated PLC network. The gateway PLC would then be accessible through the LAN network and would handle all communication to the subnode(s) on the PLC network.
	For further details on subnodes, search for "subnodes" in the System Configuration Help file.
Special types of telegrams	In System Configuration , you can exchange different kinds of telegrams between IGSS and the PLCs (nodes). These telegrams include system events, time synchronization and keep alive telegrams. They are defined on the Advanced tab at the node level.
	For further details, search for "telegrams; using extended services" in the System Configuration Help file.

Make the Background Drawings

PurposeThe background drawing for the project of a process diagram holds all that is static in the process. The
dynamic process components are subsequently defined in Definition.
NOTE: You can also use a background color for your diagrams and build the process picture from scratch.Background color
or background
picture?In IGSS, you have two alternatives for the diagram background:
1: Background color
You choose a background color and draw the static elements of the diagram using the built-in IGSS
drawing tools found in the Drawing toolbar. This allows you to take individual graphics and resize and
position them freely on the diagram and to use shapes like lines, polygons, rectangles, etc.
To avoid scaling/resizing problems, it is recommended to use the built-in IGSS drawing functions.

2: Background picture

In order to use a background drawing in IGSS, it must be saved in one of the supported formats. To view the list of supported formats, open the **Diagram Properties** dialog box, select the **Picture** option, click

Browse and open the **Files of type** drop-down list. The supported file formats include the well-known formats used on the Internet (*.jpg and *.gif).

7T recommends using file formats generally supported by Microsoft Windows. For background pictures, it is recommended to use vector-based file formats to avoid resizing problems. For example, the Enhanced Metafiles (.emf) format is very well-suited for IGSS applications.

To create a background drawingpicture

Perform the following steps:

Step Action

- 1. Open the drawing program you have chosen to use
- **2.** Draw the background picture. Include all parts that are static in the process.
 - *TIP:* You do not need to include static text on the picture. This can be done directly in **Definition** where the text can be freely formatted.

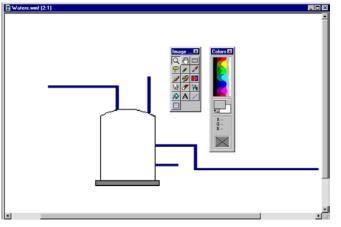


Figure 3.8 The background picture is made in an external drawing application.

3. Save or convert the picture to one of the supported formats considering the above recommendations about file formats.

Plan the Alarm Texts

Purpose We recommend that you plan and structure alarm texts, priorities and alarm colors at an early stage in the configuration process to obtain consistency. Planning decisions include determining the number of alarm priorities to be used, associating a color with each alarm priority, planning reuse of alarm texts (the same alarm text can be associated with as many objects as you like).

What is an alarm
text?An alarm text is a general description of an error situation, for example, "Motor overheated". Each alarm
text consists of the following properties:

Component	Description
Alarm No.	Identifies the alarm text with a unique alarm number. If you are creating a new alarm text, the next available number is automatically suggested, but you can change it, if required.
Priority	Type a priority from 255 (highest priority) to 1 (lowest priority). <i>TIP:</i> Carefully plan alarm priorities and their associated colors. To help the operator immediately understand the alarm priority, be consistent and use only a limited number of alarm priorities.

Alarm and acknowledge colors	 Specify the colors for alarm and acknowledged states and enable or disable blinking of object symbols on process diagrams. <i>TIP:</i> To help the operator easily distinguish between an object in alarm and an object where the alarm is acknowledged, check Blinking for the alarm color and uncheck it for the acknowledge color.
Alarm Text	Write a brief description of the alarm situation. This is the text that the operator will see in the Alarm List when the alarm occurs.
Sound	Specify whether you want to play a sound when this alarm occurs. The sound can be either a beep or a sound file (*.wav).
Event on alarm	 Specify the event(s) you want to trigger when this alarm occurs. The following events are available: To Notifier sends the alarm number via Notifier to mobile phones. Use this function to ensure that alarms are handled during periods where the operator stations are unmanned. Notifier is a separate sales module. To PLC sends an alarm change telegram to the selected PLC, provided that this telegram type is enabled in System Configuration. To Print prints the alarm text on the alarm printer. Auto Acknowledge automatically acknowledges the alarm when it occurs. Use this setting for intermittent alarms.
Instructions	Gives recommended operator action should this alarm situation arise. The operator can access the instructions from the process diagram and from the alarm list.
Сору	Select an existing alarm text in the drop-down list, and then click Copy to copy its properties to the current alarm text. The properties can then be freely changed.

Draw the New Symbols

Purpose IGSS comes with a large library of symbols (about 150). If these symbols are sufficient for your needs, you can skip this procedure. However, you can easily modify the existing symbols or draw new symbols.

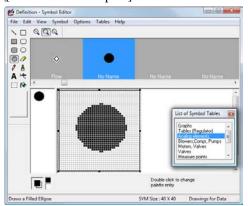
Symbol tables The above-mentioned library of symbols is contained in the symbol file, **Symbols.v20**. The file consists of a number of subtables, each containing symbols for a specific type of component, for example, valves. The names of the subtables of Symbols.v20 are the ones you see in lower part of the **Objects** menu and on the **Symbol Definition** tab when you define process components. You can change the names of the subtables in Symbol Editor.

To draw new symbols

Perform	the	followin	g	steps:

Step	Action
1.	In Definition go to Edit → Symbols

2. Open the Symbols.v20 file located in the [Installation path]\Gssdemo\Eng folder. In Windows Vista the folder Gssdemo\ is located in C:\ProgramData\[IGSS installation path]



- **3.** In the **List of Symbol Tables**, click the subtable to which you want to append a new symbol.
- **4.** Use the scroll bar to find an empty symbol position marked **No Name** and select it.
- 5. *REFERENCE:* Draw the new symbol.
- 6. Click to save the Symbols.v20 file. *RESULT:* You can now select the new symbol, when you define a new process component in Definition.

Checklist Review - Setting Up and Preconfiguring

Review

The Setting Up and Preconfiguring phase is now completed. To sum up, we have now done the following:

Procedure	Mark when completed
Created the new project	\checkmark
Define IGSS station type	√
Set up the station parameters	√
Set up the driver parameters	\checkmark
Made background drawings	√
Planed alarm texts	√
Draw new symbols	\checkmark

Section C: Mandatory Design Procedures

Overview

About this section	 This section contains the following information: A short introduction to the Definition module Step-by-step procedures for creating the sample project
Contents	This section contains the following topics:
	Checklist Review - Mandatory Design Procedures
	The Definition Program
	Define Measurement Units
	Define Areas and Diagrams
	Define Alarm Texts
	Define Digital Templates
	Define Digital Objects
	Define Analog Objects
	Define Table Objects
	Define Counter Objects
	Define String Objects
	Define Graph Windows
	Install the Project
	Define Operator Reports

Checklist Review - Mandatory Design Procedures

What we need to do to complete the project: do
Procedure
Mark when completed

Procedure	Mark when completed
Define areas and diagrams (Overview)	
Define scaling objects (Fahren.toCel) and templates (VALVE)	
Define digital objects (V1 and V2)	
Define analog objects (F0147 and L0147)	
Define table objects (T0147)	
Define counter objects (C0147)	
Define string objects (Message)	
Define alarm texts	
Define graph windows (G0147)	
Simulate process values	
Install the project and troubleshoot	
Define operator reports	

The Definition Module

Introduction

tion Most of the remaining procedures in this section are performed in **Definition**. This topic tells you how to access **Definition** and gives a brief introduction to the menus.

To start

Menus in Definition $Click \text{ Start} \rightarrow \text{Programs} \rightarrow \text{IGSS 9.0} \rightarrow \text{IGSS Master} \rightarrow \text{Switch to Design Mode} \rightarrow \text{Definition}$

The table below summarizes the pull-down menus in **Definition**:

This menu	allows you to
File	check and install projects, import/export Groups revert to the previous version and print diagrams or screen pictures.
	<i>NOTE:</i> It is recommended that you save your work regularly using the Save command (the keyboard shortcut is $CTRL + S$).
Edit	cut, copy, paste and delete objects or just their references on a diagram, select and find objects, edit alarm texts, manage Groups, create measurement units and report formats.
	<i>TIP:</i> You can also view the properties of an IGSS object by right- clicking the object and selecting Properties in the popup menu.
View	show or hide the toolbars and the status bar, change the date/time display, and show all states of digital objects.
Format	format text, set colors, set up multiple screens, set grid size and enable snap to grid, set initial display for each area, align objects and stack objects on the diagram.
Area	create and delete areas, edit area properties and select any of the existing areas in the current project provided that the Name to Menu option is selected for each area.
Diagram	create and delete diagrams, edit diagram properties and select any of the existing diagrams within the current area provided that the Name to Menu option is selected for each diagram.

This menu	allows you to	
Graph	create and delete graphs and select any of the existing graphs within the current area provided that the Name to Menu option is selected for each graph.	
Template	edit, create and delete templates.	
Objects	define any type of object. The first section of the menu allows you to create, edit and delete objects. The second section allows you to choose between the standard display types and descriptors. The third section allows you to choose between the symbol tables in the current symbol file. <i>NOTE:</i> This menu is only available when a diagram is open.	
User Programs	add links to external programs to be shown either in the Definition or the Supervise module.	
Tools	configure the menus and toolbars of Definition and Supervise , delete all objects or delete all objects except templates and create VBA macros or open the Visual Basic Editor.	
Views	create different views for different scenarios. It allows to show/hide selected object values/states that might be useful to a view exclusively	
Window	close the current window and select any of the currently open diagram or graph windows.	
Help	open the Definition Help file and view the version number.	

For details about the individual menu items, search for "menus" in the **Definition** Help file.

- **Right-click menus**Apart from the pull-down menus, a number of right-click menus (or context menus) are available.For further details, search for "*right-click menus*" in the **Definition** Help file.
 - ToolbarsTo provide easy access to the most frequently used commands, a number of toolbars are available. Some of
them are predefined; others can be customized by you.For further details, search for "toolbars" in the Definition Help file.

Define Measurement Units

PurposeSome of the process components have a measurement unit. We will now define all the units we need for the
project and these units are then selected as part of the object definition procedure.

Units in IGSS To ensure consistency in the use of measurement units, IGSS features a number of unit-related functions. You start by creating a units set into which the individual base units are put. By default, a set of units called SI is included. You can define your own sets of units, if required. If you convert a project from an older version, the units are imported into the SI units set. For further details about units sets and unit conversion, search for "units" in the Definition Help file.

Units in the project

For the sample project we need the following measurement units:

Object name	Unit
F0147	1/h
L0147	1
C0147	1/h
T0147	°C

You can write the ° sign by typing ALT+0176.

То	define
me	asurement
uni	its

We need three different measurement units which are defined as follows:

Step

Step	Action
1.	Select Edit \rightarrow Measurement Units. The Base Units dialog box appears.

- 2. Click New to add a new base unit.
 - In the **Unit text** field, type 1 for litre. •
 - Click **OK** to save and return to the **Base Units** dialog box. ٠

Edit Base Unit		? <mark>×</mark>
Unit text	1	
Member of units set	5	-
	OK	Cancel

Figure 3.9 In this dialog box you define new base units. If you have several units sets, you select the relevant one in the drop-down list.

3. Repeat step 2 for the 1/h and °C base units.

Base unit	Units set	
°C	SI	New
1	SI	
l/h	SI	Edit
		Delete

Figure 3.10 The three base units are now created and can be chosen when we later create the process components.

TIP: You can write the $^{\circ}$ sign by typing ALT+0176.

4. Click Close.

Define Areas and Diagrams

Purpose Before we start defining the process components, we need an area and the process diagram on which we want to show the process.

> For details about areas and diagrams, refer to "The Area Object Type" and "The Diagram Object Type" in Chapter 2.

To define the area For our small process we only need one area. We will use the built-in area called Global. (Global)

rview)	Step		Action	1	
	1.	Select Diagram \rightarrow Cr	eate. The Diagram P	r operties dial	og box ap
		New Diagram	n Properties		? 🔀
		Definition of	New Diagram Function Key Assignment]	
		Name	Overview	Diagram Type	
		Descripti		Standard diagram	
		Window	Properties	 Reusable diagram Control group: 	
		Cap		Replicate gr	oup
		•	Name 🔘 Description	Background	
		🔽 Tit	e bar 🔽 Name to menu		
			stem menu 📃 Keep window		
		I Mi			
		V Ma			
			ep aspect ratio		
		- Plac	ement in Pixels	Background Pr	
		Left	0 Top 0		Browse
		Wid	h 1276 Height 676	Color	Browse
			Default Size	Connect to : (Unus	ed) 🔻
				Protection : (Unus	ed) 🔻
		Define	îews		
			· · · · · · · · · · · · · · · · · · ·	Controlling Object	
		Cre	te Edit Delete]	
		User de	ined entries for command menu		1
			e ()) to delimit multiple menu entries nicolon (:) to delimit multiple commands		
			xx] to display xxx in the command menu oth	nerwise text up till first space	e is used
		In para	neter list \$0 will be substituted with object r	name and \$A with area	

Figure 3.11 In this dialog box you define the properties of the **Overview** diagram.

OK Annuler

Aide

- 2. In the Name field, type Overview and leave the Description field blank.
- 3. Check the Name to Menu option to allow operators to open it from the Diagram menu during supervision.
- 4. Leave the **Keep Window** option unchecked.

NOTE: During supervision four diagrams may be open simultaneously. When diagram number five is opened, the system automatically closes the first one. However, if you check the **Keep Window** option, the diagram is never closed automatically. In this case we only have one diagram, so there is no need to use the option.

5. Define which window elements you want to show on the diagram, for example, **Status Bar** (the information line at the bottom of the diagram).

Step 6.

Action

In the **Background** group, select **Picture** and click **Browse** to find the picture which is located in the [Install Path]**Samples** folder. The **Open a Background Picture** dialog box appears.



Figure 3.12 In this dialog box you choose the background picture for the diagram.

- 7. Double-click the image you want to have as background.
- 8. Click OK.

RESULT: The new **Overview** diagram appears. Here is an example of a diagram with a background:

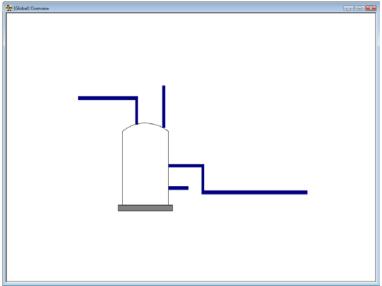


Figure 3.13 The Overview diagram is ready.

Define Alarm Texts

IntroductionBefore we start defining the individual components, we will create the alarm texts to be used in the project.
We recommend that you plan the alarm texts at an early stage to ensure consistent use of alarm priorities
and colors. Careful planning will also maximize the reuse of alarm texts.

How the operator views alarms One of the things that happen when a component enters a state of alarm during supervision is that a text describing the alarm situation is shown in the Alarm List. The alarm texts in the Alarm List are displayed in

different colors depending on how critical the alarm situation is. In the figure below the column **Alarm Text** shows the user-defined alarm texts, below the alarm list the event list is placed.

Active Alarms										0	
	istomize Actions Help										
Active Alarms Alarm Log	5 × A ■ ¹ 2 ₂	Date Start Time	Acknowledge	Acknowledge	End date 7/24/2009	End Time 100519	Value 75	Worst Value	Priority 5	Alarm Text Level loo high	
- Active Events Event Log	 S.No., Start Date Start Time 	e Event			Info 1	Info J	1	Info 3	Info 4		
or Help, press F1										N	UM

Figure 3.14 The Alarm List provides the operator with an overview of all active alarms and gives access to historical alarms in the Alarm Log. The event list shows all the defined events.

Alarm texts for this project

For our project we need the following alarm texts:

For these components	we need alarm texts if
Valves	they are defective.
Flow	the flow is too high, much too high, too low or much too low, that is, we need four alarm texts.
Level	the level is too high or too low.

Alarm text properties

properties

We need to create the following alarm texts:

TIP: We recommend that you associate each alarm priority with one color. A consistent use of colors will ensure that the operator immediately recognizes the importance of an alarm.

Alarm no.	Priority	Alarm color	Alarm text	Instructions
101	5	Light red	Valve defective	
102	6	Red	Flow exceeds high alarm	
103	5	Light red	Flow exceeds high limit	
104	5	Light red	Flow below low limit	
105	6	Red	Flow below low alarm	
106	5	Light red	Level too high	The level in the basin is too high. Open safety valve
107	5	Light red	Level too low	The level in the basin is too low. Pour faster

NOTE: Fill in the remaining properties as you like. It is recommended to enable **Blinking** for alarm color and disable it for acknowledgement color. In that case, the component in alarm will blink on the process diagram and will stop blinking when the operator acknowledges the alarm.

Two ways of defining alarm texts

In IGSS you can create and edit alarm texts as follows:

• from the Alarm Details dialog box accessed from the Edit → Alarm Texts menu

• from the Edit Alarm Description dialog box accessed from the Edit Mapping tab of the object properties dialog box

To define alarm
textsThe following procedure describes how you define all the above alarm texts from the Alarm Details dialog
box. The alternative is to create the alarm texts as part of the object definition procedure.

Step Action

1. Select Edit \rightarrow Alarm Texts. The Alarm Details dialog box appears.

Alarm Details	? 🔀
Alarm Texts 50: D C received bad packet 51: The output buffer is full 80: Cornection to AB-server lot 81: A and B server configurations out of sync 83: Error on printer. 93: Alarm inhibit (al.alarms) 93: Viripager Inhibit 94: Disk usage above first mark 95: Disk usage above second mark. 95: Disk usage above second mark. 96: Event 97: Viripager communication error 98: Event 99: Undefined alarm received 100: Last predefined alarm received	New Edit Delete

Figure 3.15 From the Alarm Details dialog box you can create, edit and delete alarm texts for the current project.

2. Click New to add the first alarm text. The Edit Alarm Description dialog box appears.

Edit Alarm D	escription		? 💌
Alarm no.	101	Use as	
Alarm text			
		Alarm color Change	🖉 Blink
Priority	5	Acknowledge color Change	📝 Blink
Sound No so			To Notifier
Beep		Test Sound	To PLC
	vav file	Browse	🔲 To Print
Repe	at sound		🔄 Auto Acknowledge
Instructions			
			*
*			+ Help
Copy from			OK
		- Сору	Cancel

Figure 3.16 In this dialog box you create new alarm texts or edit existing ones.

3. Specify the alarm properties from the table above and fill in the remaining properties, as you like.

Edit Alarm Des	cription		? 💌
Alarm no.	101	Use as	
Alarm text	Valve defectiv	e	
		Alarm color Change	📝 Blink
Priority	5	Acknowledge color Change	Blink
Sound Nosound Beep Use wav Repeat s	file	Test Sound Browse	To Notifier To PLC To Print Auto Acknowledge
Instructions			
< Copy from		• Copy	Help OK Cancel

Figure 3.17 The first alarm text is ready for use..

4. Click **OK** to save the alarm text and return to the **Alarm Details** dialog box.

- 5. Repeat steps 2 to 4 for the remaining alarm texts. *RESULT:* The alarm texts are now ready for use. We will merely have to associate them with the relevant alarm atoms when we later define the process components.
- 6. Click **Close** to close the **Alarm Details** dialog box.

For further details, search for "alarm texts" in the Definition Help file.

Define Digital Templates

Purpose In the project we have two valves. Instead of defining them one by one we will define a valve template to ensure that both valves share the same properties.

 To define the digital template (VALVE)
 Perform the following steps:

 Step
 Action

 1.
 Select Template \rightarrow Create. The Create Template dialog box appears. Select Digital and type VALVE in the Name field and 2-state valve in

the **Description** field.

Create Temp	late	? X
Area Type © Table © Analo	0	OK Cancel
Name Description	Valve 2-state valve	
Copy From	(Unused)	•

Figure 3.18 In this dialog box you select the template type and type a unique template name and an optional description.

 Click OK. The digital template properties dialog box appears. On the Bit Map I/O tab, define a state bit in the To PC field and a command bit in the From PC field. See the LEGEND for an explanation of the symbols used.

Valve @ Global	- 2-state va	lve			? ×
Data Manag	ement Definit	ions E	dit Mapping	Calculation	Symbol Definition
Bit Map I/O	Alarm	n/Ack Bit	Command/S	State Config	States and Commands
Name:	Valve		Descrip	tion 2-state val	ve
To PC: State:	76543210	76543210	76543210	76543210	Single Bits
Logic:	11111111	11111111	11111111	11111111	States
From PC: Command:	76543210	76543210	76543210	76543210	Displays
Logic:	11111111	1111111	1111111	1111111	
		: Ur 1 : Or	ate or Command assigned bit ne bit Logic Actir ro bit Logic Acti	ve	
				ОК	Cancel Help

Figure 3.19 On the **Bit Map I/O** tab you define the individual bits sent to and from IGSS

3. Click the Alarm In/Ack bit tab and define an alarm indication bit To PC (bit 0) and alarm acknowledgement bits (bit 1 to PC and bit 0 from PC).

Bit Map I/O Alam In/Ack Bit Command/State Config States and Command Name: Valve Description 2ctate valve To PC: 76543210 76543210 76543210 76543210 Logic: 11111111 1111111 1111111 1111111 From PC: 76543210 76543210 76543210 76543210 From PC: 76543210 76543210 76543210 76543210 Gigic: 1111111 1111111 1111111 1111111 ELEGEND: : Amm indication bt : Collard transminibit bit O: Cillent exceeded bit : 1: O'c Lindt exceeded bit : 2ero bit Logic	Data Manag	ement Definiti	ons Ed	dit Mapping	Calculation	Symbol Definition
To PC: 76543210 <	Bit Map I/O	Alarm Ir	n/Ack Bit	Command/S	itate Config	States and Command
To PC: Logic : IIIIIII IIIIII IIIIII IIIIII IIIIII IIII	Name:	Valve		Description	2-state valve	
From PC: Ack Logic : IIIIIIII IIIIIIIIIIIIIIIIIIIIIIIIII					*+	-
 : Alarm acknowledge bit : Alarm inclusion bit I: Alarm inclusibit bit 0 : Limit exceeded bit 1 : One bit Logic 	Ack				*	Individual
			1 : 0 : L 1 :	Alarm inhibit bit .imit exceeded One bit Logic		

Figure 3.20 On this tab you define the alarm indication and acknowledgement bits.

- 4. Click on the **States and Commands** tab. Do the following:
 - Select the default states < 0 and type **closed** in the box.
 - Repeat for state < 1 but type open.
 - Select the default command 0 > and type close in the box and click Add command.
 - Repeat for command **1** > but type **open**.

Data Managem	ent Definitions	Edit Mapping	Calculation	Symbol Definitio
Bit Map I/O	Alarm In/Ack Bit	Command/S	State Config	States and Comman
State				
closed	Add	State	•	-
open				
	Del	ete		
Command				-
open	Add Co	mmand		
			ОК	Cancel Help

Figure 3.21 On the **States and Commands** tab you define the names of the individual states and commands.

Step Action 5. Click the Command/State Config tab and do the following: • In the States list, select Closed • In the Commands list, clear the close check box. • In the Default Command drop-down list, select open. Repeat for the open state, but choose close as the default command. Image: Command State Constrained State Closed in the Default Command drop-down list, select open. Repeat for the open state, but choose close as the default command.

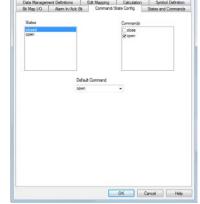


Figure 3.22 On this tab you specify the valid and default commands for each state.

6. Click the Data Management Definitions tab and set the Scan interval, Base interval and Data reduction to the settings shown in Figure 3.23.

Bit Map I/O	Alam In/A		Comm	and/Stat	e Con	fig	States and	Commands
Data Managem	nent Definitions	E	dit Mappir	ng	Calc	ulation	Symb	ol Definition
Scan interval			n rt	ogging				
2000	100	00) All char	-		> 1 %	
) All valu	es		> 2 %	
◎ 5000	0 300	DO	() None			>5%	
None	In millise						> 10 %	
- None				_) comman Database	as	
Base interval		Data redu	ution .	_ cog to			to history	
base interval							ced value	
0 2	10	Minimu				0	l total value	
© 5	30	Maximu Sum	ım			0	red total value	
0 5	0 30	☐Sum ☐Actual				 None 		lue
None	In mins.	Change	е			For each		
		Differer	nce				n data n method	
Log to printe	er A	Narm delay	0 🗐		sec.			
Protection	Safe comm	ands	Scal	e as	,	Conne	ct to	
(Unused)	 (None) 		•			(Unuse	ed)	-
User defined e	entries for comm	and menu						_
Use pipe ()) to	delimit multiple	menu enti	ies					
	n (;) to delimit m							
	display xxx in th							ed
in parameter li	ist \$0 will be su	ostituted v	with object	t name a	nd \$/	with area	1	

Figure 3.23 On the **Data Management Definitions** tab you define the data collection properties.

Step	Action
7.	Click the Edit Mapping tab.
	<i>NOTE:</i> The more information you can type into a template, the less work you will have when using the template to define objects. So we can type all address information which will be common to the valves.
	VALVE - 2-state valve Bit Map I/O Alarm In/Ack Bit Command/State Config States and Commands Data Management Definitions Edit Mapping Calculation Symbol Definition

Command State Free Value Alamn-In Driver : Node :	71 0 ress for Co	ion Sym ct: VALVE S7TCP (IGSSS ommand atom: DB (Data Bloc	•
State Drver : State Node : Atom N PLC Add Data Site Dota Site	71 0 ress for Co	STTCP (IGSSS	•
State Drive . Free Value Node : Alami-To PLC Add Data Are Data Are VD mode : out	0 ress for Co	ommand atom:	•
Fire Value Node : Alam-To PLC Add Data Are Data Are L/D mode : out	ress for Ci		•
International Content of the second of	a		
I/O mode : out	-	DB (Data Bloc	
I/O mode : out 💌	ok Numb		:k) 🔻
	on reamb	er 2.	2 😫
	g	Word (16-bit)	•
Alarm Details Offset	ſ	0 🖨	Bit 0 🚔
Simatic	Mnenonic	; 1	DB22.DBW0
Bit Offse	t	0	-
New Edit Delete External	type	FP16S	-
Use nume	eric +/-to	scroll to next/p	revious atom

Figure 3.24 On the **Edit Mapping** tab you define the parts of the PLC address which are common to the objects you will base on this template.

