SIEMENS

SIMATIC

BRAUMAT/SISTAR Readme V7.5 (Online)

Readme

Version: 2018-05-30 (Online)

05/2018
A5E44319741-AA

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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A5E44319741-AA
℗ 05/2018 Subject to change

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Security information

1

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:

http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

http://www.siemens.com/industrialsecurity.

Overview

2

You have obtained the BRAUMAT/SISTAR software with the version V7.5 .

This system offers you appropriate solutions for automation of discontinuous batch processes in the food and beverage industry.

BRAUMAT/SISTAR is the proven process control system for F&B production plants with the Siemens "Totally Integrated Automation" concept.

- Based on robust SIMATIC S7 and IPC hardware and software components complying with industry standards
- Flexible and simple integration of field devices and drives on the basis of PROFIBUS and PROFINET
- Modular structured and scalable process control system
- Openness at all levels
- Modern, distributed client-server architecture
- Greater availability due to server redundancy
- Scalable from a small laboratory system to networks of plants
- Efficient, plant-wide engineering
- Simple and quick system expansion and optimization in runtime

We wish you every success and hope you enjoy working with BRAUMAT/SISTAR.

Your BRAUMAT/SISTAR team

Note

Read these notes carefully; they contain important information and additional details about BRAUMAT/SISTAR.

The information provided in this readme file takes precedence over all manuals of the system documentation.

Note

Complementary to the BRAUMAT control system for control and monitoring of brewing processes, the scope of delivery starting from Version V7.5 additionally contains an industry-neutral variant of the control system named SISTAR. By running the corresponding setup program from the data storage medium, SISTAR can be installed alternatively to BRAUMAT.

This system documentation is generally valid for both systems. In light of this, the product will be referred to generally as „BRAUMAT/SISTAR“. Isolated uses of the individual terms BRAUMAT or SISTAR also describe both systems.

Installation instructions 3

3.1 Delivery format

3.1.1 Delivery package

When you order one of the products listed in the following section, you will also receive one of the following individual components:

- Certificate of License CoL
- BRAUMAT/SISTAR V7.5 DVD - depending on order number
- BRAUMAT/SISTAR V7.5 License Key ALM-USB Memory Stick - depending on order number
  The license keys required to operate the software for the supplied product are located on the USB memory stick.
  To simplify your license management, you can also save the license keys for other SIMATIC products on this memory stick.

3.1.2 Licenses and configuration limits

The following table describes the available BRAUMAT/SISTAR products as well as their functional properties:

Product name	Article number	Basic license type / License type Scope of delivery	Activated function / application
BRAUMAT,SISTAR IOS Server 7.5	6DL5210-1BX57-0YA0	Single DVD, CoL, ALM stick	PCU server (server function), recipe server, trend server, order system server For redundancy this license is required on both IOS server PCs. Operation of all applications except engineering applications
BRAUMAT,SISTAR IOS Server Upgrade 7.x→7.5	6DL5210-1BX57-0YE0		
BRAUMAT,SISTAR Client 7.5	6DL5210-1CX57-0YB5	Floating DVD, CoL, ALM stick	PCU server (client function) Operation of all applications except engineering applications
BRAUMAT,SISTAR Client Upgrade 7.x→7.5	6DL5210-1CX57-0YE5		

Product name	**Article number**	**Basic license type / License type** **Scope of delivery**	**Activated function / application**
BRAUMAT,SISTAR Engineering 7.5	6DL5210-0AX57-0YA5	Floating DVD, CoL, ALM stick	Parameter assignment/text parameter assignment, image design, measured value editor, curve entry, ZL synchronization, Excel import/export
BRAUMAT,SISTAR Engineering Upgrade 7.x→7.5	6DL5210-0AX57-0YE5		
BRAUMAT,SISTAR RCS Server 7.5	6DL5210-1DX57-2YB0	Single CoL, ALM stick	RCS server For redundancy this license is required on both IOS server PCs.
BRAUMAT/SISTAR RCS Server Upgrade 7.x→7.5	6DL5210-1DX57-2YE0		
BRAUMAT,SISTAR PCU 7.5	6DL5210-1EX57-0YB0	Single / Count relevant CoL, ALM stick	S7 coupling for 1 PCU (S7-400 or S7-1500) Note: • For the number <n> PCUs, **<n> licenses are required per IOS server, which means 2 x <n> licenses for a redundant server pair**. • If more PCUs are configured in the plant configuration, the attempt to establish a connection is rejected.
BRAUMAT,SISTAR PCU Upgrade 7.x→7.5	6DL5210-1EX57-0YE0		
BRAUMAT,SISTAR SQL Adapter IOS 7.5	6DL5210-1FX57-2YB0	Single CoL, ALM stick	SQL Adapter application IOS server function This license is required on **each IOS server** in case of a redundant server pair.
BRAUMAT,SISTAR SQL Adapter IOS 7.x→7.5	6DL5210-1FX57-2YE0		
BRAUMAT,SISTAR SQL Adapter Server 7.5	6DL5210-1GX57-2YB0	Single CoL	SQL Adapter application SQL DB Host function
BRAUMAT,SISTAR SQL Adapter Server Upgrade 7.x→7.5	6DL5210-1GX57-2YE0		
BRAUMAT,SISTAR MES API IOS 7.5	6DL5210-1JX57-2YB0	Single CoL, ALM stick	MES-API (Application Programming Interface for MES applications) IOS server function This license is required on **each IOS server** in case of a redundant server pair.
BRAUMAT,SISTAR MES API IOS Upgrade 7.x→7.5	6DL5210-1JX57-2YE0		
BRAUMAT,SISTAR MES API Server 7.5	6DL5210-1KX57-2YB0	Single CoL	MES-API (Application Programming Interface for MES applications) SQL DB Host function
BRAUMAT, SISTAR MES API Server Upgrade 7.x→7.5	6DL5210-1KX57-2YE0		

