

SIEMENS

SIMATIC

BRAUMAT/SISTAR Classic Installation & configuration

Function Manual

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BRAUMAT/SISTAR Classic V6.0 SP2

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Preface

Purpose of the Manual

In this manual the installation and configuration of BRAUMAT/SISTAR Classic V6.0 is described and it gives you an overview of the following topics:

- Installation of BRAUMAT/SISTAR Classic V6.0
- Configuration of BRAUMAT/SISTAR Classic V6.0
- Hardware configurations
- Redundancy

It helps you during installation and commissioning of the software.

This manual is intended for those responsible for configuring, commissioning and servicing automation systems.

Where is this manual valid?

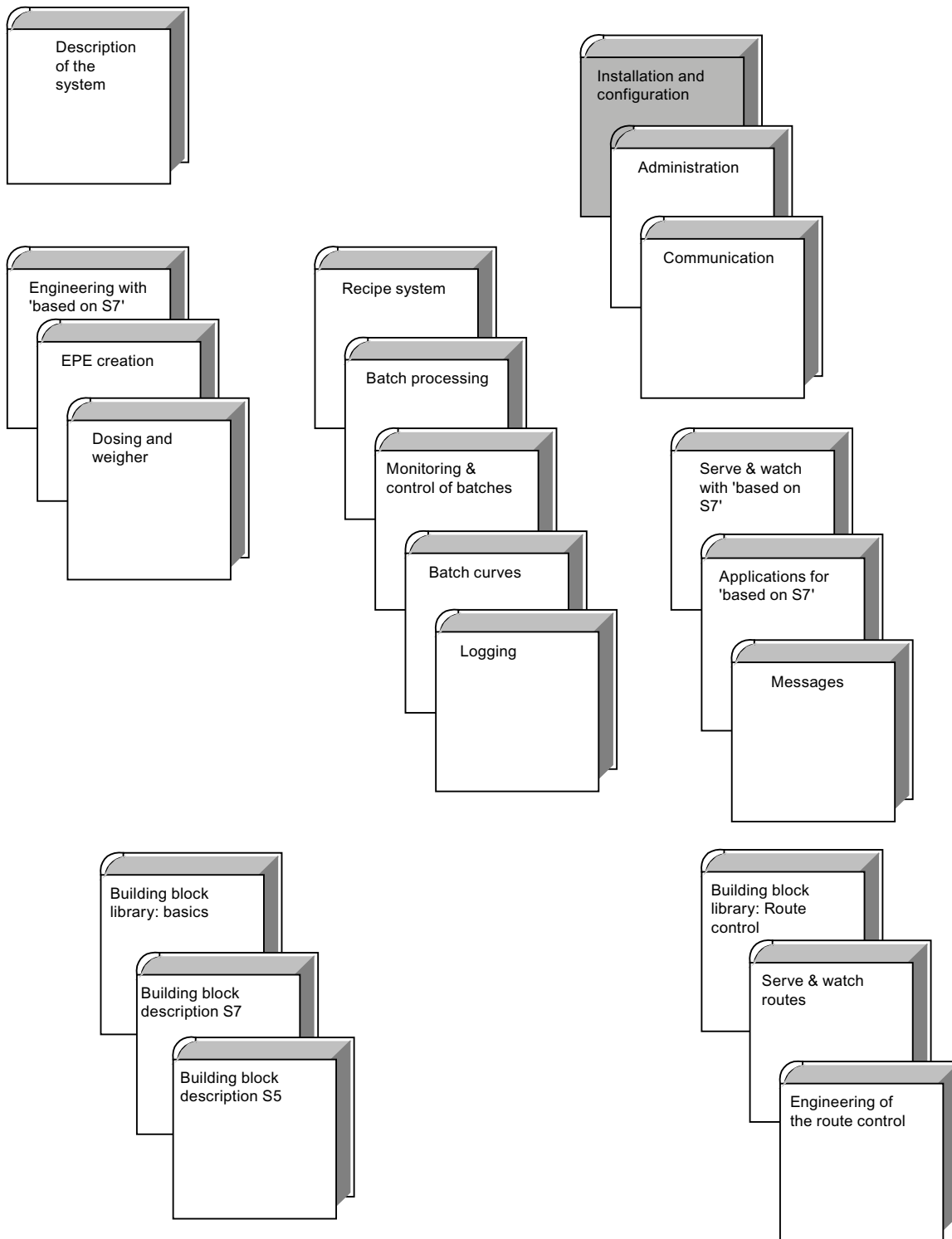
This manual is valid for the automation system BRAUMAT/SISTAR Classic from version V6.0.

The offered electronic manual is most largely identical with the contents of the on-line help. Due to a technically necessary editorial deadline for the generation of electronic manuals, there may be slight differences in comparison to the on-line help. The statements in the on-line helps are primary to those of the manual.

Place of this documentation in the information environment

This manual forms part of the BRAUMAT/SISTAR *Classic* V6.0 documentation package. The following schematic of the document architecture shows the individual manuals as well as their thematic grouping within the entire program package.

Document structure



Further support

If you have any questions on how to use products described in the manual, which are not given here, please get in touch with your Siemens representative or agents responsible.

You will find your contact person at:

<http://www.siemens.com/automation/partner> (<http://www.siemens.com/automation/partner>)

You will find a guide to the technical documentation offered for the individual SIMATIC products and systems here at:

<http://www.siemens.com/simatic-tech-doku-portal> (<http://www.siemens.com/simatic-tech-doku-portal>)

The online catalog and order system is found under:

<http://mall.automation.siemens.com/> (<http://mall.automation.siemens.com/>)

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where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on our products.
- The right documents via our Search function in Product Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Industry Automation and Drive Technology.
- Information on field service, repairs, spare parts and consulting.

OS Installation

2.1 Setup

The setup program is stored on the BRAUMAT/SISTAR Classic V6.0 CD in the following folder:

- <LW:>\sis_sys\Setup\Setup.exe

Alternatively, the setup program can also be called via the following batch file in the base directory of the data carrier:

- <LW:>\Setup.bat

The Setup program installs all necessary components on the computer. There is no difference between Engineering PC, Server or Client on the computer. These differences only occur during configuration within the WINDCS folder.

A restart is necessary during the execution of the setups, so that special OCRs can be registered. It is absolutely necessary that the user account used has "administrator rights".

Note

During setup, you can choose to install the executable basic configuration of BRAUMAT/SISTAR Classic V6.0 from your CD. Please note, however, that this basic configuration is based on the pre-defined PCU no. "PCU001" and IOS no. "IOS1". Any modifications of these defaults must be programmed manually, because there is no automatic adaptation in the configuration tools.

Log file

During the installation process, the setup program generates the "BraumatSetup.log" log file in the folder corresponding to the "TEMP" variable. This is normally the "%USERPROFILE%\Lokale Einstellungen\Temp" path. This log file contains setup actions as well as error messages. In case of an error, a message box also appears with a reference to the log file.

Note:

For security reasons Windows Explorer does not normally show the 'Local Settings' path at all. With the following setting you can enable that.

- Select Menu 'Tools->Folder Options'

In Tab "View" select the 'Show all files and folders' radio button and click to 'Apply' (instead of the normal setting "Show hidden files and folders").

2.2 Standard installation

2.2.1 General notes

Setup is menu-controlled. Here is some additional information.

- Setup creates a folder on the computer hard disk. This is located within the root directory of the hard disk and is called 'windcs'. Below this directory a structure of paths and files will be created.
- Installing the product license
Insert the BRAUMAT authorization disk, which contains the PROD32.DLL released for your system. Be careful not to mistake this authorization disk with the SoftCP or other authorization disks.
- Selecting the destination drive
BRAUMAT/SISTAR Classic V6.0 Setup always installs BRAUMAT/SISTAR Classic V6.0 in a user-defined root directory on the hard disk drive. For internal reasons, the system indicates any free hard disk space above 2 GB only with ">2048 MB".
Setup requires approx. 150 MB of free hard disk space.
- The installation source
Setup may have to restart your computer. It is therefore imperative to maintain a constant installation source drive. Of course, this does not pose a problem if you are running setup from a CD. If you are running setup from a network drive, please set up a "permanent" network path prior to installation.

2.2.2 Functional scope of Setup.exe

- Copies the required system files
- Copies the DEMO license, if the user does not insert the authorization disk and a valid authorization is not found on the destination drive.
- Sets the system name BRAUMAT V6.0 or SISTAR V6.0 in the caption bar of the applications:
You can customize this setting in:
 - File: "Area.ini"(Note: The earlier file "sys.ini" is no longer used for this purpose)
[PC]
Caption=<Neuer Systemname Vxx>
- Adaptation of "windcs" section in "win.ini", if drive C: is not the destination drive for setup
- Expands the system search path by adding "<LW:>\windcs\sys"
- Registers the ActiveX controls

2.2.3 Manual settings after setup

- PCU_SERV.INI (only when integrating S5 controls)


```
[Pcu_serv]
SinecPath=x:\sinec\data\startup.ldb
```
- A Firewall is activated when the Windows operating system is installed. In the default state, this blocks the BRAUMAT PCU server on startup and therefore also blocks the entire process connection. To remove the block, the dialog "Windows security warning" must be confirmed twice with the "No longer block" button when BRAUMAT is started for the first time: this applies both to "BRAUMAT PCU Server" and "BRAUMAT Remote Start PCU Server". Both applications will then be entered onto the Firewall's so-called list of exceptions and will no longer be blocked in future. This can be managed in the "Local Area Connection Properties / Advanced / Settings / Exceptions" dialog in Control Panel/Network Connections.
- This applies to use of both the "BRAUMAT SQL Adapter" optional package and the "BRAUMAT MES Adapter" application.

2.2.4 Directory structure

CD folder <Drive>:\sis_sys\sistar\...

Original version folder with corresponding subfolders

Subfolder	Meaning
S7ONNDIS	Files for Sinec H1 bus interface via NDIS driver
Microsoft	MS Access runtime package
RCS_III.ADO	ADDON files and SETUP for RCS offline
S7onndis	BRAUMAT Sinec H1 protocol driver (SoftCP)
WINDOWS.NT	Files that must be copied into the Windows folder
WINDCS32.SYS	System files for SISTAR/BRAUMAT
WINDCS32.USR	Predefined user files. These can only be imported on a selective basis following basic installation.

2.3 Update Installation

Setup provides an "Update only" mode for the following function:

- Automatic update with hotfixes and service packs of the same system version.
- This function only copies the files from the "windcs32.sys" folder for the relevant revision.

- It does not copy any files from the "windcs32.usr" folder (if present) because these usually contain user-specific data (e.g. INI/TXT files). These files or their content must be copied manually and adapted to meet the requirements of the relevant system configuration.
 - The function copies all revisions, up to the very latest.
-

Note

Setup is not suitable for updating to a more recent Braumat/Sistar system version. This upgrade must be carried out manually, because of the numerous variants and dependencies concerning the relevant equipment engineering, and in order to ensure safe conversion of the equipment engineering to the new version.

Many of the steps for upgrading Braumat/Sistar systems are subject to constant change and improvements and are therefore not mentioned in this documentation. Instead, these are provided in the "TXT" files on your CD inside folder "...\\sis_sys\\Sistar\\windcs32.sys \\Readme.txt\\..."

Current upgrade information is found in:

1. Hochr.txt
2. Hochr450.txt
3. Hochr510.txt
4. Hochr5xx.txt

Further information and help is available from our 'Simatic Customer Support' center. Siemens partners and addresses are found in the preface of this manual.

2.4 IOS File Directory Structure

Only the system-related IOS directories are described in this chapter. Please refer to the corresponding software documentation for information on the directory structures of the operating system as well as on the applications installed by the user (e.g. MS-WORD, MSEXCEL, etc.). Please refer to the respective manuals for information about project-related couplings (SINEC-H1).

2.4.1 Root Directory

The root directory WINDCS (=WINDOWS Digital Control System) is the term generally used for the named directory. In order to work with the system applications various files are necessary. These are filed in several directories. The structure of these directories is basically as follows:

Subdirectories

Root	Meaning
ACCESS32.V70	ACCESS database files for PI
BALI	Archives and configuration files for order system
BILDER	BMP and images files for process visualization
ENTITIES	Configuration files for entities
ETC	Help files
FRPROT	Archives and configuration files for tank data management (example), up to V4.6
LOGGING	Archive and definitions files for user and global logging
MELD	Archive files for messages
RECIPE	Archive and configuration files for the recipe system
SOUND	Wave files for sound variables
SPS	Configuration files for recipe system and silo administration
SRPROT	Archive and configuration files for step protocols
STEUERN	Configuration files for the application STEUERN
SYMBOLE	Symbol files for process images
SYS	System files, applications, DLLs
TMP	Temp. files for the system
TRANS	Configuration files for the application BLOCKTRANSFER
(TREIBER)	Driver files
TREND	Archive and configuration files for PI curves
V_Q_ING	Definition files for queuing
DLL.*	Applications DLLs, multilingual for different languages
HELP.*	Help files, multilingual for different languages.
NOTETXT.*	Notiztext files, multilingual for different languages.
TEXTE.*	Configuration files, multilingual for different languages.
PCU.*	PCU-dependent archives and configuration files
PCU.XXX	Template of PCU project files. When a new PCU is created, the relevant files are taken from this directory
SPOOLER.CIS	Archive and configuration files for the 'SQL-Adapter' option
PARAM.PCU	Files for the description of the technological objects in SISTAR
(FRPROT.TAK)	Archive and configuration files for tank data administration (example)
README.TXT	Readme files with system information

2.5 Product protection

2.5.1 Product DLL

The product is usually supplied with a system-specific authorization DLL (PROD32.DLL). Copy this file to the \windcs\SYS folder.

2.5 Product protection

The included DEMO DLL allows users to run the system for up to eight hours. This DLL is found in the \windcs\SYS\PROD_DLL folder.

SETUP copies the DEMO DLL automatically. SETUP does not overwrite your current system-specific authorization DLL so you need not reinstall the system-specific DLL in "windcs\sys" in case of update.

The DLLs enable specific programs and functions, analogous to the selection from the price list. SETUP also defines the number of automation devices which are ready for communication.

2.5.2 Soft Dongle

A software license key is used to protect the system. The software key must be installed from the disk supplied:

- 'LICENSE DISK V2.xx / BRAUMAT/SISTAR V6.xx '

(README file on the AUTHORIZATION disk).

2.6 Installing the BRAUMAT Sinec H1 protocol driver (SoftCP)

2.6.1 Installing the BRAUMAT SoftCP communication driver

The CD folder

- "...\sis_sys\sistar\S7ONNDIS\Disk\..."
contains the driver files for the SoftCP and H1 package drivers. These are required for the interface connection between a network card and the PCUs.
- The procedure of the SINEC-H1-protocol driver installation is the same as with any other protocol driver installation within the Windows network connections view.

Note

Using SIMATIC STEP 7

If the "SIMATIC STEP 7" programming SW is installed on the relevant IOS, please pay attention to the following:

During the installation of SimaticNET components the SoftNET protocol driver "SIMATC Industrial Ethernet (ISO)" is installed normally and activated in all existing LAN connections (=LAN adapters). In a LAN connection only one ISO/OSI model protocol driver may be active at one time. If the Braumat SoftCP driver "SINEC H1-Transport SINEC" was acting here before, it should be deactivated, since a trouble-free operation cannot otherwise be guaranteed. Braumat uses in this case the 'SimaticNET Industrial Ethernet (ISO)' protocol for the PCU server communication too.

If Simatic S5 PCUs are present in the system configuration, please note that the Braumat SoftCP protocol driver must be installed and activated. However, it must be installed on a dedicated LAN adapter if STEP 7 is going to be used at the same time. Both LAN adapters may be connected to the same LAN segment (HUB, Switch); a separation is not required.

2.6.2 Installation steps

- Insert the installation floppy disk.
- Control Panel -> Network and Remote Connections
- Right-click "LAN connection" -> Properties
- Install...
- Protocol ... Add...
- Drive...
- a:\ -> OK
- PACKET TDI Transport -> OK
- Install...
- Protocol ... Add...

2.6 Installing the BRAUMAT Sinec H1 protocol driver (SoftCP)

- Drive...
- a:\ -> OK
- SINEC H1-Transport -> OK
- Insert the authorization disk and run LICENSE.EXE. Install the SoftCP(Ind.Ethernet) authorization. See also the information in README.TXT on the authorization disk.
- Restart the computer after setup. The driver is now ready for operation.

2.6.3 Selection of the network card and deactivating the Braumat SoftCP driver

Important:

In configurations with more than one LAN adapter, on each adapter only one of the two protocol drivers should be activated. This has to be checked and corrected (where necessary) whenever SIMATIC NET components are installed or updated (even when initiated indirectly via STEP 7, for example). Otherwise, the Braumat PCU server process may experience startup problems or the PCU interface may be disrupted.

Deactivating the SoftCP driver on other LAN Adapters

- Control Panel -> Network and Remote Connection
- Right-click the NIC at which you want to disable the SINEC H1 Protocol -> Properties
- Reset the "SINEC H1 Transport" check box in the driver list.

In that case the following has to be mentioned:

For verification/diagnostics of the PCU Server online connections, Braumat normally uses the H1PING test-tool which relies on the 'Packet TDI Transport' protocol driver. If that protocol driver was installed but deactivated on the relevant LAN adapter, a Windows system crash (STOP error with bluescreen) could occur when H1PING is called manually by the user or automatically at Braumat startup.

Such system behavior can be prevented with one of the following measures:

- Activate 'Packet TDI Transport' at the LAN adapter which is running the Simatic S7 process connection. This is also possible with deactivated Sinec H1 Protocol driver
- Deinstall 'Packet TDI Transport' (Control Panel / Network connections / Local Area Connection / Properties ...). Braumat no longer calls H1PING.
- The automatic H1PING call from Braumat may be stopped with the following change in file S7.INI:

```
[S7]
;List of S7 PCUs
...
UseH1Ping=0
```

AS Installation

3.1 Creating an AS user project

In BRAUMAT/SISTAR Classic V6.0 , only the "based on STEP 7" variant (= configuration with STEP 7 STL as in the case of V4.x versions) is supported for configuring the process cell software when using Simatic S7.

Note

- If you are using the SIMATIC S5-155U as a PCU, please refer to the following file for the relevant installation instructions:
...\\windcs\Readme.txt\5.txt.
This folder can be found in the Braumat/Sistar destination drive once IOS installation is complete.
 - If a system update provides new functions in the AS blocks (e.g. additional data set parameters for a specific class) and you want to use these, it is not enough to simply install the relevant OS system version (incl. new param.pcu file). In this case, the relevant PCU software version must also be fully updated to the OS SW version.
-

Creating a new user project

- The AS project supplied can be found inside folder '...\Sis_S7.pcu') on the system data storage medium.
- Open it using SIMATIC Manager and save a copy under <MyProjectName>.

Adapting the HW configuration

- Delete all ASs that do not actually exist.
- Delete all PROFIBUS lines that do not actually exist.
- Next, adapt the hardware configuration in the hardware configuration manager so that it matches the actual configuration.

Note

Using other CPU types

- If another module (e.g. another CPU version, etc.) is actually going to be used, replacement should be performed, wherever possible, by dragging and dropping the new module from the hardware catalog to the default module slot. Do not delete the default module. As a result of the replacement operation, the hardware manager attempts to transfer all hardware parameterization data to the new module. The connection configuration between the AS stations (ASx ↔ ASy) in particular remains intact.
 - The same applies when you need to move modules in the rack: Move, but do not delete. Unless the CP slot matches the actual situation, it is not possible to establish a PG connection via SOFTNET.
-

Copying blocks to the AS container:

- Copy all SIS_SYS\Blocks* blocks into all ASs which are operated with this variant.
 - Copy all SIS_USR\Blocks* blocks into all ASs which are operated with this variant.
-

Note

New project vs. update

Since SIS_USR always contains "empty" program/data templates to be configured by the project engineer, only one copy operation should be performed from this folder at the beginning of the configuration process. (Copying must not be performed during a system update, for example.) The same applies to all subsequent copy steps.

Copying the symbol table

- Copy <_DE/_EN>\Symbols_XXXXXX symbols into all ASs which are operated with this variant.

Options

Further libraries can also be installed (as an option) to provide additional functions. These are V6.0:

- Route control option
Copy all SIS_RCS_SYS\Blocks* blocks into all ASs which are operated with this variant.
Copy all SIS_RCS_USR\Blocks* blocks into all ASs which are operated with this variant.
- SIWAREX weigher option
Copy all SIS_SIWA_SYS\Blocks* blocks into all ASs which are operated with this variant.
Copy all SIS_SIWA_USR\Blocks* blocks into all ASs which are operated with this variant.

Note

Other weigher types

For the other weigher types ("tipping scales" and "counter weigher"), sample programs can be provided as a STEP 7 library on request. These can be obtained via Simatic "customer support" (see the preface of this manual for the contact address).

3.2 Adjust the AS Number

Adjust in each block offline file of each AS the DB701.DBB4 ("SYS".u.byAS) to the AS Number (adjust the XX from "AS_XX_MPI_YY_417", to the name of the corresponding Simatic Station).

Note:

As the FC 505 ("SISTAR_FC") is called by the primary FCs with the input parameter "Variant" = 1 (means "SISTAR based on STEP 7"), the input parameter PCUNo is irrelevant. The Project Manager should supply the AS number itself in the DB701.DBB4

The AS number can be set by means of parameter assignment.

- Menu Engineering Tools -> Configuration
- Area (select the required PCU)
- Class (PCU_Allg)
- Click OK
- Type in the PCU at the "PCUno" parameter

3.3 Download to AS

With this version of the blocks you have created a booted basic installation version. This one can be loaded in the PLCs.

3.4 Free system resources for users

The BRAUMAT/SISTAR Classic V6.0 system uses diverse CPU blocks and flag areas. Access by user programs to these and to other resources reserved for future or project-specific expansions is locked. The table below shows the resources available to the user:

Type	S5 CPU 948		S7 CPU 414		S7 CPU 416		S7 CPU 417	
	CPU range	Users	CPU range	Users	CPU range	Users	CPU range	Users
FB	0 - 255	1 - 58, 70 - 79	0 - 7999 max. 3000	>= FB1500	0 - 7999 max. 5000	>= FB1500	0 - 7999 max. 8000	>= FB1500
FC	-	-	0 - 7999 max. 3000	>= FC2051	0 - 7999 max. 5000	>= FC2051	0 - 7999 max. 8000	>= FC2051
FX	0 - 255	65 - 127	-	-	-	-	-	-
DB	2 - 255	3 - 99	1 - 16000 max. 6000	>= DB2500	1 - 16000 max. 10000	>= DB2500	1 - 16000 max. 16000	>= DB2500
DX	3 - 255	230 - 255	-	-	-	-	-	-
SB	0 - 255	-	-	-	-	-	-	-
PB	0 - 255	-	-	-	-	-	-	-
MB	0 - 255	0 - 95 128 - 199	0 - 8191	1432 – 2045 2048 – 8191	0 - 16383	1432 – 2045 2048 – 16383	0 - 16383	1432 – 2045 2048 – 16383
SY	0 - 4095	0 - 127 2114 - 4095	-	-	-	-	-	-
Timer (Zeiten)	T0 - T255	T1 - T95	T0 - T2047	T0-T95 T224- T509	T0 - T2047	T0-T95 T224- T509	T0 - T2047	T0-T95 T224- T509
Counter	Z0 - Z255	Z0 - Z255	Z0 - Z2047	Z0 - Z2047	Z0 - Z2047	Z0 - Z2047	Z0 - Z2047	Z0 - Z2047

Configuration – General

4.1 Preliminary note

After a successful installation of the system and establishing additional functions, some basic system configurations have to be established.