- **8.** Type the following information:
 - Select Command or State in the Atom box.
 - In the I/O mode field, select out for command and in for state.
 - Select Alarm-In and in the Alarm Details field, select alarm number 101 as described in "Define Alarm Texts" in Chapter 3.
 - In the **Driver** field, select the appropriate driver, **7TS7TCP** (lgssStation1).
 - In the **Node** field, type 0 (the node number we defined in **System Configuration**).
 - In the Data Block Number field, type 22 for command and 23 for state.

NOTE: To make the communication as efficient as possible, we will use one block for commands and another one for states. That way the driver will not scan any unnecessary data (i.e. commands) that will merely be discarded when collecting changes of state.

- Leave the Offset field unchanged.
- Leave the Bit Offset field open, as each object will have its own specific address.
- In the External Type drop-down list, select the FP16S data type.

Step	Action
9.	Click the Symbol Definition tab. Do the following:
	• Check the Copy symbols to template box to save the color and symbol selections that you are about to make as a part of the template.
	• In the Digital state for symbol field, select Closed.
	• In the Symbol color drop-down list, select a yellow color to represent the state.
	 In the Choose symbol group, select the symbol that you want to represent the state.
	Bit Map I/O Alarm In/Ack Bit Command/State Config States and Commands Data Management Definition Edit Mapping Calculation Symbol Definition Symbol propertie Template Inhertance Copy Symbol Strem Template Copy Symbol Strem Template Marce symbol color Image symbol color and background Template for symbol Copy Symbol Strem Template Symbol deplay Image symbol color and background Copy Symbol Stote template Copy Symbol Stote template Symbol deplay Image symbol color and background Copy Symbol Stote template Diptal attack for symbol Alternate symbol color and background Alternate symbol color and background Image symbol Image symbol Background for neutral symbol Imagesent Imagesent Imagesent
	Choose symbol Symbol table Valve

Figure 3.25 On the **Symbol Definition** tab, you select the colors and the symbols for the various states.

- **10.** Repeat step 9 for the **Open** state, but select a green color instead.
- **11.** Click **OK**, and the digital template is complete.

Define Digital Objects

Purpose

At this point we have a diagram without any objects, a scaling object and a digital template - in other words we have all the basic building blocks for our project.

We will begin by defining the two valves, V1 and V2, which use the digital template, VALVE.

To define the two *TIP*: The only properties we need to define for the two valves are their specific PLC addresses and their valves (V1 and V2) symbols.

Perform the following steps:

Step Action

1.

Select Objects → Valves. The Object Browser dialog box appears.

2. Click the + sign beside Global, then Digital and select VALVE in the Tree view and type V1 in the Name field. Click Create.

🖃 🎒 getting started.mdb	Object	Area	Туре	
🖶 🝙 Global	Driver Protect	Global Global	Digital Digital	
< m → 1 Tree node filter settings Criteria Wild ca Area ▼ Type (all possible) ▼	rd text criteria	List filter setting Show redu Show only	ctions std. types	ard text criteria
Template (Unused)		Open by name Go to diagr Show prop		Open / Select
Create new object Area Template Type		Name Description Vame Value	V1 Description Moving symbol	ol Create
		📝 Value	Moving symbol	ol Create

Figure 3.26 In this dialog box, you select the appropriate template and type the unique name of the new object.

3. On the Edit Mapping tab, type the precise PLC addresses. We will use the same word offset for state and command - this will help us create consistent in the PLC programming. Vi@Global Vi@Global Plc Node for object: VI Data Management Definitions Plc Node for colocit: VI Plc Address for Command atom: Data Block Number Plc Address for Command atom: Data Block Number Plate Block Number Data Block Number Data Block Number Data Block Number Data Block Number Diffet Bit Diffet Diffet Bit Diffet Diffet Bit Diffet	same word offset for state and command - this will help us create consistency in the PLC programming.	Step	Action	
New Edit Delete External type FP16S	Use numero +/- to scrol to next/previous atom		On the Edit Mapping tab, type the precise PLC addresses. We will use the same word offset for state and command - this will help us create consistent in the PLC programming.	зy

Figure 3.27 On the **Edit Mapping** tab you type the precise PLC address and the alarm numbers.

- 4. Click on the **Symbol Definition** tab. Do the following:
 - Click the **Copy Symbols from Template button** to use the color and symbol selections you defined as part of the template.

TIP: If you want to turn the symbol by, for example, 90° to represent the state **open**, simply select that percentage in the **Symbol Angle** drop-down list.

V1						? <mark>×</mark>
Change State	Bit Map I/O	Alam In/Ack	Bit	Com	mand/State Confi	g Lavers
Data Management Defini		Edit Mapping	Calcul		Report Format	Symbol Definition
Symbol properties			Tem	plate inf	heritance	
Rotate symbol	0 degree	•		Cody Svi	mbols from Templ	ate
Mirror symbol						
Make symbol scalable				Copy s	ymbols to templat	e
Choose symbol color			Digit	al state	for symbol	
Symbol display			clos			
 No blink Alternate symb 	ol color and bac	karound	ope	n		
	ol color and sec					
Rapid flash						
Secondary color		-				
Background for neu	ıtral symbol					
☑ Transparent		-				
Choose symbol						
· · _	ves	-]	[Edit Symbol	
	X- 👂	💐 🖂		X	X	
	alve Va	alve Valve		Valve	• Value	
•						4
				ОК	Cancel	Help

Figure 3.28 On the **Symbol Definition** tab, you select colors and symbols or you use the selections from the template.

5. Click OK. The two state symbols appear on the diagram. By default, they are placed on top of each other, but you may move them individually, if required (select View → Show All States).

Position the symbol, then the name and the state.

6.	Repeat steps 1 - 4 for V2, but use a Offset of 1 for both state and command.
	<i>NOTE:</i> As both V1 and V2 use only one state bit, we could have used 0.1 as the bit offset for state. However, in our example it is not necessary to pack the states (it is only a very small project). Also, it is pleasantly symmetrical to use the same bit offset for state and command.
	Note that command bits cannot be packed. The system always writes (at least) one word (16 bits) at a time.

- 7. Click on the **Symbol Definition** tab and click **Copy Symbols from Template** to select the same colors and symbols as for V1.
- **8.** Position the symbol, name and state for V2.

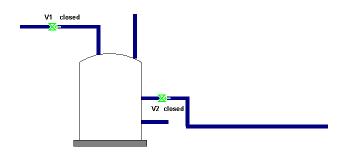


Figure 3.29 The **Overview** diagram with the two valves in position.

Define Analog Objects

Purpose

In our project we need two analog objects:

- the flow meter measuring the flow into the tank, F0147
- the water level in the tank, L0147

To define the flow Perform the following steps: meter (F0147)

_	Step	Action
	1.	Select Objects \rightarrow Analog Elements. The Object Browser appears.

Step	Action						
2.	F0147 and	sign beside the G in the Descriptic	on field, t	ype Flo			
		etteonfig	Object System	Area Global	Type Analog		
		Tree node filter settings Criteria Will (Area • Type (all possible) • (Template • (Unused) •	d card text criteria	List filter settin Show red Show only Show only Open by name Go to diag Show prop	uctions y std. types y referenced ram	Wild card text oriteria Print List Open / Sele	
		Create new object Area Global Template Type Analog Always on top V Advant	ced	Name Description Vane Value	F0147	ription ng symbol Create	

Figure 3.30 In the Definition of Object dialog box you type the unique name of the object and an optional description.

- 3. Click Create. The analog object properties dialog box appears. Do the following:
 - Adjust all the values as shown in Figure 3.31 using the keyboard or by moving the appropriate horizontal line in the bar to the desired value. The flow meter measures in the range 0 - 100 liters an hour (l/h).
 - In the **Units** box, select the measuring unit 1/h. •
 - Check the four limit and alarm boxes, High Alarm, High Limit, Low Limit • and Low Alarm.

NOTE: The Actual Value is, of course, updated as soon as the data collection starts.

Calculation Analog Layers			Report Format			bol Definition
Analog		rers	Data Manage	ement Definitions	Display	Edit Mapping
	Name	F0147				
l	Description	How int	o tank T0147			
Max.	100		Decimal Point	0	7654321.	
	80		Units	l/h	•	
	60		🔽 High Alarm		90	
	00		🔽 High Limit		80	
	40		Actual Value		80	
	20		SetPoint		50	
	20		Low Limit		20	
Min.	0		Low Alam		10	
	From 7/	0000/ 1/2/	10:27:43 AM:12	n		
	1011 77	24/2003	10.27.45700.12	5		

Figure 3.31 On the Analog tab you specify the measuring range, the measuring unit and the alarm limits.

4. Click the **Data Management Definitions** tab and make the selections shown in Figure 3.32.

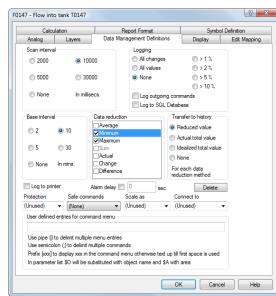


Figure 3.32 On the **Data Management Definitions** tab you define the data collection properties.

- 5. Click the **Edit Mapping** tab and do the following:
 - In the Configure atom box, select Actual Value.
 - In the **Data Block Number** field, type 20. We choose a different data block for our analog measurements than for the digital ones.
 - In the Atom box, select Set Point, and set the data block number to 18.

NOTE: The other five values are local to the PC and thus have no PLC address.

- In the Atom box, select High Alarm and select the associated alarm text (number 102) as described in "*Define Alarm Texts*" in Chapter 3.
- Repeat for High Limit (alarm no. 103), Low Limit (alarm no. 104) and Low Alarm (alarm no. 105).

Calculation	Report Format	Symbol Definition
Analog Layers	Data Management Definitions	Display Edit Mapping
Analog Layers Atom Image: Analog Layers Atom Image: Analog Layers Image	PLC Node for obj Driver : Z Node : 0 PLC Address for / Data Area Data Block Numl Adressing Offset Simatic Mnenoni Bit Offset External type	ect: a1 TTSTTCP (IGSSStation1) • Actual Value atom: DB (Data Block) • ber 20 * Word (16-bit) • 0 * Bit 0 *

Figure 3.33 On the **Edit Mapping** tab you type the specific PLC address and attach the appropriate alarm texts.

6. Click the **Symbol Definition** tab and select a color and a symbol.

_	Step	Action
	7.	Click OK . The symbol appears on the diagram. Position the symbol, then the name and the value. See Figure 3.39.

Perform th	ne following steps:
Step	Action
1.	Select Objects \rightarrow Bar Display. The Object Browser dialog box appears.
2.	Click the + sign beside Global and select Analog and type L0147 in the
	Name field, then type Water level in tank T0147 in the
	Description field.
	Step 1.

	tconfig Global I Analog I Table	Object F0147 System	Area Global Global	Type Analog Analog	
			List filter setti		
Tree node Criteria Area Tupe (all p	- W	/ild card text criteria	Show red		ld card text criteria Print List
Criteria	v ossible)	/ild card text criteria	Show red	ductions ly std. types ly referenced	•
Criteria Area Type (all p	- W	/ild card text criteria	Show red Show on Show on	ductions ly std. types ly referenced re gram	•
Criteria Area Type (all p Template (Unused) Create new	v object	fild card text criteria	Show rec Show on Show on Open by nam Go to dia Show pro	Juctions ly std. types ly referenced re Igram operties	Print List
Criteria Area Type (all p Template (Unused) Create new Area	v ossible) v v	fild card text criteria	Show red Show on Show on Open by nam Go to dia Show pro	Juctions Wi Juctions Juctions July Juctions Juctions Juctions Juctions July Juctions July Juctions July Juctions July July Juctions July July July July July July July July	Print List Open / Select
Criteria Area Type (all p Template (Unused) Create new	v object	/ild card text criteria	Show rec Show on Show on Open by nam Go to dia Show pro	Juctions ly std. types ly referenced re Igram operties	Print List Open / Select T0147

Figure 3.34 In the **Object Browser** dialog box you type the unique name of the object and an optional description.

- **3.** Click **Create**. The bar display object properties dialog box appears. Do the following:
 - Adjust the maximum value to 1000.
 - Remove all values except **High Alarm**, **Actual Value** and **Low Alarm** by moving the corresponding horizontal line above the top or below the bottom of the bar. Use the color-coding to determine which line to move. A quicker alternative is to clear the check boxes for the atoms you do not want to use on the **Edit Mapping** tab.
 - In the **Units** drop-down list, select 1 for liters.

Analog	Layers	Data M	lanagem	ent Definitions	Display	Edit Map	oina	Calculation	Report Form	at Attribu	ites Of Bar	
-	Name		L0147]	Lat Hup	Pring	Calculation				
	Descripti	ion	Water le	evel in tank T01	47							
Max.		1000		Decimal Point	0		765	4321.				
		800		Units 	I			•				
		600		✓ High Alam ■ High Limit	1			900 1000				
		400		Actual Value SetPoint				150 1000				
		200	_	Low Limit				1000				
Min.		0		Low Alarm				50				
	From											
						3						
												_
									ОК	Annuler	Aid	

Figure 3.35 On the **Analog** tab you specify the measuring range, the measuring unit and the alarm limits.

4. Click the **Data Management Definitions** tab and make the selections shown in Figure 3.36.

L0147 - Water level in tank T0147	? 💌
Analog Layers Data Management Def	nitions Display Edit Mapping Calculation Report Format Attributes Of Bar
Scan interval 2000 10000	Logging ④ All changes ○ > 1 % ◎ All values ○ > 2 %
◎ 5000 ◎ 30000	None ○ > 5 % ○ > 10 %
None In millisecs.	Log outgoing commands Log to SQL Database
Base interval Data rec 2 10 5 30 None In mins. Data rec None In mins. Data rec None In mins. Data rec None In Minin Data rec More Sum Data rec More Data rec None Data rec Data rec None Data rec Data rec None Data rec Data rec Data rec None Data rec Data rec Data rec None Data rec Data rec Da	Reduced value Reduced value Actual total value Idealized total value Idealized total value Idealized total value None For each data reduction method V O sec. Delete Scale as Connect to (Unused) V (Unused) V
	OK Annuler Aide

Figure 3.36 On the **Data Management Definitions** tab you define the data collection properties.

5.

Click the Edit Mapping tab. Do the following:

- In the Atom box, select Actual Value and type the PLC address shown in Figure 3.37.
- Select **High Alarm** and associate the relevant alarm text (alarm no. 106), then select **Low Alarm** and associate alarm no. 107.

L0147 - Water leve	l in tank T014	7			? 🔀
Calculat	tion	Rep	oort Format	Symb	ol Definition
Analog	Layers	Data Mana	gement Definitions	Display	Edit Mapping
Atom			PLC Node for object		
High Alarm			Driver : 7TS	7TCP (IGSSStatio	on1) 🔻
Actual Valu	e	E	Node : 0		•
Low Limit			PLC Address for Act	ual Value atom:	
Alam-In		-	Data Area 🛛 🖸	B (Data Block)	-
I/O mode :	in	•	Data Block Number	20	*
Alarm Details			Adressing V	/ord (16-bit)	•
Alaini Details			Offset 1	₽ B	it 🛛 🚔
		*	Simatic Mnenonic:	DB2	D.DBW2
			Bit Offset	0	×
New	Edit	Delete	External type F	P16S	•
			Use numeric +/- to so	croll to next/previo	ous atom
<u>.</u>			OF	Cano	el Help

Figure 3.37 On the **Edit Mapping** tab you type the specific PLC address and the appropriate alarm numbers.

6. Click the Attributes of Bar tab. When you make new selections, the bar preview to the left changes accordingly. Make the selections as shown in Figure 3.38.

Analog	Layers	Data	a Manager	ment Definitions	Display	Edit Mapping
Calcul	ation		Repo	t Format	At	tributes Of Bar
		Display at Center x Center y Width	380 356 127	Align Bar Cleft Right Top Bottom	Base Point © Zero Based Setpoint Based Pixed Based Base Point	d
		Height	169	Allign Axis	Bar View	Frame and Border
		Show Limits		 Left 	3-D View	Enable
		Areas		Right	2-D View	Settings
		C Lines		Scale Attribu	tes	
		 Lines No Line 		Show So	cale Exponent	Rep Divisions in
olors and Patt	ems	U 10 L		Show Va	alues V Extended	
icale	Ba	r		Show U		
iet Point			•	Value Real	© % © Tog	gle Decimals
imit Area	- Ba	ckground Ba	r	Scale Line	e Style	
lase Area		-		Solid	Dotted Das	hed
imit	-	Transparent		Thickness		
Level controlle	ed Ba	ckaround Al		1	02 03	Scale Font
Enable		I.I		Barwidth		
Settings		Transparent		Fixed Ban	width 0	

Figure 3.38 On the Attributes of Bar tab you define the layout of the bar.

7.

Click **OK**. A small rectangle representing the bar display appears. Position the bar display inside the water tank and resize it so that it fits within the tank as shown in Figure 3.39, then position the name and the value.

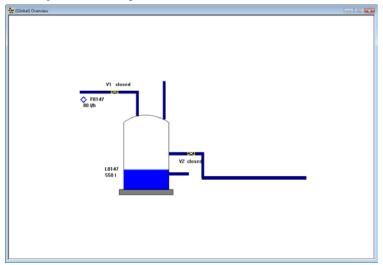


Figure 3.39 The Overview diagram with the bar display in the right position.

Define Table Objects

Purpose In our project we need to show the four temperature gauges, which measure temperatures at different levels in the tank. We integrate the four temperature gauges in one table object, **T0147**.

To define the Perform the following steps: table object (T0147)

1.

Select Objects → Rectangular Field	The Object Browser a	ppears.
------------------------------------	----------------------	---------

Select **Table** and type the name and description as shown in Figure 3.40.

bject Browser (Locked by <crea< th=""><th>te object from men</th><th>u>)</th><th></th><th>? 🛃</th></crea<>	te object from men	u>)		? 🛃
🖃 👹 newconfig	Object	Area	Туре	
😑 🝙 Global	Regulator [1]	Global	Table	
- Analog	Regulator [2]	Global	Table	
🚰 Area 🍋 Counter	Regulator [3]	Global	Table	
Diagram	Regulator [4]	Global	Table	
in Digital	Regulator [5]	Global	Table	
Graph	Regulator [6]	Global	Table	
- Group	Regulator [7]	Global	Table	
🚞 Scale	Regulator [8]	Global	Table	
🚞 String	Regulator [9] Regulator [10]	Global Global	Table Table	
Tree node filter settings Criteria Wil	d card text criteria	List filter settin	uctions	ild card text criteria
Area 🔻			y std. types y referenced	
Type (all possible) 🔹		snow only	y rererenced	Print List
Template 🔻		Open by name		
(Unused)		📝 Go to diag	gram	
(unusea)		Show pro	perties	Open / Select
Create new object				
Area Global		Name	T0147	
Template		Description	Temperature in tar	nk T0147
Type Table		📝 Name	📝 Descriptio	
		📝 Value	Moving sy	mbol Create
🗌 Always on top 🛛 📝 Advan	ed			Close

Figure 3.40 In the **Object Browser** you type the unique name of the object and an optional description.

- Click **Create**. The table object properties dialog box appears.
 - In the **Type** field, select **Fixed Table**.
 - Type in the names and values shown in Figure 3.41.
 - In the **Units** drop-down list, select °C.
 - In the **Minimum value** field, type 0 and in the **Maximum value** field, type 100.

T0147 - Ter	npera	ature in tank T014	7					? 🔀
Table La	ayers	Data Managemer	t Definitions	Display	Edit Mapping	Report Format		
Name		0147 emperature in tank	10147		Type Fixed Fixed			
					Pioat	Iable		
	Vame		Val					
T1				5	7654321.			
T2				7				
T3 T4				11 17	Decimal Poin	t.0		
14					Units	°C	-	
					Minimum valu		0	
					Maximum val	ue	100	
From			L.					
11011								
L						_		
					OK	Annuk	er	Aide

Figure 3.41 On the **Table** tab you type the names of the individual temperature gauges and their initial values.

3. Click the **Data Management Definitions** tab and make the selections shown in Figure 3.42.

As you can see, the selections differ from the ones for the analog objects as follows:

- Logging is set to None which means that historical graphs of the object values cannot be shown. However, trend graphs can always be displayed, as they do not depend on logged data.
- **Base interval** is set to **None** which means that there is no data reduction method and thus no values for the operational reports.
- In the **Scale As** field, we have selected the scaling object, **Fahren.toCel** which we defined in the Define Scaling Objects section. The scaling object converts values between 32 and 212 to values between 0 and 100.
- In the **Base interval** group set the base interval to 10. Put at checkmark in **Minimum** and **Maximum** in the **Data reduction** group. Select **Reduced value** in the **Transfer to history** group

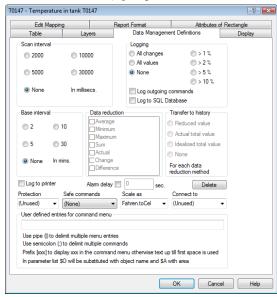


Figure 3.42 On the **Data Management Definitions** tab you define the data collection properties. Note that we use the **Fahren.toCel** object to convert the values from °F to °C.

Step	Action						
4.	Click the DispIn the State table value	/Value group	, chec	ck the Units	box to sl	how the un	it beside the
	[10147 - Temperature in tank	c T0147			? 🗙	1
		Edit Mapping		Report Format	Attributes	of Rectangle	
		Table	Layers	Data Managemer	nt Definitions	Display	
		Selectable	State / Image: En Align Image: Align Atom Forma	hable Left VIII Right Tat Al values at Decimal refix Zero Prefix	m Timestamp ble Texts		
					OK Can	cel Help	1

Figure 3.43 On the **Display** tab you define that the values and units are shown with the table object.

5. Click the **Edit Mapping** tab and type the values shown in Figure 3.44.

As the table object uses the external type **FP16S**, it occupies the addresses 18.00 to 21.00.

NOTE: Although the table object holds four values, you need only give one address, namely the one for the first value in the table. It is assumed that the other values in the table are on addresses that follow immediately after the first one.

T0147 - Temperature in tank T0147	? 🔀
Table Layers Data Management Definitions	Display Edit Mapping Report Format Symbol Definition
Table Layers Data Management Definitions Atom Table Vo mode : Vo Aam Details	Display Edit Mapping Report Format Symbol Definition PLC Node for object: T0147
New Edt Delete	External type FP16S Use numeric +/- to scroll to next/previous atom
	OK Cancel Help

Figure 3.44 On the **Edit Mapping** tab you type the specific PLC address. Note that you only need to specify one address. IGSS assumes that the values have consecutive addresses.

6.

• Click **OK**. A small rectangle representing the table object appears. Position the rectangle and resize it to the appropriate size, then place the name above it and the values inside it.

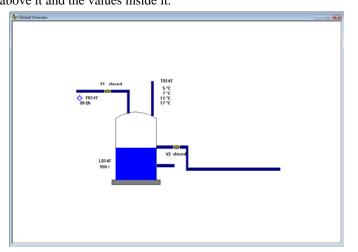


Figure 3.45 The Overview diagram with the temperature gauges in position.

Define Counter Objects

Purpose

We nearly have a complete project now. Only two things are missing:

• The counter that counts liters in the tank and

• The text that displays the current status

We will start by defining the counter object, C0147.

To define the	
counter object	
(C0147)	

Perform th	ne fo	owing steps:
Step	A	ion
1.	•	Select Objects \rightarrow Rectangular Field . The Object Browser appears. Select Counter and type the name and description as shown in Figure 3.46.
		Object Browser (Locked by <create from="" menu="" object="">) Image: Control of the second second</create>

Wild card text criteria

•

•

•

•

🔽 Advanced

Figure 3.46 In the Object Browser you type the unique name of the object and an optional description.

List filter settings

Open by name Go to diagram Show properties

Name

Description

☑ Name ☑ Value

Show reductions Show only std. types Show only referenced

C0147

V Description

Moving symbol

Wild card text criteria

Print List...

Open / Select

Close

2. • Click **Create**. The counter object properties dialog box appears.

Tree node filter settings

Type (all possible)

Create new object

Global

Counter

Criteria Area

Template

(Unused)

Template

🔲 Always on top

Area

Туре

Select the measuring unit and the values as shown in Figure 3.47. •

Edit Mapping	R	eport Format	Attributes of	of Rectangle
Counter	Layers	Data Managem	ent Definitions	Display
Name C0147				
Desc. Counts	/h into tank T0147			
Jnits I/h	-			
Decimal Point 0				
Current count	55	Start		
Limit	75	Stop		
Preset value	0	 Reset Preset 		
Maximum value	100	Freset		

Figure 3.47 On the Counter tab you specify the measuring unit, the preset and maximum values and whether you want to enable alarm supervision (Limit check box).

3. Click the **Data Management Definitions** tab and type the values shown in Figure 3.48. As you can see, this counter object has no logging.

In the **Base interval** group set the base interval to 10. Put at checkmark in **Maximum** in the **Data reduction** group. Select **Reduced value** in the **Transfer to history** group.

Edit Mappi		Re	port Format	Attributes o	f Rectangle
Counter	Lay			ment Definitions	Display
Scan interval 2000 5000 None	 1000 3000 In millise 	0	Logging All changes All values None Log outgoing Log to SQL I	 ○ > 1 % ○ > 2 % ○ > 5 % ○ > 10 % y commands 	
◎ 5 ◎	10	Data reductio Average Minimum Maximum Sum Actual Change		Transfer to history Reduced value Actual total value Idealized total value None 	
Log to printer Protection (Unused)	Safe comma (None)	•] 0 sec. Scale as	reduction method Delete Connect to (Unused)	
) to delimit mu play xxx in the	ltiple comma e command n		up till first space is used with area	

Figure 3.48 On the **Data Management Definitions** tab you define the data collection properties. Note that there is no logging and base interval.

- 4. Click the **Display** tab.
 - In the **State/Value** group, check the **Units** box to show the unit on the process diagram.
- 5. Click the Edit Mapping tab and type the values shown in Figure 3.49.

NOTE: We use the Offset immediately after the table object, that is, 3.