Product name	Article number	Basic license type / License type Scope of delivery	Activated function / application
BRAUMAT,SISTAR Lean (4 Units) 7.5	6DL5210-1HB 57-0YA0	Single DVD, CoL, ALM stick	Includes in limited form 1x IOS server, 1x PCU and 1x Engineering. Access from IOS clients is possible. If the LEAN license is in use, the following restrictions apply: • Only one Lean license per IOS is used • Only 1 PCU coupling is established (PCU server connection setup). • Engineering is permitted on this IOS, including where no Engineering license is present • No RCS server is started (RCS port = disabled), including where there is an RCS license present • Any potential redundancy switching or server synchronization is prevented • The Lean license **cannot** be used on the same station together with other licenses (IOS Server, IOS Client, Engineering, PCU). • **Important:** The number of units is limited to **4**. In the recipe server, the configuration of the "SEQUENCE" class is checked accordingly and limited to the use of instances **1..4**. • When upgrading from V7.x to V7.5, a BRAUMAT,SISTAR Lean **(16 Units)** license is created.
BRAUMAT,SISTAR Lean Upgrade 7.x→7.5	6DL5210-1HD 57-0YE0		
BRAUMAT,SISTAR Lean PowerPack +12 Units 7.5	6DL5210-1HX 57-0YF0	Single / PowerPack CoL, ALM stick	Extends an existing Lean license by **12** UNITs. This PowerPack can be used up to 3 times. This enables the following conversions: 1. BRAUMAT,SISTAR Lean (4 Units) → Lean (16 Units) 2. BRAUMAT,SISTAR Lean (16 Units) → Lean (28 Units) 3. BRAUMAT,SISTAR Lean (28 Units) → Lean (40 Units)
BRAUMAT,SISTAR Convert Lean (4 Units) → IOS Server 7.5	6DL5210-1HB 57-0YD0	Single / PowerPack CoL, ALM stick	Converts an existing Lean (4 Units) license into an IOS Server license. ALM stick also contains 1x Engineering and 1x PCU license
BRAUMAT,SISTAR Convert Lean (16 Units) → IOS Server 7.5	6DL5210-1HD 57-0YD0	Single / PowerPack CoL, ALM stick	Converts an existing Lean (16 Units) license into an IOS Server license. ALM stick also contains 1x Engineering and 1x PCU license
BRAUMAT,SISTAR Convert Lean (28 Units) → IOS Server 7.5	6DL5210-1HF 57-0YD0	Single / PowerPack CoL, ALM stick	Converts an existing Lean (28 Units) license into an IOS Server license. ALM stick also contains 1x Engineering and 1x PCU license
BRAUMAT,SISTAR Convert Lean (40 Units) → IOS Server 7.5	6DL5210-1HH 57-0YD0	Single / PowerPack CoL, ALM stick	Converts an existing Lean (40 Units) license into an IOS Server license. ALM stick also contains 1x Engineering and 1x PCU license

3.2 Hardware requirements

3.2.1 PC hardware

3.2.1.1 Recommended PC hardware configuration

Released PC hardware for server and client

We recommend the following configuration for PC components (the higher the quality of the equipment, the better):

Parameter	IOS single station IOS server SQL DB host	IOS client
Basic PC (see catalog)	SIMATIC IPC 847C / 847D / 647C / 647D / 547D / 547E / 547G	
Processor	min. INTEL Core 2 Duo; >=2.4GHz, INTEL Core 2 Quad	
Work memory (RAM)	>= 8 GB (64-bit operating system)	>=4 GB (64-bit operating system)
Hard disk Partition size	>= 500 GB HDD / SSD ***1)** C:\ 100 GB	>= 160 GB HDD / SSD C:\ 100 GB
Network adapter/communications interfaces • For terminal bus communication • For plant bus communication	• RJ45 on-board gigabit Ethernet • CP1613 A2 / CP 1623 or BCE network card	• RJ45 on-board gigabit Ethernet
Opt. drive	DVD	