Note

The settings described in the next chapters are made in the INI files (readable text files). The INI files are read in once during startup of the BRAUMAT/SISTAR Classic V6.0 system by the local process "PCU server". User modifications of switches and variables in these INI files do not take effect until after the next system restart. This applies to changes made in the configuration tools described below, as well as to most of the switch variables, regardless of whether attention is explicitly drawn to this point in the relevant subsection or not. Hence, always proceed as follows after you have made any changes in your configuration files:

- Close all BRAUMAT/SISTAR Classic V6.0 applications, including "PCU server"
- Close the (additional) processes "RSPCUSR.V.EXE" in the Windows Task Manager under "Process"
- Run "newmenu.exe" to restart BRAUMAT/SISTAR Classic V6.0

As an alternative, you can also shut down and restart your PC. We advise this procedure particularly for the "Autologin application"

4.2 Defining the IOS/PCU numbers/names

Old AREA.INI Format

In the 'System settings' application, select the 'IOS SETTING' and 'PCU SETTING' command, and type in a unique name. The IOS number has been set under "PCNo=" in the SYS.INI file.

Each PCU receives a configuration subfolder: '...\windcs\PCU.<Number>.'

Extended AREA.INI Format

The complete configuration is performed with the tool 'SITECFG.EXE' which stores all the settings in file AREA.INI (see chapter Plant configuration with SiteCfg - Application)

There are two subfolders PCU.001 and PCU.XXX (as a template folder) in the delivery condition of the IOS. With the input of any further PCUs a copy of PCU.XXX is created. The configurations should be adapted accordingly.

General

Only if the PCUs have been entered here does the IOS have a connection to them after a restart.

4.3 Windows settings

Windows network connections

For IOS communication, Braumat/Sistar essentially requires at each IOS – whether client or server – a share to the disk drive of the windcs folder or the windcs directory itself.

- Access can be defined as follows:
 - Case 1: Access to the disk drive, e.g. "D:\\" (=default setup upon system delivery)
 - Case 2: Access to the windcs directory, e.g. "D:\windcs"
- Choose your own name, but for reasons of clarity this should be consistent for all IOSs
- The "system path" definition in the IOS settings of the configuration tool "SiteCfg.exe" (-> configuration file AREA.INI) must agree with the respective access of any IOS
 - Case 1: System path = \\<Computername>\<Sharename>\windcs
 - Case 2: System path = \\<Computername>\<Sharename>
- Two examples:

Share:	"D" on drive "D:\\" on IOS2	"Braumat" on <Dir>. "D.\windcs" on IOS2
System path:	\\IOS2\D\windcs	\\IOS2\Braumat

- The access must include "Full Control" rights
- For reasons of IT security, the access can be restricted to certain users or groups; however, ensure that all users authorized for Braumat are actually members of the local administrators group
- The Windows standards and regulations for work groups and domain administration apply to creating and administering the users/passwords. Particularly with domain administration, the respective responsible domain administrator must be consulted.
- However, with domain operation you should remember that to maintain a smooth production operation a consistent and secure access to the domain controller(s) must be guaranteed. If the domain controllers of an office network are to be used, you must ensure the load balance of both subnetworks by means of suitable LAN switch components.

4.4 Starting the System

4.4.1 Start via Desktop

In order to start the system, only the application MENU.exe or 'NEWMENU.exe' should be called from the ...\\SYS\\ folder. Any other necessary processes, such as the PCU Server, etc., are started automatically. You reach the corresponding applications via the basic menu.

4.4.2 Starting the system from the shell

4.4.2.1 BRAUMAT Start Menu from the Shell

The system can also be started from the SHELL, i.e. automatically after startup. The following key must be changed via the registry editor (regedit.exe):

32-bit and 64-bit operating system key	Value (type)
HKEY_LOCAL_MACHINE\Software\... Microsoft\Windows NT\... CurrentVersion\Winlogon	Shell (REG_SZ) = d:\windcs\sys\menu.exe or ... Shell (REG_SZ) = d:\windcs\sys\newmenu.exe (if BRAUMAT on D: installed on C:).

Note

If a program is entered which doesn't exist or can't be found, Windows NT starts without shell!
In order to cancel the changes, you should either

- Call the registry via the Task Manager or
- the registry on another computer (important: the user who is logged in must have administrator rights) and change the setting via the menu item "Registry -> Select computer".

When the system is started from the shell, there might be timing problems with the coupling. The PCU Server should, therefore, be started time-displaced to the main menu. The following adjustments are necessary:

- configuration file '...\windcs\sys\Menu.INI'
[Wnd]
Delay = <value greater than zero>

Delay=2 has resulted as a favorable value, i.e. the PCU Server is started 2 seconds time-delayed.

4.4.2.2 Activating the AutoLogon Function

General

With the AutoLogon function it is possible to log in a user automatically. However, this user must have a password.

Windows XP and Server 2003

The following keys must be changed via the registry editor (regedit.exe) or added via the "Edit/New/String" menu command:

Windows XP operating system key	Value (type)
HKEY_LOCAL_MACHINE\Software\... Microsoft\Windows NT\... CurrentVersion\Winlogon	DefaultUserName (REG_SZ) = <Username> AutoAdminLogon (REG_SZ) = 1 DefaultPassword (REG_SZ) = <Password> ForceAutoLogon (REG_SZ) = 1

Windows 7 and Server 2008 R2

- Call Start → Run → **netplwiz.exe**
- Deselect the option 'Users must enter a username and password to use this computer'
- Terminate dialog with 'OK'
- Enter the username and password in the 'Automatic logon' dialog
- Terminate dialog with 'OK'

The desktop or the BRAUMAT menu now starts up directly when the system is restarted.

The following registry key needs to be set so that this also runs upon logout:

- HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion\Winlogon → ForceAutoLogon (REG_SZ) = 1
- The "Shift" key must be pressed during logon in order to receive the logon dialog again after this.

4.4.2.3 Displace Task Manager

Even if you start BRAUMAT/SISTAR from the shell and protect the reference on the Program Manager or Explorer by the password, you could call every application on the operating system level.

Corrective measures: Move the application '...\Windows\SYSTEM32\TASKMGR.EXE' to a folder where no path is set.

NOTICE

Branching is not possible if you have not executed the shell input correctly (BRAUMAT e.g. can't be started).

As a result:

- Change first shell input
- Startup test, test reference to Program Manager
- Copying Task Manager

4.4.2.4 Activate Explorer

The Windows EXPLORER can be activated via the Braumat menu:

- The display with the Windows toolbar can only be reached if the Explorer is started as shell. Therefore the basic menu writes the input "shell=Explorer.exe" in the registry before calling the Explorer. After calling, the original input has immediately been created again. The requested display of the toolbar is reached with it.

However, there might be a minor problem:

- If the user wants to close the Explorer again, he can select between "Logoff" and "Shutdown". In order to close the Explorer, the Explorer should have been "killed out" of the Task Manager. There is an aid program in the BRAUMAT Standard. This program should be bound in the Explorer interface as a link or called as a menu item by the toolbar ('START' -> 'Adjustments' -> 'Toolbar' -> 'Insert' under e.g. programs, Name 'Back to BRAUMAT/SISTAR').

The user can close the Explorer by mouse click or function selection in this way. The program is called ENDEEXPL.EXE and is in the subfolder \\WINDCS\SYS\.

4.4.2.5 Call additional applications

After the main menu has been started from the shell, the PCU Server application, which displays the coupling interface to the ASs and the other OSs, is also started. In order to activate further applications (e.g. the Trend Manager to record curve sequences) at system startup, the following configuration settings are available to the user.

In the file SYS.INI under

```
[PC]
```

```
AutoStart = <App1;App2;App3;...>
```

the corresponding application names should be entered – separated with semicolons.

Example:

The Trend Manager and the Hardcopy program should be activated after calling the basic menu. The entry should be:

- `AutoStart = trendman.exe; clipprnt.exe`

Note

The applications in sys.ini are started only if the Menu application was started as shell. In all other cases these applications are not called automatically.

Configuring the IOS-PCU communication

5.1 Preliminary note

For configuring the communication you should distinguish between the following aspects:

- used Control family - SIMATIC S5 and S7
- the type of coupling between OSs and ASs

Each possible combination of these parameters leads to a dedicated system-typical plant configuration. This extends from simple structures, such as e.g. one PCU coupled to one IOS, up to very complex configurations with e.g. 16 or more PCUs coupled via a redundant H1-Bus to several Server IOSs plus several Client IOSs which are tied via a normal Ethernet.

A Server IOS is connected directly with the PCUs, whereby a Client IOS can only communicate via Server IOS via TCP/IP with the PCUs.

The communication is organized in channels. These communication programs are supplied either with a default or with a plant-specific configuration.

Special path settings, configuration files and parameter assignments are required for the relevant system configuration. In this context, and of importance when using SIMATIC S7 products, is the appropriate configuration of S7.INI and the assignment of FIFOs by means of the auxiliary program FIFOCONF.EXE. The operator stations (OS) must be numbered and named, and these data must be downloaded to the corresponding automation systems (AS). This is done by means of the "Control Panel". The data are stored in "\windcs\SYS\SYS.INI".

Note

BRAUMAT/SISTAR Classic V6.0 now supports the multiclient mode, which has a significant impact on the S7.INI and SYS.INI files. A user-friendly configuration tool is now available for configuring the multiclient (see chapter Plant configuration with 'SiteCfg' Application (Page 58)).

5.2 Usage of the SIMATIC S5 family

5.2.1 General information

The data exchange between IOS and PCU is realized via an industrial Ethernet connection (former term 'Sinec H1'). Versions V5.x do not support coupling via serial RK512 interface any more.

As a connection media between the OS stations (terminal bus), all the 'Windows'-supported industrial Ethernet network components can be used. This coupling is part of the scope of delivery of the system dependent on the configuration.

So-called channels are necessary for the connections from IOSs to PCUs. There are altogether 8 channels available for each PCU for the S5-155U and 6 for the S5-115U.

Each channel includes:

- 255 process variables (PA variables)
- 255 curves variables (PI variables)
- 1 FIFO + 1 Send buffer

These channels can be assigned to the corresponding IOSs. A corresponding configuration is necessary on the IOS side as well as the one that fits accordingly on the PCU side.

5.2.2 Standard channel configuration for Sinec H1

The following configuration is supposed to be the most favorable for the demands of a plant with a redundant Job and Recipe System. Two Server IOSs in each area share the available channels via which the CIS Client IOSs can communicate with the PCUs.

- IOS - PCU connections:
 - IOS 1+2: Server for PCU 1-8
 - IOS 3+4: Server for PCU 9-16
 - IOS 5+6: Server for PCU 17-24
 - IOS 7+8: Server for PCU 25-32

Each IOS uses 4 channels, i.e. 1020 PA variable, 1020 PI variable, 4 FIFOS. The PI variable can also be used as PA variable.

- PCU - PCU connections:
 - PCU 1-16 can exchange data for CP1430 Ext.
 - PCU 17-32 can exchange data for CP1430 Ext.

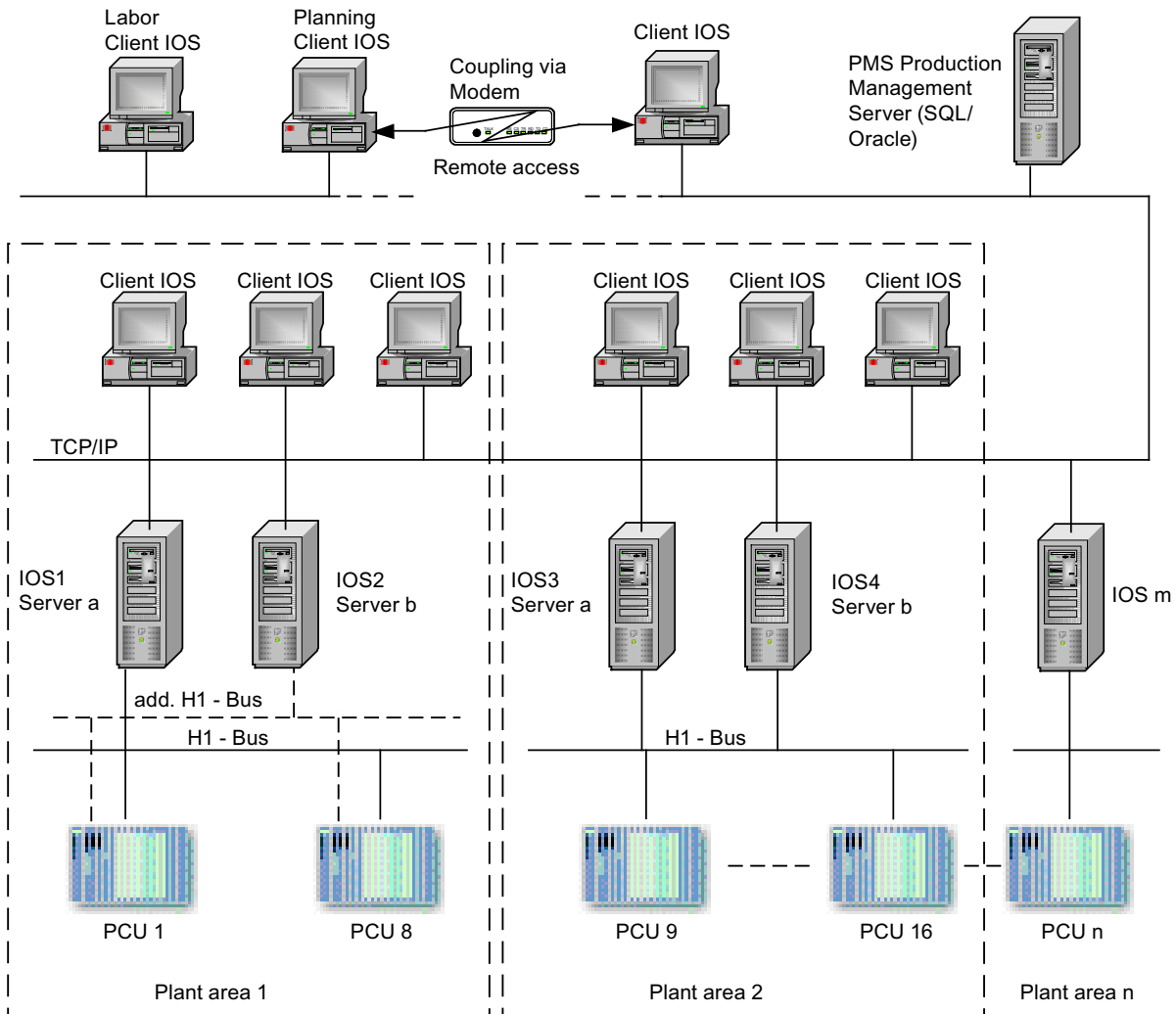
The files for the CP143 as well as for the CP1430 are included in the Standard configuration. There are two different versions for the CP1430:

- CP1430 Basic (max. 16 TF connections)
- CP1430 Extended (max. 100 TF connections)

The H1-Bus can also be redundant, i.e. with two independent buses which are designed each with a separated CP in the PCUs and a Server IOS per area.

The Client IOSs are assigned to special Server IOSs via which you can request process variables from the PCUs or receive messages.

Client IOSs can also be connected via Modem and Standard RAS connection to the system.



As described above, corresponding areas are defined. Two Server IOSs are coupled with H1-Bus-Card to the PCUs per area. Via an Ethernet connection (TCP/IP), the areas are connected to each other and corresponding Client IOSs are coupled. The assigned Clients share channels with the Server IOSs.

Any further Client IOSs can be connected to the Ethernet cross-area. This enables them to access special PCUs via the server.

By means of RAS coupling (Remote Access Service) and two modems there is a connection from outside via the telephone line to the plant.

5.2.3 Different configurations with H1-Bus

Any further conceivable and technical configurations can be created individually. The corresponding configuration files from CP1413 (IOS) and CP143* (PCU) should be adapted.

5.3 Usage of the SIMATIC S7 family

The connections should fit in the CP143* H1-Card in the PCUs. In the PCU Server under 'Coupling' 'SINEC H1' or 'Recipe Server' should be selected.

Note

Help and special configuration files can be ordered from SIMATIC Customer Support... (addresses/partners are found in the preface of this manual).

5.2.4 The following should also be considered

If more than 10 incoming connections are used on a Server IOS (i.e drive connection, printer connection, etc. from other IOS Stations), a Windows Server License should be installed. The normal Windows Workstation licenses only support up to 10 incoming connections.

5.3 Usage of the SIMATIC S7 family

5.3.1 General information

The data exchange between IOS and PCU is implemented either via an Industrial Ethernet connection (former term 'Sinec-H1', also redundant), or via an MPI/Profibus or TCP/IP connection.

A maximum of 2 IOSs as server may be connected at each PCU; any further IOSs should communicate via this server by means of a Client connection.

Each server can manage 3700 variables per PCU (37 Var./Block, 100 blocks). These are assigned block by block to the PA or PI variables. In addition 3 FIFOs and 3 send buffers are also available.

5.3.2 Standard configuration for H1 connection

This configuration is the most favorable for the demands of a plant under Windows with a redundant Job and Recipe System. Two Server IOSs in each area share the available variables and FIFOs/Send buffer via which the CIS IOSs can communicate with the PCUs.

This configuration is defined for the usage of SIMATIC S7:

- IOS - PCU connections:
IOS 1+2: Server for PCU 1-8
IOS 3+4: Server for PCU 9-16
IOS 5+6: Server for PCU 17-24
IOS 7+8: Server for PCU 25-32
- PCU - PCU connections:
PCU 1-16 can exchange data
PCU 17-32 can exchange data
(from V4.6 connections of PCU 1-32 are possible)

The corresponding connections are defined on the IOS side in the AREA.INI and on the PCU side in the HW configuration. For the assignment and allocation of the FIFOs the help program FIFOCONF.EXE is called.

The Client IOSs are assigned to the areas and special Server IOSs. Via these they can request process variables from the PCUs or receive messages.

Client IOSs can also be connected via modem and standard RAS connection to the system.

As described above, corresponding areas are defined. Two Server IOSs are coupled with H1-Bus-Card to the PCUs per area. Via an Ethernet connection (TCP/IP), the areas are connected to each other and corresponding Client IOSs are coupled. The assigned Clients share variables with the Server IOSs.

Any further Client IOSs can be connected to the Ethernet cross-area. This enables them to access special PCUs via the server.

By means of RAS coupling (Remote Access Service) and two modems there is a connection from outside via the telephone line to the plant.

5.3.3 Standard configuration for MPI connection and PLCSIM mode

In reference to the division of the IOSs and PCUs to the corresponding area, the solution with MPI connection is the same as the one with H1-Bus connection. The same conventions as above are valid. In MPI mode the used communication interfaces and connection lines are different as well as the configured MPI address (2 characters).

Note

In PLCSIM mode the following switch in the S7.INI file should be set, deviating from the default state (at system delivery). Without this setting, there could be errors when transferring large blocks from/to the simulated PCU.

```
[S7]
```

```
...
```

```
;Asynchronous reading from PCU
```

```
AsyncRead=0
```

5.3.4 Standard configuration with a direct TCP/IP connection

In reference to the division of the IOSs and PCUs to the corresponding area, the solution with TCP/IP connection is the same as the one with H1-Bus connection. The same conventions as above are valid. Only the used coupling assembly group and connection lines are different and the corresponding transfer rates which are part of it.

5.3.5 Configuration of IOS-PCU connections:

The connections between IOS and S7-PCU are configured on the IOS. There should be assigned only an explicit address (MAC and/or TCP/IP) to the CP443 (communication processor for Industrial Ethernet in the PCU).

Old "Area.ini" Format

The connections can be configured with the application 'System adjustments'. The inputs are entered in the file S7.INI. This file is in the S1STAR system folder (..\windcs\sys\).

Extended "Area.ini" Format

Connections can be configured in "System settings -> Configtool". These entries are saved to area.INI, which is stored in the S1STAR system folder "...\\windcs\\sys\\".

The file structure should be explained in the following example:

In the key slaves under Section [S7] all S7 PCUs with which the computer should communicate should be listed. It is irrelevant whether the communication is executed via a direct connection to the PCU or indirectly via a Server IOS.

For each PCU to which a connection should be established, there should be an area [PCUx], whereby x is to be replaced by the PCU number.

- **Mac_Addr**
defines the Ethernet address of the S7 by a 12-digit hexadecimal number.
Mac_Addr must have the value FF.FF.FF.FF.FF.FF, if the IP address is used.
- **L2_Addr**
defines the MPI or PROFIBUS/L2 address of the S7. The key has priority over Mac_Addr.
When using a SINEC-H1 bus coupling the L2_Addr should be removed.
- **IP_Addr**
defines the TCP/IP address of the S7.
- **DB_Write_Var**
defines which DB should be used as the writing buffer for operating variables. An indirect adjustment is made as to whether the computer should be used as Server A or Server B.
Possible values are 706 or 707; for missing configuration 706 is used. (insignificant with extended Area.ini, because it is generated there!)
- **CPU_Socket**
should include the plug-in station number, in which the S7-CPU is plugged in the rack. This parameter is required for the connection structure. If there aren't any inputs, 4 will be used.

- **Type**
defines the AG type. Default value is an AS416. This input is necessary for the output of the possible amount of blocks per AG type. It refers to the AS inputs which are in the square brackets (see e.g. [AS417] or)
- **Device**
defines the relevant coupling type for this PCU. Default value is the coupling type which is entered in the SIMATIC Manager under 'PG/PC interface'. If different types for special PCUs are requested the corresponding text should be copied from the PG/PC interface coupling.

Note:

When the "Area.ini with extended format" is used, the attributes listed above are read from the [PCU] section of Area.ini

After having changed adjustments in the file S7.INI, the PCU Server should be closed and restarted, so that the changes can be active.

PCU Server

6.1 General

For the coupling between AS and OS or OS and OS the application PCU Server is necessary. This application should run on every Server or Client.

The application is automatically started with the start of BRAUMAT/SISTAR Classic V6.0 .

The PCU Server has two particular tasks:

- It makes the necessary functions available for the Client-Server via TCP/IP
- It administrates a sequence of Server functions. Server functions are coupled as so-called 'Miniports' to the PCU Server.

The PCU Server may be expanded functionally by the functions of the Miniports. The Miniports are implemented as Windows DLLs.

6.2 Miniports

For the connections from the IOSs to the PCUs or to other IOSs, so-called Miniports are available (preconnected coupling interfaces) to the PCU Server applications. (e.g. coupling via H1-Bus, serial...) Depending on the type of the connections the coupling-specific functions are called in the Miniports.

In addition there are further Miniports, which adopt special, exchangeable functionalities for the PCU Server (e.g. Job/Recipe System....).

The corresponding Miniports should be combined so that special total functionalities are reached.