C0147 - Counts I/h into tank T0147	8
Counter Layers Data Management Definitions	Display Edit Mapping Report Format Symbol Definition
Atom Count Count Lunt Preset VO mode :	PLC Node for object: C0147 Driver : 7TS7TCP (IGSSStation 1) • Node : 0 • PLC Address for Court atom: Data Area DB (Data Block) • Data Block Number 20 • Adressing Word (16-bit) •
-	Offset 3 Bit 0 - Simatic Mnenonic: DB20.DBW6
New Edit Delete	Bit Offset 0 -
	OK Cancel Help

Figure 3.49 On the **Edit Mapping** tab you type the specific PLC address. We use the **Offset** immediately after the table object, that is, 22.

Action Step

6.

- Click OK. A small rectangle representing the counter object appears. •
- Position the rectangle and resize it to the appropriate size, then place the • name above it and the value inside it.

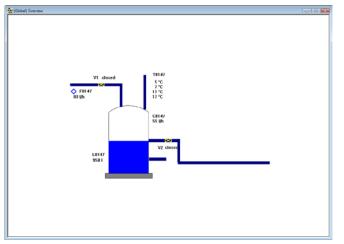


Figure 3.50 The Overview diagram with the counter object, C0147, in position.

Define String Objects

.

Purpose The last object we will place on the diagram is the text describing the current state of the process. For that purpose we will define the string object, Message.

To define the	Perform the	ne following steps:
string object (Message)	Step	Action
	1.	 Select Objects → Rectangular Field. The Object Browser appears. Select String and type Message in the Name field Clear the Name check box and check Value.
		Object Browser (Locked by <create from="" menu="" object="">) Image: Control object from menu>) Image: Control object Browser (Locked by <create from="" menu="" object="">) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Object Area Image: Control object Browser (Locked by Control object from menu>) Objec</create></create>

🖃 👹 newconfig	Object	Area	Туре		
🖮 💼 Global	LogUserLogin	Global	String		
- Analog	1		-		
Area					
Diagram					
Digital	1				
Graph					
🛁 Group					
🛁 Scale					
	1				
Table	1				
	1				
Tree node filter settings	·	List filter settin	as		
	card text criteria	Show red	-	Wild card	text criteria
Area 👻		📃 Show onl	y std. types		•
		📃 Show on	y referenced	ſ	Print List
		<u> </u>		l	1 11 11 12 12 12 12
Template 🔹		Open by name			
(Unused) 🔻		Show pro			Open / Select
Create new object			perues		
		Name	Message		
Area Global Template		Description	I		
remplate					
		Name	🔽 Desc		
Type String		Mahua .	C March	and a second second	Create
		Value	🗌 Movir	ng symbol	Create

Figure 3.51 In the Object Browser you type the name of the string object.

- 2. Do the following:
 - Click **Create**. The string object properties dialog box appears.
 - In the **Maximum Length** field, type 70 and type the initial string shown in Figure 3.52.

Edit	Mapping	Re	eport Format	Attributes of	f Rectangle	
String Object		Layers	Data Manager	Data Management Definitions		
Name	Message		Maximum Len	igth 70		
escription						
itring						
Vow filling	more water in	to basin				
rom	7/24/200	9 10:27:23 AM:012				

Figure 3.52 On the **String** tab you type the max length of the text and an initial text string.

3. Click the **Data Management Definitions** tab and make the selections shown in Figure 3.53.

isage					-?	
Edit Mappi	ng	Rep	port Format	Attributes of	Rectangle	
String Object		Layers Data Management Definitions			Display	
Scan interval			Logging			
2000	100	00	All changes	> 1 %		
			All values	> 2 %		
5000	300	00	None	> 5 %		
				> 10 %		
None	In millise	CS.	Log outgoing			
			Log to SQL [Database		
Base interval		Data reduction	n	Transfer to history		
02 0	10	Average		Reduced value		
02	10	Minimum Maximum		Actual total value		
05 0	30	Sum		Idealized total value		
		Actual		None		
None In	mins.	Change		For each data		
				reduction method		
Log to printer	A	Narm delay 📃	0 sec.	Delete	1	
Protection	Safe comm	ands	Scale as	Connect to	,	
(Unused) 👻	(None)	-		-		
User defined ent	ries for comm	and menu			,	
Use pipe (1) to de	elimit multiple	menu entries				
Use semicolon (nds			
				ıp till first space is used		
In parameter list	\$0 will be su	bstituted with o	object name and \$A	with area		
				OK Cancel	He	

Figure 3.53 On the **Data Management Definitions** tab you define the data collection properties. Note that there is a scan interval, but no logging.

Action	
Click the Ed 3.54.	lit Mapping tab and type the PLC address as shown in Fig
NOTE: We	use a new data block for the string object, 21.
	Message @ Global
	String Object Layers Data Management Definitions Display Edit Mapping Report Format Symbol Definition
	Atom PLC Node for object: Message Tred Driver: 7TS7TCP (IGSSStation1) • Node : 0 • PLC Address for Text atom: Data Block Number 21 Data Block Number 21 • Alam Details Offset 0 • Offset 0 • • New Edt Delete External type STRING • Use numeric +/-to scroll to next/previous atom • • • •
	Click the Ec 3.54.

Figure 3.54 On the **Edit Mapping** tab you type the specific PLC address. We use a new data group for the string object, 21.

- 5. Do the following:
 - Click **OK**. A small rectangle representing the string object appears.
 - Position the rectangle and resize it to the appropriate size, then place the text string inside it.

RESULT: The project is now complete. To allow the operator to open the **Overview** diagram automatically, follow the procedure below.

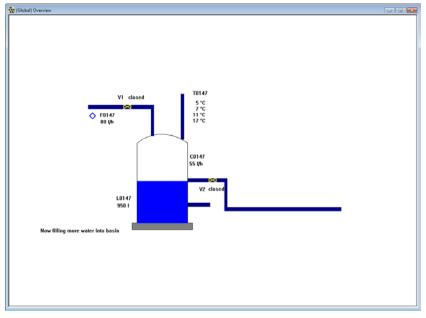


Figure 3.55 The **Overview** diagram with the string object in position showing the current state of the process.

To prepare the diagram for the	Perform the	he following steps:
operator	Step	Action
	1.	Select Format \rightarrow Set Initial Display to make this diagram open automatically when Supervise is started.
	2.	Select File \rightarrow Save or press CTRL + S to save the work you have done so far.

NOTE: As in any other program, you should save your work regularly to avoid losing valuable work and wasting the time to redo it.

Define Graph Windows

IntroductionThere are two graph types in IGSS. One is the well-established graph which is presented in a separate graph
window. The procedure below describes how you define this type of graph. The second type is the
embedded graph which can be integrated in a process diagram. This graph type allows you to create XY
plots apart from the traditional time plot which is, of course, supported by both graph types.
For details about the embedded graph type, refer to the Definition Help file.

Purpose The project is actually complete, but we will also like to see the flow meter, the inlet valve and the level gauge in a graph window to get a general impression of the state of the tank T0147. For that purpose we will define the graph object, **G0147**.

To define the	Perform the following steps:
---------------	------------------------------

To define the graph window	Perform ti	ne following steps:								
(G0147)	Step	Action								
	1.	Do the following:								
		• Select Graph \rightarrow Create. The New Graph Properties dialog box appears.								
		• Enter the name	and descript	ion shown in	Figure 3.60.					
		• Select the Name menu in Super	Name to Menu option to show the graph name in the Graph upervise.							
		• Select the wind Figure 3.60.	ow elements	to be shown	on the diagram as she	own in				
		!	New Graph Properties		? ×					
			Name G0147		Caption Name					
			Desc. Flow and level	in T0147	 Description 					
			Attributes Title Bar System Menu Minimize Minimize	 ✓ Name to Menu ✓ Grid ✓ Horiz Scroll Bar ✓ Status Bar 	Protection :					
			✓ Pinable	Рорир	OK Cancel					

Figure 3.56 In the **New Graph Properties** dialog box you enter the name and an optional description and select the window elements you want to show.

- **2.** Do the following:
 - Click OK. The Define Graph Parameters dialog box appears.
 - In the **Object name** column, select the objects shown in Figure 3.61 from the drop-down lists.

NOTE: Leave the remaining options with the default settings. For further details, click the ? in the upper right hand corner of the dialog box, then click the item you want information about.

Name				G01	47	Descripti	on	Flow and lev	el in T0147					
Autostart Start offset Window period X-divisions	DD H 0 0		-	irce LOG BCL		Start F © D © H	ay	on OMin OSec	Time Resolut 2000 5000 Automatic	100	000		nd now Detail now Descr	-
Object name				Ato	m	Reduc	tion	Y-max	Y-min	Y-div.	Y-axi:	s Smooth Wide	Patt.	Color
F0147			•	PV	•	•	-	100	0	10	V		•	
V1			•	ST	•	•	-	2	0	10	V		-	
L0147			-	ΡV	•	•	-	1000	0	10	V		-	
(Unused)			-		-	·	-				V		•	
(Unused)			•		-	·	-				V		-	
(Unused)			•			·	-				V		-	
(Unused)			•			·	-				V		-	
(Unused)			•			·	-				V		•	
(Unused)			•			·	-				V		•	
(Unused)			•		-	·	-				V		-	
Background Cole	ors: (E	àraph	Windo		axis	Ruler	1	Grid				OK		ancel

Figure 3.57 In the **Define Graph Parameters** dialog box you define which process components you want to show, graph period and layout.

- **3.** Do the following:
 - Click **OK**. The graph window appears.
 - Scale the window to the desired size and position it where you want it to appear on the operator's screen.

TIP: If you want to ensure that the graph window always opens in the same size and position, you can lock these properties by clearing the check box **Allow graph move and resize** on the **Supervise** tab in the **System Configuration** module.



Figure 3.58 The graph window can be scaled and positioned as you like.

Install the Project

PurposeThe project is now ready for installation. Let us install it and correct any installation errors, if required.To install thePerform the following steps:

To install the Perform the following steps: project

- Step Action
- 1. *TIP*: Select File \rightarrow Check and Install or press CTRL + T. The Installation Options dialog box appears.
- 2. Do the following:
 - In the Installation report settings group, check all the boxes to display this information in the installation report.

Installation settings Do not report errors on Do not report driver se		Installation report settings Sort objects by PLC address Sort objects by alarm number				
Do not generate report		Sort objects by object type				
Do NOT install - show Include these object		Show detailed object information				
Area	Table					
Diagram	Counter					
🗌 Graph	String					
Analog	Scale Scale					
Digital	Template					
	_	OK Cancel Help				



TIP: Check the **Skip This Dialog** box to install without seeing this dialog box in future. To show the dialog box again, hold down SHIFT while you select **Check and Install** in the **File** menu.

- **3.** The installation program is automatically launched and checks the entire project.
 - If the installation is successful, a message prompt appears informing you of how many objects the installed project holds. From the message prompt, you can access the installation report, *<MyConfig>*.prt by clicking the **Yes** button.
 - If there are any errors in the project, the **Troubleshooter** program appears automatically. The program lists the errors and allows you to correct the errors one by one. When all errors are corrected, repeat the installation.
- 4. To run the project in **Supervise**, select the **Start** button under the **Home** tab in IGSS Master (This can be done both in **Runtime** or **Design** mode).
- 5. If the project is running, you don't have to stop it to update the project. Simply use **Check and Update** under the **Design and Setup** tab and follow steps 2-3 above.

The installation report

When a project is successfully installed, a dialog box appears allowing you to view the installation report, $\langle MyConfig \rangle$.prt. The report contains detailed information about the project, for example, scan intervals, base intervals, communication efficiency.

myconfig.PRT - Wor	dPad		
File Edit View Inse	ert Format Help		
0 🛩 🖬 🐗 🗅	A X 10 🚳 🗠 🧕		
Configuration I Configuration I file backup\my System Version Number of object	file: config.ELM :	09/07/27 07:29:44 c:\usera\ybe\deaktop\config 8.00.00 32	1
Area: Global			
Global	AREA	Global area. Objects defined in	
this area are		Sicbal area. Objects defined in	
		available in the configuration.	
AB-SWITCH	DIGITAL TEMPLATE	-	
C0147	COUNTER	Counts 1/h into tank T0147	
DIALSUSPEND	DIGITAL TEMPLATE		

DIALUP	DIGITAL TEMPLATE	Pia	
Dia	DIAGRAM	2	
Driver	DIGITAL	Communication monitor	
F0147	ANALOG	Flow into tank T0147	
	1')-0.SetPoint('F0147')	IIF	
	1-)-0,SetFoint('F0147')		in the second
r Help, press F1			NUM

Figure 3.60 The installation report contains detailed information about the project.

Towards the end of the installation report, important information about the efficiency of the communication with the PLC is included as shown in Figure 3.65.

myconfig.PRT - WordPad			
<u>File Edit View Insert Format Help</u>			
D 📽 🖬 🖨 🕻 🗛 🔏 🖷 🛍 🗠	B		
			~
Communication efficiency in sc	an records		
Number of bits used for object	3		
674			
Total number of bits in scanre	cords		
960			
Efficiency 70%			
Total number of words in scanr	ecorda		
60			
Possible number of words with	same number of scan	records	
256			
Efficiency			
23%			
Number of scan records:4			
Driver configuration			
briver configuration			
Active profile	org		
Number of stations	1		
Station name	IGSSStation1		
Station type	_		=
Station description	-		
LAN A	-		
LAN B	-		
Number of drivers	1		
			*
For Help, press F1			NUM

Figure 3.61 The installation report includes information about the efficiency of the communication with the PLC.

For further details about the installation report, search for "installation report" in the **Definition** Help file.

To correct installation errors

The Troubleshooter program

NOTE: If your installation is not successful, the **Troubleshooter** program automatically appears. The installation errors are listed. Double-clicking an error brings up a dialog box with further details. Clicking the Leaster Error in Definition button guides you to the object which is in error.

	ew Tools He	lp ? \?						
Object Name	Area Name	Object Type	Object Desc.	Atom	Err No.	Err Desc	Driver	Node
V1	Global	DIGITAL			4353	The assigned node number 2 does not exist for the assigned		2
V1	Global	DIGITAL			4353	The assigned node number 2 does not exist for the assigned		2
or Help, press F								NUM

Figure 3.62 The error log file, <MyConfig>.err, clearly marks the errors found during installation allowing you to quickly find the erroneous objects and correct the errors.

To correct installation errors

Perform the following steps:

Step Action

- **1.** Double-click the line representing the error you want to correct.
- 2. Click the Locate Error in Definition button to go to the properties dialog box for the object in error.
- **3.** Correct the error using the information given in the **Troubleshooter** program, and click OK.
- 4. Repeat step 1 to 3 for all the errors.
- 5. Re-install the project.*NOTE:* You cannot start a project before all errors are corrected.

For details about installing projects, search for "installing" in the Definition Help file.

Define Operator Reports

Purpose The final thing we need to do is to create the operational reports which the operator will be able to access from the **Supervise** module. Reporting When you define new reports, you go through the following phases: workflow create a report format create the report headings include the objects in the reports test the reports make the reports accessible in Supervise **Report types** IGSS includes the following standard report types: Periodical report (daily, weekly, monthly, quarterly and yearly) • Snapshot report (current process values)

• Alarm statistics report

To create a report format In this example, we will create a report format to be used for periodical reports (daily, weekly, etc.). Perform the following steps:

Step	Action
1.	Select Start \rightarrow Programs \rightarrow IGSS 9.0 \rightarrow IGSS Master \rightarrow Switch to Design Mode (Under the dropdown menu) \rightarrow Definition (Under Design and Setup tab). The Definition module starts.
2.	Click Edit \rightarrow Report Formats. The Report Formats dialog box appears.
3.	 Do the following: Click Create in the Report Format area. The Report Format Properties dialog box appears. Type the name DemoRep in the Format name box.
	 Report Format Properties Format name DemoRep Set as default to automatically suggest this report format when the operator requests a report.

- Click the **Periodical** report option to allow the operator to base daily, weekly, monthly, quarterly and yearly reports on this format.
- Click **OK** to return to the **Report Formats** dialog box.

	Area	Object	Reduct	Report formal
*	7.1.00	object	neudeen	Create
				E dit
				Preview layo
				Clean
				Delete
				Report head
				Create
				E dit
	Use drag & drop to	change ord	er of headings and of	Delete
Properties for selected obje	icts			
Description				Chosen object
Unit	Show			Browse
Decimals		tal [duced	Total Idealised	Manual
		l.dev.		manual
Reset Properties				Delete

Figure 3.63 From this dialog box you create and maintain the report formats on which operator reports are based. A report format can be divided into sections (**Report Headings**).

- 4. Click the **Create** button in the **Report heading** area. The **Report Heading Properties** dialog box appears.
 - Type Flow and level in the heading text box as shown in Figure 3.68.

Heading text:	Flow and level	
Start on new		

Figure 3.64 In this dialog box you specify the names of the sections you want in the report.

- 5. Repeat step 4 for the two other headings named "Miscellaneous" and "Valves"
- 6. Click **OK** to return to the **Report Formats** dialog box.
 - *TIP:* To change the sequence of report headings, drag and drop the headings with the mouse. By default, headings are sorted alphabetically.

 To include the objects, first click the appropriate report heading, in this case "Flow and level". Then click Browse in the Chosen objects area. The Object Browser appears.

This object name	Goes under this report heading
F0147 (Min/Max)	Flow and level
L0147 (Average)	Flow and level
C0147 (Max)	Miscellaneous
T0147 (Average)	Miscellaneous
V1 (Change)	Valves
V2 (Change)	Valves

• We will now include the following objects:

- **8.** Do the following:
 - Select the first two objects in the list by holding down CTRL while you click each object, and drag them onto the "Flow and level" report heading in the **Report Formats** dialog box.
 - Repeat this step for the remaining objects, dragging the objects onto the "Miscellaneous" and "Valves" headings, respectively.

RESULT: The report format is now ready for use. But we still need provide direct access to the report modules for the operator (see "*To include reports as user programs*").

					Report format
🗉 🎨 DemoR		Area	Object	Reduct	Create
Flow and level Miscellaneous Valves		Global	F0147	Minim	
		Global	F0147	Maxim	Edit
E Valu	6				Preview layou
					Clean
					Delete
					Report heading
					Create
					E dit
	Use	drag & drop to	change or	der of headings and ol	bjects
Properties for s					
Description	Flow into tank				Chosen object
Unit	l/h	Show			Browse
Decimals	0	🔽 Tot	al	📃 Total Idealised	
		🔽 Red			Manual
	Properties	C Std	.dev.		Delete

Figure 3.65 In this dialog box you include the individual objects in the report and specify the report heading to which the object belongs.

9. • Click Close to return to the Report Formats dialog box.

To include reports The operator needs direct access to this report format, so we will include links to reports in the **User Programs** menu of the **Supervise** module.

NOTE: By default, the installation program adds links to the **Periodical Reports** and the **Snapshot Reports**. The procedure below describes how you do this manually.

Perform the following steps:

- 1. In **Definition**, select **User Programs** → **Customize for Supervise**. The **Access to User Programs from Supervise** dialog box appears.
 - Click New, then type Dmyrep. mde which is the file name of the Periodical Reports program. Click OK.

NOTE: During installation, the installation path of IGSS becomes part of the Windows PATH environment variable. This means that you do not need to specify the full path.

- In the Menu Text box, type Periodical Reports.
- Repeat for snapshot reports. This time type the file name, Actrep.mde.
- Click OK.
- Install the project (see the "Install the project" procedure in this section).

ccess to User Pr	ograms from Supervise	? X
User Programs :		
Periodical Rep Snapshot Rep		OK Cancel
		New Remove
Menu Text	Periodical Reports	
Command	C:\PROGRA~2\7T\igss32\v8.0'	Browse
Arguments		

Figure 3.66 In this dialog box you specify the paths and names of the programs you want to include in the **User Programs** menu of **Supervise**.

- 2. Verify the results in **Supervise** as follows:
 - Select IGSS Master→ Start (Under the Home tab).
 - Select User Programs → Periodical Reports. The Periodical Reports dialog box appears.

eport format	DemoRep 💌		ΓU	TC time
eport date	7/28/2009	7/28/2009	<u>⊏</u> <u>s</u>	equential reports
	4 4 5 b			Default time
leport geriod		Select output		
		View		Printer Setup
C <u>W</u> eekly	Start day Sunday 👻	E Print		Overview Report
C Monthly C Quarterly		Wide Suppress headers		Detail Report
C Yearly		F Print selected pages		Data to Excel
				Exit
		🔲 Send report as e-mail		

Figure 3.67 In this dialog box the operator selects the appropriate report type and report date and selects either an overview report or a detailed report.

Automatic printing of reports

If you want to print reports at regular intervals, we recommend using the Job Scheduler module. It allows you to start any program at a specified time. You may want to print a daily report every morning at 7:00 a.m. This is easily done using Job Scheduler.

For further details about automatic printing, refer to the Job Scheduler Help file.

For details about reports, refer to the **Report** Help file.



Section D: Optional Design Procedures

Overview

About this section	This section describes some of the advanced features in IGSS. To allow you to get acquainted with these facilities, we refine the project we have just built by using:					
	 The Drawing toolbar Standard descriptors (drawing objects, Windows controls, etc.) 					
	• The Library toolbar					
Contents						
	Using Advanced Features in IGSS	68				
	Use Lines for Analog Objects	70				
	Use Polygons for Analog Objects	72				
	Define Events	75				
	Simple Calculations	78				
	Refine Bar Displays	79				
	Use Command Buttons for Counter Objects	82				
	Use Command Fields or Combo Boxes for Digital Objects	84				
	Embedded alarm list	87				
	Embedded Diagram	88				
	Grid Control	91				
	Using animated symbols	94				
	Place Your Favourite Graphics in the Library Toolbar	96				
	Property Table View	97				

Using Advanced Features in IGSS

Introduction In this section we will try out some of the advanced features in IGSS. These features allow us to present process components in completely new ways, for example, by using standard Windows controls.

Drawing toolbar In older versions of IGSS, a background picture from an external drawing program was used, but now you can simply use a background color and draw the process from scratch using the **Drawing** toolbar and other features known from drawing programs.

The figure below shows the functions of the individual buttons of the Drawing toolbar.



Polyline Ellipse Rectangle Picture OLE Embedded Graph Embedded Alarm list Windows button Group Box

Figure 3.68 The Drawing toolbar allows you to create drawing objects and place graphics files and ActiveX/OLE objects and the embedded graph type on the process diagram.

The components you create using the Drawing toolbar can either be static or connected to an IGSS object. In the latter case, the appearance of, for example, a drawing object is linked to the state or value of the process component.

For details about the Drawing toolbar, search for "toolbars; Drawing toolbar" in the Definition Help file.

The most typical way of showing IGSS objects on a process diagram is to use the symbols from the built-in descriptors symbol file, Symbols.v20. However, a number of additional ways of displaying objects are also available.

- Drawing objects (line, polygon, etc.)
- Windows button (button, combo box, etc.)
- Graphics files (.bmp, .wmf, .emf, .gif, etc.)
- Multimedia files (.avi and .gif)
- **OLE** objects

Standard

- ActiveX controls
- Embedded Graph
- Embedded Alarm List
- Embedded Diagram
- Animated Symbol

When you use a standard descriptor to represent an IGSS object, you can link its appearance to the state or value of the object.

For details about standard descriptors, search for "standard descriptors" in the Definition Help file.

Library toolbar The Library toolbar allows you to drag and drop your favorite graphics objects onto process diagrams. The figure below shows the functionality of the toolbar.

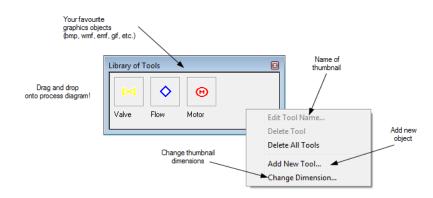


Figure 3.69 Place your favourite graphics files on the Library toolbar and drag and drop them onto process diagrams.

For details about the Library toolbar, search for "Library toolbar" in the Definition Help file.

Use Lines for Analog Objects

PurposeInstead of using a standard symbol from the symbol file for the flow meter, F0147, you may want to use a
line instead. The line could be placed on top of the inlet pipe to make it evident for the operator that an
alarm on this object is directly related to the inlet pipe.

We will apply different colors for the alarm ranges and enable line flashing when the object is in alarm.

To use a line for the flow meter, F0147 *NOTE:* Before we start using the advanced features, we will create a new diagram, **Overview_New**. Create the new diagram as described in the "*Create Areas and Diagrams*" procedure in Section C.

Step Action 1. Select Objects \rightarrow Standard Descriptors \rightarrow Line. The Object Browser dialog box appears. Select Analog and check Value. • In the right window list, select F0147. Click **Create** and the line representing the object appears. ? X Object Browser (Locked by <Create object from menu>) ₩ myconfig Object Area Туре 👝 Analog System Global Analog Counte 🗄 🚞 Digital - 👝 Table List filter settings Tree node filter settings Wild card text criteria Wild card text criteria Show reductions Criteria 🔲 Show only std. types Area Show only referenced Print List... Type (all possible) -Open by name Template Go to diagram (Unused) -Open / Select Create Area Global Name F0147 Description Flow into tank T0147 Template Туре Analog 📝 Name Description Moving symbol Value Always on top Close Advanced

Figure 3.70 The **Object browser** dialog box appears when you connect a standard descriptor to an IGSS object.

2. Position the line as shown in Figure 3.75, then position the name and the value.

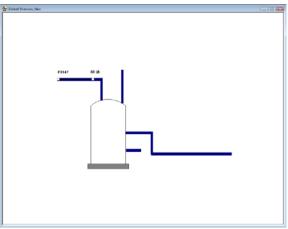


Figure 3.71 Position the line on top of the inlet pipe.

- 3. Double-click the line to define its properties. Click the Attributes of Line tab.
 - In the Line Color group, double-click the Bind Line Color property to enable it.
 - Double-click each of the color bars to choose the appropriate colors for the individual atoms (alarm limits).

Analog Layers Data M Calculation		Management Definitions Report Format	Display	Edit Mapping outes of Line	
Calculation			Report Format	Auto	Jules of Line
Properties					
— Gei — Sta	dings to Object : Line Color ometry tic Colors dings to Object :		Name Bind Line Color Above Alarm Between High War Not in Alarm Between Low War Below Alarm	Value Yes	
Save as Te	emplate				

Figure 3.72 In the Line Color group, you link the color of the line to the actual process value. You can specify individual colors for the different alarm ranges.

- **4.** Do the following:
 - In the **Bindings to Object Alarms** group, double-click **Flash Line** to enable line flashing when the object is in alarm.
 - Double-click each of the color bars to choose the appropriate colors.

Calculation Report Format Attributes of Line Properties Sindings to Object State Flash Line On Color - Line Color Flash Line On Color - Static Colors Flash Line Off Color Bindings to Object Alarms Yes	ine	Sisplay Edit	Display	Management Definitions	s Data	Layers	Analog
Properties Bindings to Object State Line Color Geometry Static Colors Value Flash Line On Color Flash Line Off Color Flash Line Yes		Attributes of Li	A	Report Format		lculation	Calc
Bindings to Object State Flash Line On Color Line Color Geometry Static Colors							Properties
Line Color Flash Line Off Color Geometry Flash Line Off Color Static Colors Yes			Value	Name			
- Geometry - Static Colors Flash Line Yes							
Static Colors			Vec			eometry	- Gei
			10	- indan ciric	- Static Colors		
					bject Alarms	indings to Objec	- Din
Save as Template						Template	Save as Te

Figure 3.73 In the **Bindings to Object Alarms** group, you enable line flashing when the object is in alarm and choose the appropriate colors.

5. Click OK.

Use Polygons for Analog Objects

PurposeIf you have a tank with a non-square form, you may want to use a polygon to represent the level of the tank
contents. In this example, we will use the existing object, L0147. We will make the background of the
polygon flash when the process value exceeds one of the alarm limits.
This time we will use the Drawing toolbar to create the polygon and then later connect its appearance to
L0147.

To use a polygon for an analog	Perform th	he following steps:
object	Step	Action
	1.	If the Drawing toolbar is not visible, select View \rightarrow Drawing toolbar.
	2.	Click 🕅 to activate the polygon-drawing tool.

- **3.** Do the following:
 - Click once where you want the top left corner of the polygon and draw the first vertical line.
 - Click once where you want the first line to end.
 - Repeat for all lines until you have the shape shown in Figure 3.78.
 - Double-click on the border when you have completed the polygon.

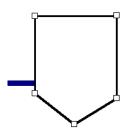


Figure 3.74 The polygon representing the tank is now drawn, ready to be connected to the appropriate IGSS object.

NOTE: If you place one of the corners of the polygon incorrectly you can click **Edit** \rightarrow **Undo**. You can redo an undo command, by clicking **Edit** \rightarrow **Redo**.

- 4. Right-click the polygon and select **Connect**. The **Object Browser** appears.
 - Select Analog and check Value.
 - In the Name area, select L0147.
 - In the open by name area, check the show properties box.

Object Browser (Locked by <menu:< th=""><th>Connect descript</th><th>or>)</th><th></th><th>? ×</th></menu:<>	Connect descript	or>)		? ×
ewgfxversion.elm	Object	Area	Туре	
🖻 🚡 Global	F0147	Global	Analog	
Analog Counter	L0147	Global	Analog	
e — Donter e — Digital ∟ _ Table	System	Global	Analog	
Tree node filter settings Criteria Wild o Area • Type (all possible) •	ard text criteria	List filter setting Show redu Show only Show only	ctions std. types	text criteria ▼ Print List
Template •		Open by name		
(Unused)		Go to diagr		Open / Select
Create new object				
Area Global		Name	L0147	
Template		Description	Water level in tank T0147	
Type Analog		√ Name ▼ Value	Description Moving symbol	Create
Always on top	ł			Close

Figure 3.75 The **Object Browser** appears when you connect a standard descriptor to an IGSS object.

5. Click **Open / Select**. The object properties dialog box appears.

Click **OK** again, as we do not want to change any properties. The object name and value appear. Position them as shown in Figure 3.83.

- 6. Double-click the polygon and select the Attributes of Polygon tab.
 - In the **Background Color** group, double-click the **Bind Background Color** property to enable it.
 - Double-click each of the color bars and choose the appropriate colors.

Analog	Layers	Data	Management Definitions	Display	Edit Mapping
Calci	ulation		Report Format	Attributes	s of Polygon
Properties					
– Gei – Sta – Bin	ties dings to Object Border Color Background Cc metry tic Colors dings to Object dings to Object ccellaneous	lor	Name Bind Background Above Alarm Not in Alarm Below Alarm	Value Yes	
Save as Te	emplate				

Figure 3.76 In the **Background Color** group, you enable background flashing and choose the appropriate colors.

- 7. Do the following:
 - In the **Bindings to Object Alarms** group, double-click the **Flashing Background** property to enable background flashing when the object is in alarm.
 - Double-click the **Flash Background On Color** bar and choose the appropriate color.

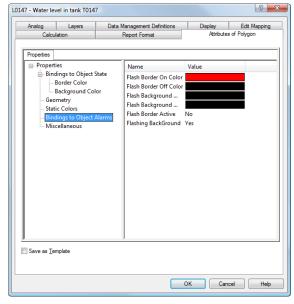


Figure 3.77 In the **Bindings to Object Alarms** group, you enable background flashing when the object enters the alarm state and choose the appropriate colors.

- 8. Do the following:
 - In the **Miscellaneous** group, double-click each of the two color bars to choose the fill color and pattern.
 - Double-click Fill Direction and select Up.
 - Double-click Fill Criteria and select Actual Value.
 - Double-click **Fill Active** to enable filling of the polygon according to the process value.

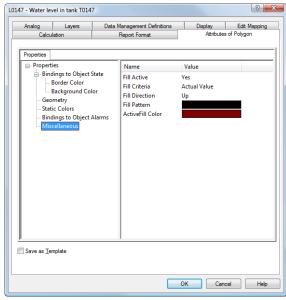


Figure 3.78 In the **Miscellaneous** group, you select the fill color and pattern and the fill criteria, for example, **Actual Value** to show the process value. These properties determine the filling of the polygon.

9. Click **OK**. The polygon should now look like this.

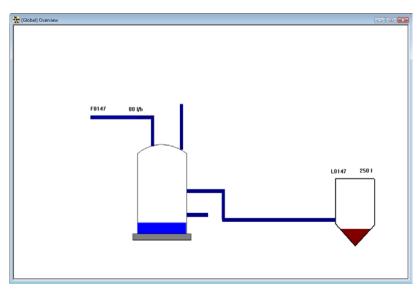


Figure 3.79 The polygon is positioned and the filling reflects the current process value.

Define Events

Introduction

Purpose

The operator uses the **Event List** to get a quick overview of the most important system and object events. The events in the list are user-defined and can be configured both from the **Definition** module and the **Supervise** module. The **Event List** is presented just below the **Alarm List**.

The following event types can be defined for display in the Event List.

- OP connect/disconnect
- Periodical
- System start/stop
- User defined
- User login/logout
- Writing stopped/started
- Error packet

In our project we need to register an event when the water level exceeds 800 l and the valve V2 is closed, so that the operator gets an early warning and can take the needed corrective action, before the water level object enters alarm state.

To define the Perform the following steps:

event for V2 and		
_0147	Step	Action
	1.	Select Edit \rightarrow Event list The Events dialog box appears.
	2.	Click Add. The Edit Event dialog box appears.
	3.	In the Name field, type: Water level (L0147) is 800 l and V2 is closed.
	4.	In the Type drop-down list, select User defined .
	5.	In the Display color list, select the color to be shown in the Event List .
	6.	Select the Alarm on event check box to show the event in the Alarm List.
		<i>NOTE:</i> When the event is also shown in the Alarm List , the alarm and acknowledgement colors defined for alarm number 90 will apply. Refer to the "Showing events in the Alarm List topic in the Alarm help file.
	7.	In the Criteria section, click the Add Criteria button.
	8.	Click the Object Browser button.
	9.	Find the object, V2, and drag it into the first line of the criteria field.
	10.	Do the following:
		• Under Atom, select State.
		• Under Relation, select =(value).
		• Under Object/value type 0 which corresponds to the digital command
		Closed.

Step Action

11. Repeat steps 7-10 for the **L0147** object and do the following:

- Under Atom, select Actual Value.
 - Under Relation, select >(value).
 - Under **Object/value** type 800.

Your dialog box should look like the example below.

Туре 🔓	Water level (L0147) is 800		Display color	Hours	Alarm on even
Type [User defined	T			02 PM
	edit fields and copy/paste	-	Add Criteria	Delete Criteria	
Туре	Object	Atom	Relation	Object/value	Atom
NA AND	V2@Global L0147@Global	State Actual Value	= (value) > (value)	0.000000 800.000000	
	ate result of all criterias				
Nega					
	s disabled (no events will b	e generated while in thi	s statej		

12. Click OK.

The event list will look like the example below when the event occurs.

Active Events	S.No.	Start Date	Start Time	Event	Info 1	Info 2	Info 3	Info 4	
- Event Log	1 2 3 4	22/02/2005 22/02/2005 22/02/2005	10.59.02.420 10.50.19.477 10.55.30.441	Video two ((())147) in 8001 and V2 is closed. System start & ingo System start & ingo System start & ingo	Data collectic Data collectic Data collectic	on started on Stopped on started			

Simple Calculations

Purpose

In our project we need to control the flow F0147 and the valve V1 so that the flow into the tank stops, when the level in the tank is 850 l or above. This is done in two steps, first closing the V1 valve when the level in the tank is 850 l or above, this affects the set point of F0147 (since the valve is closed the flow will be 0). First we define the simple calculations for the V1 valve.

To define the	Perform th	e following steps:
simple calculation for V1	Step	Action

- 1. Right-click the V1 object and select Properties.
- 2. Click the Calculation tab.
- 3. Set a check in the **Command** checkbox, to enter a calculation expression.
- Click the expression field, and type IIF(Value('L0147')>850.00, 0,1). The tab should look as shown in Figure 3.84.

					? 론
Change State	Bit Map I/O	Alarm In/Ack		mand/State Confi	
Data Management D	Definitions Display	Edit Mapping	Calculation	Report Format	Symbol Definition
Atom		Execu	tion trigger		
Command		On On	object change	s in expression	
State					
□Free Value □Alam-In		0	timer.	• • •	
Alam-Out		11	mer value (in m	Secs.)	×
Expression					
Command		1470-050-00-0-1)			
		147')>850.00,0,1)			<u> </u>
Test Expression	1				*
Only execute	e expression if this co	ndition is true			
Comment					
					*
					-
			ОК	Cancel	Help

Figure 3.80 The calculation expression on the Calculation tab.

NOTE: The expression closes the valve V1 when the level in the L0147 tank exceeds 850.00 liters.

- 5.
- Click the **Test Expression** button to test that the expression is correct.

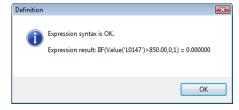


Figure 3.81 The dialog box from successful expression test.

Click OK.

6. Click **OK** to exit the properties dialog box.

Perform the following steps: To define the simple calculation Step Action for F0147 1. Right-click the F0147 object and select Properties. 2. Click the Calculation tab. 3. Put a check mark in the **SetPoint** box in the **Atom** group. 4. Click the expression field in the **Expression** group, and type: IIF(StateValue('V1')=0,SetPoint('F0147')=0,1) F0147 @ Global - Flow into tank T0147 ? × Analog Layers Data Management Definitions Display Edit Mapping Calculation Report Format Symbol Definition Atom Execution trigger High Alarm * On object changes in expression High Limit Ξ Actual Value On timer. Set F Timer value (in mSecs.) Low Limit Low Alarm □ Alam-In Expression Set Point IIF(StateValue('V1')=0,SetPoint('F0147')=0,1) . Test Expression.. Only execute expression if this condition is true Comment . Cancel OK Help

Figure 3.82 The calculation expression on the Calculation tab.

5. Click the **Test expression** button to test that the expression is correct. Figure 3.87 shows the dialog box from testing a correct expression.

Definition		×
i	Expression syntax is OK. Expression result: IIF(StateValue('V1')=0,SetPoint('F0147')=0,1) = 1.000000	
	ОК	_

Figure 3.83 The dialog box from successful expression test.

Click OK.

6. Click **OK** to exit the properties dialog box.

For further details, search for "Calculation" in the Definition Help file.

Refine Bar Displays

Purpose

When we defined the object representing the water level in the tank, **L0147**, we defined a standard bar display. We will now customize the display using some of the numerous layout features available.

The next step is to define the simple calculations for the set point of **F0147**.

	ect from menu>)		8
	bject Area	Туре	
Global F0	147 Global	Analog	
👝 Table	147 Global	Analog	
Sy	stem Global	Analog	
Tree node filter settings Criteria Wild card Area V Type (all possible)	text criteria 📃 Shi	r settings wreductions ow only std. types ow only referenced	l text criteria Print List
Template		to diagram	Open / Sele
		in proposition c	
Create new object			
Create new object Area Global	Name	L0147	
(Unused)		to diagram ow properties	Open

Figure 3.84 The **Object Browser** dialog box appears when we define a new bar display. In this case, we choose the existing analog object, **L0147**.

Perform the following steps:

To define a bar display (advanced)

Action

Select Objects \rightarrow Bar Display. The Object Browser appears.

- •
- •
- f Bar tab •

Step

1.

- **2.** Do the following:
 - In the Show Limits group, select Lines + Arrows to show the alarm limits.
 - In the **Colors and Patterns** group, click **Limit** and select a red color for the alarm limit line.
 - In the Align Axis group, select Left to show the value axis to the left of the tank.
 - In the **Bar View** group, select **2-D View** to show the bar two-dimensionally.
 - In the Scale Attributes group, check Show Scale and Show Values.
 - Click **OK**. The bar display appears.

900 Certer x 379 © Right 800 Certer y 476 Top 600 Width 125 ® Bottom 600 Height 113 Align Axis 300 Show Units @ Left Right 300 Show Units @ Left Right 100 Ences only No Limits Scale Attri Colors and Pattems Bar Show Show Value Value Value No	3-D View Enable 2-D View Settings butes Scale Exponent Rep Values Scale Lines 10
1000 List, by aubutes □ Ert 800 Center x 373 800 Center y 476 700 Wath 125 900 Show Lints © Left 500 Height 113 300 Show Lints © Left 200 One only © Lines only Colors and Patems Bar Show Scale Line Show Lines only Show Show Value Value Show	Zero Based Setyore Based Fixed Based Base Point Sav Vew 3-D Vew Settings butes Scale Exponent Rep Values Scale Lines To
Set Point Limit Area Base Area Lumit Area Base Area Lumit Area Base Area Lumit Area Base Area Level controlled Settings Transparent Parangarent	Ine Style Dotted Dashed 2 3 Scale Fort

Figure 3.85 The layout properties of the bar display have been entered. Use the bar preview to verify your selections.

3. Move the bar display over the tank and resize it so that it fits within the tank as shown in Figure 3.90, then position the name and the value.

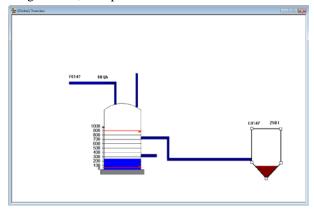


Figure 3.86 The bar display is positioned. Notice the two alarm limit lines which clearly alert the operator if the water level is nearing an alarm level.

Use Command Buttons for Counter Objects

Purpose

The counter object, **C0147**, which counts the number of liters let into the tank per hour, was initially defined as a rectangular field. By using a command button instead, we allow the operator to insert, for example, the preset value simply by clicking the button.

To use a command button	Perform th	ne following steps:					
for a counter object	Step	Action					
	1.	Select Objects \rightarrow Standard Descriptors \rightarrow Button Control. The Object Browser dialog box appears.					
		• Select Counter and check Value .					
		• In the Name field, type C0147.					
		• Click Create . The command button appears.					
		Object Browser (Locked by <create from="" menu="" object="">)</create>					
		Image: Second system Object Area Type Image: Global C0147 Global Counter					

Group		
Tree node filter settings Criteria Wild card text criteria	List filter setti	ductions Wild card text criteria
Area Type (all possible)		nly std. types nly referenced Print List
Template	Open by nam	agram
Create new object	Name	C0147
Area Global	Description	Counts I/h into tank T0147
Template Type Counter	V Name	Description
1999 Jooding	Value	Moving symbol Create

Figure 3.87 The usual **Object Browser** dialog box appears when we correct a command button to represent an IGSS object.

2. Move the command button, the name and the value to the position shown in Figure 3.93 and resize the button, as required.

- **3.** Double-click the button and select the **Attributes of Button** tab.
 - In the **Command On Click** group, double-click the **Bind Command On Click** property and double-click the **Preset** property to enable the operator to issue this command by clicking the button.
 - In the **Miscellaneous** group, double-click the **Text to be displayed** property and type Preset in the ensuing dialog box and click **OK**.

C0147 - Counts I/h into tank T0147			? ×
Counter Layers Data Management Definition	s Display Edit Mapp	ing Report Format	Attributes of Button
Bindings to Object Command on Click Geometry Style Miscellaneous	Name Bind Command o Start Reset Preset	Value Yes No No Yes	
Save as Template			
		OK Canc	el Help

Figure 3.88 In the **Command on Click** group, you bind the button to one of the four counter commands the operator can issue.

4. Click **OK**. The counter object should now look like this.

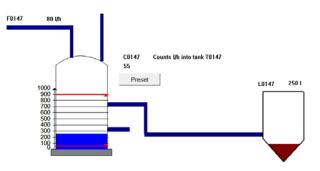


Figure 3.89 The command button representing the counter object is complete. The operator can issue the Preset command just by clicking the button.

Use Command Fields or Combo Boxes for Digital Objects

Purpose

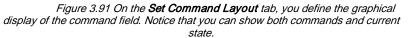
The two valves, V1 and V2, were initially defined using standard valve symbols from the symbol file. IGSS provides two useful alternatives, a command field or a combo box.

To define a digital object as a	Perform th	ne following steps:						
command field (V1)	Step	Action						
	1.	Select Objects \rightarrow Command Field. The Object Browser dialog box appears.						
		• In the Tree view , click the + sign beside Global , then the + sign beside Digital and select the Valve template.						
		• In the list of objects, select V1.						
		Object Browser (Locked by <create from="" menu="" object="">)</create>						
		Image: Second						
		Criteria Wild card text criteria Show reductions Wild card text criteria						
		Area Type (all possible) Type (all possible)						
		Template						
		Cinused Dpen / Select						
		Create new object Area [Globa] Name V1						
		Template Valve Description						
		Type Digital V Name V Description V Value Moving symbol Create						
		Always on top V Advanced						

Figure 3.90 The usual **Object Browser** dialog box appears when we define a command field.

- 2. Click Create. The Set Command Layout tab appears.
 - Check all four boxes to the right of the preview.
 - In the Align group, select Horizontal.

V1 @ Global Set Command Layout			? X
	Show Command	Align © Vertig	cal
close	Show State	 Horiz 	
open	Shadow	Display Attr	ibutes
	V Space	Center X	25
State display Pattem	Rows 2	Center Y	25
	Rows 2	Width	50
Text color	# Cmds 2	Height	50
Button color			
Use Windows Colors			
	ОК	Cancel	Help



- **3.** Click **OK**. The command field appears.
 - Position and resize the field as shown in Figure 3.96, then position the name.

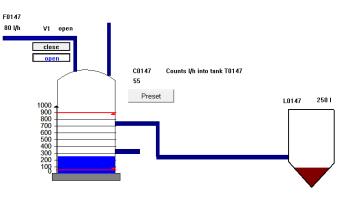


Figure 3.92 The command field is positioned. Notice that the operator can instantly view the available commands and the current state.

To define digital Perform the following steps: objects as combo

boxes (V2)

StepAction1.Select Objects \rightarrow Standard Descriptors \rightarrow Combo Control. The Definition of

- Object Browser dialog box appears.
 In the Tree view, click the + sign beside Global, then the + sign beside
 - In the **Free view**, click the + sign beside **Global**, then the + sign beside **Digital** and select the **Valve** template.
 - In the list of objects, select V2.

	gfxversion	Object	Area	Туре	
🗄 🝙 Global		Driver	Global	Digital	
		Protect	Global	Digital	
		V1	Global	Digital	
		V2	Global	Digital	
Criteria	-	fild card text criteria	Show o	eductions only std. types	Wild card text criteria
Tree node f Criteria Area Type (all po	- w	fild card text criteria	Show r	eductions	Wild card text criteria Print List
Criteria Area	- w	'ild card text criteria	Show r	eductions only std. types only referenced	· · ·
Criteria Area Type (all po	v ssible) v	fild card text criteria	Show of Show of Show of Open by na	eductions only std. types only referenced	· · ·
Criteria Area Type (all po Template	v ssible) v	fild card text criteria	Show r Show c Den by na Go to d Show p	eductions only std. types only referenced ame fiagram properties	Print List
Criteria Area Type (all po Template (Unused)	v ssible) v	fild card text criteria	Show of Show of Show of Open by na	eductions only std. types only referenced ame fiagram	Print List
Criteria Area Type (all po Template (Unused) Create new	w ssible) v v object	'ild card text criteria	Show r Show c Den by na Go to d Show p	eductions only std. types only referenced ame fiagram properties	Print List
Criteria Area Type (all po Template (Unused) Create new Area	ssible)	fild card text criteria	Show of Show of Show of Control of Show of Control of Show of Control of Show of Name	eductions only std. types only referenced ame fiagram properties	Print List Open / Select
Criteria Area Type (all po Template (Unused) Create new Area Template	w ssible) v object Global Valve	fild card text criteria	Show r Show c Show c Open by na Go to d Show p Name Description	eductions only std. types only referenced me flagram properties	Print List

Figure 3.93 The **Object Browser** dialog box appears when we define a combo box.

2. Position and resize the combo box as shown in Figure 3.98, then position the name and the state.

TIP: To allow both commands to be shown in the drop-down list, extend the combo box area downwards. Click on the combo box and position the cursor over the centre handle in the bottom. When the hand appears, resize as required.

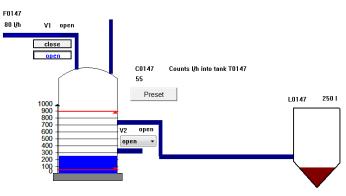


Figure 3.94 The combo box representing V2 is positioned. The operator selects the appropriate command by opening the drop-down list and selecting the command.

The Embedded Alarm List

Purpose

We now want to make an embedded alarm list that shows all the alarms from the flow, this will be alarm number 102 to 105.

A selection of the alarms from the project can be shown in an embedded alarm list. The embedded alarm list may for example contain alarms from the objects on a specific diagram.

To use embedded

alarm list

Perform the following steps:

Step	Action
1.	Select Objects \rightarrow Standard Descriptors \rightarrow Embedded Alarm List. An alarm list is placed on the diagram.
	Place the alarm list in the upper right corner of the diagram

Place the alarm list in the upper right corner of the diagram.

- 2. Right-click the background of the alarm list and select **Properties**.
- 3. The Embedded Alarm List Properties dialog box appears.

Header text	Active	Sorting	Column content	
Object Name	×	84	Object Name	
Start Date	×	5 D	Start Date	
Start Time	×	6 D	Start Time	
Acknowledge Time	×	4 D	Acknowledge Time	
End Time	ж	7 D	End Time	
Worst Value		9A	Worst Value	=
Alarm Text		10 A	Alarm Text	
Area Name		11 A	Area Name	
Description		12 A	Description	
Value		13 A	Value	
Priority		2 A	Priority	
Alarm Number		14 A	Alarm Number	
Acknowledge Date		3 D	Acknowledge Date	
End date		15 A	End date	
Alarm State		1A	Alarm State	
Driver ID		16.4	Driver ID	1
Define	Colu	umn and sou	t order can be changed by drag	and dron
Column order			ble-click to change other proper	
_			de-click to change other proper	162
Show gridlines Backgrou	nd color	,		
Headers	Filters			
Show header				
Allow sorting			▼ Detaul	1
Allow column resize	Add	Ed	it Delete	mport

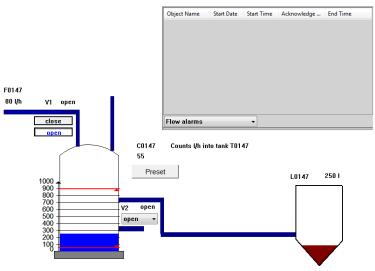
4. Click the Add... button in the Filters group. The Defining Filters dialog box appears.

efining Filters				? ×
Filter name				
Filter Conditions				
Not 📃	Add		hange	Delete
Edit Condition				
And		Condition	Value	-
Or Or	knowledge Date 🔻	on 🔻	7/28/2005 •	
Protect	Prompt for peri	od 📃 Forn	nat as 'alarm print'	
🔄 Global Filter	Exclusive		ОК	Cancel

- 5. In the **Edit Condition** group do the following:
 - In the **Property** list select Alarm no.
 - In the Condition list select is between.
 - In the Value type 102 and 105.
- 6. Click Add to add the filter condition. The dialog box should now look like this.

Filter Condition	Flow alarms			
	s stween 102.000000 A	ND 105.000000		
Not		Add	Change	Delete
 And Or 	Property Alarm No	Condition Is between	Value • 102.000	105.000(
Protect	Promot f	or period	Format as 'alarm prir	ıt'

- 7. Click OK.
- 8. In the Filters group select the Flow alarms filter, and check the Default check box.
- 9. The diagram should now look like this.



Embedded Diagrams

Purpose

We now want to make an embedded diagram where we can watch both the Overview diagram and the Overview_New diagram. To do this we first create a new diagram and name it Dualview.

An embedded diagram collects a number of logically related subprocesses into one descriptor. The descriptor is embedded on a standard IGSS diagram.

For each subprocess, a subdiagram is defined and a button appears for each of these. This results in a button bar from which the operator can choose the subprocess to view.

First we create a new diagram where we put the embedded diagram.

Perform the following steps:

To make an embedded subdiagram

Step Action 1. Select Objects → Standard Descriptors → Embedded Diagram. A diagram appears in the upper left corner. Resize the embedded diagram descriptor.

- 2. Right-click the white bar in the top of the embedded diagram, and select **Properties**.
- **3.** The **Embedded Diagram Properties** dialog box appears. Set the fraction used for buttons to 0.1 and the **Text color** as wanted.