6.2.1 Communication ports

- H1.DLL
Coupling to SIMATIC S5 via the CP1413.
- H1_NDIS.DLL
Coupling to SIMATIC S5 via the driver Soft-CP.
- S7.DLL
Coupling to SIMATIC S7 via S7-DOS. The interface via which S7-DOS communicates is defined with the function 'PG/PC interface'.

- CLIENT.DLL
In this DLL the connection to different PCU Servers is realized via TCP/IP.
- DATAPORT.DLL
For the client-server communication a new communication port is necessary from V5.3 SP2. In the respective sections of the used connection types (see below) the string of text 'dataport.dll' must be placed in the line 'Ports=' before the 'client.dll' entry. This modification must occur on all IOS stations of the installation.

6.2.2 Server functions

The server functions are addressed as virtual PCUs by the system. This means that for Client access, entries such as those necessary for PCUs should be created.

- TA.DLL
In this DLL a copy of the Sequencer is listed in the SIMATIC control. The copy is supplied with data via the message 13.
- RECCTRL.DLL (virtual PCU 254)
In this DLL the sequencer-crossed control (Synchronizations) is realized.
- BALIDATA.DLL (virtual PCU 252 and 253)
In this DLL the server functionality of the job system is realized.
- CAS.DLL
In this DLL the functions for starting batches are realized.
- RCS_PORT.DLL (virtual PCU 245)
In this DLL the Runtime functions of the Route control are implemented.
- ENTPOINT.DLL (virtual PCU 249)
In this DLL the functions for the ICM functions which are in the same context as Entities are realized.
- GLOBLOG.DLL
In this DLL the convergence of the decentrally registered change protocols is realized.
- SIM.DLL
In this DLL elemental simulation functions are realized for demonstrations and offline operation.
- CALL_APL.DLL
This DLL can be used to configure automatic calling of other applications using the "CALL_APL.INI" file.
- MAINTSUPV.DLL
This DLL implements the cyclic monitoring of the switch alterations and operating hours. If this feature is required, it has to be included additionally in the actual list of miniports, with the following entry in the PCU_serv.ini file:

```
[SINEC &H1];List of ports for SINEC
H1Ports=s7.dll,h1.dll,MaintSupv.dll...
```

See manual '16_Application based on S7I Chapter 13 Maintenance Data' for configuration details of this miniport.

6.2.3 PCU Server coupling types

The PCU server has several coupling types.

Via the menu item 'Coupling types' the PCU server can be adjusted to a special functionality.

There is a line of miniports behind a coupling type. The following coupling types are predefined for the system delivery.

- SINEC H1
- SINEC H1 (Soft CP)
- Recipe Server
- Recipe Server (Soft CP)
- Client
- Simulation Recipe Server
- The possible coupling types should be adapted to the plant configuration. The coupling type 'Simulation Recipe Server' in particular should be removed in the plant operation later.

6.2.3.1 General information on possible coupling types

The possible coupling types are defined via the file `pcu_serv.ini`.

```
[Communication]
;Communication types
Types=SINEC &H1,SINEC H1(So&ftCP),&Recipserver ...
Active=&Client
```

- Sign '&'
Via the sign '&' the shortcut is defined. In the menu this letter is underlined and selected functionally direct via the keyboard (Windows standard properties).
- Adapt the coupling types
The coupling types can be reduced or expanded. The list, which is defined with 'Types', should be changed. A stroke in the list leads to a hyphen in the menu. A wordwrap isn't allowed. The inputs should be separated by a comma.
- Coupling type in squared brackets
There should be an input in the `pcu_serv.ini` for each coupling type. The inputs in the 'Types' list and in the squared brackets should conform to each other exactly.
- Adapt Port list of a coupling type
The list of the ports of a coupling type can be adapted. For the standards there may only be appended additional ports. The inputs should be separated by a comma. It is important to ensure that the `CLIENT.DLL` stands at the end of the list.

6.2.3.2 Coupling type SINEC H1

This coupling type is defined for stand-alone visualization.

The coupling for SIMATIC S5 is executed via the CP1413. A valid startup.ldb is necessary for the operation of the CP.

The coupling to SIMATIC S7 is executed via the adjusted access of the S7-DOS shift. Inputs in the file s7.ini should be made for the coupling.

Input in the file pcu_serv.ini

```
[SINEC &H1]
;List of ports for SINEC H1
Ports=s7.dll,h1.dll
;Statusbar display for SINEC H1
Statbar=SINEC H1
```

6.2.3.3 Coupling type SINEC H1 (Soft-CP)

This coupling type is defined for stand-alone visualization.

The coupling to SIMATIC S5 and S7 is executed via the driver Soft-CP. A valid startup.ldb/txt is necessary for the coupling operation to PCU S5 (under SINEC/DATA).

The coupling to SIMATIC S7 is executed via the adjusted access of the S7-DOS shift. Inputs should be made in the file s7.ini for the coupling to S7.

Input in the file pcu_serv.ini

```
[SINEC H1(So&ftCP)]
;List of ports for SINEC H1
Ports=s7.dll, h1_ndis.dll
;Statusbar display for SINEC H1'
Statbar=SINEC H1 with SoftCP
```

6.2.3.4 Coupling types Recipe Server/Recipe Server (Soft-CP)

With this coupling type miniports are loaded, which are used for the operation as Recipe Server with SINEC H1 connection. For the coupling to SIMATIC S5/S7, the executions are valid as for coupling type SINEC H1 or SINEC H1 (Soft CP) (Soft CP).

The Recipe Server uses the unit copy, the recipe control, the job control and the batch start function. Furthermore the Client function is entered for the communication for any further visualization servers.

The sequence of the inputs is important and may not be changed.

Input in the file pcu_serv.ini for 'RecipeServer'

```
[&Recipeserver]
;List of ports for Recipe Server
Ports=ta.dll,s7.dll,h1.dll,recctrl.dll,balidata.dll,cas.dll,dataport.dll,client.dll
;Statusbar display for Recipe Server
Statbar=SINEC H1 - Recipeserver
```

Input in the file pcu_serv.ini for 'RecipeServer (Soft CP)':

```
[&Recipeserver]
;List of ports for Recipe Server
Ports=ta.dll,s7.dll,h1_ndis.dll,recctrl.dll,balidata.dll,cas.dll,dataport.dll,client.dll
;Statusbar display for Recipe Server
Statbar=SINEC H1 - Recipeserver
```

6.2.3.5 Coupling type Client

With this coupling type all data is accessed which cannot be handled via the miniports which are not loaded locally at the PCU server. These are e.g. data, which are requested by PCUs which are not connected directly at the local PCU server via s7.dll or h1.dll/h1_ndis.dll .

6.2.3.6 Coupling type Simulation Recipe/Route Control Servers

This coupling type is available for live presentations or process image creation where no real PCUs are available. Hereby elementary write and read access to data blocks of PCUs (online mode operation) are captured and simulated from the Sim.dll miniport. The recipe server is activated and thus essential functions of a simulated batch process are provided.

- Braumat applications are showing 'Simulation' in the caption line
- Batches may be created
- Batches are running in simulation mode with user-configurable "StepTime"
- While doing so, the data tags from the Braumat applications are updated in online mode.
- The simulation reads the data from the offline data blocks and writes the value of operations in the blocks.
- No further actions of technological function blocks in the AS are simulated (this could however be achieved with the PLCSIM software package at least).
- The feedback inputs of ICM blocks maybe simulated (without delay)
- The setpoint/actual values of DFMs may be adopted from the control recipe (valid for all enabled PCUs commonly)
- On selecting a recipe alternative, the result producing RUP will be paused; the user may set the alternative result manually by editing this value in the according sequencer data record within the PARAM application
- With Route control only the server miniport is started including simulated general PCU query but without route running; so that RCS online may be started and fixed but inactive routes (16 per PCU) may be viewed; concerning that, the RCS datablocks DB100 and DB404 should be present in the Offline DB folder of each PCU

Conditions for a useful Simu operation are:

- The Offline DBs should be present in the PCU folder
- In the PCU_SERV.INI the following entries were made


```
[SimTa]
Enable=1
Cycle=2
StepTime=5
```
- Optional entries


```
PLCSimPCU=1
EnableDFMSimu=1

SimICM]
ICMsToBeSimulated=(1,*,*)
```

Description of keys:

Enable:	general simulation enable/disable
Cycle:	cycle time of sequencer simulation in seconds (must be >=2)
StepTime:	StepTime sequencer step runtime (times cycle time in seconds)
PLCSimPCU:	this PCU will be ignored in Sim.dll (=present), as it is emulated with PLCSim

EnabledDFMSimu read DFM setpoint/actual values from control recipe

ICMsToBeSimulated=(<PCU-number>, <ICM group number>, <ICM instance number>); [next description]

;Wildcards "*" are allowed and reasonable

;Examples	Key
;Simulate everything:	(* , * , *)
;Simulate all ICMs belonging to PCU1:	(1 , * , *)
;Simulate all ICMS belonging to PCU1 or PCU2:	(1 , * , *); (2 , * , *)
;Simulate only the first two groups of all PCUs:	(* , 1 , *); (* , 2 , *)

Note

This coupling type doesn't make any sense in a real plant configuration and should at least be removed from the list during commissioning.

6.2.3.7 Expansion Route Control

For the operation of the Route Control an additional miniport should be added to the list. If the Recipe Control also runs on the server, the entry for 'RecipeServer' should be expanded. If stand-alone operation of the Route Control is desired, the entry for 'SINEC H1' should be expanded.

For Route Control the miniport 'rcs_port.dll' should be appended in the list of ports.

6.2.3.8 Expansion Change protocol

For the global convergence of all change protocols of the Clients and Server the miniport globlog.dll should be appended to the list of ports. The Globlog miniport should run on the Recipe Server.

Further adjustments are necessary for the function.

- See logging

6.2.3.9 Expansion of ICM Entities

Only the instance based on S7 is necessary for the function. The Server functionality of the Entities is realized with it (Entport.dll).

- See 15_ 'Watch and Serve' with based on S7'

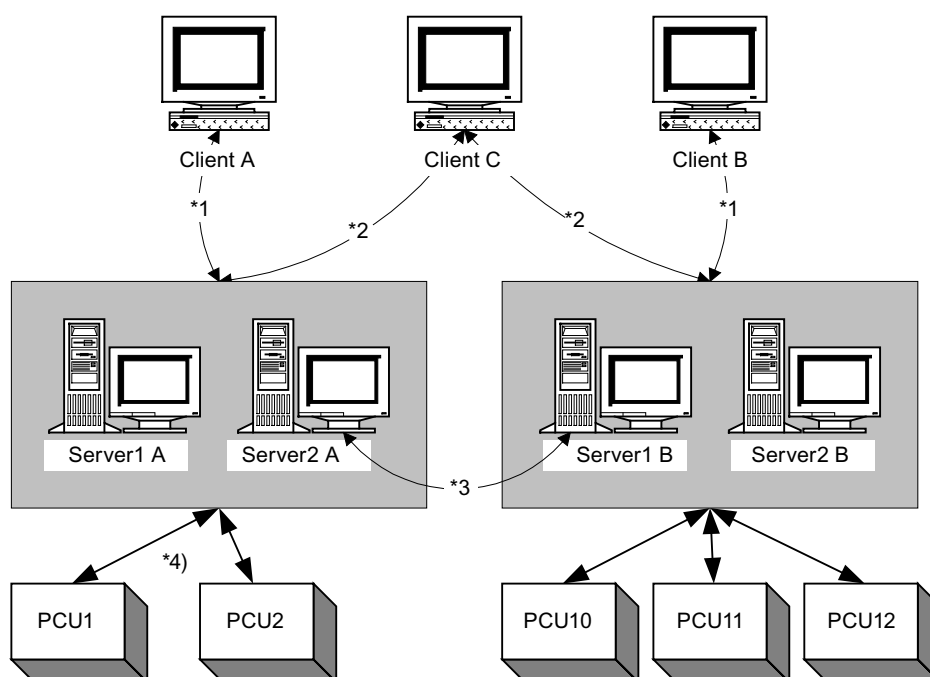
6.3 Interprocess communication between the IOSs

In the image the possible IOS-IOS constellations are displayed.

These are:

- Client-Server constellation (*1)
Online data for the runtime applications are supplied by 1 server couple.
- MultiClient-Server constellation (*2)
Online data for the runtime applications are supplied by more than just 1 server couple.
- Server-Multi Client constellation (*3)
Online data for the runtime applications at the server (now as client) are supplied by the local process connection as well as from different servers from other areas.

The corresponding inputs in the file sys.ini should be made for the different constellations or – in case of the multiclient configuration with new 'AREA.INI' file format - this can be done in a user-friendly manner with the configuration utility 'SITECFG.EXE' (see chapter Plant configuration with 'SiteCfg' Application (Page 58) for more information).



Via the PCU-Server connection *4) a Server IOS normally requests online values from the PCUs to which it has a direct online connection via e.g. H1-Bus. Additionally an interprocess communication *3) has been established between the PCU servers via the normal network connection by the TCP/IP protocol. By that method server IOSs can request and visualize online data from PCUs of different areas.

6.3.1 Configuring the TCP/IP connections

By configuring the 'Server Sequence' fields in configuration tool 'SITECFG.EXE' the following TCP/IP addresses are built by the system automatically, which means they need not be entered manually in the file SYS.INI as was necessary in former system versions prior to V5.2.

- [PC]
- HostIPAddr=<main server address>
- ResIPAddr=<backup server address>

This means e.g. for a Client IOS11 which must have access to all PCUs of the server couple IOS1 and IOS2, the TCP/IP address of the IOS1 as main server and the one of the IOS2 as backup server will be employed here. After the start of the Client IOS it is bound for this example with IOS1 at first, i.e. both IOSs share the PA/PI variables of Server 1. If this one is canceled, the Client transfers to the IOS2 automatically. After re-acceleration of IOS 1 the connection is set automatically in the initial requested state.

For intra area communication (see constellation *3) the corresponding server IP addresses for each PCU could be defined in former system versions prior to V5.2. Now these addresses are adapted from the 'server sequences' definition from SITECFG.EXE utility too, which means that they need not be entered manually in the file SYS.INI.

- [IPAddr]
- PCU1=<main address>,<backup server address>
- PCU2=...

For example a Server IOS from area x can connect to a 'foreign' PCU from a different plant area via their server IOSs to which it now connects as a client. For this, the function "Assign Multiclient Areas" is to be called in the context menu of the main server IOS and the external area is to be transferred from the list of the not assigned (on right) to the list of assigned (on the left).

6.4 Messages from the PCU

The system is able to transmit messages which are received from the PCU to different IOSs. In this way the PCU server checks by means of the type after it has received a message to which IOSs it should transmit and if it also should be processed by itself (local).

The configuration is executed in the file PCU_SERV.INI in the system folder:

- [Protocol]
- <Typ>=<Computername>[,<Computername>,...]

The message identifier has to be entered as type. The names of all IOSs (possibly also the own name), which should receive and process the message.

Message types which aren't listed are only processed locally. If the own computer name in the list is missing, the message is only passed on and not processed locally.

Example:

The Server IOS1 receives messages from the type 3, 5, 6 and 7 from the PCU1, which should be processed according to the following table:

Type	IOS1	Client IOS11	Client IOS12
3	X	X	
5			X
6	X		
7	X	X	X

The following configuration is necessary in the PCU_SERV.INI of the IOS1:

- [Protocol]
- 3=IOS1, IOS11
- 5=IOS12
- 6=IOS1 *)
- 7=IOS1, IOS11, IOS12

*) The line for the message type 6 is not absolutely necessary, as these messages are only processed locally.

6.5 Message display via the client

PCU servers which receive messages directly can forward these via the client TCP/IP connection to other PCU servers for display. These messages then appear in the PCU server message window but are not filed onto its hard disk.

This forwarding function can also be disabled if, e.g. another PCU server is already receiving the messages, or if datagram 3 is forwarded to another client. This remote message can be enabled/disabled in the PCU_SERV.INI file under:

- [Remote]
- ShowRemoteMsg=1/0

This switch is set to 1 by default, so that messages may be displayed more than once (direct and via network).

6.6 Disabling specific PCU

With this function, it is possible to prevent write access to certain PCUs with reference to messages and operation.

It is possible to send certain operations to the connected PCUs either directly or via TCP/IP connection. This means that specified data areas in the control systems are overwritten. For example, if you want to allow data to be visualized, i.e. read, from a remote area (remote PCU via client connection) but wish to prevent remote operation.

You can now block operation of specific PCUs from any IOS (user-definable), e.g. the "Acknowledge ICM/Horn" function. The relevant switches in the PCU_SERV.INI file are as follows:

- [Trans_NT]
- NoWrite = <PCU-Nrn.,....>

This also applies to messages from various PCUs. These can also be disabled in order, for example, to prevent messages from a remote area being displayed. The list of PCUs is also stored in the PCU_SERV.INI file under:

- [Mld]
- NoMsg = <PCU-Nrn.,....>

6.7 Recipe Server

In order to set the coupling type see chapter: coupling types/Recipe Server (CP).

6.7.1 Startup Recipe Server

After the standard installation, the Recipe Server runs only if all parameterized PCUs are running and can be accessed via the communication. In the case of large installations it is normal for one or more PLC not to be running. In order to allow startup in this case some inputs in the file recipe.ini should be made.

Release of the function

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	EnablePCUSkipping=1

Release message for missing PCU during startup

If, during recipe server startup, some PCUs are missing and these PCUs are skipped, a message can be generated. This message will be displayed on all IOSs.

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	SkippedMessage=1

6.7.2 Operation with RCS Server

The Recipe and RCS servers both configure the FIFOs during startup in accordance with the actual server configuration of the current and standby server. In order to prevent a mutual influence of the FIFO configuration some inputs in the file recipe.ini should be made.

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	RunWithRCS=1

With this setting, FIFO number 2 and 5 will only be configured by the recipe server.

6.7.3 File synchronization during startup

One of the last steps during recipe server startup is the file synchronization. The default behavior is to synchronize all files that are necessary for the recipe server.

The default behavior can be changed. In order to adapt the standard synchronization definition the startup time can be reduced or the synchronization extended for user files.

File synchronization also on the standby server

The file synchronization can also be executed on the standby server. This function should be released.

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	EnableSyncOnStandBy=1

Delayed file synchronization on the standby server

The execution of the file synchronization on the standby server can be delayed. This delay is useful if RCS is running on the standby recipe server. So the file synchronization can be started after the startup of the RCS server. The default delay time is 30 seconds.

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	DelaySyncOnStandBy=30

Definition files for file synchronization on the active server

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	SyncServerFile=server.def

The file should be filed in the subfolder 'etc'. The name can be user-defined.

Definition file of the file synchronization for the Standby Server

File:	windcs\sys\recipe.ini
Entry:	[RecCtrl]
Key:	SyncStandByFile=standby.def

The definition file should be stored in the subfolder 'etc' of the BRAUMAT/SISTAR Classic V6.0 system folder. The name can be user-defined.

6.8 Load distribution

The redundancy concept of BRAUMAT/SISTAR Classic V6.0 allows a load distribution for the runtime tag visualization. The load distribution enhances performance in normal operation without losing the redundancy functions.

For the load distribution the 'server sequence' entries in the 'SITECFG.EXE' utility should be configured differently for the client IOSs. This is performed via the dialog 'IOS settings' (context menu->parameters) in the server sequences tab in the field 'default'.

Example:

For the clients 1, 2 and 3 the first server is set to '1' and the backup server is set to '2' and vice versa for the clients 4, 5 and 6. In case of loss of one server the total load is assumed by one server. In normal operation each server should handle only 3 clients.

Configuring the process control system

7.1 General

A BRAUMAT/SISTAR Classic V6.0 plant should be classified into areas. The areas are configured in area.ini . The file is in the folder 'windcs\sys'.

7.2 Plant areas

The division of the area can be performed as in S88.

One area has more properties for BRAUMAT/SISTAR Classic V6.0 :

- One area has one or two (then redundant) recipe and (or) Route Control Servers.
- Clients are assigned to one area.
- PCUs are assigned to one area.
- The servers of the area have direct communication connection to the PCUs of the area.
- One area can include several plants.
- A data server of a different area cannot be used as redundancy IOS of the area.

The content of the file area.ini is identical on all computers of the plant.

7.3 Content of the file area.ini

- Site definition
- Area definition
- Plant definition
- Server definition (in version => V5.3 with extended Area.ini format, the attributes of this section are moved to the IOS definitions)
- IOS Definitions
- PCU Definitions
- S7 definitions (with extended Area.ini)
- PC definitions: global IOS parameters (with extended Area.ini)

The inputs should be separated with a comma if a list of values can be entered in the key. Names have a maximum of 16 chars in general. If lengths do deviate, this will be indicated.

7.3.1 Site definition

Definition	Key	Note
Section Sitename	[PlantAreas] Site=Site1	The name of the plant can have a maximum of 16 characters. It may not have any special characters.
List of areas	Areas=1,2,3	The numbers of the areas are separated by a comma. The numbers should be between 1 and 255. A maximum of 255 areas are permitted.

7.3.2 Area definition

Definition	Key	Note
Section	[Area#]	All indications for an area should be entered under the Area#, whereby # stands for the area number.
Name	Name=Ber_1	The name of the area can have a maximum of 16 characters. It may not have any special characters.
List of servers	Server=1,2	Server IOS numbers are entered. The first input is Server 1, the second input is the Server 2. The second input is optional (only in the event of redundancy).
List of clients	Clients=1,2	The Client IOS numbers are entered. A server should not be entered again.
List of PCUs	PCUs=10,11	The PCU numbers of the area are entered.
List of plants	PCELL=1,2,3,4	The numbers of the plants of the area are entered.
Batch system	KWTIME=00:00:00 KWSTART=1	;Describes the day and start time for the batch system (SO=0,MO=1,DI=2,MI=3,DO=4,FR=5,SA=6)

7.3.3 Plant definitions

Definition	Adjustments	Note
Section	[PCell#]	All indications for an area should be entered under the Area# whereby # stands for the area number. The plant numbers should be explicit in the plant.
Name	Name=Plant1	The name of the plant can have a maximum of 16 characters. It may not include any special properties.

7.3.4 Server Definitions

Definition	Adjustments	Note
Section	[Server#]	All indications for a server should be entered under the area Server r#. # stands for the server number.
Name	Name=IOS1	Logical computer name. The name should correspond to the computer name which was allocated under the network adjustment, although this is not mandatory.

In versions >= V5.3 with extended Area.ini format, this section is removed (see 'Name=' in IOS Definitions)

7.3.5 IOS Definitions

Definition	Adjustments	Note
Section	[IOS#]	All indications for an IOS should be entered under the area IOS#. # stands for the IOS number. One IOS definition is used for the Server and Clients.
Name	Name=	The name should correspond to the computer name which had been allocated under network adjustments.

7.3 Content of the file area.ini

Definition	Adjustments	Note
System path	Systempath=	Here a valid access route should be entered on the system path of the computer. A corresponding release on the computer should also be established. The input is useful as in: \\ios#\C\windcs.
TCP/IP address	IPAddress=	Here the IP address of the IOS should be entered as: w.x.y.z
With extended Area.ini		
Add-on applications	AutoStart= trendman.exe,.....	When the system is started from the shell, all comma-separated applications in the list are also automatically started.
Enable recipe server	EnableRecipeControl=	This IOS is enabled for recipe server functionality
Enable route control server	EnableRouteControl=	This IOS is enabled for route control server functionality
Server sequence for path access	Ax_ServerSeq=	Default sequence
	Ax_Proj ... Ax_Bali	Substitution of the default server sequence for Area x of path category (Proj..Bali)
Server sequence for route control	Ax_RCSeq=2,1	Substitution of the default server sequence for Area x of route control
If server:		
Remote paths	RemotePathProj=\\IOS1\C\windcs ... RemotePathMsg=\\IOS1\D\windcs ... RemotePathBali=\\IOS1\C\windcs	Definition of server paths

Note:

The following (previously sys.ini) switches are derived from the server sequences:

- Path of the various path categories
 - Sequence + remote server path (if sufficient, the server system path)
- HostIPAddr/ResIPAddr for Client.dll for server connections
 - HostIPAddr=1st server of ServerSeq RECIPE
 - ResIPAddr=2nd server of ServerSeq RECIPE
- IPAddr for virtual PCUs of miniports with PCU=245
 - 1st server of ServerSeq RCS
 - 2nd server of ServerSeq RCS otherwise
 - 1st server of ServerSeq RECIPE
 - 2nd server of ServerSeq RECIPE

7.3.6 PCU Definitions

Definition	Adjustments	Note
Section	[PCU#]	All indications for a PCU should be entered under the Area PCU# whereby # stands for the PCU number.
Name	Name=	The name of the PCU is indicated once again for information purposes. The name in file 'windcs\pcu.xxx\name.txt' is decisive.
FIFO allocation	FIFOS=	<p>Here the allocation of the FIFOs should be entered for the server. The examples are given if Server 1 is the IOS 5 and Server 2 is the IOS 7.</p> <p>For S5::</p> <p>There are 8 FIFO channels. The first 4 FIFOS are used by Server 1, the FIFOs 5-8 are used by the second server. Example: Fifo=5,5,5,5,7,7,7,7</p> <p>For S7::</p> <p>There are 6 FIFO channels. The first 3 FIFOS are used by Server 1, the FIFOs 4-6 are used by the second server. Example: FIFO=5,5,5,7,7,7 With extended Area.ini: In S7, this switch is no longer read in, but generated by the system. FIFO1..3 Server1 and 4..6 Server2</p>

7.3 Content of the file area.ini

Definition	Adjustments	Note
FIFO configuration	FIFO configuration=	Via this counter the Fifos are configured completely during the Recipe Server startup. <ul style="list-style-type: none"> • 0: Function is switched off • 1: Function activated
Additional message	Fifox=	Here for each Fifo the additional message types are entered, which should be entered during the Recipe Server start. The messages for the Recipe System should not and may not be entered.
The following attributes are of significance for a system with extended Area.ini		
Ethernet address	Mac_Addr=	Mac_Addr defines the S7 Ethernet address with a 12-digit hexadecimal number.
MPI or PROFIBUS/L2 address	L2_Addr=	L2_Addr defines the MPI or PROFIBUS address of the S7. The key has priority over Mac_Addr. When using a SINEC-H1 bus coupling the L2_Addr should be removed.
TCP/IP	IP_Addr=	IP_Addr defines the TCP/IP address of the S7.
DB for write buffer	DB_Write_Var=	Irrelevant, because generated!
Slot number	CPU_Socket=	CPU_Socket must contain the slot number indicating the rack position of the S7 CPU. This parameter is required for the connection structure.
AS type	Type=	Type defines the AS type. Default value is an AS416. This input is necessary for the output of the possible amount of blocks per AG type. It refers to the AS inputs which are in the square brackets (see e.g. [AS417] or)
Coupling mode	Device=	Device defines the coupling mode relevant for this PCU. Default value is the coupling mode set in the STEP 7 Manager under 'PG/PC interface' coupling. If different types for special PCUs are requested, the corresponding text should be copied from the PG/PC interface coupling.
Version of the various subsystems of PCU software:		
Software version standard system	SW_Base=	Standard software "PCS7*", "S7" * option PCS7 is valid only in existing projects for backward compatibility
Software version recipe system	SW_Recipe=	Recipe version "V3", "V5"
Software version cross-coupling	SW_XC=	Cross-coupling "V1", "V1"

Definition	Adjustments	Note
Software version FIFO	SW_FIFO=	V1 only
Software version technology	SW_TECH=	None

7.3.7 S7 Definitions

Topic

Note:
This section is only valid with extended Area.ini.

Definition	Adjustments	Note
Section	[S7]	
	UseCRC=	For H machine =1!
	UseS7H=	For H machine =1!
	MinWaitTime=	PA/PI read delay time in [ms]
	CheckForStop=	PCU Stop watchdog with S7.dll

7.3.8 PC definitions

Note:

This section is only valid with extended Area.ini.

Definition	Adjustments	Note
Section	[PC]	
	Caption=SISTAR V6.xx	The version caption is supplied with the appropriate default for each version.
Engineering language	LanguageEngineering=-1/0/1..	-1: Default setting, no switchover of the engineering language Value >= 0: Switchover of engineering language according to the system language; this is the default engineering language
Dynamic engineering language	LanguageEngineeringX=1/10..	X: system language = assigned engineering language See also " <i>Administration</i> ", chapter 2

7.4 Plant configuration with 'SiteCfg' Application

7.4.1 Introduction

Up to version V5.2 , global information was also entered in Sys.ini and S7.ini , even though these files also contain IOS-dependent entries.

BRAUMAT/SISTAR Classic V6.0 now uses the extended configuration file "area.ini" in order to group the global information in SYS.INI, S7.INI and to isolate this from S7.ini and Sys.ini . This file can thus be created locally and distributed to all IOSs.

The introduction of an extended area.ini now allows multiclient mode under BRAUMAT/SISTAR Classic V6.0 . This area.ini is a prerequisite for multiclient mode!

The sections below describe the configurations tool "SiteCfg.exe", which supports users in creating, converting, modifying and distributing the area.ini.

7.4.2 Extended area.ini file

The extended Area.ini contains:

- All area information for the previous Area.ini
- Global information from "Sys.ini"
- Substitutions for information in "Sys.ini". Here the most important:
 - HostIPs now by means of server sequences (ext. Area.ini)
 - PATH variables now by means of server sequences (ext. Area.ini)
 - Name now the station name of the system
 - PCNo now IOSNo in area.ini with corresponding name
- Global information from "S7.ini"
- Information for multiclient mode.

7.4.3 Configuration with extended or old area.ini

The extended area.ini format is standard in V5.3 and later (conversion information is found in the following chapters).

The Area.ini format is derived from the switch "[Global]FileType=" in Area.ini.

When "Site??" is set, the area.ini has an extended format.

In configurations with the old Area.ini format, the INI files are read in as in versions up to V5.2. Hence, the relevant files are not automatically converted during system startup. After the system restart, the user is instead prompted to convert the files. This message is repeated at every restart of the system, until the user converts the files or cancels by answering the message "Repeat this message?" with "No".

7.4.4 Creating a new extended area.ini

To create a new Area.ini , select the menu item File>New.

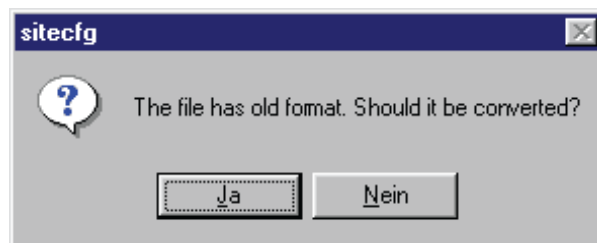
The system now generates a basic frame for an area 1.

(This configuration must be complemented with detail parameters for the relevant system.)

7.4.5 Loading/converting an existing area.ini

To read in a new Area.ini , select the menu item File>Open. If the selected file is an extended area.ini, the configuration is written to the system and visualized.

If it is an area.ini with an old format, this dialog box pops up:



You can select "Yes" to convert the old area.ini. The required data are read from S7.ini and sys.ini in the same folder and are then applied.

After its conversion, the file is used as the source. Further information on this procedure is found in the next chapter.

The file is not converted and cannot be opened in the old format if you have selected "No".

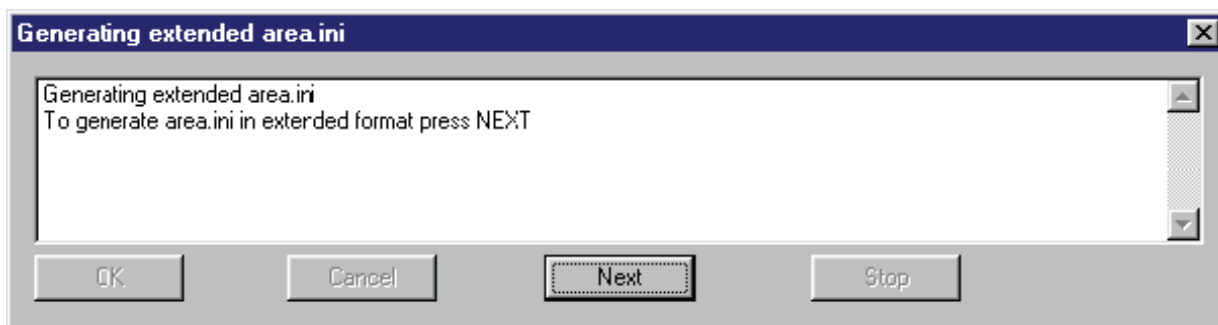
Converting the area.ini

A backup copy of the old Area.ini file is saved prior to its conversion (area.000..099).

During its conversion, the area.ini is extended with information previously entered in S7.ini and Sys.ini . The function generates all the data necessary for the operation of the local IOS with extended area.ini and multiclient functionality.

Data which cannot be generated in detail are indicated in dialogs, which prompt the user to confirm the defaults or to add data.

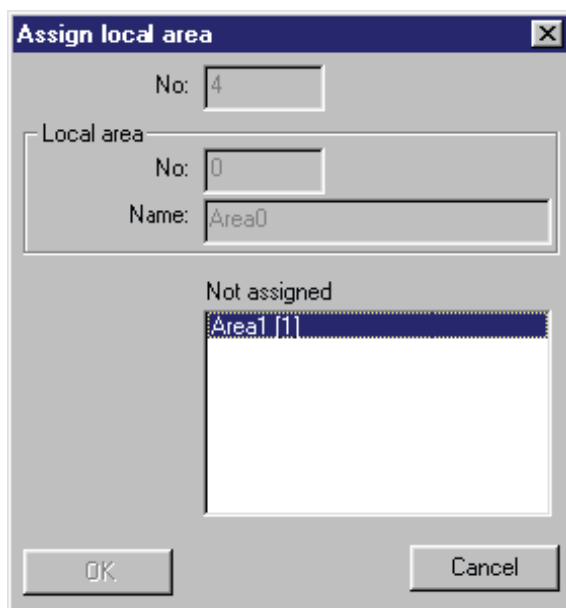
Start and log dialog



"Next" Conversion or the next interim step starts.

The various interim steps generate additional dialogs for configuration details.

Assigning a PCU to an area:

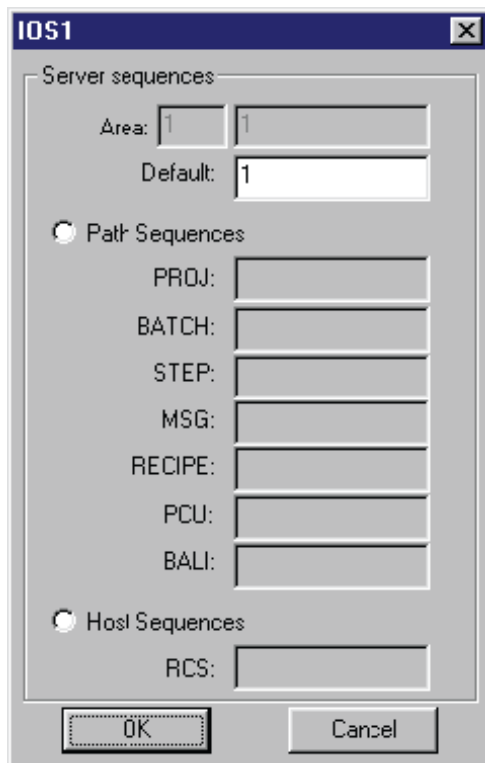


A PCU was found which is not assigned an area in the current Area.ini . In this dialog box, you can assign the PCU to one of the known areas.

Note

Without this assignment, the system considers the PCU non-existent. However, you can rectify this after the conversion by means of the Configtool.

Server sequence of local IOS:



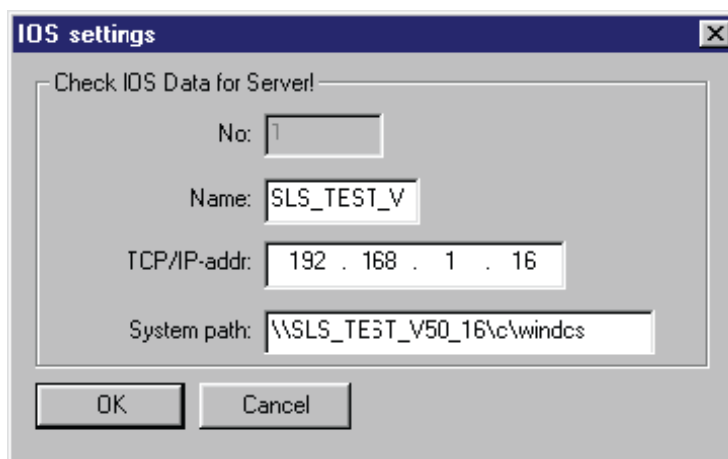
The screenshot shows a dialog box titled "IOS1" with a close button (X) in the top right corner. The main area is titled "Server sequences" and contains the following fields and options:

- Area: [1] [1]
- Default: [1]
- Path Sequences
 - PROJ: []
 - BATCH: []
 - STEP: []
 - MSG: []
 - RECIPE: []
 - PCU: []
 - BALI: []
- Host Sequences
 - RCS: []

At the bottom of the dialog are two buttons: "OK" and "Cancel".

The server sequences must be defined at least for the local IOS.

Checking server parameters:



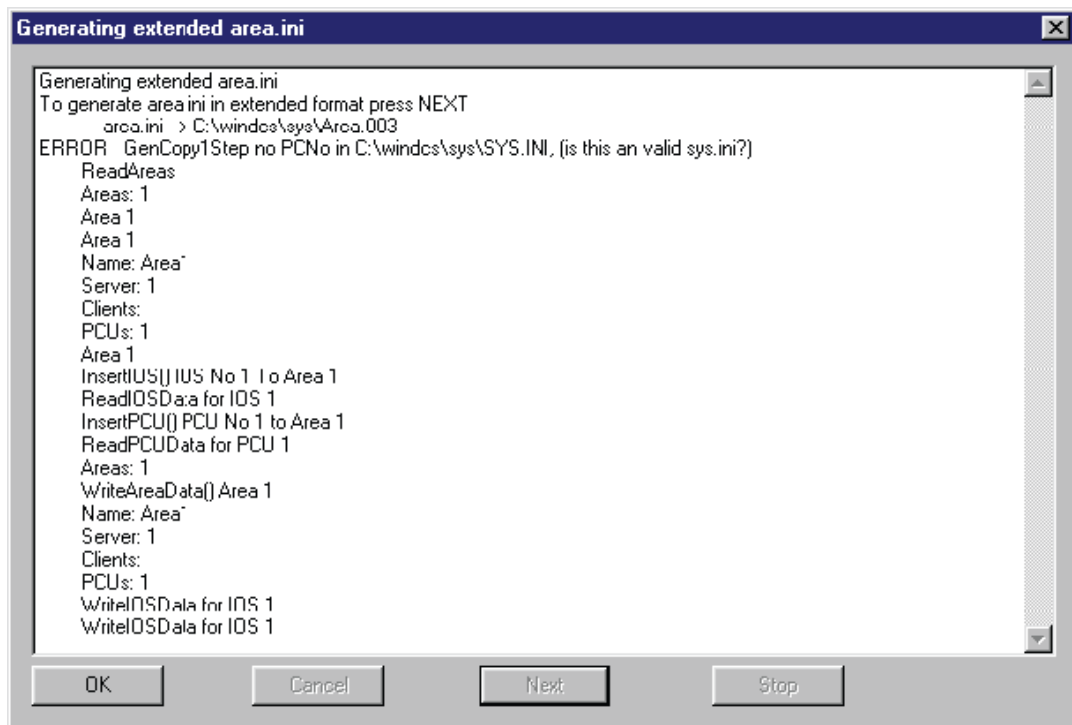
The screenshot shows a dialog box titled "IOS settings" with a close button (X) in the top right corner. The main area is titled "Check IOS Data for Server!" and contains the following fields:

- No: [1]
- Name: [SLS_TEST_V]
- TCP/IP-addr: [192 . 168 . 1 . 16]
- System path: [\\SLS_TEST_V50_16\c\windcs]

At the bottom of the dialog are two buttons: "OK" and "Cancel".

Shows the minimum required parameters for server access, which you can confirm or modify.

End of conversion:

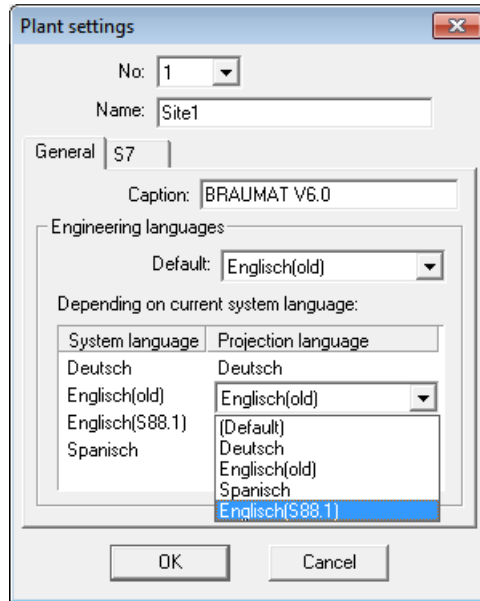


“OK” Saves the converted file and returns to Configtool.

7.4.6 Modifying Plant settings

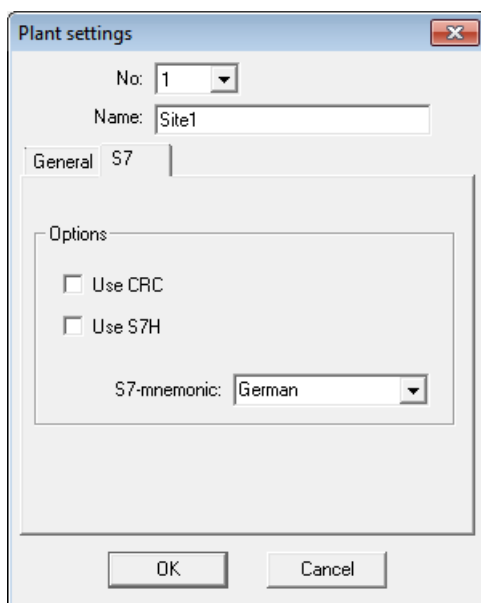
Select Area>Plant settings to start the dialog for editing the factory settings.

Register Tab General:



Element	Meaning
No.	Factory number
Name	Factory/Plant name
Caption:	Title bar text
Engineering languages:	<p>Selection of Engineering language</p> <ul style="list-style-type: none"> • Default = (system) > 'Fixed' Engineering language (Text strings from folder ... \PCU.nnn\Texte) • Default = <any language> default language for dynamic engineering languages according to the following assignment table. if the entry 'default' is shown, this language applies (Text strings from folder ... \PCU.nnn\Texte.x) <p>(see manual "03_Administration", chapter "Language selection")</p>

Register Tab S7



Element	Meaning
Use CRC:	for H machine
Use S7H:	for H machine
S7 mnemonic:	Language for the S7 mnemonic <ul style="list-style-type: none"> • (System): following runtime language • German • English

7.4.7 Area settings

7.4.7.1 Adding an area

Select Area -> Add to insert a further area.

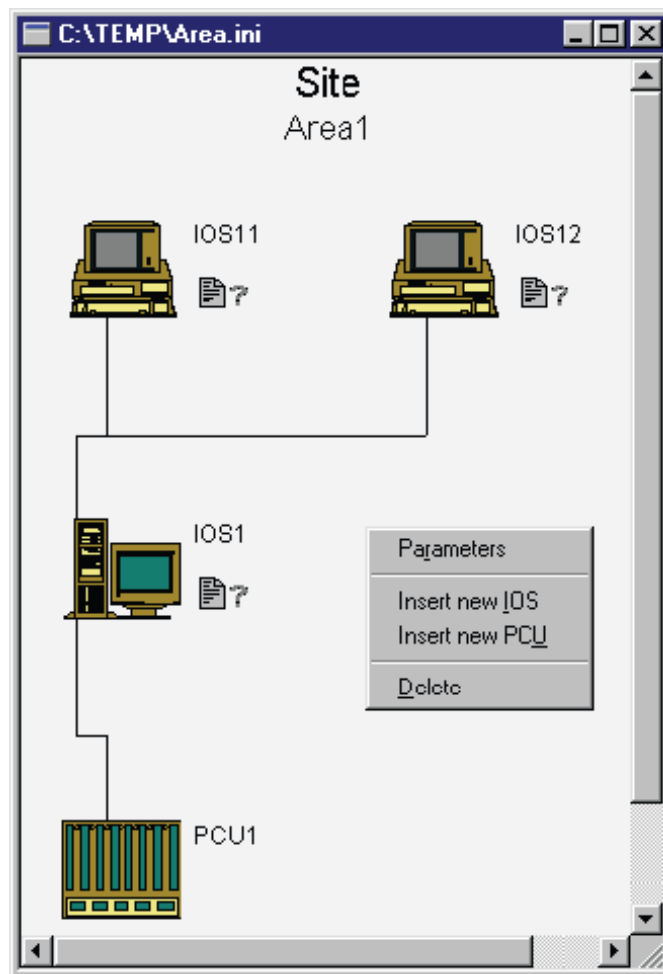
7.4.7.2 Deleting an area

Select the area shortcut command

- Delete

to delete the current area.

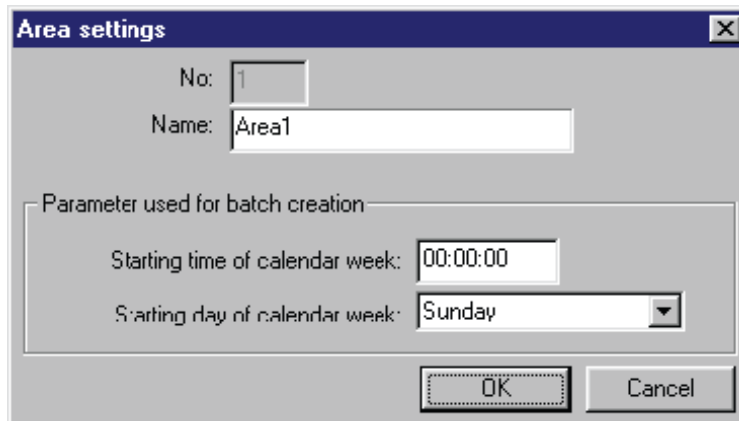
Click the area between the corresponding IOS and PCUs to open the shortcut menu of the area.