	Align	Display At	ributes	
	Top	Center X	910	
	Bottom	Center Y	210	
	C Left	Width	410	
	Right	Height	424	
Diagram selection style				
 By combo 				
By tabs				
	Fraction used	for buttons:		
Text color		0,10		
	- Rows	1		
Button color				
	Fo	nt		
Rotate text				
90 degrees right				
Ø 90 degrees left				
O not rotate				

- 4. Click the Subdiagrams tab and click the Add button in the List of Subdiagrams.
- 5. In the **Display name** field type Overview.
- 6. In the **Background** group, select **Picture** and click **Browse** to find the picture which is located in the [Install Path]**Samples** folder. The **Open a Background Picture** dialog box appears.

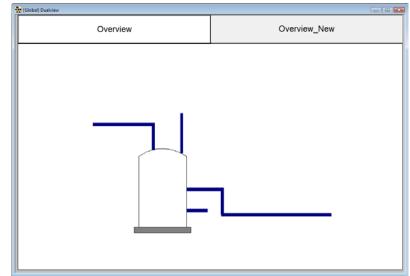
📓 Open a Bac	kground Picture					×
Look in: 🌗	Samples		- 0 6	b 📂 🛄 -		
Name	Date taken	Tags	Size	Rating		
Wwaters	wmf					Show Preview
File name:	waterx.wmf				Open	
Files of type:	Windows Metafi	es (*.wmf)		•	Cancel	.41

Figure 3.95 In this dialog box you choose the background picture for the diagram.

- 7. Double-click the file **Waterx.wmf**.
- 8. Click OK.

- The dialog box should now look like this.
- 9. Repeat the procedure for the Overview_New diagram.

- **10.** Click **OK**.
- **11.** Your diagram should now look like this.



- 12. Go to the **Overview** diagram and select all the objects. Then copy them.
- 13. Go to the **Dualview** diagram and click the **Overview** subdiagram.
- 14. Select Edit \rightarrow Paste As Reference. Click Yes when the following prompt appears.

aste to Embedded Diagram		88
Would you like to have the descriptors on the currently selected subdiagram?	pasted to the selected embedded diagram	
unit control poeter subalogioni		

15. Repeat the procedure for the Overview_New diagram.

že Overview Overview_New Start Date Start Time Acknowledge ... End Time Object Name F0147 80 l/h V1 open Flow alarms close C0147 55 Counts I/h into tank T0147 Preset L0147 250 1 1000 900 800 700 600 500 400 300

16. Your diagram should look like shown below.

Grid Control (pinnable)

Purpose	We now want to make a diagram containing the key values of the project. First create a new diagram named KeyValues.					
To make a grid control	Perform the	he following steps:				
	Step	Action				
	1.	Select Objects \rightarrow Standard Descriptors \rightarrow Grid Control . A grid appears on the diagram in the top left corner.				
	2.	Double-click the grid. The Grid Properties dialog box appears. Click the Environment tab and adjust the properties so that it looks like shown in the figure below.				

3. Click on the cell(s) you want to edit and go to the **Selected Cells** tab.

Grid Properties	2 ×
Selected Cells Envir	ronment
Background color	
Foreground color	
Font	11, Arial
Horizontal alignment	Left -
Cell type	Text 🔻
Object	
No Object selecte	
Browse	You can also drag objects directly from object browser to cells Drag + CTRL will drag all atoms
Atom	
Display	Bindings
Values	
Unit with value	Editable cell
Menu command	
- Range check	cing
Minimum	No value
Maximum	No check
Show alarm o	n
Background	Foreground

Adjust the table so it looks like the one shown in the figure below. The cells can be edited when you double-click them.

Object name	State/Value	Command/High Alarm
V1		
V2		
L0147		
C0147		
F0147		

4. Under Object name, type the texts in the **Object Name** column as shown below. Then click the **State/Value** cell for the V1 row, and select **Object value** under **Cell type**.

			G	irid Properties		? X
				Selected Cells Enviro	onment	
Object name	State/Value	Command/High Alarm				
V1	open			Background color	\	
V2				Foreground color	-	
L0147				Font	0, Arial	
C0147				Horizontal alignment	Left -	
F0147				Cell type	Object value 🔻	
				Object		
				V1@Global		-
				Browse	You can also drag objects di from object browser to cells	rectly
					Drag + CTRL will drag all ato	ms
			L	Atom	State 🔻	
			L	Display	Object value 🔻 Binding	JS
			L	Values		——— III
				Unit with value	Editable cell	
				Menu commands		
				Range checki	ing	
				Minimum	No va	
			L	Maximum	INO CI	теск
				Show alarm or	n	5
				Background	Foregrour	nd
				L		

- 5. Click Browse. The Object Browser dialog box appears.
- 6. Find the V1 object and click **Open/Select**.
- 7. Select **State** in the atom list.

- 8. Select the background check box in the Show alarm on group to display when the object is in alarm state.
- 9. Repeat these steps 4 to 8 for the Command/High Alarm column, but select Command in the list instead.
- Repeat the procedure for the remaining steps of the objects so that the table looks like the example shown in the figure below. (Select Actual Value and High Alarm for L0147 and F0147. For C0147 select Count. Remember to check the Unit with value and Show alarm boxes).

Object name	State/Value	Command/High Alarm
V1	open	close
V2	open	close
L0147	950	900
C0147	55 l/h	75 l/h
F0147	80 l/h	90 l/h

- **11.** Check and install the project.
- **12.** Start the project from the IGSS Master module.
- 13. Select Diagram \rightarrow KeyValues.
- 14. Click the icon at the left edge of the title bar of the **KeyValues** diagram. The system menu appears, select **Pin** in the menu.
- **15.** You can now browse through your project while keeping the **KeyValues** diagram on top.

Using Animated Symbols

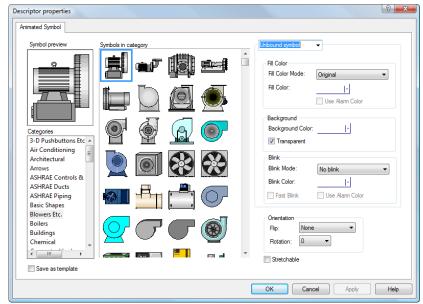
Purpose We now want to display the V2 valve using an Animated symbol.

To make an	Perform the following steps:
Animated Symbol	

2.

Step	Action
------	--------

- 1. Select View \rightarrow Drawing Toolbar to open the toolbar.
 - Find the symbol and click on it, then click the diagram where you want the symbol to be placed.
- **3.** A graphic for a blower appears.
- 4. Double-click the graphic and the page for **Animated Symbol** appears.



5. Use the scroll bar to scroll down to the category **Valves** and use the one in to top left corner.

Descriptor properties			? X
Animated Symbol			
Symbol preview	Symbols in category	Unbound symbol	
	III	Fill Color Fill Color Mode: Original	•
		Fill Color:	
Categories		Background Background Color: *	
Process Cooling Process Heating Pulp & Paper		Image: State St	
Pumps Safety Scales		Blink Mode: No blink Blink Color: Fast Blink Use Alarm Color	•
Segmented Pipes Sensors Tank Cutaways		Orientation	
Tanks Textures Valves		Flip: None Rotation: 0	
Save as template	`₩ ~ + >>	▼ Stretchable	
		OK Cancel Apply	Help

- 6. Click OK and the graphic appears on the diagram.
- 7. Right-click the symbol and select **Connect...**. The **Object Browser** appears.

8.	Click the + sign beside Global, then Digital and select VALVE in the Tree view
	and click the V2 valve in the right pane.

Object Browser (Lo	ocked by <menu: cor<="" th=""><th>nect descripto</th><th>or>)</th><th></th><th></th><th>? X</th></menu:>	nect descripto	or>)			? X
	rersion al Analog Counter Diagram Digital (None) AB-SWITCH DIALSUSPEND DIALSUSPEND DIALUP PROTECT Valve Graph	Object V1 V2 E	Area Globa Globa		ital	
Tree node filter s Criteria Area Type (in use) Template (Unused)	ettings	text criteria		e gram gram	_	t criteria viint List en / Select
Create new obje Area Glo Template Va Type Dig	bal Ive		<u>N</u> ame Description ✓ Name ▼ <u>V</u> alue	V2	iption ng sym <u>b</u> ol	<u>C</u> reate
Always on top	☑ <u>A</u> dvanced					Close

- 9. Click **Open/Select**. The Animated symbol is now connected to the V2 valve.
- 10. Go to the Animated Symbol tab.
- **11.** Make the following settings for the following groups: In alarm:
 - Set Fill Color Mode to Shaded
 - Check the Use Alarm Color check box
 - Set Blink Mode to Invisible

Closed:

- Set Fill Color Mode to Shaded
- Set Fill Color to blue

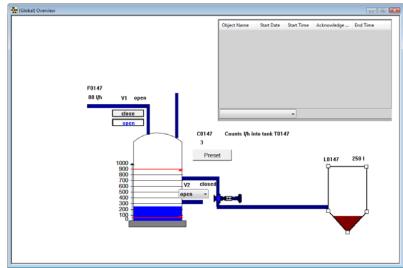
Open:

- Set Fill Color Mode to Shaded
- Set Fill Color to green

Orientation:

- Set Flip to Vertical
- Set Rotation to 90

12. Position the graphic as shown below.



13. Add the following line in your *.sim file:10 V2 1 1

This makes the animated symbol go into alarm state.

Place Your Favorite Graphics in the Library Toolbar

Purpose Let us imagine that you are creating a project for a plant that has numerous identical tanks, but they are placed on different process diagrams. The tank is drawn in an external drawing program, but instead of using the copy/paste function, we will place the graphic on the Library toolbar.

To use the Library Perform the following steps: toolbar

Step	Action
1.	Draw the tank in your favorite drawing program and export it or save it in one of the supported graphics formats. In the example we use the tank, tank- 2.emf, from the Demo project.
2.	Select View \rightarrow Library Toolbar to show the toolbar.

- **3.** Do the following:
 - Right-click the toolbar and select Add New Tool in the popup menu.
 - Select the picture and click graphic you created in step 1 and click **Open**, the path is **[IGSS installation path]**\Gssdemo\ENG. In Windows Vista the folder Gssdemo\ is located in the C:\ProgramData\[IGSS installation path] folder. The graphic appears on the toolbar.



Figure 3.96 In this dialog box you select the graphic you want to place on the Library toolbar. Check the **Show Preview** box to view the graphic.

- **4.** Do the following:
 - Right-click the graphic in the toolbar and select **Edit Tool Name** in the popup menu.
 - Type Tank 2 in the ensuing dialog box and click OK.



Figure 3.97 In this dialog box you type the name you want to show along with the graphic thumbnail on the Library toolbar.

5. Click the graphic in the toolbar and drag it onto the process diagram.

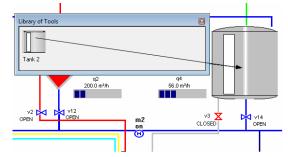


Figure 3.98 The tank has been dragged from the Library toolbar onto the process diagram. The tank can be reused any number of times you like.

Property Table View

View

Purpose Let us say that you have created a project and you find out that you need to change the nodes for all of the objects in one specific diagram. You can then go to the diagram open the Property Table View, and make the changes for all of the objects much faster than if you were to edit the properties for every single object.

To use the Perform the following steps: Property Table

Step Action

- 1. Go to the Overview_New diagram. Select Diagram \rightarrow Property Table View. The Property Table View appears.
- 2. Click the Atom level. The properties for the atoms are displayed in the right pane.

Overview	Sec.	Object name	Area	Atom	Defined	In	Out	Driver	Node	Data group	Word offset	Bit offset	External type	C
Objects Atoms	Fiter								1000000					
- Calculations	VI @ Global : Command	11	Globel	Command	Yes	No	Yes	7T3964R (00555tation1)	1	22	16	0	FP165	
- OPC items	VI @ Global : State	1/2	Outsel	Stata	Yes	Yes	No	7T3964R (005555tation1)	1	23	16	0	FP165	
Descriptors	V1 @ Global : Free Value	14	Glubal	Free Value	No	No	No	7T3964R (ISSSStation1)	1	0	0	0	FP185	
	V1 @ Global : Alarm-In	14	Gebal	Alarm-In	Yes	No	No	7T3964R (00555Ration1)	1	.0	. 0	9	FP165	
	VI @ Global : Alarm-Out	1/3	Clubal	Alarm-Out	Yes	No	No	7T3964R (00555Station1)	1	0	0	0	FP165	
	V2 @ Global : Command	V2	Glubal	Command	Yes	No	Yes	7T3964R (IGSSStation1)	1	22	17	0	FP185	
	V2 @ Global : State	12	Gebal	State	Yes	Yes	No	7T3964R (IDSSSRation1)	1	23	17	0	FP165	
	V2 @ Global : Free Value	92	Global	Free Value:	No	No	No	7T3964R (05555tation1)	1		0	0	FP165	
	V2 @ Global : Alarm-In	VZ	Glubal	Algerei-Dri	Yes	No	No	7T3964R (IGSSStation1)	1	0	0	0	FP185	
	V2 @ Global : Alarm-Out	12	Global	Alarm-Out	Yes	No	No	7T3964R (IOSSSRation2)	1	0	. 0	9	FP165	
	F0147 @ Global : High Alarm	F0147	Glidel	High Alarm	Ves	No	No	7T3964R (05555tation1)	1	0	0	0	FP165	
	F0147 @ Global : High Limit	F01.47	Gubal	High Limit	Yes	No	No	7T3964R (IGSSStation1)	1		0	0	FP165	

3. Click the Node column. Enter 0 for each object. The table should now look like the example below.

U Overview	The Constant of Co	Object name	Area	Atom	Defined	1n	Out	Driver	Node	Data group	Word offset	Bit offset	External type	C ·
Objects Atoms	Fiter													
- Calculations	V1 @ Global : Command	12	Globel	Command	Yes	No	Yes	7T3964R (00555tation1)	0	22	16	0	FP165	
- OPC items	VI @ Global : State	95	Outsi	Stata	Yes	Yes	No	7T3964R (05555tation1)	0	23	16	0	FP165	
Descriptors	V1 @ Global : Free Value	14	Glubal	Free Value	No	No	No	7T3964R (ISSSStation1)	0	0	0	0	FP185	
	V1 @ Global : Alarm-In	14	Gebal	Alern-In	Yes	No	No	7T3964R (00555Ration1)	0	0	. 0	0	FP165	
	VI @ Global : Alarm-Out	15	Glubal	Alarm-Out	Yes	No	No	7T3964R (05555tation1)	0	0	0	0	FP165	
	V2 @ Global : Command	¥2	Glubal	Command	Yes	No	Yes	7T3964R (ISSSStation1)	0	22	17	0	FP185	
	V2 @ Global : State	23	Gebal	State	Yes	Yes	No	7T3964R (005558ation1)	0	23	17	0	FP165	
	V2 @ Global : Free Value	92	Global	Free Value:	No	No	No	7T3964R (05555tation1)	0	0	0	0	FP165	
	V2 @ Global : Alarm-In	5 V2	Glubal	Algerei-In	Yes	No	No	7T3964R (ISSSStation1)	0	0	0	0	FP185	
	V2 @ Global : Alarm-Out	2/3	Gebal	Alarm-Out	Yes	No	No	7T3964R (005558ation1)	0	0	. 0	0	FP165	
	F0147 @ Global : High Alarm	F0147	Glidel	High Alarm	Yes	No	No	7T3964R (IGSSStation1)	0	0	0	0	FP165	
	F0147 @ Global : High Limit	F0147	Gubal	High Limit	Yes	No	No	7T3964R (IGSSStation1)	0		0	0	FP165	

Chapter 3: IGSS Types and Templates

About this	This chapter contains the following information:
chapter	• Definitions of the key IGSS object types
	• Examples of their typical use
	Detailed descriptions of each IGSS object type
	A description of IGSS templates
Contents	This chapter contains the following sections:
	Section A: IGSS Types
	Section B: IGSS Templates

Section A: IGSS Types

Overview

About this section This section contains the following information:

- Descriptions of each IGSS object type
- Descriptions of the most important object properties
- Descriptions of the dialogs used when defining new objects
- A visual guide highlighting the most important properties

Contents

What Is an IGSS Type?	100
The Area Object Type	.104
The Diagram Object Type	105
The Graph Object Type	.109
The Analog Object Type	.111
The Table Object Type	.116
The Counter Object Type	.119
The Digital Object Type	.121
The String Object Type	.122
The Scaling Object Type	.124
The Group Object Type	.125
Visual Guide to Object Types	.127

What Is an IGSS Type?

Definition An IGSS type is a predefined system object that ensures that you provide all the necessary information about each process component you define.

It reflects real life in the sense that different kinds of information are required for different types of objects. For example, for a motor you need to be able to start and stop it and know its maximum capacity. For a temperature gauge, you need to tell IGSS the temperature range you want to accept and the unit of measurement.

Use Each time you define a process component (an IGSS object), it must have the properties of one of the IGSS types. When the relevant type is selected, you are automatically guided through a definition sequence ensuring that you provide all the necessary information.

IGSS types

The following types are used in IGSS:

- Area
- Diagram
- Graph
- Analog
- Table
- Counter
- Digital
- String
- Scaling

Area, diagram and graph are non-process objects, that is, they do not represent a physical process component, but they are containers of other objects. The remaining object types represent process components, except scaling which is an internal object.

For a detailed description of each type, refer to the descriptions in this section.

Type versus
templateAs you can see, an IGSS type is a generic system object. When building projects you will often see that
many real life components are similar or share a number of properties: one type of valve may be closed, half
open and open, one type of level gauge may measure levels between zero and 1000 m³. To automate the
definition of such components, IGSS includes a facility to define your own templates when components are
identical or share several properties. A template holds all the information which is common to this set of
objects. Templates make it very fast to configure and to make several similar projects. For further
information about templates, refer to Section B of this chapter.

Defining a
process
componentWhen you define a process component, use the object wizard and you go through the following steps:NOTE:The Object Wizard is only used in this general definition of a process component, otherwise the
traditional way of defining a process component is used to give a better understanding of the settings you
make.

NOTE: This procedure applies to the standard object types: analog, digital, counter, table and string. Therefore except area, diagram, and graph, and special display types are not included. For specific information on a particular type, refer to the descriptions in this section. Most of the steps tabs described in the procedure are common to all object types. However, if you are using special display types, for example, bar display, the **Symbol Definition** tab will be replaced by a special tab for that display type.

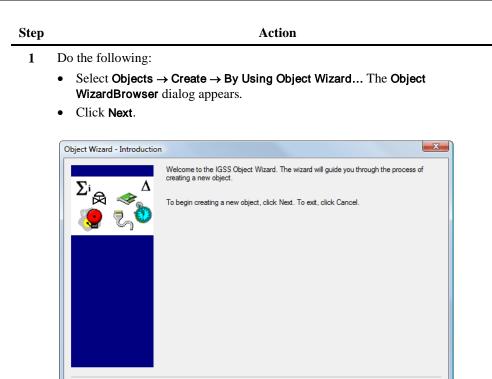


Figure 2.1 The welcome page of the object wizard

Finish

Cancel

2 In the next dialog you select the type of object you want to create, and give it a specific name.

Next >

< Back

Click Next.

Object Wizard - Selection of object type			
	Which type of object do you want to create ?		
	< Back Next > Finish Cancel		

Figure 2.2 In this dialog you select the type of object you want to use and give it specific name.

3 In this dialog you specify the PLC address(es) where the data for this component is available or to which data must be written. It can be located on the **Edit Mapping** tab in the object property dialog.

Click Next.

Object Wizard - Step 1 of 6 - Temperature						
	Which atoms and driver should be set up for this object ?					
🖻 🐟	Task 1: Select atoms	Task 2: Select driver				
7	Atom	Driver				
<u> </u>	✓ High Alarm	▲ Driver 7T3964R (IGSSStar ▼				
	☐ High Limit ☑ Actual Value	≡ Node 0 -				
	Set Point					
	Low Limit	Task 3: For each atom being sent out to or being received from the				
	Alam-In	PLC, a specific address must be keyed in.				
(□ I/O mode for local	Click the button below.				
An atom is a single I/O point ortag which can be set up for an object.		Driver specific addressing				
	< Back Next >	Finish Cancel				

Figure 2.3 In this dialog you specify the PLC address(es).

4 In this dialog you specify the value range, the actual value, the set point and the alarm texts. In the object property dialog the entered values and alarm texts can be located on the **Edit Mapping** tab and the **type-specific** tab (in this example the **Analog** tab.).

Click Next.

Object Wizard - Step 2 of 6 - Temperature						
	Define a range of What should the What should the	0				
Each alarm atom in the list below must be bound to an alarm text. Alarm Alarm Text Value High Alarm 335 : Overflow Started 9000.000000 Low Alarm 333 : Minimum water level 1000.000000						
Click on (unspecified) to select a text or to create a new one. Each alarm atom must also be associated with an alarm limit under Value. Left click or default number to key in a new number. What should the actual value be ?						
	What should the s		4500 Cancel			

Figure 2.4 In this dialog you set the values and the alarm texts.

5 In this dialog you specify the scan interval. It can be located on the **Data** Management Definition tab in the object property dialog.

Click Next.

Object Wizard - Step 3 of 6 -	Temperature	×
	How often should this object be scanned for changes ?	
	 No scanning Every 2000 milliseconds Every 5000 milliseconds 	
	Every 10000 milliseconds	
	Every 30000 milliseconds	
	< Back Next > Finish Cancel	

Figure 2.5 In this dialog you specify the scan interval.

6 In this dialog you specify the base interval. It can be located on the **Data** Management Definition tab in the object property dialog.

Click Next.

Object Wizard - Step 4 of 6	- Temperature	×
	Task 1: What should the time interval between data reduction be for the object $? % \left({{\left({{{\rm{T}}_{\rm{s}}} \right)}_{\rm{s}}} \right)$	
Σi	 No data reduction 2 minutes 5 minutes 30 minutes 30 minutes Task 2: Which data reduction method do you want to use ? Average Minimum Maximum Sum Actual Change Difference	
	< Back Next > Finish Cancel	

Figure 2.6 In this dialog you specify the base interval.

7 In this dialog you specify the log settings. It can be located on the Data Management Definition tab in the object property dialog.

Click Next.

Object Wizard - Step 5 of 6 -	Temperature	x
	How should changes in object value be logged ?	
Log	 No logging All changes All values Log only changes above 1 % Log only changes above 2 % Log only changes above 5 % Log only changes above 10 % Log outgoing commands Options Use the following: Log to SQL database Log to printer 	
	<pre></pre>	

Figure 2.7 In this dialog you specify the log settings.

8 In this dialog you specify the symbol you want to use for the process component and what to display with the symbol. It can be located on the **Symbol Definition** tab and the **Display** in the object property dialog.

 $Click \ \textbf{Finish}.$

Object Wizard - Step 6 of 6	- Temperature				
q12 5500 m3∦nr ⊮a_12 ♦ 011	How should the object be displayed on the mimic ? Image: Show the object's name Image: Show the object's state/value Image: Which color do you want to use on the symbol ? Image: Which symbol table and which symbol do you want to use ?				
	GRAPH TABLE PID Graph Table				
	Rotate symbol Odegree Click Finish to complete the creation of this object. Click Cancel to exit. Click Show Properties to complete and then show all properties for this object (for advanced users).				
< Back Finish Show Properties Cancel					

Figure 2.8 In this dialog you select the symbol and specify what to display.

9 Position the object symbol and caption on the diagram.

The Area Object Type

Definition	An area is a collection of diagrams, graphs and objects that belong together.
Use	Typically an area is used to depict a production line or a separate section of the process. If the process cannot be seen as divided into sections, only one area is used.
Global area	IGSS includes a default area called Global. Everything that is defined in this area is global to the entire

project and may be used in any other area. Therefore, it is always a good idea to define templates and
scaling objects in this area. For a description of how you define these objects, refer to "Define Scaling
Objects and Templates" in Chapter 3.

User-defined When building your own projects, you need to define your own areas. There are a few things to remember when defining your own areas:

- Give the area a unique and descriptive name so that it is easily recognised in the Area menu.
- All objects defined in a user-defined area are not available in other areas. If you know that a particular object will only be used in one particular area, define it there to limit the number of global objects.

Area menu The Area menu contains all available areas provided that the Name to Menu option is selected for each area (see below). These areas are selected by the operator in the Area menu of Supervise.

Defining an area object	Step			Action	
	1	Select Area → (Create. The New	Area Properties dialog appea	urs.
		ĺ	New Area Properties	? <mark>×</mark>	
			Definition of New Area	1	
			Name	MyOwnArea	
			Description	Optional description	
			Default Node	0 Vame to Menu	
			Default Driver	7T3964R (IGSSStation 1)	
			Protection :	(Unused) 👻	

Figure 2.9 In the **New Area Properties** dialog give the area a unique name and select the **Name to Menu** option to show the name in the **Area** menu.

Cancel

2 Type a unique name and select the **Name to Menu** option to show the area name in the **Area** menu.

OK

- **3** If required, enter a default node number and select a default PLC driver. *NOTE:* The default node and driver are automatically suggested for all objects you create in this area.
- 4 Optionally, attach a **Protect** object to protect the area against unauthorized access.

NOTE: For further information about user administration, refer to the Help function of **User Administration**.

For further details about areas, search for "areas" in the Definition Help file.

The Diagram Object Type

Definition A diagram provides a graphical view of a section of the monitored process. A diagram typically consists of a static background picture, a number of static process objects and connectors and, most importantly, the dynamic process components represented as symbols. A process diagram is often called a mimic diagram.
 Use A diagram defined in Definition is exactly the same diagram that the operator sees during supervision. Depending on the complexity of the process, an area may contain a number of diagrams each representing a section of the process. A diagram gives the operator a quick overview of the monitored process and clear visual indication if there are any alarms.