7.4.7.3 Modifying area parameters

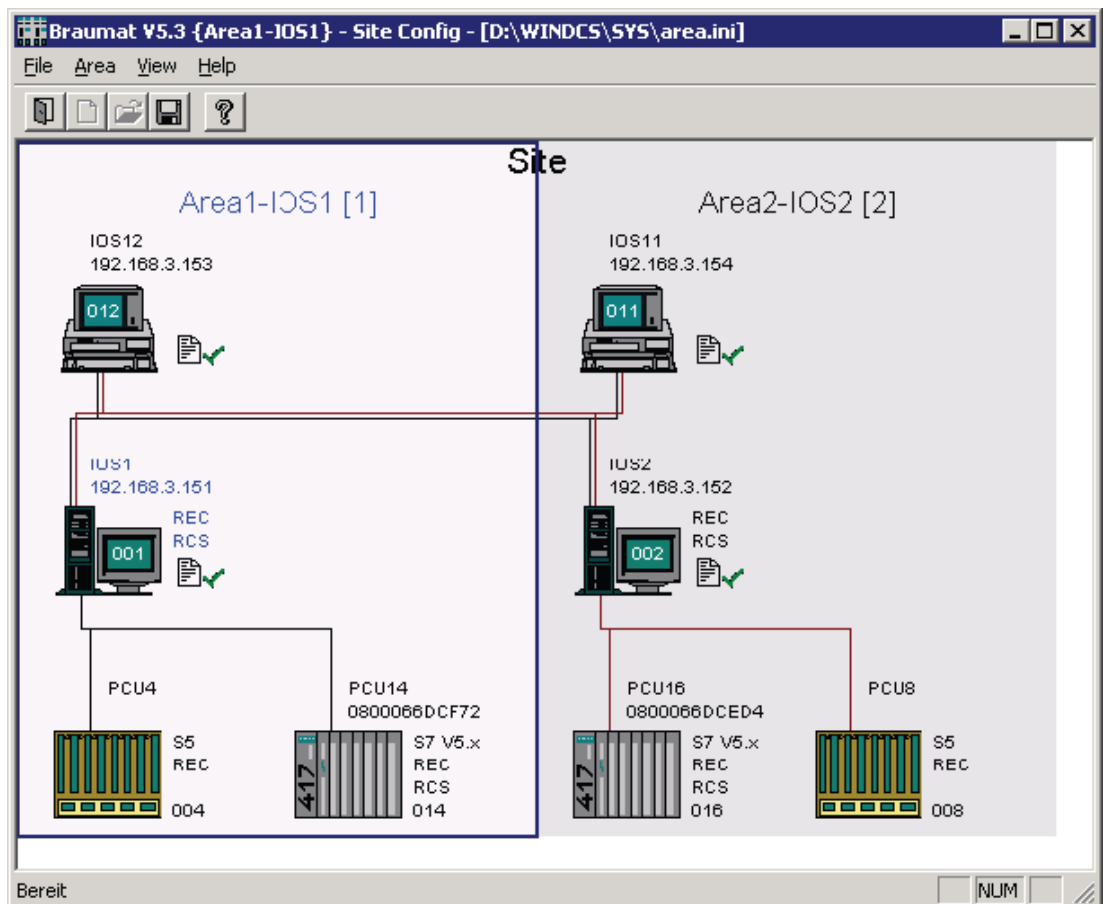
Select the Parameter shortcut command to edit the parameters of the current area.

This dialog box appears:







Starting time of calendar week:	Parameter for "automatic batch start"
Starting day of calendar week:	Parameter for "automatic batch start"

7.4.8 Display of the connection configuration



- The local IOS (own PC station) and the associated AREA is viewed in blue font type
- The different area interconnections are shown in different colors.
- The most important configuration information is displayed above or beside the respective station

The state of the Area.ini (right beside the IOS) compared to the actual configuration is indicated as follows:

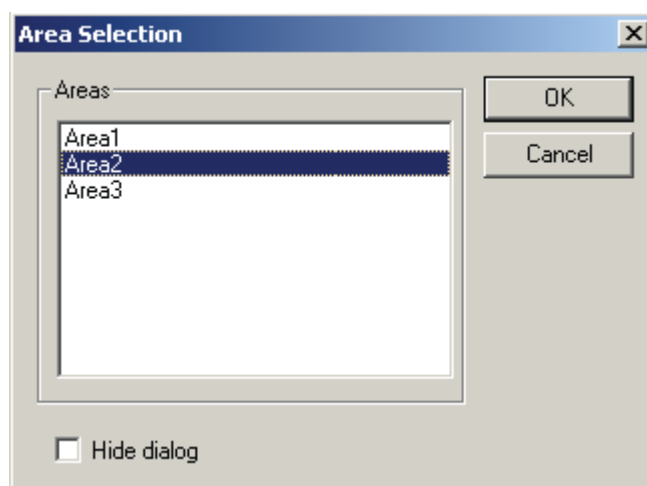
	saved Area.ini is the same as actual configuration
	No Area.ini found
	saved Area.ini is not the actual configuration
	Access to this IOS/folder denied

When saving the configuration the following options are available in a separate dialog:

- 'Update all stations' > the local configuration is copied to all IOS stations, while for each IOS the network path is displayed and the overwrite has to be confirmed
- 'Checking PCU subdirectories' > the PCU subdirectories of the local or all IOS servers are checked and created – if not existent – by copying the ...\pcu.xxx\... folders

7.4.9 Application behavior on Multiclient IOS

When the client (or server) is enabled for more than one area, this "Area selection" dialog box appears when you start the application:



Here you select the logon area for the current application. If 'Hide dialog' is selected, the last selected Area is used at the next application call, without viewing that dialog.

Important:

In order to display that dialog again, press and hold the <CTRL> key at the next application call.

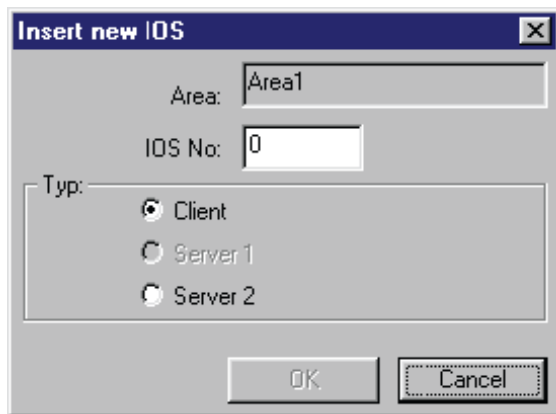
Refer to the application description for information on possible area selections inside that application.

7.4.10 IOS settings

7.4.10.1 Inserting an IOS

Select the Insert new IOS command from the shortcut menu of the server IOS to add a further IOS to the corresponding area of the server IOS. Click the IOS icon to open the shortcut menu of the server IOS.

This dialog box appears:

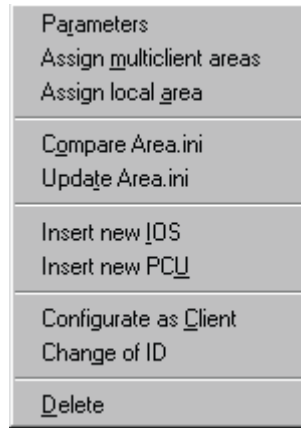


The OK button is disabled until you type in a valid IOS number.

The IOS configuration dialog opens after you have entered this information.
(see next section)

7.4.10.2 Activate IOS context menu

Click the IOS icon to activate the shortcut menu of the IOS.



The menu items "Insert new IOS" and "Insert new PCU" are only enabled if the current IOS is a server.

For clients, the menu item "Configure as server" appears instead of "Configure as client"

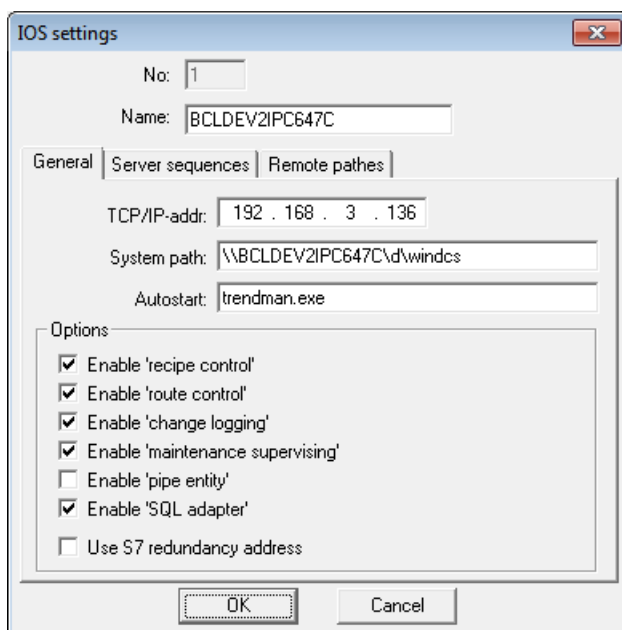
7.4.10.3 Modifying IOS settings

From the IOS shortcut menu, select Parameters. Here you can modify the parameters of the current IOS.

The following dialog boxes appear:

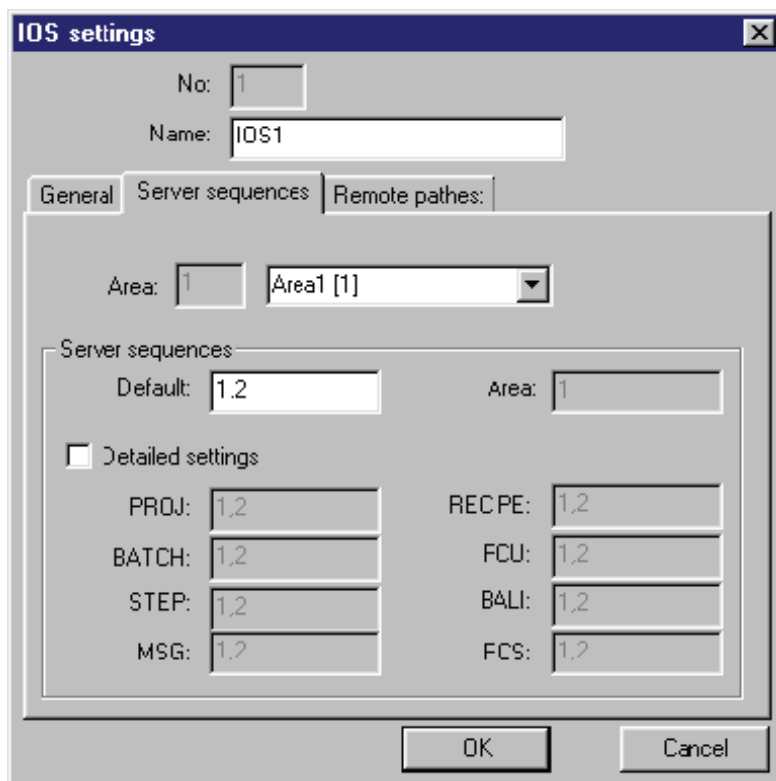
- General
- Server sequences tab
- Remote paths tab

"IOS settings", "General" tab:



Dialog element	Function
TCP/IP-Adr:	Address for client/server connections.
System path:	Default path for client logon
Autostart:	When the system is started from the shell, all comma-separated applications in the list are also automatically started.
Enable 'recipe control':	This computer can operate as a recipe server.
Enable 'route control':	This computer can operate as a route control server.
Enable 'change logging':	This computer supports the change logging function
Enable 'maintenance supervising':	This computer supports maintenance supervising
Enable 'pipe entity':	This computer supports the entity function
Enable 'SQL adapter'	The SQL adapter ('sistar_adp.exe' application) is started along with the system. The option can only be activated with a valid license.
Use S7 redundancy address:	If selected, this computer uses the addresses of the redundant network for PCU access.

"IOS settings", "Server sequences" tab:

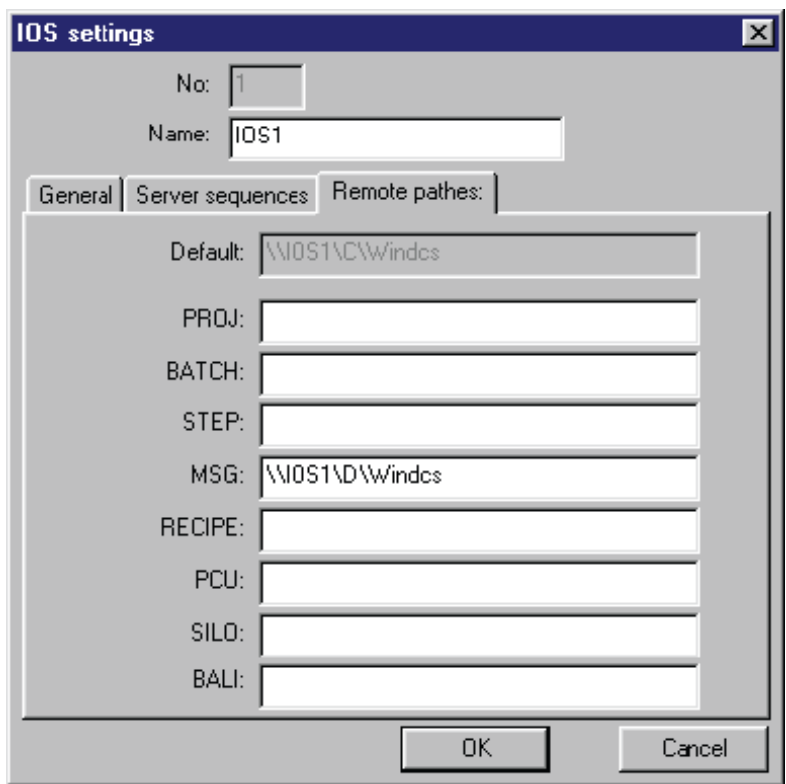


Here you define server access to the current IOS.

A dialog is offered for each area the IOS uses in multiclient mode. The function is selected from the area combo box. The following parameters can be defined for each connected area:

Default:	Default sequence, or logon with file access at the servers of the relevant area. Default entry is the server sequence of the area.
PROJ,BATCH..:	Here you can define a separate logon sequence for each path category, which overrides the default access settings.
RCS:	Here you determine the sequence for the logon to the RCS servers.

"IOS Settings", "Remote paths" tab:



The "Remote paths" tab is only visible for server IOSs.

Default:	For file access by means of server sequence, the default setting shows the specified system path of the server IOS.
PROJ,BATCH...:	If the default access to the system path of the server IOS is not desirable in specific configurations you can define a separate remote path for path categories. Such an entry overrides the system path/server sequence.
MSG:	Access to the message archives of server IOS1 was redirected to hard disk drive D.

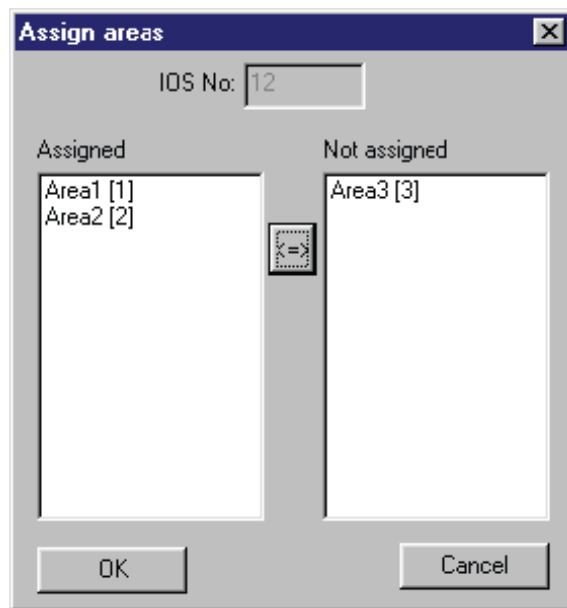
Note:

Because of the same context, the path settings under PROJ, PCU, BALI and RECIPE should match.

7.4.10.4 Assigning multiclient areas

You can select the "Multiclient Areas" command from the IOS shortcut menu to assign the current IOS to the areas you want to enable for multiclient applications.

This dialog box appears:



Assigned:	List of areas enabled for multiclient logon.
Not assigned:	List of areas locked for multiclient logon.

Double-click the area name or "↔":
This enables/disables the selected area.

Note:

The local IOS area always remains assigned!

7.4.10.5 Assigning a local area

You can select the "Assign local area" command from the IOS shortcut menu to assign the current IOS to another area group.

This dialog box appears:



Select the area by double-clicking its name.

7.4.10.6 Comparing the area.ini of the IOS

You can select the "Compare Area.ini " command from the IOS shortcut menu to verify that the IOS can be accessed on the network and to check the status of its local Area.ini .

The bitmaps below represent the status of the local Area.ini of the selected IOS, compared with the Area.ini last opened or saved in Configtool.

	Status not verified
	Local Area.ini is the last saved version
	No Area.ini found
	Local Area.ini is not the last saved version
	Access to this IOS/folder denied

7.4.10.7 Update area.ini

You can select the "Update Area.ini " command from the IOS shortcut menu to copy the last edited Area.ini into the system path of the selected IOS.

Note:

On the destination IOS the last Area.ini is saved as a *.bak file!

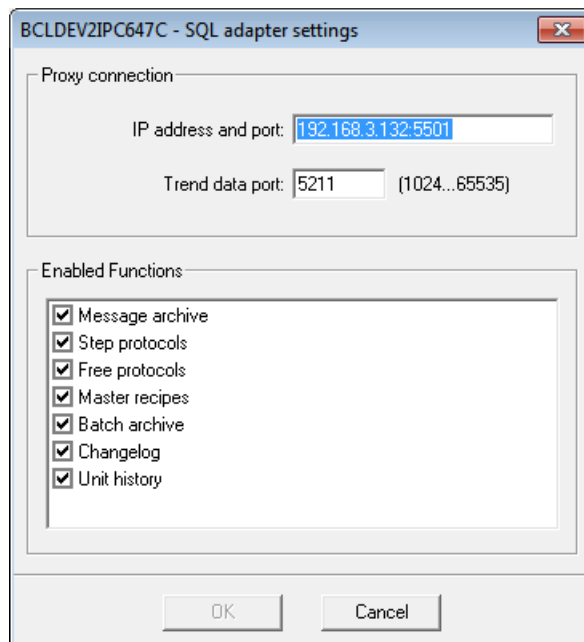
7.4.10.8 Changing the IOS ID

You can select the "Change ID" command from the IOS shortcut menu to change the ID of the current IOS.

7.4.10.9 Configuring the SQL adapter

'BRAUMAT SQL adapter' option package

With correct licensing for the option, the following dialog box can be called via the 'Area / IOS... / Configure SQL Adapter' menu or the IOS shortcut menu:



'Proxy connection' section

The following parameters define the connection data to the Windows 'SQL proxy service' service on the DB host computer.

Parameter	Description
IP address and port:	The IP address or HOST name plus TCP/IP port of the PC station on which the SQL proxy service is installed (area 1024 to 65535). ": 5501" describes the standard TCP/IP (=default value).
Port for trend data:	Local TCP/IP port for the transfer of measured value trend data (area 1024 to 65535). The SQL proxy service connects to this automatically. ": 5211" describes the standard TCP/IP port (=default value).

NOTICE
<p>Assigning TCP/IP port numbers</p> <p>The default settings should be retained as far as possible.</p> <p>If these need to be changed in order to meet company IT administration specifications, the user is responsible for ensuring that no collisions occur.</p>

'Enabled Functions' section

The 'PCU-Server' and 'SISTAR-Adapter' IOS components are configured here. These must be told which archives are to be transferred to the SQL database host. To this end, the corresponding selection boxes must be activated in the dialog box.

Delivery state

In the delivery state or in the case of a new installation, all archive types are enabled when the option is licensed.

Configuration data from the selected protocol types is stored in the following files:

- Configuration data from the 'PCU-Servers' '...\windcs\sys\Spooler.ini'
- Configuration data from the 'SISTAR-Adapters' '...\windcs\sys\sistar_adp.ini'

Sections of text with specific parameters are entered in these files for each archive type.

Note

Structure and contents of configuration files

Both configuration files named here are managed entirely via the 'SiteCfg' configuration dialog. This means that their internal structure and contents are not relevant to users and therefore are not described in any more detail here.

7.4.10.10 Client/server configuration

You can select the "Configure as client/server" command from the IOS shortcut menu to configure server mode for a client or vice versa.

7.4.10.11 Deleting an IOS

You can select the "Delete" command from the IOS shortcut menu to delete the current IOS.

Note:

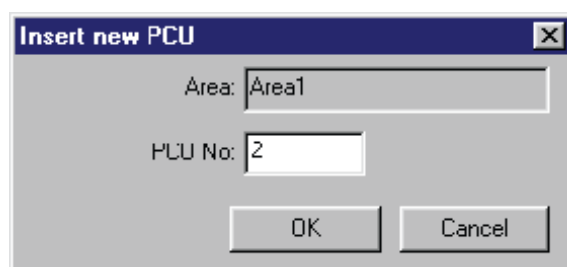
You must delete the complete area to delete its last server!

7.4.11 PCU settings

7.4.11.1 Insert new PCU

You can select the "Insert new PCU" command from the server IOS shortcut menu to add a further PCU to the relevant server IOS area. Click the IOS icon to open the shortcut menu of the server IOS.

This dialog box appears:



The OK button is not enabled until you type in a valid PCU number.

After you have entered this information, the PCU configuration dialog box opens. (see next section)

7.4.11.2 Modifying PCU settings

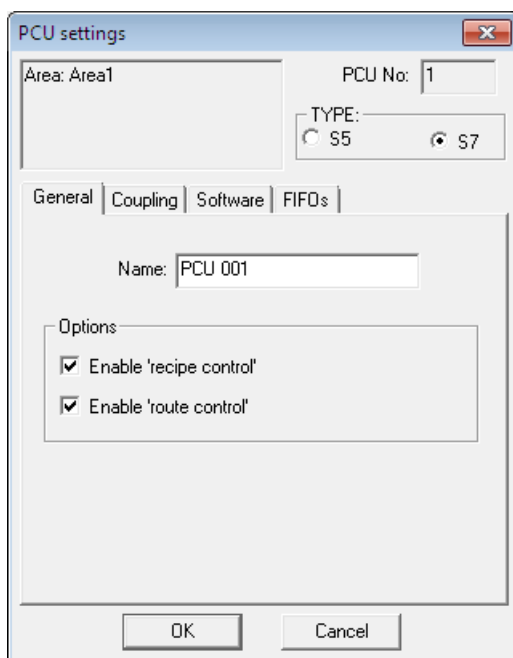
You can select the "Parameters" command from the PCU shortcut menu to edit the parameters of the current PCU. Click the area of the PCU icon to open the PCU shortcut menu.

The following dialog boxes appear:

- General
- Coupling
- Software
- FIFOs

Only the permitted attributes are enabled for S5/S7 PCUs.

"PCU settings" dialog box, "General" tab:

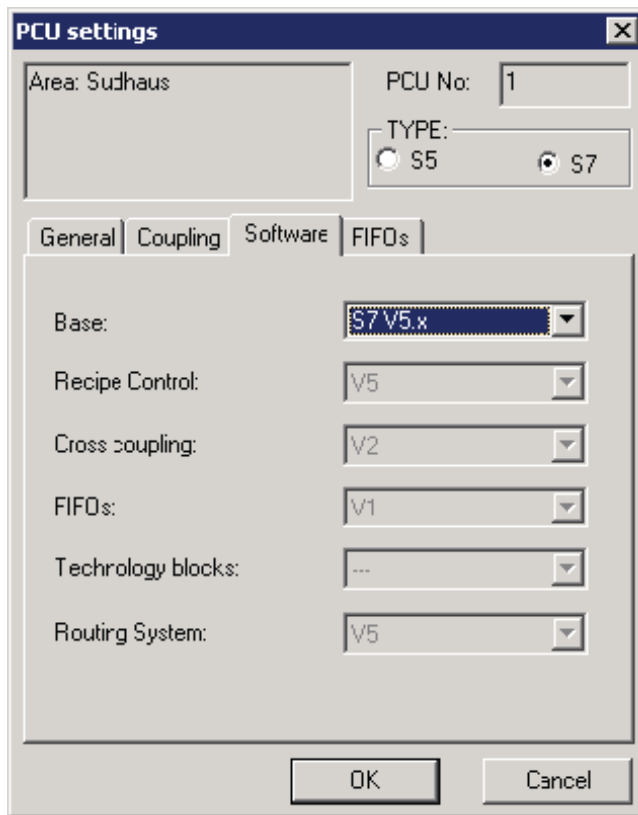


Dialog element	Function
TYPE: S5/S7:	Determines the AS type.
Name:	PCU name
Enable recipe control:	This PCU is relevant to the recipe server.
Enable route control function:	This PCU is relevant to the route control server.

"PCU settings" dialog box, "Coupling" tab:

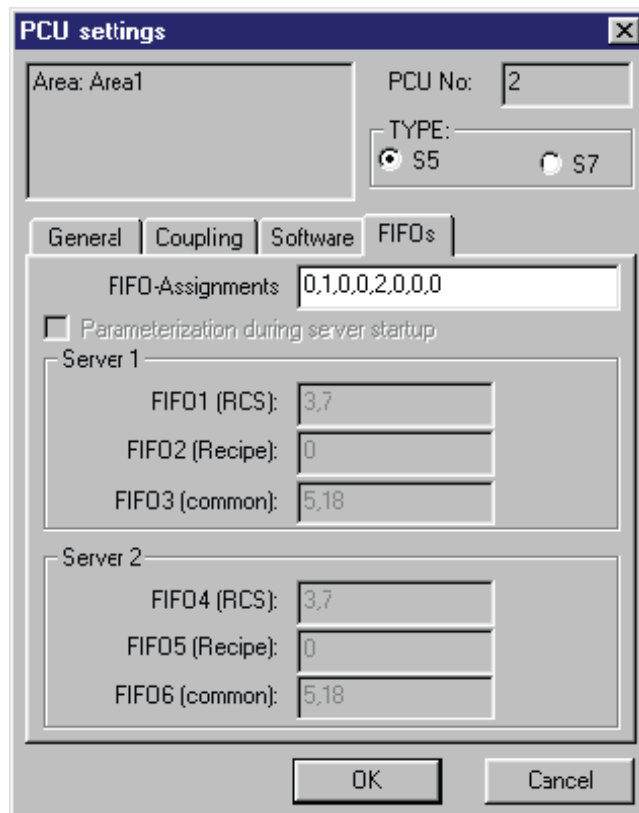
Dialog element	Function
Slot:	Rack slot number.
Device:	Coupling mode to PCU.
Coupling type:	H1, MPI or TCP/IP.
Redundancy:	Addresses used to configure a redundant network. Only the servers configured for this mode ("General" tab in "IOS settings") evaluate these addresses.

"PCU settings" dialog box, "Software" tab:



Dialog element	Function
Base:	S7V4x / S7V4.6 / S7V5x or PCS7* * option PCS7 is valid only in existing projects for backward compatibility
Recipe control:	V3 or V5
Cross-coupling:	V1 or V2 (extended to 32 S7 <-> S7 connections)
FIFO:	V1 only
Technology blocks:	None
Route control:	V5 only

"PCU settings" dialog box, "FIFOs" tab:



Dialog element	Function
FIFO Assignments:	This switch is relevant only for S5 PCUs, and defines the assignment of FIFOs to the IOS. In S7, the FIFOs 1, 2 and 3 are assigned to the first server of the area, and FIFOs 4, 5 and 6 to the second server.
Parameter assignment during server startup:	Download of the FIFO assignment shown below to an S7 during the start of a server.
FIFO1 (RCS):	Datagram via FIFO1 to Server1
FIFO2 (recipe):	Datagram via FIFO2 to Server1
FIFO3 (general):	Datagram via FIFO3 to Server1
FIFO4 (RCS):	Datagram via FIFO4 to Server2
FIFO5 (recipe):	Datagram via FIFO5 to Server2
FIFO6 (general):	Datagram via FIFO6 to Server2

7.4.11.3 Deleting a PCU

You can select the "Delete" command from the PCU shortcut menu to delete the current PCU. Click the area of the PCU icon to open the PCU shortcut menu.

Data storage

8.1 System Path per IOS

There is an explicit route for the access of an IOS on its system files. This is by default: "C:\WINDCS".

All accesses which are not occupied via special route adjustments are performed via this system path. In this way e.g. all INI files are searched in the following path :
<Systempath>\SYS\

If a different route is required, this one should be in the file:

```
<Systemroot>\WIN.INI under
[WINDCS]
Path = <Laufwerkskennung>
```

.

If, for example, the system had been installed on the hard disk with the identifier D: under WINDCS.5xx, the input should be in the WIN.INI :

```
Path = d:\windcs.5xx
```

This path should also be entered as a search path in the System Control of the operating system.

Note

Changing the 'Windcs' system path after having already engineered and commissioned the system project should be avoided as far as possible, since drive and path designations are stored in different INI files which would all then have to be changed. If this is unavoidable, however, the following list can serve as a guide for conversion.

- Change Windows "Win.INI"
- Change Windows Path variable
- Change IOS path in "SiteCfg.exe"
- After booting the IOS PC call 'Register.bat' in ..\windcs\sys\ocx
- If necessary, change path declarations in the following files
 - ... \windcs\sys\controls.ini
 - ... \windcs\sys\trendman.ini (if Path is used for 'Server=')
 - ... \windcs\sys\meldarch.ini (only when using 'user messages')
 - ... \windcs\sys\prosched.ini (only when using 'Process Scheduler')
- Path specifications in process diagrams are overlaid by the system automatically when loading the picture.
- Path specifications in process diagrams outside of "... \windcs\..." are no longer supported from BRAUMAT/SISTAR Classic V6.0 and must be corrected manually.

After these modifications the PC must be restarted.

8.2 Categories of paths

The IOSs communicate with each other via different path areas. For example, files which affect a very special PCU are addressed via very special routes and information which affects the batch and recipe system, via special ones.

On the one hand this results in specific IOSs (e.g Client IOSs) for a requested functionality having access to exactly one or several Server IOSs. On the other hand files can be distributed redundantly in the total system, and this is tuned to a special area of function.

With extended Area.ini:

The category paths are generated based on the default server sequence or, if different, on the server sequence of the category and on the corresponding remote paths of the relevant server.

When Area.ini is not extended:

This category route is entered in the file SYS.INI under [Paths]. In the following there is a list of the possible routes with the functions and relevant file area:

Category	Affected Applications	Affected Project files	Function
Project path PROJ =	<ul style="list-style-type: none"> Text configuration PCU Server Block transfer Trend Manager Input of messages Synchronization Entity Function Queuing Function Language-dependent PCU Texts Route Control Function 	<ul style="list-style-type: none"> \texte.*\.* \etc\.* \trans\.* \trend\.* \texte.*\.* \bilder\.* \symbole\.* \bilder\dbf\.* \sound\.* \entities\.* \v_q_ing\.* \pcu.*\texte.*\.* \rcs\.* 	All project-specific files are stored under these paths, e.g. global text files, project files for unit overview, block transfer, curve records, synchronization, process images, symbols, entity definition, queuing, route control
PCU Path PCU =	<ul style="list-style-type: none"> Curve input Configuration Text configuration PCU Server Controller System adjustments Unit overview Trend Manager Maintenance data Input of messages Synchronization All Applications Offline Notice functions 	<ul style="list-style-type: none"> \pcu.*\.* 	All PCU-specific files are stored under these paths, e.g.: PCU text files, block files of PCUs, notice files, PARAM.PCU files, configuration files for controller, system adjustments, maintenance data
Recipe path RECIPE =	<ul style="list-style-type: none"> Offline Recipe Editor Online Recipe Editor Recipe Control Recipe Conversion PCU Server Synchronization 	<ul style="list-style-type: none"> \recipe\.* \pcu.*\recipe\.* \pcu.*\rezept\.* \texte.*\.* \pcu.*\texte.*\.* 	All recipe system-specific files are stored under these paths, e.g.: configuration files for basic recipes, recipes, component list, master recipes, etc. PCU-dependent and text-dependent recipe parts.
Job System path BALI =	<ul style="list-style-type: none"> Job editor 	<ul style="list-style-type: none"> \bali\.* \frprot\fs.* \pcu.*\recipe\.* 	All Job System-specific files are stored under these paths, e.g.: configuration files for job editor, job data, history data, job parameter, etc.

8.2 Categories of paths

Category	Affected Applications	Affected Project files	Function
Free Protocol path BATCH=	<ul style="list-style-type: none"> Free Protocols Filing message of the type 6 Free interface 	<ul style="list-style-type: none"> \frprot*.* \srprot\sr_frpr*.* 	All free protocol archives are stored under these paths: receive data, manual data, copy data, free interface protocols, usage data
Step Protocol Path STEP=	<ul style="list-style-type: none"> Step Protocol Filing message of the type 5 	<ul style="list-style-type: none"> \srprot*.* 	All step protocol archives are stored under these paths
Message path MSG =	<ul style="list-style-type: none"> Message archive Filing message of the type 3 	<ul style="list-style-type: none"> \meld*.* \texte.*\meld*.* 	All message archives are stored under these paths,
Silo path SILO=	<ul style="list-style-type: none"> Silo administration, current Tank/silo administration, archive 	<ul style="list-style-type: none"> \recipe\complist\silon.ini \frprot\...\fe_*.dbf 	All tank/silo-specific files are stored under these paths, e.g.: free protocol silo archive, silo text files

Note

The configured images aren't synchronized as standard via the PROJ path. The following counter should be set in the file by activating: \WINDCS\SYS\BIKO.INI :

- [Options]
- CopyFileToAll = 1

Because of the same context, the path settings under PROJ, PCU, BALI and RECIPE should correspond with each other.

For the path name either a drive disk letter (should be connected by starting) or the corresponding path identifier

H:\WINDCS or
 \\IOS1\c\WINDCS or
 \\101.0.0.1\c\windcs can be used

Example:

A Client IOS (IOS11) should read all relevant configurations from its server IOSs or write changes on them. The IOS11 should have network connections to IOS 1 (disk drive H:\) and 2 (disk drive G:\).

The archives are only held redundant, whereby the free protocols are only recorded on IOS 1.

The inputs should be as follows, so that the Client IOS has the correct access to its own hard disk as well as to the Server IOSs and so that the Server IOSs synchronize themselves:

SYS.INI files with an Area.ini which is not extended:

Category	Client – IOS 11	Server – IOS 1	Server - IOS 2
PROJ =	H:\WINDCS;G:\WINDCS;C:\WINDCS	C:\WINDCS;G:\WINDCS	C:\WINDCS;H:\WINDCS
PCU =	H:\WINDCS;G:\WINDCS;C:\WINDCS	C:\WINDCS;G:\WINDCS	C:\WINDCS;H:\WINDCS

Category	Client – IOS 11	Server – IOS 1	Server - IOS 2
RECIPE =	H:\WINDCS;G:\WINDCS	C:\WINDCS;G:\WINDCS	C:\WINDCS;H:\WINDCS
BALI =	H:\WINDCS;G:\WINDCS	C:\WINDCS;G:\WINDCS	C:\WINDCS;H:\WINDCS
BATCH=	H:\WINDCS	C:\WINDCS	H:\WINDCS
STEP=	H:\WINDCS;G:\WINDCS	C:\WINDCS	C:\WINDCS
MSG =	H:\WINDCS;G:\WINDCS	C:\WINDCS	C:\WINDCS
SILO=	H:\WINDCS;G:\WINDCS;C:\WINDCS	C:\WINDCS;G:\WINDCS	C:\WINDCS;H:\WINDCS

With an extended AREA.INI , use the SITECFG.EXE program to enter the path names in "... \windcs\sys\AREA.INI'. The settings are made in the "Server sequences" and "Remote paths" tabs.

IOS Einstellungen

Nr: 1
Name: IOS1

Allgemein | **Serversequenzen** | Remotepfade

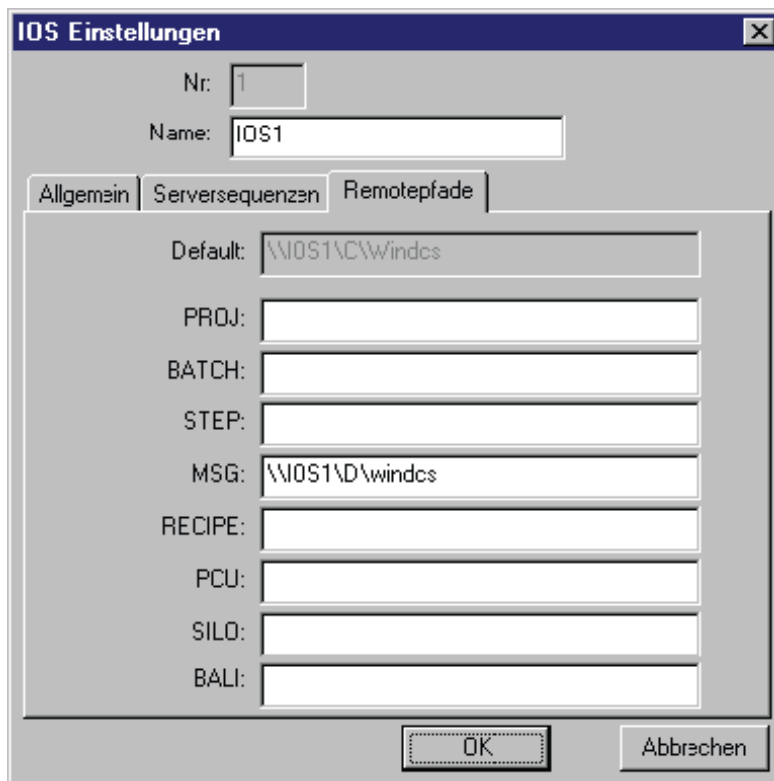
Area: 1 | Area1 [1]

Serversequenzen
Default: 1,2 | Area: 1

Details Einstellungen

PROJ: 1,2 | RECPE: 1,2
BATCH: 1,2 | FCU: 1,2
STEP: 1,2 | BALI: 1,2
MSG: 1,2 | FCS: 21

OK | Abbrechen



Remote path MSG for server IOS1 was specified here in order to shift the message archive files to drive D. This overwrites the default system path which is derived from the previous register tab settings.

8.3 Client-specific folders on IOS server

It is now possible to create a subfolder (IOS.XXX) for each client on the server in which client-specific settings and process pictures can be stored.

Example:

- ..\windcs\IOS.102\etc\kpos001.ini → Area definitions for plant overview
- ..\windcs\IOS.102\texte.0\bereich.txt → Area names
- ..\windcs\IOS.102\texte.0\Panel.ini → Panel faceplate application bar
- ..\windcs\IOS.102\texte.0\Paneltree.ini → Panel faceplate navigation bar
- ..\windcs\IOS.102\bilder\xyz.bik → Process pictures
- ..\windcs\IOS.102\bilder\xyz.bmp → Background images

As soon as a client folder is created on the server, the relevant information is read from it (e.g. Open image dialog in LZSYS or "Process cell" menu in SEQCtrl). If no client folder exists, the default access path is used. This can also be used, for example, to manage/save specific AREA-related client images on the server.

Other configurations

9.1 System time synchronization

It is absolutely necessary to ensure that the current data and time are synchronized on all machines of a CIS (all interconnected IOSs and PCUs). This is the only way to ensure precise datagram assignment.

IOS (with or without radio-controlled clock) is time master

- A 'Time-Master' IOS transfers the time to its connected PCUs using the TRANSTIME.EXE program.
This method is described in chapter 'TRANSTIME.EXE' Synchronization of Date and Time between IOS and AS (Page 89).
- IOS to IOS time synchronization
Using a suitable program, the 'Time-Master' IOS sends the time to all servers and clients connected in the network via TCP/IP.

Note

A program for the synchronization of PCs on a TCP/IP network is usually included with the radio-controlled clock card for the PC (e.g. Siemens DCF77 client software on PCS 7 Toolset DVD/Additional Products)

A further possibility for time synchronization on the IOS level is described in chapter Between IOS and IOS (Page 92).

PCU as time master

This method is also still used in individual cases in older plants.

For this method, a PCU must be assigned the system time master function in the overall configuration. Here it is irrelevant which PCU is used. However, its internal clock should be as accurate as possible, and this PCU should represent the one handling the highest number of direct network connections to other IOSs and PCUs.

This method is described in chapter Between PCU and IOS (Page 92).

9.1.1 'TRANSTIME.EXE' Synchronization of Date and Time between IOS and AS

9.1.1.1 Overview

This tool is used to send the current time on your IOS to one or more automation system(s) at defined intervals. This tool allows you to set the interval between the update cycles, to specify

9.1 System time synchronization

one or more automation system(s) to which the time will be sent. You can also log all actions in a file, so that you can see which values were sent.

Notes on PCU configuration

- The time telegram in the PCUs (telegram type 7) is not used in this configuration (Telegram type 7 should be deleted in the FIFOs)
- Remove telegram type 7 from the area.ini with ,Sitecfg'
- It is also not practical to transfer the time via PCU cross-coupling or to forward telegram 7 to other IOSs on the IOS level using `pcuser.vini`.

9.1.1.2 Files Required

,Time-Master' IOS configuration

Transtime

- TRANSTIME.EXE (normally located in <windcs>\sys\...).
- TRANSTIME.INI is written automatically. You can save settings when using the tool for the first time.

Starting ,Transtime.exe' via the PCU_Server and Scheduler

Contents of ,Pcu_serv.ini':

```
[Pcu_serv]
;Start and Check for running of ProcessScheduler "ProSched.exe"
RunProcessScheduler=1
```

Contents of 'ProSched.ini' - TimeMaster

```
[Global]
Processes=TransTime
[TransTime]
Application=d:\windcs\sys\Transtime.exe
Type=PERMANENT
ShutDown=0
StartDay=81
StartTime=10:06:19
```

9.1.1.3 Configuration (transtime.ini)

```
[Config]
```

```
;Cycletime [ms] to update PLC time
CycleTime=30000
;PLCs to be updated "1,4,5"
AS=
;Log updates
Logging=0
;Filename of logfile
LogFileName=C:\tmp\TransTime.log
ShowWindow=1
```

What do these keys mean?

- CycleTime = time in milliseconds between two update steps (cycle time). Default = 30 seconds
- AS = number of automation system(s) to which the time will be sent. If you want to specify more than one system, write their numbers separated by a comma, for example, AS=1, 4, 5
- Logging = 0 means logging is disabled, 1 (default) means logging is enabled
- LogFileName = specifies the name of the log file, full path included. Default=c:\tmp\TransTime.log
- ShowWindow = 0 (default) window is not displayed, 1 means the dialog will be displayed

9.1.1.4 User Interface Description

- Button 'Apply' = Makes the current setting valid
- Button 'Make invisible' = Hides the entire window permanently. To make it visible again, edit 'transtime.ini'
- Button 'End application' = Exit saving any settings you have changed.
- Box 'Last time written' =Shows the last values sent to the automation system(s)
- For input fields "Cycle time [ms], Time Master AS, Log file name, and Logging on" refer to "What do these keys mean?"

9.1.2 Possible time synchronizations

9.1.2.1 Between PCU - PCU

This data can be forwarded to all connected PCUs via the PCU cross-coupling. You therefore require one cross-couple data record per system time synchronization, i.e. per PCU.

See "*Communication Configuration of the cross-coupling*"

9.1.2.2 Between PCU and IOS

By means of the FIFO connection and via telegram type 7, this system time is then sent cyclically from the PCU to the IOSs in a configurable time interval (setpoint in [sec]).

- With SIMATIC S7:
The time interval is configured in the 'TSynSoll' attribute in the 'PCU_ALG' object class.
- With SIMATIC S5:
The time interval is configured directly in the FIFO.

The parameter assignment is described in the "Application based on S7" manual, chapter "Configuration/Working with the application".

9.1.2.3 Between IOS and IOS

'Time-Slave' IOS configuration

In all 'Time - Slave' IOSs, the time and date are read cyclically from a 'Time - Master' IOS via the 'Net-Time' protocol. This takes place with the Batch-File 'Time.bat', which is called from BRAUMAT Scheduler 'ProShed.exe' in a predefined time cycle:

Contents of 'Time.bat':

```
@Echo off  
Net.exe time \\<PCNameTimeMaster> /SET /YES
```

<PCNameTimeMaster> should be replaced with the computer name of the 'Time - Master' IOS.

The associated call in 'ProSched.ini' for this is:

```
[Global]  
Processes=Time, ...  
[Time]  
Application=d:\windcs\sys\Time.bat  
Type=HOURLY  
ReqTime=00:10 ;to be started each hour at xx:10
```

In this case, 'Time.bat' is called hourly from 'ProSched.exe', at 10 minutes past every hour.

9.2 Datagram interchange from the PCUs -> IOSs

As already mentioned, communication between the PCUs and IOSs is controlled via so-called channels (see chapter 3.2). Each channel has a FIFO block in the PCU where the datagrams to the IOSs are buffered. Depending on the plant configuration, several channels are assigned to a specific IOS/PCU connection. This means, therefore, that the relevant FIFOs are also assigned to this connection.

There are various datagram types, whereby each type corresponds to a specific function, or the message contents. For example, the datagram for messages has the ID 3, the datagram for system time synchronization is assigned ID 7 (for further IDs, see chapter 11).

Thus, in order to receive such a datagram, the ID of that datagram should be entered in the header of a FIFO (one assigned to this connection), whereby it is important to ensure that a datagram type is not entered in more than one FIFO of the same connection. If this is the case, these datagrams will be received more than once by the same IOS (e.g. in the case of a 4-channel configuration, if you assign datagram type = 3 to all 4 of the respective FIFO headers, the specified IOS will always receive 4 identical messages).

The datagrams received by an IOS, i.e. PCU Server, and at which frequency, can be seen in the trace window of the PCU Server (under the menu: Display, Trace).