Diagram background	In older versions of IGSS, the background picture of a diagram was made in an external drawing application in either bitmap (*.bmp) or Windows metafile (*.wmf) format. This option is still available, but many new graphics formats are supported, for example, Enhanced Metafile (*.emf) and Graphics Interchange Format (*.gif).			
	drawing a then be fr	also use a background color and build the diagram from scratch. You may still need an external application to create static components, such as tanks, containers, etc. but these components can eely positioned and resized on the diagram. You can easily draw the connectors between nts using the Drawing toolbar.		
Diagram menu	The Diagram menu shows all available diagrams in the current area provided that the Name to Menu option is selected for each diagram. A checkmark beside the diagram name means that the diagram is open. These diagrams are selected by the operator from the Diagram menu of Supervise .			
Defining a diagram	To define a diagram:			
	Step	Action		
	1	Select Diagram \rightarrow Create .		
	2	Define how you want to display the diagram (see " <i>The Definition of New Diagram tab</i> " below).		

3 Assign function keys to the most commonly used operations (see "*The Function Key Assignment tab*" below).

The Definition of New Diagram tab

The figure below shows the **Definition of New Diagram** tab.

lew Diagram Properties				
Definition of New Diagram Function Key Assignment				
Name MyOwnDiagram Description	Diagram Type Standard diagram Reusable diagram			
Vindow Properties Caption Name O Description	Control group:			
Itile bar Name to menu System menu Keep window Minimize If Function keys Maximize Status bar Innable To pottal Keep aspect ratio Popup Placement in Pixels Top Left 0 Top Width 1154 Height Default Size	Background Preview Picture Conrect to : (Unused)			
Define Views	Controlling Object			
Create Edit Delete User defined entries for command menu Use pipe (1) to delimit multiple menu entries Use semicolon (1) to delimit multiple commands Prefix [soc] to display xxx in the command menu otherwise text up till first space is used in parameter list \$0 will be substituted with object name and \$A with area				
	K Annuler Aide			

Figure 2.10 On this tab you specify the name of the diagram, include a background picture or color and select various display options.

This tab contains the following important object properties:

Property	Description
Name	Enter a unique and descriptive name.
Name to Menu	Select this option if you want to show the diagram name in the Diagram menu.

Background	Select Picture to include a background picture from an external drawing application. Select Color to include a background color.
Diagram Type	Select reusable diagram if you want to create multiple diagrams that are identical with the exception of the underlying process components. All the underlying process components will be created as a group in the project. <i>NOTE:</i> For further information about the group object refer to the <i>"The Group Object Type"</i> section.
Miscellaneous display options	Select the diagram window elements you want to show, for example, Title Bar and Status Bar .

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

The Function Key	The figure below shows the Function Key Assignment tab.
Assignment tab	New Discourse Documentian

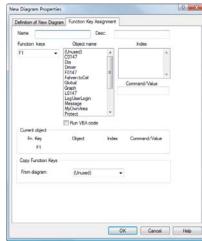


Figure 2.11 On this tab you assign function keys to the most frequently used operations.

This tab contains the following important object properties:

Property	Description
Function Keys	Select the function key to which you want to assign an operation. <i>NOTE:</i> By default, F1 is used to access Help, but you can overwrite it, if required.
Object Name	Select the object that you want the function key to operate on.
Index	Select the atom you want the function key to activate, for example, HA (High Alarm) for an analog object.
Command/Value	Select the command you want to execute or the value you want to assign to the object when the key is pressed.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.



The figure below shows an example of a diagram window:

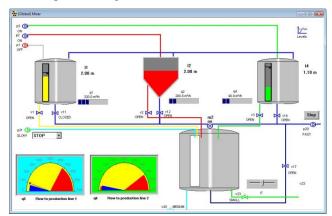


Figure 2.12 The diagram window shows a section of the monitored process.

OLE-embedded diagrams You can also embed an OLE object as a diagram. This is useful, if you want the operator to open an external application simply by choosing that diagram. When the OLE-embedded diagram is opened, all the functionality of the server application is available.

For further information, search for "OLE-embedded diagrams" in the Definition Help file.

The Graph Object Type

Definition	A graph is a graphical chart showing the value or state of one or more process components. The data source for a graph can be either log files (*.log) or base class files (*.bcl). A graph can show historical data, curred data or a combination of both.	
Use	Use a graph to achieve the following:	
	• a graphical overview of the values and states of related process components	
	• detect adverse trends at an early stage	
Three types of	There are three types of graphs:	
graphs	• A <i>predefined graph</i> is a graph defined by the system designer which the operator can access from the Graph menu or by clicking on a symbol representing the graph. Most of the graph properties cannot be changed by the operator during supervision, but he can change certain layout properties.	;
	 A dynamic graph is a graph created on-the-fly by the operator during supervision. The operator simply selects the IGSS objects to include in the graph and then selects Graph → Create Dynamic Graph. This function is very useful, if the operator wants to monitor a specific process component before and after a intervention. A dynamic graph can be saved as a user-defined graph (*.usr). When re-opened, the graph will be dynamically updated. 	an
	• A <i>static graph</i> is a snapshot of a predefined or a dynamic graph that the operator wants to save for documentation purposes. A static graph can be saved as a graph file (*.gph). When re-opened, the grap can be shown, but not updated.	h
Export to CSV	The graph values can be exported to a comma-separated values (.csv) file. The values can then be further processed in another program, for example, MS Excel.	
Graph menu	The Graph menu shows all available graphs in the currently selected diagram provided that the Name to Menu option is selected for each graph. A checkmark beside the graph name means it is open.	
Defining a graph object	Step Action	
	1 Select Graph \rightarrow Create.	
	2 Define how you want to display the graph (see " <i>The Definition of New Graph dialog</i> " below).	

- 3 Define the graph properties (see *"The Define Graph Parameters dialog"* below).
- 4 Scale and position the resulting graph window.

The Definition of In this dialog you assign the name and description to the graph and define the window elements you want on the graph window.

Name Desc	MyOwnGraph	Caption Name Description	
	Aes Title Bar System Menu	Name to Menu	Protection :
	Minimize Maximize Pinable	V Horiz Scrot Bar V Status Bar Popup	Connect To :
			OK Caricel

Figure 2.13 In this dialog you assign the name and description to the graph and define the window elements you want on the graph window.

This dialog contains the following important object properties:

Property	Description
Name	Type a unique and descriptive name.
Name to Menu	Check this box to show the graph name in the Graph menu.
Miscellaneous display options	Select the graph window elements you want to show, for example, Title Bar and Status Bar.

The Define Graph Parameters dialog

The figure below shows the Define Graph Parameters dialog.

Name		My	OwnGra	ph	Descriptio	n							
Autostart Start offset Window period X-divisions	DD HH MM 0 0 0 0 1 0	۲	urce LOG BCL		Start Pro	y	on O Min O Sec	Time Resolut 2000 5000 Automatic	ion () 100 () 300 In Millie	000		gend Show Deta Show Desi	
Object name			Ato	m	Reduct	ion	Y-max	Y-min	Y•div.	Y-axis	Smc Wide	ioth Patt.	Color
L0147		•	PV	•		-	1000	0	10	V		v -	
F0147		•	PV	•		-	100	0	10	V		v -	
T0147		•	1	•		-	100	0	10	V		v -	
(Unused)		•				-				V			
(Unused)		•				-				V		v -	
(Unused)		•				-				V		v -	
(Unused)		•				-				V		v -	
(Unused)		•				-				V		v -	
(Unused)		•				-				1		v -	
(Unused)		•				-				V		-	
Background Co		Windo		axis	Ruler		Grid				ОК		Cancel

Figure 2.14 In this dialog you define which objects you want to represent in the graph, the scaling of the axes, colors and various other properties.

The dialog			

Property	Description
Start offset	Specify the offset from the current time with which you want the graph to start.
Source	Choose either *.log files or *.bcl files as the data source for the graph.
Object Name	Select the name of the object you want to show in the graph.
Atom (log data only)	Select the name of the object atom you want to show, for example, PV for the process value of an analog object.
Reduction (BCL data only)	Select the relevant reduction method, for example, MV to show the average value.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

The graph window The figure below shows an example of a graph window.

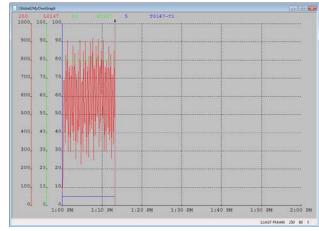


Figure 2.15 The graph window shows values or states of multiple process components.

The Analog Object Type

Definition An analog type in the IGSS system is used to represent a process component that can take on any value within a specified range. Analog objects can include two sets of alarm limits and a set point.

Use

The following examples show what analog objects may be used for:

- a level gauge measuring the contents of a tank in litres. When the tank is empty, it contains 0 litres and when full it holds 520 litres. This would mean that the analog IGSS object would have a specified range of 0 to, for example, 550 litres.
- a temperature gauge measuring room temperature within the limits -5 to 35 °C (used in the following example).

Defining an analog object

To define an analog object:

NOTE: The following procedure describes how you define an analog object using standard symbols. You may want to use alternative display types, for example, a bar display or a circular display. For further information, search for "*bar displays*" or "*circular displays*" in the **Definition** Help file.

Step Action

- 1 Select Objects \rightarrow Analog Elements. The Object Browser dialog appears.
- 2 Type a unique name and an optional description, select the area Global in the **Tree-view**, and then click **Create**. The analog object properties dialog appears.
- **3** Specify the measuring range, low and high alarm limits, number of decimals, etc. (see "*The Analog tab*" below).
- 4 Specify how you want to collect and log your data (see "*The Data Management Definitions tab*" below).
- 5 Specify what you want to show along with the symbol of the process component (see "*The Display tab*" below).
- 6 Specify the PLC address of the process component and attach alarm texts (see *"The Edit Mapping tab"* below).
- 7 Choose the symbol you want to represent the process component (see "*The Symbol Definition tab*" below) and click **OK**. The object symbol and caption appear.
- 8 Position the object symbol and caption on the diagram.

The Analog tab The figure below shows the **Analog** tab:

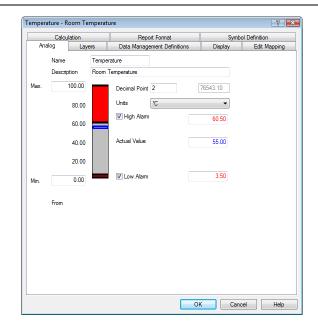


Figure 2.16 On this tab you specify the measuring range, the desired process value, unit of measurement, the number of decimals and alarm limits.

This tab contains the following important object properties:

Property	Description
Alarm limits	An analog object has two built-in sets of alarm limits expressing varying degrees of seriousness that may be used if relevant - or disabled if not required.
	Alarm supervision is enabled simply by checking the box next to the desired limit. When enabled, an alarm is generated and shown in the Alarm List during supervision when the actual value exceeds or goes below the limit.
	<i>TIP:</i> You can easily enable or disable the individual limits on the Edit Mapping tab.
Actual value	In this box you can type an initial process value. The value will, of course, be updated dynamically during supervision; the value defined in Definition is overwritten as soon as the data collection is started.
Set point	The set point is the desired process value, the value according to which the process value is calibrated.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

 Data Management
 The figure below shows the Data Management Definitions tab:

 Definitions tab
 Temperature - Room Temperature

Temperature - R	Room Tempera	ture				? 🔀
Calcu	ulation		Report Format		Symbo	ol Definition
Analog	Layers	Data Ma	anagement Definiti	ons	Display	Edit Mapping
Scan interva	l		Logging			
◎ 2000	100 100	00	All change	s	> 1 %	
	0		All values		○ > 2 %	
5000	300	00	None		> 5 %	
					> 10 %	
None	In millis	ecs.	Log outgo	ing com	mands	
			Log to SQ	L Datab	ase	
- Base interva		Data reducti	ion	Trar	sfer to history	5
© 2	© 10	Average		R	educed value	
02	010	Minimum		O A	ctual total value	
0 5	30	Maximum Sum		© ld	ealized total value	
0.	0	Actual		© N	one	
None	In mins.	Change			each data	
		Difference	e		iction method	
Log to prin	iter	Alarm delav	0	~	Delete	
Protection	Safe com		Scale as		nnect to	
(Unused)	 (None) 	•	(Unused)		nused)	-
	entries for com	and menu			-7	
	a chance for collin	and mond				
Use size (0	to delimit multiple					_
	to delimit multiple lon (;) to delimit r					
			menu otherwise te:	d up till f	irst space is used	
In paramete	r list \$0 will be su	ubstituted with	n object name and	\$A with	area	
				OF	Cano	el Help
				01		

Figure 2.17 On this tab you specify how you want to collect and log data.

This tab contains the following important object properties:

Property	Description
Scan interval	Decides how often IGSS scans the component address in the PLC (the address itself is given on the Edit Mapping tab). In this example, the temperature does not change very rapidly, so a scan interval of 30 seconds (30,000 msec) is selected. Note that if you are using event-oriented communication, you must select None .
Logging	With the logging buttons, you decide whether you would like the system to save the values that are scanned with 30-second intervals for this component in the log files. You only need to select logging for the process components for which you want to log historical data (for example, to be used in graphs). If you do not need logged data for a particular component, select None . Note that the buttons have a percentage next to them. If you click > 10 % , the system will log all changes that are larger than 10 %.
Base interval	Defines how often the system reduces the scanned values to one value with the purpose of calculating statistics on the measured values. In this example, a base interval of 10 minutes is used which means that every 10 minutes, the system will reduce the up to 20 values (with a scan interval of 30 seconds) to one value. This reduced, statistically calculated value is subsequently used in the operational reports.
Data reduction	Defines how the data is reduced to one value according to the Scan interval and Base interval settings. By clicking one or more boxes in the Data reduction group, you select which method the system is to reduce by: calculate an average, save the smallest or the largest value in the 10-minute interval (Min and Max), calculate the sum of the values in the 10-minute interval, save the latest value (Actual) or save the number of times the process component has changed state (Change). Which method you choose will depend on the nature of the component. For a temperature measurement, Average is frequently selected.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

Display tab The figure below shows the **Display** tab:

Calculation		Report F	Symbo	Definition		
Analog Layers		Data Manageme	ent Definitions	Display	Edit Mapping	
Object Name :	Tempe	erature				
Show						
Name		State / Value				
Enable		Enable				
Align		Align	Units			
Left		C Left		Timestamp		
Rig	ht	Right	Table			
Description	n	Atom Ad	ctual Value	•		
Atoms in C	OPC Server	Format D	ecimal	•		
		Prefix Zero	Prefix For	mat info		
		Field width	13			
Font			_			
Current:	System			Change Font		
Symbol	Aami	ndication				
Selectable	V 0	n Symbol 📃 N	o display in referen	cing diagram		
	0 🗐	n Name				
	0	n Value				

Figure 2.18 On this tab you specify what you want to show along with the symbol of the process component.

This tab contains the following important object properties:

Property	Description
Show	Check the relevant items you want to display on the diagram.
Symbol selectable	Check this box to allow the operator to select the object symbol on process diagrams.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

Edit Mapping tab On this tab you specify the PLC address of the process component and attach alarm text(s). Note that a full PLC address consists of a node number, a data group, a word offset and a bit offset. The figure below shows the **Edit Mapping** tab:

nperature - Ro	oom Temperat	ure			?
Calcul	ation	Report Format		Symbo	ol Definition
Analog	Layers	Data Management Definition	ons	Display	Edit Mapping
Atom		PLC Node fo	r object: Te	emperature	
🖌 High Alarm		 Driver ; 			-
High Limit					
Actual Value	Je	Node :	0		-
Set Point					
Low Limit		PLC Address	for Actual	Value atom:	
Alam-In		-			
		Data Group	0		
I/O mode :	local	•			
		Word Offset	: 0		
Alarm Details		Word Onacc			
					1000
102 : How e	exceeds high ala	m Bit Offset :	0		* *
		External Typ	e:		-
New	Edit	Delete			
INCH	Luit		+/- to scroll	to next/previo	us atom
		(ОК	Canc	el Help

Figure 2.19 On this tab you specify the PLC address of the process component.

This tab contains the following important object properties:

Property	Description
Configure atom	Select the atom to which you want to assign a PLC address or an alarm text. The number of atoms listed depends on your selections on the Analog tab.
I/O mode	Select the relevant input/output mode in the drop-down list. In addition to an actual value (Actual Value), this object has also been configured with two sets of alarm limits and a set point; as this tab reflects the decisions made on the Analog tab, six atoms are listed. However, only one address needs to be entered, namely for the actual value. This is due to the fact that the limits (high alarm, high limit, low alarm and low limit) and the set point are all local to the PC system. Other possibilities for the limits and the set point are: in , out or in/out in which case PLC addresses should also be given for these values. Normally, though, local is preferred.
Alarm Details	Either attach an existing alarm text by selecting it in the drop-down list or create a new one by clicking New and then define the alarm text properties in the ensuing dialog. An alarm number must be given for each alarm limit with alarm supervision enabled on the Analog tab. To edit an alarm text, select it in the drop-down list, click Edit and change the alarm text properties, as required. <i>TIP:</i> You can also create and edit alarm texts by selecting Edit \rightarrow Alarm Details .
Driver	Select the relevant PLC driver. The list of drivers corresponds to the drivers included in the active driver profile. The drivers are configured in Driver Setup. <i>TIP:</i> You can select a default driver in the Area Properties dialog.
Node	Enter the relevant node number to identify the PLC. Each PLC has a unique number. When there is only one PLC, node number 0 is default. <i>TIP:</i> You can select a default node in the Area Properties dialog.
Data Group	Enter the relevant data group. This setting identifies a section (data group) of the memory layout of the PLC which consists of a number of units or blocks of words (16 bit each).
Word Offset	Enter the relevant word offset. This setting identifies the precise word within the data group. In this example, data for the temperature measurement is read from PLC number 0 , from data group number 20 and from word number 16 within that block. <i>NOTE:</i> The system will always write one data word (that is, 16 bits) at a time. The sending of a command means that the 16 bits are sent to the PLC, even if only one or two bits have been defined as command bits.
Bit Offset	Enter the relevant bit offset. This setting identifies the precise bit within the word of the data group.
External Type	The last bit of information the system needs is the external data type in the PLC. Clicking the field will open a list of the data types available for the selected PLC driver. In this example, FP16 (Fixed Point 16 bit) is selected. Please refer to the relevant driver manual for details. The external types are enabled or disabled in Driver Setup.

NOTE: Dependent on the PLC driver used, the text labels of the **Data Group**, **Word Offset** and **Bit Offset** fields may be replaced by driver-specific terminology. However, if you want to show the default terminology, hold down CTRL while you select the driver name.

For further details about driver configuration, refer to the Driver Setup Help file.

For further details about alarm texts, search for "alarm texts" in the **Definition** Help file.

Symbol Definition	The figure below shows the	Symbol Definition tab:
tab		Temperature - Room Temperature

	Layers	Data Management [Definitions	Display	Edit Mappin
Calcu	lation	Report Form	at	Symbo	l Definition
Symbol prop	erties		Template	inheritance	
Rotate sym	loc	0 degree 🔻			
Mirror symbo			Copy	Symbols from Ten	plate
Aake symbo			Cop	y symbols to temp	ate
Choose sym	bol color	-	- Digital sta	ate for symbol	
Symbol di	splay				
No b					
		r and background			
		r and secondary color			
-	id flash				
	ary color	ы.			
Backgrou	nd for neutral syr	mbol			
Backgrou		nbol -			
V Tran	sparent				
Tran	bol				
Tran	bol		J J	Edit Symbo	
Tran	bol		〕 	Edit Symbo	
Tran	bol		•	Edit Symbo	
Tran Choose sym Symbol tabl	bol e Analog ek	ements	•	۱۳	
-	bol e Analog ek		▼ € Logger		L

Figure 2.20 On this tab you select the symbol you want to represent the process component.

This tab contains the following important object properties:

Property	Description
Symbol color	Select the color of the symbol.
Symbol angle	Select an angle if you want to rotate the selected symbol.
Symbol table	Select one of the symbol tables from the drop-down list. The table names can be edited in Symbol Editor. <i>NOTE:</i> IGSS automatically selects the relevant symbol table for the object type you are currently defining.
Symbol preview	Select the symbol you want to use. This field shows the symbols of the currently selected symbol table.

For an explanation of the individual items in the dialog, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

The Table Object Type

Definition

A table object, as is the case for an analog object, is used to represent a process component that can take on any value within a specified range. However, a single table object may be used for up to ten analog objects that belong together in some way.

Use		owing examples show what table objects may be used for:
	would	erature gauges placed at different levels in a tank. Being placed at different levels, the gauges d probably give different measurements but it would still be interesting to see their values
	• the or	xygen uptake in a tank monitored at four different locations (used in the following example).
When do I use a	You shou	uld use a table object:
able object?	• when	you have multiple analog objects that logically belong together and
	• share	the same measuring range, alarm limits and alarm texts
Inheriting alarm limits	creating a connecte	object has no alarm limits and hence no alarm supervision. However, this may be avoided by an analog object that defines the alarm limits for the table object. The analog object is then d to the table object by selecting the name of the analog object in the Connect To drop-down list of Management Definitions tab.
	For furth	er details about inheriting alarm limits, search for "table objects" in the Definition Help file.
Defining a table object	To define	e a table object:
	Step	Action
	1	Select Objects \rightarrow Tables (Regulator). The Object Browser dialog appears.
	2	Type a unique name and an optional description, select the Global area in the Tree-view , then click Create . The table object properties dialog appears.
	3	Specify the constituent analog objects, a minimum and a maximum value, the number of decimals and measuring unit (see " <i>The Table tab</i> " below).
	4	Specify how you want to collect and log your data (see "The Data Management Definitions tab" below).
	5	Specify what you want to display along with the symbol of the process component (see " <i>The Display tab</i> " below).
	6	Specify the PLC address of the table object (see " <i>The Edit Mapping tab</i> " below).
	7	Choose the symbol you want to represent the table object (see " <i>The Symbol Definition tab</i> " below) and click OK . The object symbol and caption appear.

8 Position the object symbol and caption on the diagram.

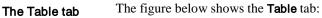


Table L	ayers	Data Management Definitions	Display	Edit Mapping	Report Format	Symbol Definition
Name	0	xyUptake		Type Fixed	Table	
Description 0		xygen uptake rate bio. left	 Float Table 			
1	Name	Va	alue			
01			7.00	7654321.		
o2			6.00			
o3			9.00	Decimal Poir		
o4			2.00		1 -	
				Units		•
				Minimum val	ue	0
				Maximum va	lue	100.00
From						

Figure 2.21 On this tab you specify the constituent analog objects, a minimum and a maximum value, the number of decimals and measuring unit.

This tab contains the following important object properties:

Property	Description
Name/Value	In this example, the oxygen uptake in a tank is monitored at four different locations and the results are shown in a table as the values o1 , o2 , o3 and o4 .
Туре	The values in the table are presented as fixed values with a fixed number of decimals (Fixed Table).
	You may choose to have the values in the table represented as floating points instead (Float Table) in which case the values would be represented as, for example, 7.00000e+000 .
Decimal Point	Type the desired number of decimals in the box.
Minimum value	Enter a minimum value for the object.
Maximum value	Enter a maximum value for the object.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

The Data Management Definitions tab	On this tab you specify how you want to collect and log data. This tab is identical to the one for analog objects. In this example, we have chosen to scan every 30 seconds (the oxygen uptake does not change suddenly) and to save all scanned values in the system's log files. Statistics - in the form of an average value - is calculated every 10 minutes.
	For further information about this tab, refer to the "The Analog Object Type" section.
The Display tab	On this tab you specify what you want show to along with the symbol of the process component. The tab is identical to the one for analog objects.
	For further information about this tab, refer to the "The Analog Object Type" section.
The Edit Mapping tab	On this tab you specify the PLC address of the table object. Note that a full PLC address consists of a node number, a data group, a word offset and a bit offset.
	Note also that an external data type must be selected so that the system knows the PLC format of the process value.
	<i>NOTE:</i> Although a table object can handle up to ten process values, only one address is given. This is because the system assumes that the values have consecutive PLC addresses.

For further information about this tab, refer to the "The Analog Object Type" section.

The Symbol
Definition tabOn this tab you select the symbol you want to represent the process component. This tab is identical to the
one for analog objects, except for the available symbols.
NOTE: IGSS automatically selects the relevant symbol table for the object type you are currently defining,
but you are free to choose one of the other symbol tables.
For further information about this tab, refer to the *"The Analog Object Type"* section.

The Counter Object Type

Definition

A counter object is actually a variation on the standard analog type. Similar to the analog type, a counter object may take on any value up to a given maximum. Unlike the analog object type, though, a counter object has only one alarm limit. The operator can issue four commands to a counter object: start, stop, reset and preset.

Use A counter object is typically used for counting hours of operation of, for example, a motor to ensure that maintenance is performed on time. This use would imply that the PLC program would start the counter when the motor starts and stop it when the motor stops.

Defining a counter Step Action object 1 Select Objects \rightarrow Rectangular Field. The Object Browser dialog appears. NOTE: A counter object is frequently made as a click-sensitive area, that is, an area on the screen merely displaying the name and the value. Hour-count 98 hours When you define a rectangular field, you get a rectangle that you can freely position and resize. 2 In the **Tree-view** open the Global area, select **Counter**, type a unique name and an optional description, then click Create. The counter object properties dialog appears. 3 Type the alarm limit value and enable alarm supervision and type the preset and maximum values (see "The Counter tab" below). 4 Specify how you want to collect and log your data (see "The Data Management Definitions tab" below). 5 Specify what you want to show along with the symbol of the counter object (see "The Display tab" below). Specify the PLC address of the counter object and attach the alarm text (see 6 "The Edit Mapping tab" below). 7 Choose the symbol you want to represent the counter object (see "The Symbol Definition tab" below) and click **OK**. The object symbol and caption appear. 8 Position the counter object symbol and caption on the diagram.

The Counter tab The figure below shows the Counter tab:

Counter	Layers	Data Managem	ent Definitions	Display	Edit Mapping	Report Format	Symbol Definiti
Name	[Hour-count					
Desc. Units		hours	•				
Units	l	nouis	•				
Decima	l Point	0					
	t count		98	Start			
V Lim	it value		70	Stop			
	um value		35 105	 Reset Preset 			
MGAIN			100				

Figure 2.22 On this tab you specify the preset and maximum values and whether you want to enable alarm supervision.

This tab contains the following important object properties:

Property	Description
Limit	Check this box to enable alarm supervision so that an alarm will be generated when the limit value is exceeded.
Preset value	Enter the value you want to insert when the operator issues the Preset command.
Maximum value	Enter the maximum value for this object.