If you are using SIMATIC S7 with version 4.0 and higher, depending on the plant configuration, you can preset the datagram IDs in the FIFOs with the help tool FIFOCONV.EXE. Thus, in the case of 'Switch-over Configuration', IOS1 is assigned to the necessary datagram types for the job/recipe system in its FIFOs 1-3, and IOS2 the datagrams for messages and step protocols. Depending on the parameterization in the send buffers, these datagrams are transferred to the FIFOs of the reserve IOS if the first IOS fails.




You can achieve the same function with SIMATIC S5 if you specify a reserve FIFO for each of the FIFOs respectively.

However, the A/R system message identification enters the system for both control types by recipe server activation/change in the corresponding FIFOs.




9.3 FIFO configuration

Via the FIFOs the message traffic to the IOSs is processed.

In the configuration of the FIFOs the message types are entered which should be sent to the corresponding IOS

 See also:  Blocks S7  FIFO1 .. FIFO6 - PCU System data - General

A maximum of two servers can be connected to each S7 PCU. FIFOs 1-3 are assigned to the first server, FIFOs 4-6 to the second server as well as the send buffers.

By activating the server switchover function the send buffers can be parameterized ( See also:  Blocks S7  SENDPU - Send buffer-1..6) in such a way that they automatically send the messages to the other server (not the one to which they are assigned) if the server fails.

Three different basic configurations can be adjusted with the help program fifoconf.exe in the folder 'windcs/sys'.

Any adjustment to the configuration must take place on a server PC. Changing the configuration affects all S7 PCUs that are connected to this server.

After having selected a configuration, the DB files are copied into the local PCU memory backup and if required are written into the PCUs with the block transmission.

The following three basic configurations are supported:

Stand alone

Server 1 receives all messages, there is no server 2.

FIFO1:	3,7
FIFO2:	8,9,13,15,4,16
FIFO3:	5,6,14,18
FIFO4:	-
FIFO5:	-
FIFO6:	-
Sendpu1:	Switch-over deactivated
Sendpu2:	Switch-over deactivated
Sendpu3:	Switch-over deactivated
Sendpu4:	Switch-over deactivated
Sendpu5:	Switch-over deactivated
Sendpu6:	Switch-over deactivated

Parallel communication

Server 1 receives all messages, server 2 receives all messages with the exception of those for the order and recipe system.

FIFO1:	3,7
FIFO2:	8,9,13,15,4,16
FIFO3:	5,6,14,18
FIFO4:	3,7
FIFO5:	16
FIFO6:	5,6,14,18
Sendpu1:	Switch-over deactivated
Sendpu2:	Switch-over deactivated
Sendpu3:	Switch-over deactivated
Sendpu4:	Switch-over deactivated
Sendpu5:	Switch-over deactivated
Sendpu6:	Switch-over deactivated




Switch-over communication

Server 1 receives all messages for the order and recipe system, server 2 receives all messages and logs.

FIFO1:	7
FIFO2:	8,9,13,15,4,16
FIFO3:	18
FIFO4:	3,7
FIFO5:	16

FIFO6:	5,6,14,18
Sendpu1:	Switch-over active
Sendpu2:	Switch-over deactivated
Sendpu3:	Switch-over active
Sendpu4:	Switch-over active
Sendpu5:	Switch-over deactivated
Sendpu6:	Switch-over active

If you require an individual configuration it is recommended either to activate the "parallel communication" or "switch-over communication" via the tool 'fifconf.exe'. Then change the message types in the FIFOs according to individual requirements.

 See also:  Blocks S7  FIFO1 .. FIFO6 - PCU System data - General

Please note that the regulations for the FIFOs are to be considered:

FIFO1+4:	messages (3), time messages (7)
FIFO2+5:	Order and recipe system (8,9,13,15,4,16)
FIFO3+6:	logs (5,6,14), curve triggering (18)

Note

Messages for the order and recipe system and messages or protocols in FIFO 2 may not be configured at all. With a burst of messages, the FIFO for the order and recipe system can be disabled or by switching over the recipe server the messages that are still in the FIFO can become lost (e.g. messages).

If there is a recipe server switchover, the message types of the order and recipe systems are transferred automatically from the FIFO of the previous recipe server into the FIFO of the active recipe server.

The optional telegram types 17 and 19 must be parameterized when used in FIFO3+6.

9.4 IOS/PCU adjustment

It is possible to make IOS/PCU-specific adjustments with the applications 'System adjustment' and 'user administration'. In the following lists a selection of the most important IOS/PCU-related INI switches is printed with explanation. A few of these switches are supplied via the corresponding applications. The bold printed inputs should be manipulated directly in the INI file by the user or can be changed with the INI Editor under 'System adjustments'. Several inputs are described in more detail in relation to the topic in the corresponding chapters of the system manual. The lists do not claim to be complete.

9.4.1 SYS.INI

Definition	Adjustments	Note
IOS Adjustments	[PC]	
IOS Name	PCName= IOS01	The name of the IOS should be unique. It may have a maximum of 16 characters. It may not have any special characters. Extended Area.ini: The computer name is based on the system name!
IOS Number	PCNo= 1	The number should correspond to the value > 0 max. = 255 Extended Area.ini: The IOS number is based on the system computer name and on the corresponding entry in the [IOSxx] section of Area.ini.
system language	Language= 0/1/2/10/....	The language numbers released under [Languages] are decisive. The standard languages are 0=German, 1=English, 2=Spanish, 10 =English, s88.1
No. permitted windows	WndMax= 0/1/2.....	Value > 0: After the attempt to open a <Value> window, a message is output. Value = 0: There is no restriction of the messages.
Display in the window	Caption= SISTAR V6.xx	The version caption is delivered correctly assigned. Extended area.ini: This switch is now found in Area.ini
Add-on applications	AutoStart= trendman.exe,.....	When the system is started from the shell, all comma-separated applications in the list are also automatically started. Extended area.ini: This switch is now found in Area.ini
Route adjustment	SkipLockedPathes = 0/1	The paths under [Path] are skipped over if they are not physically available and the Path Supervising is active in PCU_SERV.INI.
Engineering language	LanguageEngineering=-1/0/1 ...	-1: Default adjustment, no change of the engineering language Value >= 0: change of the engineering language, Text is in ... \windcs\PCU.*\Texte.<value>\ Extended Area.ini: This switch is now located in Area.ini

Definition	Adjustments	Note
Dynamic engineering language	LanguageEngineeringX=1/10. .	X: Number of the language, Value: Text is in subfolder \WINDCS\PCU.*\Texte.<Wert>\. Extended area.ini: This switch is now found in Area.ini
Language for Status S7	LanguageStep7= 0/1....	Selection of the code language for calling Status S7 See also "03Administration", Chap. 2 <i>Extended area.ini</i> . This switch is now located in Area.ini
PCU Adjustments	[AS]	
PCUs	Slaves=1,2,	Numbers - List of the connected PCUs, separated with comma. Extended Area.ini: Is replaced by the PCUs of Area.ini.
Recipe Mode	RecipeMode=GLOBAL/PCU	The recipe types are either PCU-related: Names come from \PCU.*\TEXTE. GLOBAL: Names come from \TEXTE.*\ For V4.x GLOBAL is adjusted in general.
Route Adjustments	[Paths]	See "02_Installation and Configuration", chap. 8 <i>Extended Area.ini</i> : Is replaced by <i>Area.ini</i> ".
Language adjustment	[Languages]	See "System description", chapter 8
Password Levels	[Levels]	See "03_Administration", chapter 3
Export Route	[ExportDrives]Drives=A,	Route to the export/import of archive data by Archive Manager
TCP/IP addresses	[IPAddr]	See "02_Inst. & Config.", Chap. 8
Reset password	PasswdReset=1	;Reset password when closing applications
Time password is valid	PasswdTime=15	;Period in minutes for which a password is valid
16 bit Card Reader	;CODE.DLL=	;16 bit DLL reading magnetic code cards (CODECARD.DLL in 16 bit version, CDCARD16.DLL in 32 bit version)
32 bit Card Reader	;CODE32.DLL=CDCARD32.DLL	;32 bit DLL reading magnetic code cards
	StartupLevelMin=0StartupLe velMax=0	;Password level after Startup/ Reset is StartupLevelMin..StartupLevelMa x

9.4.2 PCU_SERV.INI

Definition	Adjustments	Note
Messages	[MId]	
Message archive	Archive=1,2,...	No messages are written from PCUs in the list onto the hard disk. The PCU numbers are to be separated with a comma.
Display messages	NoMsg=1,2,...	No messages are displayed from PCUs in the list in the PCU Server .
Forward message.	[Protocol]	See "Inst. & Config.", Chap. 8
	[Trans_NT]	
Block PCUs	NoWrite=1,2	On these PCUs no access is permitted in write mode. See "Inst. & Config.", Chap. 8
PCU Server adjustments	[Pcu_serv]	
Background color	BkColor=FFFFFF	BGR background color in the PCU Server window.
Sign Font	Font=TMS Roman	Sign font for the display in the PCU Server window.
Sign Height	FontHeight = 15	Sign height for the display in the PCU Server window.
Trace Directory	TraceDir=C:\TMP	The displayed traces in the PCU Server window are filed in the indicated path.
Sinec Path	SinecPath=c:\sinec\....	Path in which the SINEC files are stored for the coupling to PCU-S5,
Trace Window	UseTraceAPI=0/1	Activate Tracing for application Trace Server
Start Trace Server	StartTraceSvr=0/1	When starting the PCU Servers the window Trace Server is also started
Stop Trace Server	StopTraceSvr=0/1	When closing the PCU Servers the window Trace Server is closed
Communication Types	[Communication] + [<Types>]	See "Inst. & Config.", Chap. 8
Remote PCU Server	[Remote]	See "Inst. & Config.", Chap. 8
Remote Message	ShowRemoteMsg=0/1	The messages from the Server IOS are displayed in the PCU Server Message window of this Client IOS.

Definition	Adjustments	Note
Remote Trace	ShowRemoteTrace=0/1	The traces of the Server IOS are displayed in the PCU Server trace window of this Client IOS.
Password Type	[App], Password =0/1	0: It is only a password level: PCUSERV for all functions in the application active 1: There are several levels for the application (PCUSERV_*)
Path monitoring	[PathSupervising]	It is only useful, if also SkipLockedPaths=1 in SYS.INI
Activate	PathSupervising=0/1	1: The routes under SYS.INI, [Paths] are monitored. If a route isn't available, a message will be written in the archive. This route won't be considered as long as it is inactive.
Start Monitoring	StartSleep=x	Value in seconds. The monitoring is started after x seconds.
Repetition Monitoring	Sleep=y	Value in seconds. The monitoring is repeated every x seconds
Simulation Recipe Cycle	[SimTa]	Offline mode for the PCU Server. Relevant if SIM.DLL is loaded. On the IOS the offline DBs should be filed under the PCU folders.
Activate	Enable=0/1	If a recipe is started whose sequence will be simulated.
Step Time	StepTime=x	Value in seconds. Simulated Step Time.
Cycle	Cycle=x	Value >= 2nd cycle of system processing in sec.
Simulation ESG-RA/RE	SimICMGroup<1,2,3,4> = 0/1	DFM group 1, 2, 3, 4 Set RE/RA signals (without waiting time); this is valid across PCUs (global)
Simulation DFM	EnableDFMSimu = 0/1	Read DFM target/actual values from control recipe

9.4.3 RECIPE.INI

Definition	Adjustments	Note
Standby control	[StandByControl]	
Syncho. active	StartFileSync=0/1	For the recipe startup the automatic file synchronization is called or not called

9.4 IOS/PCU adjustment

Definition	Adjustments	Note
Waiting time	AbortWaitForSync=300	Wait time in seconds. If the synchronization hadn't been closed, the recipe startup would have also been aborted.
Server monitoring	[ServerSupervising]	
Activate	Enable=0/1	Activate recipe server monitoring. A broadcast message, 'Recipe Server failed', is output if the conditions below are fulfilled.
Cycle time	CycleTime=x	Value in seconds. The Monitoring message is repeated every x seconds
Amount of missing messages	ReactionCycle=x	Amount of messages which should be missing before the message appears.
Repeat time	RepeatTime=x	Time in seconds until the message is repeated.
Waiting time	WaitTime=x	Wait time in seconds until the server monitoring is activated.
Autom. Server transfer	AutomaticServerActivation=0/1	1: The recipe server is started automatically if the other server fails and the message appears.

9.4.4 DISKMAN.INI

See Manual "03_Administration", chap. 4

9.4.5 MENU.INI

Definition	Adjustments	Note
Wait time	[Wnd], Delay=x	Time in seconds which you wait until the PCU Server is started after the menu has been started. Value should be increased if there are connection problems to the PCUs.
Icon spacing	[NewMenu] MinIconX=xxx	Default = 120 (Pixel) Sufficient normally for all standard application names; should be increased if gaps arise between specific application icons

9.4.6 OM.INI

Definition	Adjustments	Note
Object Manager Config.	[Config]	
OM Dialog	bTracingDialog=0/1	The Object Manager dialog is opened for diagnosis.
Tracing	bTracingOn=0/1	The Trace function of the OMs is activated for diagnosis purposes.
Trace Files	BTraceToFile=0/1	A file is filed in Trace.

9.5 Define INI files

There is a menu item 'System adjustments' in the application Define INI files.

The content of the single INI inputs can be visualized and changed with the help of this dialog.

You can select between:

- Module, in which the INI input is queried
- INI file, in which the INI input is entered

The following is filed for each INI input in the database (under \WINDCS\SYS\INI.INI.DBF):

• File:	INI file with path
• Section:	Chapter filed in INI File (square brackets)
• Key:	INI input below the area
• Current:	current value in INI file
• Type:	Data type, e.g. INT, BOOL, STRING
• Default:	Value, how it is hard-coded in the software. This one is taken if the input in the INI file is missed completely or is replaced.
• Delivery:	Value in INI file for delivery
• Comment:	Comment on the INI input
•	Only the current value can be changed after a double-click on the INI input. In most cases a restart of the corresponding application or of the whole system is required.

Inputs can be searched for in INI files by means of a Filter function. In the dialog the search definition is entered and the criteria under which the search should be performed are defined. As a result a list with agreements is displayed.

Redundancy

10.1 Overview

BRAUMAT/SISTAR Classic V6.0 can be configured completely. This can be configured for the Server as well as for the Client functions. The total solution of redundancy influences the performance and flexibility of the system.

In this chapter the possibilities of redundancy for BRAUMAT/SISTAR Classic V6.0 are described.

The plant engineer and the operator should decide how to use the redundancy for the plant.

In this version BRAUMAT/SISTAR Classic V6.0 can be configured in such a way that all data and functions are available redundantly.

Exceptions that should be saved by the project manager:

- STEP 7 Projects
- RCS Offline configuration

10.2 Hardware Redundancy

10.2.1 AS Redundancy

BRAUMAT/SISTAR Classic V6.0 doesn't support the H-Version in this Version. Every PCU may support up to 2 communication processors of type CP443-1. With this a redundant process bus may be configured. See chapter Display of the connection configuration (Page 66)7.4.8 and Application behavior on Multiclient IOS (Page 67)7.4.9 for further details of Server IOS and PCU configuration with the 'SiteCfg.exe' Tool of Braumat and the AREA.INI configuration file.

10.2.2 Redundant Terminal Bus

10.2.2.1 Redundant Terminal Bus

Functionality

The terminal bus connects the servers with the clients of the process control system. A redundant terminal bus is set up using two identical network segments, or using linked terminal bus rings (double ring). The network components plus PC LAN adapters ensure unrestricted operation of the terminal bus. If a terminal bus fails, communication remains possible over the second terminal bus.

Redundant communication solution

The following solutions are available to guard against failure of the terminal bus:

10.2.2.2 Two redundant fault-tolerant terminal bus rings.

These are set up with switches of the SCALANCE series. Optical, electrical and combined networks can be configured.

Suitable SCALANCE Switches

Bus components	Description
SCALANCE X414-3E	Modular switch with standby function, transmission rates up to 1 Gbps possible (suitable media module required for 1 Gbps). SCALANCE X414-3E can be used as a redundancy manager.
SCALANCE X204-2 (6GK5204-2BB10-2AA3)	Transmission rates up to 100 Mbps possible
SCALANCE X2..IRT	Modular Switch with Standby Function
SCALANCE X408-2	Link networks optically or electrically, 1Gbps

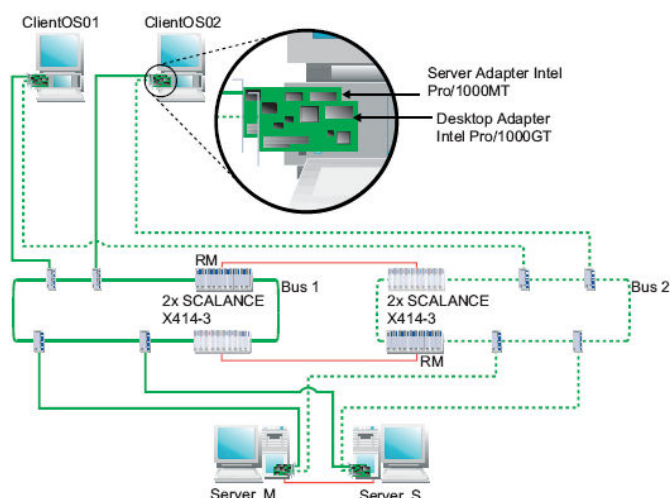
The following two network cards are used in each server or client PC station that is to be connected to the terminal bus:

- Intel Pro/1000MT server adapter
- Intel Pro/1000GT desktop adapter

These network cards work in a "team mode" with only one TCP/IP network address. Each network card is connected to one of the redundant terminal bus rings. All network components are redundant.

In a network segment (ring), a redundancy manager (RM) is configured to enable ring redundancy. The link between the redundant network segments (rings) is implemented using two switches (100 Mbps) in each network.

The following figure shows this configuration.



Linking Redundant Network Segments (Rings)

Switches and data links (network cable) connect the redundant networks. For a redundant link between the redundant network segments (standby link), you need to configure two switches within a network segment for synchronization of the network segments. You can find additional information about this in the operating instructions Industrial Ethernet Switches SCALANCE X-400. The two switches connected in the configuration exchange data frames and thereby synchronize their operating status (one device becomes the master and the other the slave).

When operating without fault, the data link to the other network segment is active only for the master. If this link section fails (for example, due to a defective device), the slave activates its data link as long as the fault exists.

Note

The redundant link of two network segments is supported only with switches that act as redundancy manager (e.g. SCALANCE X414-3E).

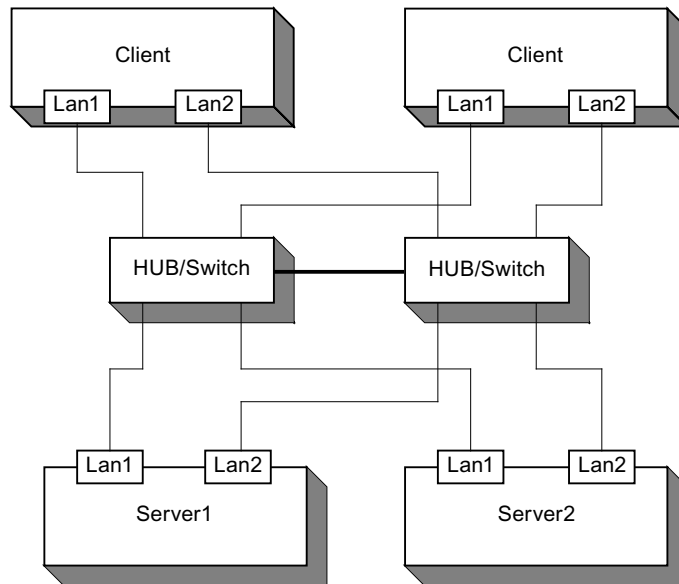
Configuration of the switches

You can find detailed information about configuring switches in the configuration manual Industrial Ethernet Switches SCALANCE X-400:

- Configuration using Web-Based Management and Command Line Interface
- Configuration and Diagnostics over SNMP

10.2.2.3 Two identical networks

These may be built up from two network components (switches, hubs, etc.) with one cross-link between each other.



The following two network cards are used in each server or client PC station that is to be connected to the terminal bus:

- Intel Pro/1000MT server adapter
- Intel Pro/1000GT desktop adapter

These network cards work in a "team mode" with only one TCP/IP network address. Each network card is connected to one of the redundant switches. All network components are redundant.

10.2.2.4 How to configure the network cards for the Terminal Bus

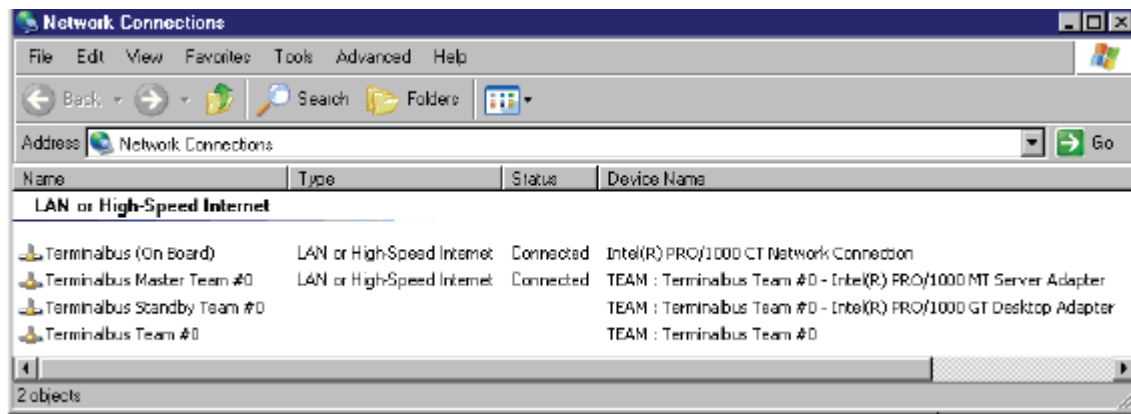
Requirements

- The following two network cards should be installed in each PC that is to be connected to the terminal bus (for example, OS server, OS client, domain controller):
- Intel Pro/1000MT server adapter
- Intel Pro/1000GT desktop adapter
- Note:
Only the standard Windows services and the TCP/IP protocol are allowed to be active on the 'Teaming Mode' LAN adapters. The ISO transport protocols Simatic Industrial Ethernet (ISO) / SINEC H1 / Packet TDI have to be disabled after installing a new adapter for the terminal bus in teaming mode.