NOTE: Seen from the point of view of the system designer, pressing any of the four option buttons corresponds to sending a specific bit combination to the PLC. The bit combinations for the four buttons are:

Start	1000
Stop	1001
Reset	1010
Preset	1011

The Data Management Definitions tab
On this tab you specify how you want to collect and log data. This tab is identical to the one for analog objects. In this example, we have chosen to scan every 30 seconds (the motor does not start every other second) and we have chosen not to log (None) as we have no wish to see the counter object's historical values. We do, however, want to see the object values in the system's operational reports and therefore we have told the system to save the process value every half hour (Base interval = 30 and Data reduction = Actual).
The Display tab
On this tab you specify what you want to show along with the symbol of the counter object. The tab is identical to the one for analog objects.

For further information about this tab, refer to the "The Analog Object Type" section.

The Edit Mapping
tabOn this tab you specify the PLC addresses of the counter object and attach the alarm text for the alarm limit.
Note that a full PLC address consists of a node number, a data group, a word offset and a bit offset. The
figure below shows the Edit Mapping tab.

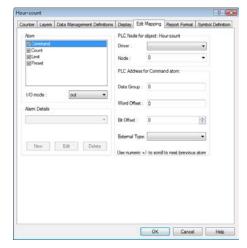


Figure 2.23 On this tab you specify the PLC addresses of the counter object.

A counter object contains the following atoms:

Select this atom	and type the following:
Command	the address for the start/stop command that the operator can issue.
Count	the address where IGSS can read the current counter value.
Limit	In this example, we have chosen to use a local alarm limit, that is, an alarm limit that exists only in IGSS and has no connection to the PLC. You must also attach an alarm text for the counter alarm limit.
Preset	the address to which the preset value is to be sent to when changed by the operator.

Note also that an external data type must be selected so that the system knows the PLC format of the process value. In this example, select **Counter**.

NOTE: For each individual atom (**Command**, **Count**, **Limit** and **Preset**), you can choose I/O mode, that is, whether the system is to read from and/or write to an address in the PLC (**i/o**, **in**, **out**) or whether the value is to be internal in the system only (**local**).

The Symbol Definition tab

On this tab you select the symbol you want to represent the counter object. This tab is identical to the one for analog objects, except for the available symbols.

NOTE: IGSS automatically selects the relevant symbol table for the object type you are currently defining, but you are free to choose one of the other symbol tables.

For further information about this tab, refer to the "The Analog Object Type" section.

The Digital Object Type

Definition	A digital type is used to represent a process component that can take on a finite number of states and commands. The operator can issue these commands to change the state of the process component. Usually, digital objects are based on digital templates which offer several advantages compared to standard digital objects.
Use	Typical uses of digital objects are as follows:
	• a valve that can be either open or closed
	• a motor that can be started, stopped and run at different speeds
The standard digital type	In its most simple form, the IGSS digital type has two states: 0 and 1 and two commands also called 0 and 1 . The figure below shows the Change State tab of the object properties dialog of a standard digital object.

ata manayeme	nt Definitions	Display	Edit Mapping	Calculation	Report Format	Symbol Definition
Change State	Bit Maj	p I/O	Alarm In/Ack	Bit Con	mand/State Conf	ig Layers
Name :	v1		Valve			
Desc. :	Valve outlet b	lender	,			
Commands :			States :			
close open]	closed open			
open			open			
		1				
	1	Free Value :				
From	7/20/2009 1:5	4:57 PM:13	31			

Figure 2.24 The Change State tab of a standard digital object.

In the dialog as you see it here, you have no possibilities of changing the state and command names or the number of states and commands.

Other tabs	The remaining tabs in this dialog are the same as for analog objects. For further information, refer to " <i>The Analog Object Type</i> " in this section.
Define digital templates	You will hardly ever define an object using the above type but you will practically always use a digital <i>template</i> to define the digital object.
	With a digital template you can
	• define exactly the number of states and commands you need
	• give states and commands the names you like
	• specify the valid commands for each state
	• define any number of alarms

- obtain control right down to the individual bit
- tailor a template to be used again and again

For a description of how you define a digital template, refer to "Defining an IGSS Template" in Section B of this chapter.

The String Object Type

Definition A string object is a text field displaying a message related to the monitored process.

Use Typically, a string object shows a message when a specific part of the PLC program is running. In the following example, the operator will see a message on his screen when the cleaning process is initiated.

To define a string object: Defining a string object The following procedure assumes that you are using a rectangular field to display the string object. Alternatively, you may want to show the string in an Edit box or a text box. For further information, search for "standard descriptors" in the Definition Help file Step Action 1 Select Objects \rightarrow Rectangular field. The Object Browser dialog appears. 2 In the **Tree-view** open the Global area, select **String**, type a unique name and an optional description, then click **Create**. The string object properties dialog appears. 3 Specify the text string you want to display and its max. length (see "The String Object tab" below). Specify how you want to collect and log your data (see "The Data 4 Management Definitions tab" below). 5 Specify what you want to display along with the text string (see "The Display tab" below). 6 Specify the PLC address of the string object (see "The Edit Mapping tab" below) and click **OK**. The rectangular field and object caption appear. Position and resize the rectangular field representing the string object on the 7 diagram.

NOTE: An **Attributes of Rectangle** tab appears, if you double-click the field allowing you to specify the precise co-ordinates, width and height of the field.

The String Object The figure below shows the String Object tab: tab

lab

					?
Edit Mapping		Re	Report Format		f Rectangle
String C)bject	Layers	Data Managen	ent Definitions	Display
Name	Message		Maximum Leng	th 40	
Description					
String					
Juling					
From			250		

Figure 2.25 On this tab you specify the text string to be displayed and its max. length.

This tab contains the following important object properties:

Property	Description
Maximum length	Enter the maximum number of characters you need for this text string. <i>NOTE:</i> You can use up to 70 characters.
String	Enter the text string you want to display.

The Data Management Definitions tab	 On this tab you specify how you want to collect and log data. The tab is identical to the one for analog objects. You may select a scan interval and a log frequency. Note, though, that as it makes no sense to perform any statistical calculations on a string, the Data reduction and Base interval options are not selectable. Of course, the logged values cannot be presented in graphs as is normally the case, but the log files may be displayed and printed. For further information about this tab, refer to the "The Analog Object Type" section.
The Display tab	On this tab you specify what you want to show along with the string object. The tab is identical to the one for analog objects. For further information about this tab, refer to the <i>"The Analog Object Type"</i> section.

The Edit Mapping tab On this tab you specify the PLC address of the string object. Note that a full PLC address consists of a node number, a data group, a word offset and a bit offset. The figure below shows the Edit Mapping tab.

Message				? 💌
String Object	Layers	Data Manag	ement Definitions	Display
Edit Mapping	Rej	port Format	Attributes of F	Rectangle
Atom		PLC Node for ol	oject: Message	
Text 🖉		Driver :	7T3964R (IGSSStation 1)	•
		Node :	0	•
		PLC Address for	Text atom:	-
I/O mode : i/o		Data Group :	0	
Alarm Details		Word Offset :	0	
	Ŧ	Bit Offset :	0	A V
		External Type:	STRING	•
New Edit	Delete	Use numeric +/-	to scroll to next/previous	atom
			OK Cancel	Help

Figure 2.26 On this tab you specify the PLC address of the string object.

A PLC address for a string object specifies the beginning of the string. The number of characters defined in the **Maximum length** field on the **String Object** tab are automatically reserved. Note also that you must select an external data type.

For further information about this tab, refer to the "The Analog Object Type" section.

For further details about string objects, search for "string objects" in the **Definition** Help file.

The Attributes of On this tab you can optionally specify the precise co-ordinates, width and height of the rectangular field. **Rectangle tab**

The Scaling Object Type

DefinitionA scaling object maps one set of values to another set of values. Note that a scaling object is an internal
object and therefore does not represent a physical process component.UseUse the scaling object when you need to map one set of values to another, instead of writing the necessary
PLC code. You can use a scaling object to convert values from one measurement unit to another, for
example, from °C (Celsius) to °F (Fahrenheit).
NOTE: You can also define unit conversions without using a scaling object. Search for "Unit Conversion
dialog" in the Definition Help file.
To define such a scaling object, refer to "Define Scaling Objects" in Chapter 3.

Defining a scaling To define a scaling object:

NOTE: It is recommended to define scaling objects in the **Global** area to make them globally available in the project.

Step	Action
1	Select Objects \rightarrow New Unreferenced. The Object Browser dialog appears.
2	In the Tree-view open the Global area, select Scale , type a unique name and an optional description, then click Create . The scaling object properties dialog appears.
3	Specify the input/output values (I/O value) and the corresponding values (Real value) to which you want to map the original values (See " <i>The Scalin</i> , <i>Specification tab</i> " below).

The Scaling T Specification tab

object

The figure below shows the Scaling Specification tab:

	eal value 10000e+000 10000e+000
Description I/O value Re	0000e+000
I/O value Re	0000e+000
	0000e+000
4 0.000	
	0000000
20 1.000	000000000000000000000000000000000000000
ОК	Cancel Help
UK C	Jancel Help

Figure 2.27 On this tab you specify the input/output values (**I/O value)** and the new values (**Real value**) to which you want to map them.

This tab contains the following important object properties:

Property	Description
I/O value	Enter the input/output values you want to map to another set of values.
Real value	Enter the values you want to use instead of the input/output values.

In this example, the scaling object maps values within the area 4 to 20 onto values in the area 0 to 100. This means that when, for instance, the value **12** is sent to IGSS, the scaling object maps the value onto **50**.

Connecting a scaling object to an analog object

A scaling object may be used any number of times to scale analog values. To connect a scaling object to an analog object:

Step	Action
1.	Open the diagram containing the analog object to which you want to connect a scaling object.
2.	Double-click the symbol representing the analog object.
3.	Click the Data Management Definitions tab.
4.	In the Scale As field, select the appropriate scaling object in the drop-down list which shows all scaling objects in the active project.

The Group Object Type

Definition

A Group is a collection of any number of related objects and descriptors that you want to treat as one entity. The members of a Group will typically have a number of dependants in the source project. These dependants may be templates, alarm numbers, report formats, VBA code, etc. and they will automatically become part of the Group. This makes the Group self-contained allowing you to either copy/paste the Group within the current project or export it to a file for import into another project at a later time. The group object includes the following features:

• Copy/paste of Group members into the current project

- Export/import of Group members into another project
- User-defined name substitution rules allow fast replication of similar diagrams
- User-defined address substitution rules allow fast replacement of PLC addresses
- Groups can be members of other Groups allowing you to build a hierarchy of Groups
- Linked groups

The linked groups allow the designer to change the "parent" group and make the changes effective in the "child" groups.

The following examples show what the group object may be used for:

- A production containing two or more identical production lines.
- A ship containing two or more identical motors requiring the same parameters.

Group objects are often used together with the reusable diagram feature.

Defining a group To define a group object:

object

Use

Step	Action
1	Select Edit \rightarrow Group Manager The Group Manager dialog appears.
2	Click the New Group . button to create a new group. The Enter Name of Group dialog appears.
3	Enter the name of the group, and click OK .
4	Select the objects that should be included in the group object. This can be done in one of three ways:
	• Click the Browse button, and through the object browser drag and drop the objects into the group manager.
	• Click Add Selected Objects, when creating a group in an existing diagram.
	Click Add Selected References, when creating a new diagram.
5	Specify the settings when pasting new objects on the Paste Options tab
6	If the group should be available in another project export the group by clicking Export , give the group a descriptive name, the default export filename is the group name, and click Ok .
	The group has now been exported

The group has now been exported.

7 Click Close to exit the Group Manager dialog.

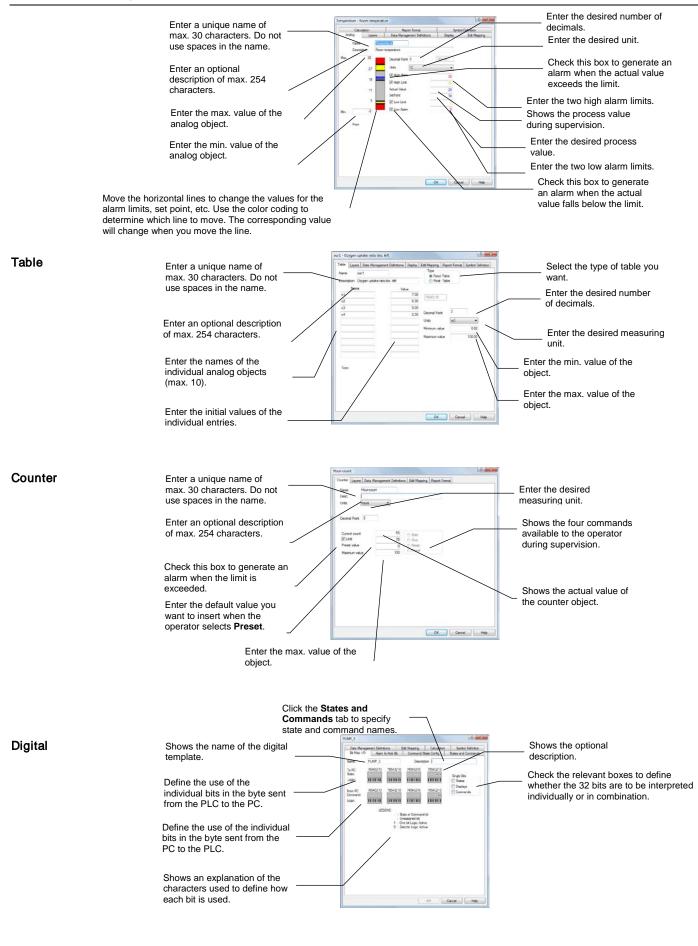
Visual Guide to Type-specific Properties

Introduction

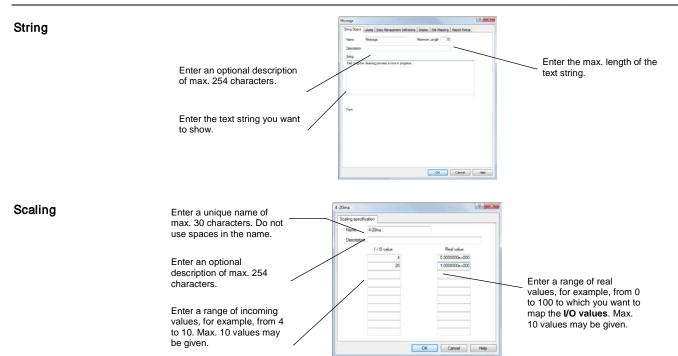
This section is a graphical illustration of the fields and buttons on the tabs containing the type-specific properties.

When you are working with IGSS, we highly recommend that you use the What's This? Help topics to get specific information on the individual item in a dialog. For information on how you use this function, refer to the "*IGSS User Documentation*" section at the beginning of this manual.

Area	Enter a unique name of max. 30 characters. Do not use spaces in the name. Type the default node number identifying the appropriate PLC in the network. This node number is automatically suggested for new objects you create in this area. Optionally, protect this area by attaching a Protect object. If the current user owns the user privileges of the Protect object, he gains access to this area.	New Area Properties Enter an optional description of max. 254 characters. Description Optional description Default Node Internet to Menu Default Dover T13964R (IGSSStetion1) Hotection: Internet to Menu OK Cancel Help Help
Diagram	Enter a unique name of	Select Name or Description to show either in the title bar of the diagram. Select Name or Description to show either in the title bar of the diagram. Displays a preview of the selected background picture or color. Check this box to show the diagram name in the D
Graph	Enter a unique name of max. 30 characters. Do not use	Name Graph Properties Select Name or Description to show either of the two in the title bar of the graph. Desc Description Winninze Field Bar Check this box to show the graph name in the Graph menu. Prodetion: Check this box to display a grid behind the graph.
Analog		



Enter a unique name of max. 30 characters. Do not use spaces in the name.



Section B: IGSS Templates

About this section	This section contains the following information:		
	A description of what a template is and what it is used forAn example where we define a digital template		
Contents	This chapter contains the following topics.		
	What Is an IGSS Template? 131 Defining an IGSS Template 131		

Definition	An IGSS template is a customized template - based on one of the IGSS object types - that the user creates when a number of process components are very similar and share several properties. The real process components are then defined using the template, thus eliminating the repetitive task of entering the same information for each component. In fact, the user only has to enter a unique name and a specific PLC address to make a new component based on a template.
Why use templates?	 There are several reasons why you should use templates extensively: They ensure consistency within a project for process components based on common templates. They save valuable engineering time by eliminating the need of entering the same information for a number of very similar process components. They limit the task of creating new process components to entering a unique name and a specific PLC address. They facilitate making changes to multiple objects at a time, simply by changing the template properties.
Four types of templates	 Templates may be defined for the following object types: Analog Table Counter Digital The digital templates are the most widely used templates. The main difference between the digital templates and the other template types is that you gain control right down to the individual bit sent to and from IGSS. For an example of how you define a digital template, refer to "<i>Defining an IGSS Template</i>" in this section.
Built-in templates	A few templates are included for your convenience, for example, the PROTECT template which is a template defining protection levels to be used in connection with the User Administration module. If required, you may define new Protect objects based on the PROTECT template.
Example: An analog template	 You have 16 different temperature gauges in your plant that all measure temperatures in the range -5 to 35 °C share the same alarm limits share the same alarm texts have their current process value scanned every 10 seconds must be included in the operational reports This would mean that it would make perfect sense to make a template including all these properties and

What Is an IGSS Template?

This would mean that it would make perfect sense to make a template including all these properties and then use this template to define each of the temperature gauges T1 to T16. The only two properties that would be different in these 16 components would be their name and their specific PLC addresses.

Defining an IGSS Template

This example

In the following example we will define a pump template, PUMP_3. The pump template will have the following states and commands:

This command	Results in this state
STOP	OFF
SLOW	SLOW
MEDIUM	MEDIUM
FAST	FAST

Advantages of using a digital template

By defining a digital template you can:

- define exactly the number of states and commands you need
- give states and commands the names you like
- define any number of alarms
- obtain control right down to the individual bit
- tailor a template to be used again and again

Usually, you will define one template for each type of valve, motor, pump, etc. If you need two templates for two different types of pumps, simply copy the first template (select **Template** \rightarrow **Create Template**) and use the **Copy From** function, make the necessary adjustments and give it a new name, for example, PUMP_2.

Defining	а	digital
template		

Step	Action
1.	Select Template \rightarrow Create Template . The Create Template dialog appears.
2.	In the Type group, select Digital and type a unique name for the template (in this case, PUMP_3) and click OK . The digital template properties dialog appears.
	<i>NOTE:</i> To easily distinguish the names of templates and process components, we recommend that you use ALL CAPS for template names and normal case for process components.
3.	Define the bits used for states and commands (see " <i>The Bit Map I/O tab</i> " below).
4.	Define the bits used for alarm indication and alarm acknowledgement (see <i>"The Alarm In/Ack Bit tab"</i> below).
5.	Assign names to the individual states and commands (see " <i>The States and Commands tab</i> " below).
6.	Define the default command and valid commands for each state (see " <i>The Command/State Config tab</i> " below).
7.	Specify how you want to collect and log your data (see "The Data Management Definitions tab" below).
8.	Specify the parts of the PLC address which are common to all process components you are going to base on this template (see " <i>The Edit Mapping tab</i> " below).
9.	Choose a color and symbol for each state (see " <i>The Symbol Definition tab</i> " below).
10.	Click ok to save the template.

RESULT: The template is now ready for use. For an example where we use a template to define a process component, refer to "*Define Digital templates*" *in Chapter 3.*

The Bit Map I/O The figure below shows the Bit Map I/O tab: tab

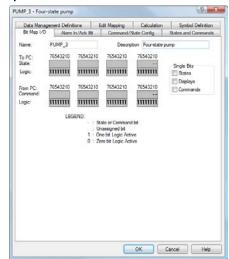


Figure 2.28 On this tab you specify how you want to use the individual bits sent to and from IGSS.

This tab contains the following important object properties:

Property	Description
To PC (State)	Define how you want to use the individual bits communicated from the PLC to IGSS. You have 32 bits for state and command indicators.
	In the example, bits 0 and 1 are used as state bits. The symbols are described in the LEGEND .
From PC (Command)	Define how you want to use the command bits sent from IGSS to the PLC. Here two command bits are used. Similar to the two bits used for states, two bits give you the opportunity to name four commands. The four commands represent the four bit combinations: 00. 01, 10, 11.

For an explanation of the remaining items, click the **?** in the upper right hand corner of the dialog, then click the item you want information about.

The Alarm In/AckThe figure below shows the Alarm In/Ack Bit tab:Bit tabPUMP.3 - Four-state pump

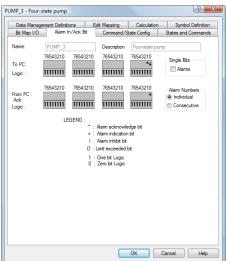


Figure 2.29 On this tab you specify the alarm indication and alarm acknowledgement bits sent to and from IGSS.

This tab contains the following important object properties:

Property	Description
To PC	Define the alarm indication or alarm acknowledgement bits communicated from the PLC to IGSS.
	In the example, bit 0 is used as an alarm indication bit (+) and 1 as an alarm acknowledgement bit (*).
From PC	Define the alarm acknowledgement bit communicated from IGSS to the PLC.
	In the example, bit 0 is used as an alarm acknowledgement bit (*).

TIP: It is recommended to set an acknowledgement bit both **To PC** and **From PC**. This ensures that the operator acknowledgement is sent to the PLC and that IGSS gets an acknowledgement back from the PLC. If you only set it **From PC**, you cannot be sure that the PLC has received the bit.

For details about alarm indication and acknowledgement bits, search for "*alarms*" in the **Definition** Help file.

The States and	The figure below shows the States and Commands tab:
Commands tab	PUMP, 3 - Four-state pump

Data Managen		Edit Map			ymbol Definition
Bit Map 1/0	Alam In/Ack I	at Cor	mand/State Co	nfg States	and Command
Sate					
OFF SLOW MEDIUM		id State	FAST	•	
Command		Delate			
STOP SLOW MEDIUM FAST	Add	Command		•	

Figure 2.30 On this tab you specify the names of the states and commands of the digital template.

This tab contains the following important object properties:

NOTE: The number of states and commands is determined by the number of state and command bits defined on the **Bit Map I/O** tab.

Property	Description
Add State	Renames the selected state in the list box with the state name you enter or select. You can either enter a new state name or select existing states by opening the drop-down list.
Add Command	Renames the selected command with the command name you enter or select. You can either enter a new command name or select existing commands by opening the drop-down list.

The Data
Management
Definitions tabOn this tab you specify how you want to collect and log data. This tab is identical to the one for analog
objects. In this example, we will choose Logging Out, because we want every command that the operator
issues to be registered in the system's log files. We will choose > 0 % because we want to log all state
changes. Every five minutes the system saves the number of state changes in the .bcl files (the data
reduction method Change is selected). These values are later used in the calculation of the values for the
operational reports.
For further information about this tab, refer to the "The Analog Object Type" section.The Edit Mapping
tabOn this tab you specify the PLC address of the process component. Note that a full PLC address consists of
a node number, a data group, a word offset and a bit offset.

	<i>NOTE:</i> Remember that we are defining a <i>template</i> and therefore we will not specify a specific PLC address. What we can do, though, is to specify the node number and the data group but leave the specific word and bit offset open to be defined for the individual objects when they are subsequently defined.
	Specifying alarm texts poses no problem - all components that will later share this template will all share the same alarm texts.
	For further information about this tab, refer to the "The Analog Object Type" section.
The Symbol Definition tab	On this tab you select a color and a symbol for each state of the digital object. This tab is identical to the one for analog objects, except for the available symbols.
	By checking the Copy symbols to template box, you save all the color and symbol selections as part of the template. When you later define new objects based on this template, you can import these selections by clicking the Copy Symbols From Template button.
	For further information about this tab, refer to the "The Analog Object Type" section.
Advanced options	There are a number of other possibilities in the dialog that we will not describe in detail here:

- you may choose to look at the bit used for, for example, states as a single, individual bit, or "un-coded" as some would have it, rather than as a bit combination. Looking at two state bits individually would give three states rather than four, that is, one state for each bit and the common zero state when all bits are set to **0**.
- you may choose to have the system automatically give alarm numbers consecutively rather than select numbers yourself.
- you may choose to use inverse logic so that **0** rather than **1** means that a bit is set high while **1** means that it is not set.

For further details about advanced template options, search for "*digital templates*" in the **Definition** Help file.