Procedure – Installing and Configuring Drivers

- Install the driver for the redundant network cards.
This can be found in the Support/Download area of the 'Intel' manufacturer's website.
- Start the install package and select the option '...Driver, Intel ProSet and Advanced Network Services...'.
This can be found in the Support/Download area of the 'Intel' manufacturer's website.
- Select the menu command
Start > Settings > Control Panel > Administrative Tools > Computer Management > Device Manager > Network Adapters.
- Select the internal network card of the PC station and disable it in the shortcut menu – only if it is not intended to be used (e.g. for AS coupling).
- Select the server adapter "Intel PRO/1000 MT Server Adapter" and then select the menu command Properties in the shortcut menu.
- Select the "Team with other adapters" check box in the "Teaming" tab and click the "New Team" button. The "New Team Wizard" dialog box opens.
- Enter a name for the team (for example "Terminal Bus Team #0") and click "Next".
- In the "Select the adapters to include in this Team:" list, select the check boxes for the network cards you wish to use to connect a server to the redundant terminal buses.
- Select the "Switch Fault Tolerance" entry in the "Select a team mode" list and click "Next".
- Click "Finish".
The wizard closes. The team (such as "Terminal Bus Team #0") is entered in the "Properties" dialog box of the network card.
- Click "Properties".
The "Team: <Team name> Properties" dialog opens (in this example, "Team: Terminal Bus Team #0 Properties").
- Select the "Advanced" tab.
- Select "QoS packet tagging" in the "Settings" list.
- Select "enabled" in the "Value" list.
- Go to the "Settings" tab and click the "Modify Team" button.
- In the "Adapters" tab, select the network card (Server Adapter Intel Pro/1000MT) on the preferred terminal bus. Click the "Set Primary" button.
- Select the network card (Intel Pro/1000GT desktop adapter) on the redundant terminal bus and click the "Set Secondary" button.
- Click "OK".
The "Team: <Team name>" dialog closes. The two network cards and their team affiliation are now entered in the device manager.

- Close any Properties dialogs with "OK"



- Open the "Properties" dialog box of the virtual Team #0 network card.
- Select the "General" tab. In the "Connect using:" group, the entry is: "TEAM: <Team name>" (for example, TEAM: Terminal bus team #0).
- Select the "Show icon in information area when connection is made" check box.
- Click "OK" to close the dialog box.

10.3 Software Redundancy

10.3.1 Redundant data maintenance

BRAUMAT/SISTAR Classic V6.0 saves all data redundantly on two (or more) servers (Parallel redundancy). The system saves all data in single files on the hard disk.

Each change in configuration, batch planning and recipes is filed immediately on both servers.

10.3.2 Route monitoring

Access to the paths is monitored cyclically both on the Servers and on the Clients.

In general the file "area.ini" should be configured for a correct monitoring function with the following options: The access paths and IP addresses of computers must be entered there.

The path supervising should be enabled

File:	pcu_serv.ini
Section:	[PathSupervising]
Key:	PathSupervising=1

The following key must be set in order to call the associated synchronization application.

Key:	RunAppl =1
------	------------

Cycle time of the monitoring

File:	pcu_serv.ini
Section:	[Config]
Key:	Sleep=30

With the value in seconds the monitoring cycle time is defined

Unhide and hide window

The function normally runs in the background without any display. The path supervising can be displayed in a window for testing and for diagnosis. The window can be closed. After closing it won't be displayed for the following starts of the PCU Server either. The window may be activated again only by changing the file 'pathsupv.ini'.

File:	pcu_serv.ini
Section:	[Config]
Key:	ShowWindow=1

With extended Area.ini:

All paths of the multiclient areas are monitored.

10.3.2.1 Disable paths in runtime operation

Path accesses of all BRAUMAT applications are disabled if access via network is no longer possible. The system then makes this access via the next entered path in the AREA.INI . Local paths will never be disabled. This function runs in the background.

When a path is locked or enabled, a message will be entered in the message archive.

Path locking must be enabled explicitly, regardless of whether path monitoring is enabled or not. To do so, enter:

File:	sys.ini
Section:	[PC]
Key:	SkipLockedPathes=1

10.3.2.2 Disable paths during server startup/enable during operation

Client accesses on a server path may occur during server startup and before file synchronization has finished. In this case old data may be read by the clients. The following Braumat mechanism prevents this issue:

- Clients recognizes a 'locked destination path' by the existence of the 'nosync.ini' file in the Braumat system folder;
- Access to a destination path is re-enabled if the server is accessible on the network and the file 'notsync.ini' does not exist; with this the path release may be delayed until the end of file synchronization.
- File synchronization after the server startup deletes this file on all synchronized drives.
- If a file synchronization started manually should delete this file, it has to be called with '\u' parameter.

Configuring alternative 'Disable on Server startup'

In the auto start group of the server the program "setnotsync.exe" should be placed. The program creates the file "notsync.ini" during the start of the server.

Configuring alternative 'Disable path at PCU Server shutdown'

In order for the client to detect the manual shutdown of BRAUMAT on the server, path access can be disabled via the 'notsync.ini' file on the server when closing the PCU server.

File:	Pcu_serv.ini
Section:	[PathSupervising]
Key:	SetNotSync=1

10.3.3 Variable visualization

The variable visualization is executed via TCP/IP for BRAUMAT/SISTAR Classic V6.0 . The TCP/IP addresses of the Server can be entered for each Client. The changeover will be executed in the background.

In a multiclient system with extended Area.ini, the TCP/IP addresses are generated based on the server sequence and on the addresses of the server IOS in Area.ini.

10.3.4 Parallel recording

All messages, step protocols, curve values and free protocols will be sent to the two servers and recorded in parallel. The corresponding inputs in the FIFOs should be made.

10.3.5 Recipe and Route control

Server Standby

A Server and Standby concept has been realized for the function Recipe and Route control. On each Server the active Control Server runs. On Server 1 recipe control can run by preference and on Server 2 route control by preference. In case of redundancy (failure of one server) both can run on one server.

Activating the automatic server switchover

In case of failure of the recipe server, the other (standby) server is activated as the recipe server automatically after a user-definable time (about 6 minutes with the default settings). The following key should be set in the file 'recipe.ini' on both servers:

```
[Serversupervising]
```

```
AutomaticServerActivation = 1
```

... for the other keys see Chapter RECIPE.INI (Page 99)

General query with Server start

By starting the BRAUMAT/SISTAR Classic V6.0 a general query of all relevant PCU data will be executed. Afterwards the data will be updated via message from the PCU.

File synchronization with Server start

Data are synchronized by starting the server. The synchronization guarantees that all necessary files for the recipe system are equal on both servers.

The configuration of synchronization files is necessary for the file synchronization. For starting the active and the standby servers, different files can be configured.

The emphasis should be placed in the recipe data for the active server. This causes a rapid (but more secure) startup.

For the standby server an extensive synchronization should be configured.

Synchronization of the process visualization

The process images and the configured text and object data are filed redundantly. Due to the high amount of data the synchronization of the process images should only be executed on the standby server.

After the installation a decision should be made as to whether an automatic synchronization of the process image is necessary at all.

Sample configuration

11.1 Server 1 and 2 fully redundant solution

The fully redundant solution with a 2 server concept will be introduced.

11.1.1 File storage

Synchronization of both servers is necessary as all data are concentrated on both servers. This synchronization has to be carried out on Server startup. The synchronization should be configured. By default a synchronization only for the recipe system is active.

In reference to the process visualization this solution has a certain delay in load times of the process images at the Client, as the image files must be loaded via the network. The delay is to be figured at around 2 seconds for a 100 MBit network.

The delay isn't obvious in other data categories.

In order to file the data redundantly, various paths should be entered in the file sys.ini. These paths are divided into different function groups.

11.1.2 Route monitoring

The path monitoring should be activated for this constellation.

In the event of a server failure all functions will be assumed by the other server. If the failed server returns, all data are synchronized. Only after this synchronization will the server work again.

11.1.3 Configuration File path

IOS	First input	Second input	Example: (on the servers LW C is released as C)
Server1	local	Server 2	[Path] PROJ=c:\windcs;\Server2\clwindcs BATCH=c:\windcs;\Server2\clwindcs ...
Server 2	local	Server 1	[Path] PROJ=c:\windcs;\Server1\clwindcs BATCH=c:\windcs;\Server1\clwindcs ...
Client	Server 1	Server 2	[Path] PROJ=\\Server1\clwindcs;\Server2\clwindcs BATCH=\\Server1\clwindcs;\Server2\clwindcs ...

Note

In systems with extended Area.ini, the paths are generated based on the server sequences (cf. chapter Categories of paths (Page 84))

11.1.4 Configuration of the PCU Server Miniports

IOS	Functions	Example pcu_serv.ini
Server 1	Preference server for Recipe control Primary Variable server for Client group A Preference server for global change logging Preference server for the ICM entity function Reserve server for Route Control Secondary variable server for Client group B	[Server] Ports=ta.dll,s7.dll, recctrl.dll, balidata.dll, cas.dll, rcs_port.dll, globlog.dll, entport.dll, client.dll
Server2	Preference for the Route Control Primary variable server for Client group B Reserve server for global change logging Reserve server for ICM entity function Reserve server for recipe control Secondary variable server for Client group A.	[Server] Ports=ta.dll,s7.dll, recctrl.dll, balidata.dll, cas.dll, rcs_port.dll, globlog.dll, entport.dll, client.dll

IOS	Functions	Example pcu_serv.ini
Client of group A	Client	[Client] Ports=client.dll
Client of group B	Client	[Client] Ports=client.dll

11.1.5 Configuration of the IP addresses

With extended Area.ini:

The IP addresses are generated automatically by means of server sequences (see chapter 8 for details).

When Area.ini is not extended:

The IP addresses in the file sys.ini are evaluated by client.dll Miniport. By dividing into Client group A and B a load balancing can be reached in the process visualization. A load balancing for RCS, the job and recipe system isn't possible as only one server has the data.

IOS	Note	Example sys.ini
Server1 IP Address s1.s1.s1.s1	For host and backup server IP address no inputs are used as the Server 1 reads data of the real PCUs via the S7.DLL directly. The inputs in section [IPAddr] are only used if Server 1 isn't the active RCS Server (PCU245) or batch server (PCU252,253,254,255) respectively otherwise the calls to these virtual PCUs are made by the Miniports assigned to the client.dll (rcs_port.dll).	[PC] HostIPAddr= ResIPAddr= [IPAddr] PCU245=s2.s2.s2.s2 PCU252=s2.s2.s2.s2 PCU253=s2.s2.s2.s2 PCU254=s2.s2.s2.s2 PCU255=s2.s2.s2.s2
Server2 IP Address s2.s2.s2.s2	For host and backup server IP address no inputs are used as the Server 2 reads data of the real PCUs via the S7.DLL directly. The inputs in section [IPAddr] are only used if Server 2 isn't the active RCS Server (PCU245) or batch server (PCU252,253,254,255) respectively otherwise the calls to this virtual PCUs are made by the Miniports assigned to the client.dll (rcs_port.dll).	[PC] HostIPAddr= ResIPAddr= [IPAddr] PCU245=s1.s1.s1.s1 PCU252=s1.s1.s1.s1 PCU253=s1.s1.s1.s1 PCU254=s1.s1.s1.s1 PCU255=s1.s1.s1.s1

11.1 Server 1 and 2 fully redundant solution

IOS	Note	Example sys.ini
Client of group A	<p>For host IP address the one from Server 1 will be entered</p> <p>For the backup server IP address the one from Server 2 will be entered. This address is only used if Server 1 failed.</p> <p>Data of Route Control (PCU245) are fetched by preference from Server 2. Only in case of Server 2 failure is the substitute input for Server 1 used.</p> <p>Data from the job and recipe system (PCU 252,253,254,255) are fetched from Server 1. Only if Server 1 failed is the data of Server 2 fetched.</p>	<pre>[PC] HostIPAddr=s1.s1.s1.s1 ResIPAddr=s2..s2.s2.s2 [IPAddr] PCU245=s2.s2.s2.s2;s1.s1.s1.s1 PCU252=s1.s1.s1.s1;s2.s2.s2.s2 PCU253=s1.s1.s1.s1;s2.s2.s2.s2 PCU254=s1.s1.s1.s1;s2.s2.s2.s2 PCU255=s1.s1.s1.s1;s2.s2.s2.s2</pre>
Client of group B	<p>For host IP address the one from Server 2 will be entered</p> <p>For the backup server IP address the one from Server 1 will be entered. This address is only used if Server 2 failed.</p> <p>RCS and job and recipe system as for Clients of group A.</p>	<pre>[PC] HostIPAddr=s2..s2.s2.s2 ResIPAddr=s1..s1.s1.s1 [IPAddr] PCU245=s2.s2.s2.s2;s1.s1.s1.s1 PCU252=s1.s1.s1.s1;s2.s2.s2.s2 PCU253=s1.s1.s1.s1;s2.s2.s2.s2 PCU254=s1.s1.s1.s1;s2.s2.s2.s2 PCU255=s1.s1.s1.s1;s2.s2.s2.s2</pre>

11.1.6 Messages and protocols

Messages and step protocols (and possibly further protocols) should be recorded in parallel. The FIFOs should be configured accordingly.

IOS Messages

All IOS messages are recorded on both servers. For the function the access paths and IP addresses should conform with the area.ini .

The path indications in the file sys.ini and area.ini should be identical.

Message synchronization

A synchronization of the message files may not occur, as a comparison of the file data won't supply the actual archive.

Both message archives should be assembled on the data record level.

This function won't be realized in BRAUMAT/SISTAR Classic V6.0 .

11.1.7 Global change logging

For this function the Miniport globlog.dll should be entered in the list of Miniports. Furthermore the area.ini should be configured completely.

Optional software package 'Route Control System' (RCS)

12

12.1 General information

The Route Control system is used for controlling and monitoring production routes in industrial process plants. Simple route settings up to a variety of complex route combinations are possible which depends on the plant complexity. Route control is mainly a tool for simplifying and standardizing configurations, processing and diagnosis of route settings. After a request for a new route (from source via partial route to destination) the assigned route can be determined, tested, controlled, monitored and watched with the help of the Route Control system.

The documentation of the RCS option pack also covers the following manuals:

Manual	Subject
"RCSProjektierung.pdf"	This manual describes the engineering of the Route Control system.
"Bedienen und Beobachten von Wegen.pdf"	This manual describes the online functions of the Route Control.
"Bausteinbibliothek Wegesteuerung.pdf"	This manual describes the block for the Route Control

12.2 Installation notes

12.2.1 AS Installation

PCU or AS installation is described in chapter AS Installation (Page 21). The PCU blocks of the RCS optional package are grouped together in separate program folders of the AS project supplied. After basic installation, the blocks in folders SIS_RCS_SYS and SIS_RCS_USR have to be copied into all PCUs which are involved in route control (the "Blocks" folder in each case).

Additional hints for integrating the RCS blocks into the AS Runtime structure can be found in manual '24_Block library RCS.pdf' chapter 1.1 'System block calls'.

12.2.2 OS Installation

The RCS online installation is part of the basic OS installation of BRAUMAT/SISTAR as described in chapter OS Installation (Page 13).

The RCS Engineering Tool (RCS Offline) has to be installed separately with its own setup program. This is provided on the CD supplied:

```
<LW>:\sis_sys\Sistar\RCS_III.ADO\rcs_offline\Disk1\Setup.exe
```

12.2 Installation notes

For RCS online operation, various configuration settings are required, depending on the OS station type (client/server). These are described in manual "19_Operator Control and Monitoring of Routes" in the chapter titled "Setting Up Route Control".

12.2.3 Diagnostics with parameterization application

The parameterization application is generally speaking an instrument with which PCU data can be monitored in online mode. So the most important data of the Route Control system is also accessible over distinct block classes within the parameterization. Reasonable diagnosis is possible only with solid knowledge about the architecture and data flow of RCS (further information in the manuals previously mentioned).

In order to be able to use these block classes in the parameterization application, it is necessary to copy the corresponding definition files manually after OS installation from the folder ...windcs\param.pcu\optionen\rcs_s7 into the PCU-specific folders ...windcs\PCU.nnn (nnn=PCU no.). This is necessary for all PCUs participating in the Route Control system.

The following table contains all classes of interest in terms of the RCS as well as corresponding parameter definition files which are necessary to work with the RCS.

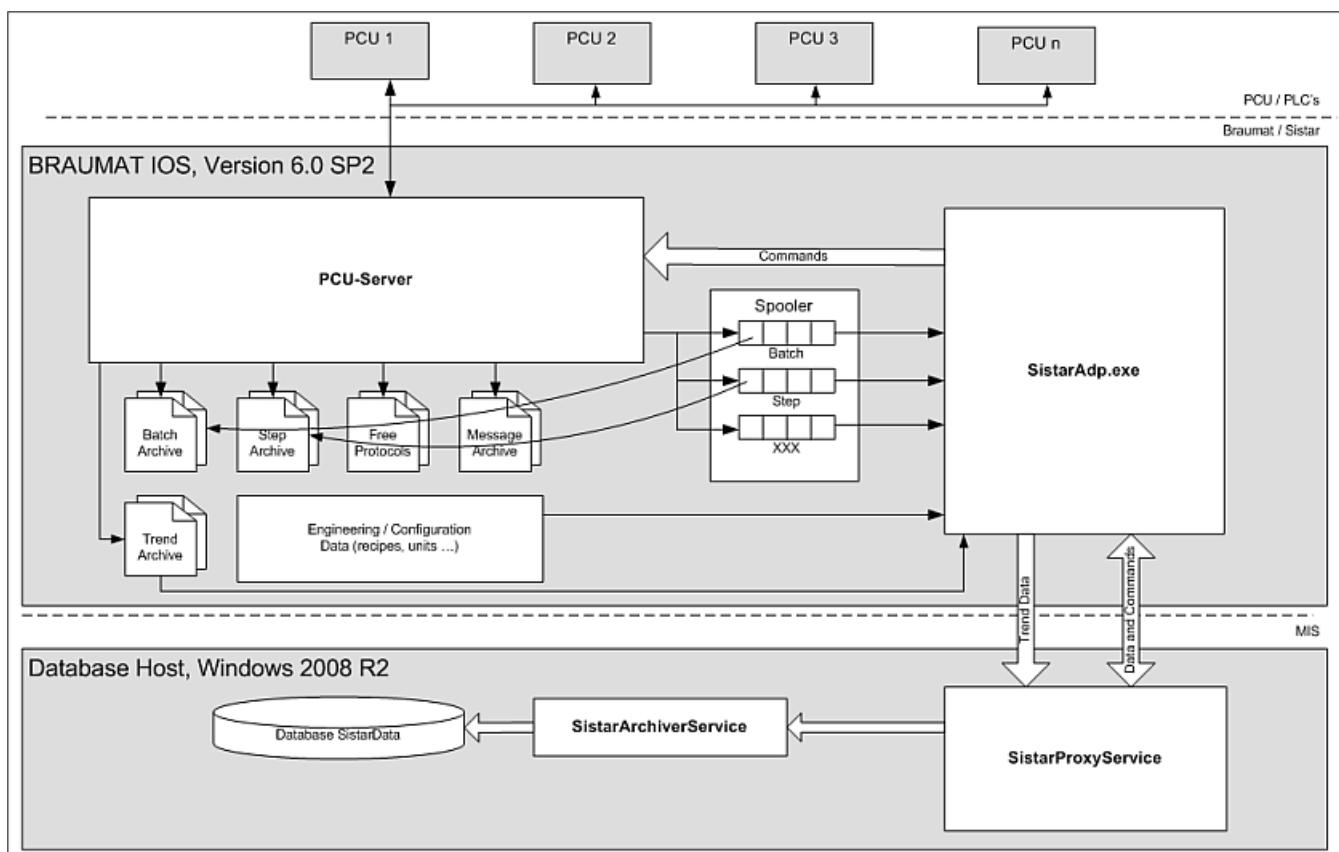
Class	Description	Parameter Definition
RC_CNF	General information on RCS that is valid across routes (e.g. number of routes or identifiers for dynamic route ID allocation)	(System)
RC_CE	1024 CE data records which include all relevant information (for example feedback, control, CE type...)	(System)
RC_SE	1024 SE data records (e.g. feedback, SE type...)	
RC_PE	1024 PE data records (e.g. controlling route, actual PE value ...)	
RC_LE	1024 LE data records (e.g. material ID, controlling route...)	
RC_Element	The class RC_Element includes the information on the loaded route lists. That is, all relevant information is stored here which is to be loaded from the OS into the route data block during the route request. (The routing lists are ultimately the configured combinations in compressed form.)	RC_Elem.csv RC_Elem.pcu
RC_Route	Route information (e.g. state, number of slaves...)	RC_ROUTE.csv RC_ROUTE.pcu
RC_Route_Ti	Timer information (monitoring/fault time setpoints/ actual values related to the modes)	Rc_route_ti.csv Rc_route_ti.pcu

"SQL adapter" option package

13.1 Overview

General description

This description relates to the BRAUMAT IOS component 'SISTAR Adapter' (application 'sistar_adp.exe') in the optional package. This creates the connection between the BRAUMAT IOS server and the SQL proxy service ('SistarProxyService.exe') component running on the 'Database Host' PC station. The adapter reads production-related data from the BRAUMAT archives and sends these to the SQL proxy service. The 'SISTAR Adapter' must be activated on every BRAUMAT IOS server which is to be included in the data recording.



The 'SISTAR Adapter' requires a connection to a BRAUMAT PCU server and an SQL proxy service. The PCU server must already be running before the 'SISTAR Adapter' starts. The 'SISTAR Adapter' communicates with the Proxy via TCP-IP Sockets. Domain limits and Firewalls pose no problem here.

In the event of a network fault or if a database host PC is restarted, no data is lost. The spooler between the PCU-Server and the SISTAR-Adapter buffers all telegram events. In the event of

an IOS failure, the SSTAR-Adapter is immediately activated on a different node. To this end, the SSTAR-Adapter must also run in Sleep mode on a 'Standby' IOS.

Note

Documentation to the Database Host

There is a separate manual for the Database Host page which describes the installation and configuration of the SQL proxy service and SQL archiver service services as well as the table structures. This manual can be found on the BRAUMAT CD in the directory:

- _manual\Pdf_000\SQL_DBHosta.pdf (language DE)
 - _manual\Pdf_001\SQL_DBHostb.pdf (language EN)
-

13.2 Installation and configuration

Installation and configuration

The installation of the SSTAR adapter IOS component is included in the basic installation (see chapter Setup (Page 13)).

Configuration is only possible with appropriate licensing ('Prod32.dll' with 'SQL Adapter IOS' option selected) and is performed with the 'SiteCfg' system configuration tool via the following steps:

- Activation of the automatic startup when the system is started (see chapter Modifying IOS settings (Page 69))
- Configuration of the archive data to be transferred (see chapter Configuring the SQL adapter (Page 75))

Windows Firewall setting

A Firewall is activated when the Windows operating system is installed. In the default state, this blocks the BRAUMAT PCU server on startup and therefore also blocks the entire process connection. To remove the block, the dialog "Windows security warning" must be confirmed with the "No longer block" button when BRAUMAT is started for the first time; this applies to the "BRAUMAT MES Adapter" application. This application will then be entered onto the Firewall's so-called list of exceptions and will no longer be blocked in future.

13.3 Transferring the engineering data

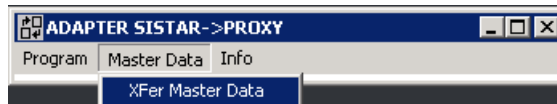
Transferring the engineering data

The engineering data must be transferred to the SQL proxy service every time a change is made to the engineering. Changes to the engineering include:

- Changes to recipe categories
- Changes to master recipes
- Changes to master recipe parameters
- Changes to units
- Changes to BOPs
- Changes to DFMs

To transfer the engineering data, follow these steps:

- Activate the SISTRAR adapter window view by clicking on the symbol in the task bar
- Select the 'Master Data → XFer Master Data' command in the menu bar



Note:

It may take up to 5 seconds for the dialog box to respond. This is normal, since the SISTRAR-Adapter communicates constantly with the SQL proxy service (waiting for commands).