Glossary

Term/abbreviation	Definition
actual value	The actual value is the current process value of an analog object.
alarm	An alarm is a notification which is generated when an error situation occurs, for example, when a value falls below or exceeds a certain limit.
alarm acknowledgement indicator	The alarm acknowledgement indicator is a specific bit indicating that an alarm has been acknowledged. The alarm acknowledgement indicator bit is defined as part of the digital template.
alarm delay	The alarm delay is a time delay specifying how long an alarm must exist before being registered as such. The default alarm delay is specified in the System Configuration module.
alarm icon	The alarm icon shows the total number of active alarms and the color of the alarm with the highest priority. Double-clicking the alarm icon will open the Alarm module. The alarm icon is also shown in the Windows System Tray (lower right corner of the Windows Taskbar).
alarm indicator	An alarm indicator is a specific bit defined to indicate incoming alarms from a digital object. The alarm indicator bit is defined as part of the digital template.
alarm priority	The alarm priority describes the seriousness of the alarm. The priority is a value within the range from 255 (highest priority) to 1 (lowest priority). Each alarm priority should be associated with a specific color.
	We recommend that you carefully plan the number of alarm priorities and their associated colors to avoid any confusion for the operators.
Alarm module	The Alarm module is opened by double-clicking on the alarm icon.
	The Alarm module allows the operator to view active and historical alarms. The operator can acknowledge alarms and make alarm notes which will be visible for all other operators in a multi-user system.
alarm text	An alarm text is a general description of an error situation, for example, "motor overheated". An alarm text consists of the following components: an alarm number, an alarm priority, a short alarm text and the operator instructions.
	A number of additional properties can be set, including sound and events to occur when the alarm arises.
analog object	An analog object is a process component that can take on any value within a specified range. Typical examples of analog objects are flow meters, level and temperature gauges.
area	An area is a collection of diagrams, graphs and process components that belong together. Areas may be used to reflect the division of a plant into different logical sections. If a plant cannot be seen as divided into different sections, the system designer may use only one area.
	When you define an IGSS object, you specify which area of the project it belongs to. However, one area is special because all objects defined here are automatically known in all other areas. This area is called 'Global' and is automatically created in every

	IGSS project. Do not rename or remove the Global area.
atom	An atom corresponds to a potential PLC address.
	As an example an analog object has 6 atoms attached, i.e. 6 entities that might have an address in the PLC: high alarm, high limit, actual value, set point, low limit and low alarm.
background picture	A background picture is a drawing used as the static background for a process diagram.
	As an alternative, you can also use a background color and create the diagram from scratch using the built-in drawing tools.
bar display	A bar display is way of visualizing the process value of analog or table objects in a bar graph. A typical example of use is to show the water level in a tank.
base class file (BCL file)	Base class files hold historical data processed by the system on the basis of the seven built-in data reduction formulas (Average, Minimum, Maximum, Sum, Actual, Change and Difference). The basis for the calculations made by the system are the data
	scanned in from the PLC at the specified scan intervals. There are four intervals with which calculations may be made; the intervals may be changed in the System Configuration module. Each interval is called a 'base class' and result in a separate file.
	The lowest base class (the lowest calculation interval) is called base class 2 and the highest is called base class 5.
	Examples of file names (GxYYMMDD.bcl):
	G2970128.bcl
	G3970128.bcl
	G4970128.bcl
	G5970128.bcl The second character in the file name is the base class, the ensuing six characters form the date when the files were created and the extension is an abbreviation of 'base class'.
	When all four calculation intervals are used in a project, there will be four files for each day.
	The base class files are located in the project's report folder.
base interval	The base interval determines how often the system reduces the scanned values read from the PLC to one data reduction value, for example, average. See also "data reduction".
bit offset	A bit offset is a number identifying the precise bit within the word of the data group. The bit offset is defined as part of the PLC address.
bitmap file (BMP)	A bitmap file is a graphic saved in the *.bmp format. It can be used as the background picture of a diagram, as an independent graphic or to represent an IGSS object.
click-sensitive area	A click-sensitive area is a field on a diagram on which the operator can click to open an IGSS object. A click-sensitive area is defined as a rectangular field in IGSS. A typical example is to use rectangular fields on an overview diagram where the operator simply clicks on the field to open the relevant sub-diagrams.
command	A command is a named command that the operator can issue to control a digital object. For example, an "open" command to open a valve and a "close" command to close it. Command names are defined as part of the digital template.
project	A project is a model of an actual process being monitored and controlled; the process may be anything from a purification plant

	to a luxury liner or a production line.
	A project consists of a number of process diagrams with dynamic representations of the process components (the valves, motors, flow meters, etc.) that the operator can control from his screen.
context-sensitive Help	Context-sensitive Help is a Help text describing the specific user interface object from which you requested help. In dialogues, context-sensitive Help is called What's This Help.
counter object	A counter object is a process component that can take on any value up to a given maximum limit. Typically a counter object is used to visualise a PLC counter, for example, one that counts the hours of operation of a motor.
data collection (DC)	The data collection engine (DC.exe) is the heart of IGSS. DC collects data from the process and sends data back to the process, for example, if the operator issues a command to stop a pump. DC also writes data to the .log, .bcl and .alm data files and distributes data to the operator stations in a multi-user system. In the System Configuration module, you can control various data collection settings.
data group	A data group is a number identifying a section of the memory layout of the PLC which consists of a number of units or blocks of words (16 bit each) numbered from 0 to 256. The data group is specified as part of the PLC address.
data reduction	Data reduction defines the method used to reduce the scanned process values to one data reduction value, for example, average. The scan interval defines the interval between the individual readings of the process values and the base interval defines the interval between the individual reductions.
Definition	The system designer's main module in IGSS. This is where you build the project that the operator should be able to monitor in the Supervise module.
diagram	A process diagram is a graphical view of a process or part of a process. A diagram typically consists of a static and a dynamic part. The static part comprises the process pipes, the tanks, etc. while the dynamic part shows the contents of the tank, the valves, the motors, etc. that change state or value.
	A diagram may be opened from the Diagram menu, from a click- sensitive area, from a symbol or using a function key.
digital object	A digital object is a process component that has a finite number of states and commands. Typical examples are valves, motors and pumps.
driver	A driver is a control program enabling IGSS to communicate with the PLC or other data collection device which collects the data from the process. 7-Technologies has developed a wide range of communication drivers, but you can also use the generic driver based on the OPC (OLE for Process Control) standard.
enhanced metafile (EMF)	An enhanced metafile is a graphic saved in the .emf format. It can be used as the background picture of a diagram, as an independent graphic or to represent an IGSS object.
external type	The external type identifies the data type used in the PLC to represent the process value. When IGSS knows this format, it automatically converts the value to normal integers. The available data types are driver-specific and can be enabled or disabled in the System Configuration module.
	Examples of external types are: FP8 (fixed point 8 bit), FP16 (fixed point 16 bit) and FP32 (fixed point 32 bit).

A function key is one of the F-keys on the keyboard. In IGSS you can assign frequently used operations to function keys. Function keys are defined as part of the diagram properties, for example, F2 to start the pump and F3 to stop it.
Up to 24 function keys can be defined for each diagram. Additionally, 24 global function keys can be defined. A prefix key is used to activate function keys 13 - 24.
The Global area is a special area. All objects defined in this area are automatically known in all areas. The Global area is automatically created in an IGSS project. Do not rename or remove this area.
We recommend that you define templates and scaling objects in the Global area to make them globally available in the project.
A global parameter defines a global setting for IGSS, for example, data management and data collection settings. The global parameters are configured in the System Configuration module.
A graph is a graphical chart showing the values or states of a set of process components. The source data can be either log data (.log files) or reduced values (.bcl files).
A grid consists of two sets of lines that crisscross at right angles. On a diagram there is an invisible grid of horizontal and vertical dots. In IGSS you can set the grid size (in mm) and snap objects to that grid to easily align objects.
The I/O mode defines whether the value is read from (in) or written (out) to a PLC address or both (in/out). Some values can be set to "local" if they are generated within IGSS. This is typically used for alarm limits on analog objects. IGSS detects when the process value exceeds the specified alarm limit and generates an alarm.
The I/O value is a value that IGSS can convert to another value (see "real value"), for example, to convert from one measuring unit to another.
Interactive Graphical SCADA System
The initial display is the start-up view that the operator will see when he starts the Supervise module. The system designer chooses the initial display in the Definition module.
The system designer should define an initial display for each area of the project. Forgetting to do so will result in a blank screen when the operator opens the area in the project.
When a project has been created in the Definition module, the system must check it for consistency and completeness. This is done using the "Install Project" command in the File menu.
If the project is running when the system designer chooses to install the project in the Definition module, he is prompted to temporarily stop the project. After installation, the project can be started again.
Job Scheduler allows you to define and maintain a set of jobs or events that need to be automatically executed either at a given point in time or at a specified frequency. You can use it to run a program or to just display a message to remind you of something.

Keep Window option	The Keep Window option ensures that a particular diagram is always kept open. During supervision four diagrams may be open simultaneously. When diagram number five is opened, the first one closes unless you have enabled the Keep Window option. The option is a diagram property.
Library toolbar	The Library toolbar allows you to place your favourite graphics and multimedia files and IGSS objects represented by symbols on a floating toolbar. You simply drag the objects to the toolbar and when you need to use them again, you drag them onto the process diagram.
local	Local is the I/O mode used for atoms which are generated locally within IGSS, for example, an alarm which is generated when the process value exceeds the alarm limit.
log file	A log file can contain process values, digital states, operator commands and login/logout information. Process values and states are logged according to the logging deadband selected on the "Data Management Definitions" tab. For example, if you specify > 5% a scanned value will not be logged until it deviates with more than 5% from the previous logged value. To log operator commands, select the "Out" check box.
	The log files are located in the project's report folder and are named (YYMMDDHH.log):
	01112708.log
	01112709.log
	01112710.log
	There is one log file for each hour in which the data collection is active. The log data can be used as the basis for graphs. The log data can be viewed via the ODBC interface.
node	A node is a unique number identifying the PLC in a network. The node number is defined in the System Configuration module.
	When you define an object in the Definition module, the node numbers defined in System Configuration can be selected as part of the PLC address.
	TIP: You can define a default node number for each area in the project. The node number will then be suggested automatically for each object you create in this area.
object caption	An object caption is the text(s) describing the object. The object caption may include the object name, object description, the current process value and unit. What you want to show in the object caption is defined on the "Display" tab of the object properties dialogue.
OLE Linking and Embedding (OLE)	OLE is a standard used for linking or embedding components made in third party programs into IGSS. You can, for example, define an OLE-embedded diagram that refers to an MS Excel worksheet that the operators can view during supervision. Note that the functions of the OLE server program become available as soon as you activate such a diagram.
operator	The operator is the person who monitors and controls the monitored process. He will typically only use the Supervise and Alarm modules. These two modules are designed to make the

periodical report PLC PLC address predefined graph preset value	 monitoring task very easy and straightforward for the operator. A periodical report is a report generated by the operator during supervision of the plant. It is based on the historical data generated by IGSS. A periodical report can cover five standard periods: daily, weekly, monthly, quarterly and yearly. The system designer can define a number of report formats that the operator can choose between during supervision. Programmable Logic Controller The PLC address is a unique address used to enable communication with the individual process components. A PLC address may hold current process values, states, commands, alarms, etc. A PLC address consists of a node number, a data group, a word offset and a bit offset. The address is specified on the Edit Mapping tab of the object properties dialogue. A predefined graph is a graph defined by the system designer in the Definition module. The system designer can choose to include the graph name in the Graph menu, embed the graph on a diagram or create a link to the graph. During supervision, the operator will typically choose the predefined graph in the Graph menu. The preset value is a value that the operator can issue for a counter object with the Preset command from the Supervise
PLC PLC address predefined graph	supervision of the plant. It is based on the historical data generated by IGSS. A periodical report can cover five standard periods: daily, weekly, monthly, quarterly and yearly. The system designer can define a number of report formats that the operator can choose between during supervision. Programmable Logic Controller The PLC address is a unique address used to enable communication with the individual process components. A PLC address may hold current process values, states, commands, alarms, etc. A PLC address consists of a node number, a data group, a word offset and a bit offset. The address is specified on the Edit Mapping tab of the object properties dialogue. A predefined graph is a graph defined by the system designer in the Definition module. The system designer can choose to include the graph name in the Graph menu, embed the graph on a diagram or create a link to the graph. During supervision, the operator will typically choose the predefined graph in the Graph menu. The preset value is a value that the operator can issue for a
PLC address predefined graph	The PLC address is a unique address used to enable communication with the individual process components. A PLC address may hold current process values, states, commands, alarms, etc. A PLC address consists of a node number, a data group, a word offset and a bit offset. The address is specified on the Edit Mapping tab of the object properties dialogue. A predefined graph is a graph defined by the system designer in the Definition module. The system designer can choose to include the graph name in the Graph menu, embed the graph on a diagram or create a link to the graph. During supervision, the operator will typically choose the predefined graph in the Graph menu. The preset value is a value that the operator can issue for a
predefined graph	communication with the individual process components. A PLC address may hold current process values, states, commands, alarms, etc. A PLC address consists of a node number, a data group, a word offset and a bit offset. The address is specified on the Edit Mapping tab of the object properties dialogue. A predefined graph is a graph defined by the system designer in the Definition module. The system designer can choose to include the graph name in the Graph menu, embed the graph on a diagram or create a link to the graph. During supervision, the operator will typically choose the predefined graph in the Graph menu.
	 the Definition module. The system designer can choose to include the graph name in the Graph menu, embed the graph on a diagram or create a link to the graph. During supervision, the operator will typically choose the predefined graph in the Graph menu. The preset value is a value that the operator can issue for a
preset value	predefined graph in the Graph menu. The preset value is a value that the operator can issue for a
preset value	
	module.
process component	A process component is a physical process component in the plant, for example, a motor, a pump, a valve, etc.
properties	The properties are the attributes or characteristics of an object. The object properties are defined and edited from a dialogue containing all object properties. For example, to edit the properties of an analog object, simply double-click the object symbol and edit the properties as required.
Protect object	The Protect object is automatically included in every IGSS project you create. It is used to protect IGSS objects from unauthorized use. By connecting the Protect object to an IGSS object, you can control what the operator is allowed to do with this object. The user privileges are set up in the User Administration module.
	Example: By connecting the Protect object to an analog object and by setting up the necessary parameters in the User Administration module, you can allow some operators to change the set point for the object and other operators will not be able to do it.
PROTECT template	The PROTECT template is a built-in template defining protection levels. By default, one object called "Protect" is based on this template and will be included in every IGSS project you create. If required, you can create additional "Protect" objects based on this template.
real value (scaling object)	The real value is the value you want to use instead of the I/O value, see "I/O value (scaling object)", for example, to convert from one measuring unit to another.
reference	A reference is a link to an existing IGSS object. A reference is typically used to show an already existing object on another diagram. If you copy an IGSS object, you can paste it as a new object or as a reference.
report format	A report format is a report template that the system designer can

	configure in the Definition module. Each report format is associated with one of the standard report types in IGSS: Periodical report, snapshot report or alarm statistics report
	A report format consists of a name, a number of report headings and a number of objects from the project. When a report format is defined, the operator can choose its name when he wants to generate one of the above standard report types.
right-click menu	A right-click menu is a context-sensitive menu which is accessed by clicking the right mouse button. The menu gives you access to the most frequently used commands associated with the user interface element you clicked on.
SCADA	Supervisory Control & Data Acquisition
scaling object	A scaling object is an internal object used to map values from one range to values within another range, for example, to convert values from one measuring unit to another. A scaling object is used to scale analog or table object values.
scan interval	The scan interval defines how often the component address in the PLC is scanned. The interval is defined on the Data Management Definitions tab of the object properties dialogue.
	Four different scan intervals can be selected in the Definition module. They are defined in the System Configuration module.
set point	The set point is the desired process value to which the process value is calibrated. The set point is defined as part of an analog object. The set point value can be changed by the operator during supervision.
simulate	To simulate data means to make IGSS use simulated process values in the project. This enables the system designer to simulate how the operator will view the process during supervision and to visually check the diagram layout when the process "comes alive".
	The data collection engine (DC.exe) must run simulated, if you want to use simulated data. The simulation mode is enabled in the System Configuration module.
snap (to grid)	Snap to grid means to align an object to the invisible grid of a diagram. This function is used to align objects neatly on a process diagram.
snapshot report	A snapshot report is a report generated by the operator during supervision. It contains the current values from the monitored process. The operator can choose to base the snapshot report on a predefined report format or simply include all objects from an area of the project.
standard descriptor	A standard descriptor is a standard object that you can use to represent an IGSS object on a diagram. The standard descriptors are divided into the following categories.
	{bmc bullet.bmp} Drawing objects (line, polygon, text, etc.)
	<pre>{bmc bullet.bmp} Drawing objects (line, polygon, text, etc.) {bmc bullet.bmp} Windows controls (command button, edit box, slider control, etc.)</pre>
	{bmc bullet.bmp} Windows controls (command button, edit box,

	Once the standard descriptor is positioned on the diagram, you can bind its appearance to the values, states and alarm limits of the IGSS object by right-clicking the descriptor and then choosing Descriptor Properties in the popup menu.
state	A state is a particular state that a digital object can enter. A valve may, for example, enter an "open" or a "closed" state. The operator can force a digital object into another state by issuing a command.
state indicator	A state indicator is a specific bit representing the state of a digital object. The state indicator bit is defined as part of the digital template.
status bar	The status bar is the area at the bottom of a window showing the current status or giving other information, such as the meaning of a particular command.
	Note that the diagram status bar contains key information about the selected IGSS object, cursor co-ordinates, etc. The diagram status bar can be enabled or disabled in the Diagram Properties dialogue.
string object	A string object is a text field displaying a message related to the monitored process, typically describing that a part of the PLC program is operative. An example: "Water is now being filled into basin".
Supervise	The module used by the operator to supervise and control the monitored process. The Supervise module always launches the Alarm module to allow operators to continuously monitor the alarm state.
symbol	A symbol is a graphic used to represent a process component, for example, a valve. Symbols are click-sensitive and during supervision open dialogues where the operator can set parameters like alarm limits or issue commands like 'close'.
	A standard symbol file (Symbols.v20) containing industry standard symbols is supplied with the system. Symbols are pixel-based and can be created or modified in the Symbol Editor program.
Symbol Editor	The program in which the system designer can create new symbols or modify the existing symbols in the symbol file. IGSS comes with a predefined symbol file, Symbols.v12, which contains industry standard symbols that the system designer can use immediately.
	The appropriate symbol for an IGSS object is applied in the object properties dialogue.
symbol file	The symbol file is a library of symbols. IGSS comes with a default symbol file, Symbols.v20. The system designer can modify or expand this file or create his own symbol file in the Symbol Editor program.
symbol table	A symbol table is a collection of symbols for a specific type of component. A symbol table may, for example, contain symbols for valves. The symbol file contains a number of symbol tables. The names of the symbol tables are shown in the lower portion of the "Objects" menu in the Definition module.
symbol table	The symbol table is a table containing a group of symbols which can be accessed from the Definition module. The default symbol file, Symbols.v20, contains a number of tables such as Valves,

	Graphs, Analog objects, etc.
system administrator	In the Definition module, the system designer selects the symbols from these tables by selecting the appropriate symbol table and then selecting the specific symbol he needs. Using the Symbol Editor program, the system designer can append his own symbol tables to the existing ones. A system administrator is a person who is responsible for
-	administering the use of a multi-user system. His duties include setting up the user administration, allocating storage space for the data files in the system (for example, .log and .bcl files), backing up data files before they are removed from the system and administering the network server and operator stations.
System Configuration	The global setup module in IGSS. This is where the IGSS servers, operator stations and PLCs are set up by the system designer.
system designer	The system designer is the person who builds an image of the monitored process and makes sure that data can be received from and sent to the process components. The system designer is typically a highly skilled engineer who uses a number of Igss modules to build the project that the operators will later use when monitoring and controlling the plant. The system designer's main progam is the Definition module.
tab	A tab is a "page" of a dialogue similar to the index tabs of a card file. A tab is accessed by clicking one of the tab names at the top of the dialogue. Each tab contains a collection of related properties, for example, data management properties.
table object	A table object, like the analog object, is used to represent a process component that can take on any value within a specified range. However, a single table object may be used for up to ten different analog objects that belong together in some way, for example, a set of temperature gauges at different locations within a tank.
template	A template is a user-defined template - based on one of the IGSS types - that you should create when a number of process components are very similar and share several properties. The real process components are then based on this template eliminating the repetitive task of entering the same information for each component. Templates may be defined for the following IGSS types: analog, table, counter and digital.
type	An IGSS type is a built-in template that ensures that you provide all the necessary information about each process component you define.
	There are nine IGSS types: area, diagram, graph, analog, table, counter, digital, string and scaling. Area, diagram and graph are non-process objects. The remaining object types represent process components, except the scaling object which is an internal IGSS object used for conversion purposes.
UTC	Universal Time Coordinated (formerly Greenwich Mean Time), used as the basis for calculating time in most parts of the world.
	IGSS uses this time format internally. You can switch between UTC and local time by enabling or disabling "UTC Date/Time" in the "View" menu.
What's This? Help	What's This? Help is a Help text describing a specific item in a

	dialogue. To view What's This? Help, simply click the "?" in the upper right corner of the dialogue, then click the item you want information about.
window element	A window element is a part of a window in the Windows environment. Window elements include the minimize and maximize buttons, the status bar, the title bar, etc. These elements can be shown or hidden in diagram and graph windows in IGSS.
Windows control	A Windows control is an item which allows the user to enter information, select from a list or issue a command. Windows controls include command buttons, combo boxes, list controls, sliders, text boxes, etc.
Windows metafile (WMF)	A Windows metafile is a graphic saved in the .wmf format. It can be used as the background picture of a diagram, as an independent graphic or to represent an IGSS object.
WinPager	WinPager is an add-on utility used to route alarm messages to personal pagers, mobile phones, e-mail accounts or telefaxes.
	In WinPager, you can set up duty schedules, which define the periods where you want WinPager to handle alarms. This would typically be evenings or weekends.
	Also, WinPager allows for remote acknowledgement of IGSS alarms by using a touch-tone telephone or by sending an SMS message.
word offset	The word offset is a number identifying the precise word within the data group. The word offset is one of the components of a PLC address.
	"Word offset" is the standard terminology used internally in IGSS. For some PLC drivers, this term may be replaced by the term relevant for the selected driver.

Index

Α

accessing
Definition
actual value (analog objects)112
Add Command (digital templates)134
Add State (digital templates)134
alarm limits
defining (analog objects)112
inheriting (table object)117
Alarm List
alarm numbers, defining 115
alarm statistics reports64
alarm texts
defining
definition of26
alarms
defining alarm texts and priorities26, 34
analog objects
defining 44, 111
description of111
showing as lines70
showing as polygons72
visual guide 127
Analog tab111
angles, selecting for symbols 116
applications
overview8
Area menu105
areas
defining 32, 105
description of104
Global area104
user-defined 105
visual guide 127
Attributes of Bar tab (bar displays) 49
Attributes of Rectangle tab 124
automatic printing of reports67

В

background pictures
drawing 25
formats supported25
including in diagrams107
bar displays
defining47
layout options49
refining (advanced) 79
base interval

base units	31
Bit Map I/O tab (digital templates)	133
bit offset	115
building configurations	29

С

C0147 counter object, defining 55 checklists building the configuration
for sample configuration
setting up and preconfiguring 28
setting up and preconfiguring 28
click-sensitive areas
defining for counter objects 119
combo boxes, using for digital objects 84
command bits 44
command buttons, using for counter objects82
command fields, using for digital objects84
commands
defining names for 38, 134
configurations
building
checklist for sample configuration13, 30
creating - overview 10
data folder for 15
installing61
sample configuration11
Configure atom property (Edit Mapping tab) .115
connecting
scaling and analog objects 125
standard descriptors to IGSS objects69
correcting, installation errors
counter objects
defining 54, 119
description of 119
showing as click-sensitive areas 119
showing as command buttons 82
visual guide128
Counter tab119
creating
a configuration - overview 10

D

data folders	
configuration data folder	15
report data folder	16
data group (block address) 1	15
Data Management Definitions tab	
for analog objects1	113
for counter objects 1	120

for digital templates134
for string objects124
for table objects118
data reduction113
data types, defining external type115
Define Graph Parameters dialogue61, 110
defining
alarm texts
alarm texts and priorities26, 34
analog objects
areas
bar displays47
counter objects
diagrams
digital templates
graphs60, 109
scaling objects125, 126
string objects
table objects
units
Definition
menus
overview
right-click menus
starting
Definition of New Diagram tab106
Diagram menu106
Diagram menu106 diagrams
Diagram menu

Display tab	
for analog objects	113
for counter objects	120
for string objects	124
for table objects	118
drawing	
background pictures	25
symbols	27
Drawing toolbar	69

Ε

Edit Mapping tab
for analog objects114
for counter objects120
for digital templates134
for string objects124
for table objects118
errors, correcting installation errors64
external type115

F

F0147 flow meter, defining44, 76
fixed table118
float table118
folders
configuration data folder15
report data folder16
From PC property (digital templates)133, 134
From Template option, using previously defined symbols44
Function Key Assignment tab107, 108
function keys,assigning107

G

G0147 graph, defining	60
Global area1	04
defining	32
global parameters, setting up	17
glossary1	36
Graph menu1	09
graph window (example)1	11
graphs	
defining60, 1	09
defining the layout of	61
description of1	09
Name to Menu option1	09
visual guide1	27

Н

Help	
search facilities	6
types of Help topics	5

L

I/O mode (Edit Mapping tab)115
I/O modes
in 115
local115
out
in (I/O mode)115
initial display, setting for diagrams 60
installation errors, correcting 64
installation reports, contents of 63
installing configurations61

Κ

Keep Window option (diagrams)...... 33

L

L0147 water level, defining
layout, editing graph layout110
Library toolbar
description of 69
using
lines, using for analog objects70
local (I/O mode)115
logging 113

Μ

manual
structure4
menus
Area menu 105
Diagram menu 106
Graph menu 109
in Definition31
Message string object, defining

Ν

5
5
)
)
5

0

object list, defining for reports	64
out (I/O mode)	115
Overview diagram, defining	33
overview of applications	8

Ρ

R

reports
automatic printing67
creating 64
creating object lists 64
data folder for16
defining report groups (headings) 64
including as user programs66
installation reports63
types of 64
right-click menus
in Definition31
rotating
symbols116

S

sample configuration
checklist for 13, 30
overview11
scaling objects
connecting to analog objects 125
defining 125, 126
description of124
visual guide 129
Scaling Specification tab125
scan interval 113
Set Initial Display option (diagrams) 60
set point (analog objects) 112
setting up
checklist review
global parameters17
overview14
snapshot reports 64

standard descriptors69
connecting to IGSS objects69
state bits37
states
defining names for
States and Commands tab (digital templates).134
String Object tab123
string objects
defining57, 123
description of122
visual guide129
Symbol Definition tab
for analog objects116
for counter objects121
for table objects119
symbol tables, using27
symbols
choosing116
drawing27
rotating116
using the From Template option44
using the To Template option43

т

T0147 table object, defining50
table objects
defining50, 117
description of116
visual guide128
Table tab118
templates
advantages of122, 131
available types131
built-in131
copying132
defining digital templates37, 42, 131
description of131
example (analog)131
versus types100

To PC property (digital templates)133, 134
To Template option
saving color and symbol selections .43
toolbars
in Definition31
troubleshooting installation errors64
types
analog111
area104
available types100
counter119
definition of100
diagram105
digital121
graph109
scaling124
string122
table116
versus templates100
visual guide127

U

units
defining31
user programs
including reports as66
user-defined areas105

V

V1/ V2 valves, defining	42
VALVE digital template, defining	37
valve templates, defining3'	7,42
valves, defining	42
visual guide to object types	.127

W

what is IGSS	7
What's This? Help	6
word offset	115

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