Parameter	BRAUMAT/SISTAR Lean on IPC 427D Microbox RTX
Basic PC (see catalog)	SIMATIC IPC427D with Windows Embedded Standard 7 SP1 and WinAC RTX 2010 SP2
Processor	Intel Core i7-3517UE
Clock rate	>=1.2 GHz
Work memory (RAM)	4.0 GB
Hard disk partition size	>=160 GB HDD / SSD C:\ 40GB
Network adapter/communications interfaces	• 2 x RJ45 on-board Gigabit Ethernet • On-board PROFIBUS CP 5611 / CP 5622 • On-board PROFINET CP 1616
Opt. drive	External via USB
Purpose	BRAUMAT/SISTAR Lean based on SIMATIC IPC427D is approved for AS and OS operation. **Notice: The use of the "Replay mode" feature is not recommended here.**

Note

Note the following:

- For IOS server and SQL DB host systems, only the Windows Server operating system versions (64-bit) are supported.
- ***1) A hard disk >= 1 TB is recommended when using the "Replay mode" feature.**
- For Multi-VGA configurations with extensive graphical configuration, we recommend a relatively high CPU clock frequency. Deactivation of hyper threading in the BIOS of the OS client can result in a better performance during graphical output.

Using other system hardware

Siemens AG guarantees compatibility between hardware and software for system configurations based on the hardware components specified.

The system test confirms that the system software of the BRAUMAT/SISTAR process control system can run on the SIMATIC Industrial Workstations.

Despite extensive testing, it cannot be ruled out that operation of a BRAUMAT/SISTAR system may be disrupted or impaired by additional software not explicitly approved for BRAUMAT/SISTAR.

If you use other basic hardware or additional non-system software, you do so at your own responsibility. If these hardware/software components cause compatibility problems, troubleshooting support is not free of charge.

Additional information

Internet Link Catalog ST80 (https://mall.industry.siemens.com/mall/en/us/Catalog/Products/5109999?tree=CatalogTree)

3.2.1.2 Network

Network configuration

The network for the process bus and terminal bus must be isolated via switches, routers or gateways so that no external interference can enter the network.

Recommendations for this can be found in the document:

- Process control system V7.5 function manual, section 1 "Safety Information"

See also

Security concept PCS 7 & WinCC (Basic) (http://support.automation.siemens.com/WW/view/en/60119725)

3.2.2 AS S7-400 hardware

3.2.2.1 HW versions

AS S7-400 CPU types

For the PCU (Programmable Control Unit), the CPU types of the S7-400 series (with the exception of the CPU-410) are generally permitted.

Note

Planning and selection of the CPU type

- Using PCU V7 is only recommended with CPUs as of version 05 for performance reasons.
- However, the full configuration limit in connection with the PCU V7 cannot be used with all CPU types.
- We strongly recommend careful planning of the application (new plant or upgrade) and dimensioning of the configuration limit in connection with the CPU selection.

Using the "Replay mode" feature

Due to the high communication performance requirements, using replay mode can only be recommended for CPU types in the upper performance segment and of the latest generation.

- CPU 416-3 (6ES7416-**3XS07**-0AB0) / 416-3 PN/DP (6ES7416-**3ES07**-0AB0)
- CPU 417-4 (6ES7417-**4XT07**-0AB0)

With older CPU generations (in particular before generation "05") even with lower numbers of TAGs long cycle times are reached and the expectation of extensive coverage of all process data cannot be met. Replay mode would then have to be limited to a few process diagrams.

The following restrictions apply to the PCU V7 when using CPU types 414 in general as well as CPU 416/417 < version 07:

- With CPU 414, only 2 MB RAM is available for data. However, the complete BRAUMAT/ SISTAR basic system already uses 1750 KB in the delivery project. This means that the delivery project should be reduced to the necessary range of functions prior to configuring to create sufficient space for user and control recipe DBs.
- The use of the max. 128 units and the max. 9 BLR groups can overload the 100 ms time slices TS01...TS10 in very extensive configurations and thus cause errors in the recipe execution.
  Solution:
  - Reduce number of units in the affected PCU (Parameter assignment / "Sequences" class / Global data / Set "Count" <= 64)
  - Disable BLR groups that are not used (Parameter assigment / "BLR1"..."BLR9" class / Global data / Set "DS_CountAct" = 0)
  - Disable TANK and LINE instances that are not in use

  - Limit the unit user programs, e.g. avoid comprehensive copying instructions
- SLB (seat lifting with double seat valve) and PULSE class must not be called in the 100 ms OB 35 "FB 1224"

Any restrictions are mainly dependent on the size of the TA-/ EOP- user programs as well as the use of the BLR-groups. The configuration engineer needs to assess based on real HW whether the use of the relevant CPU type is possible for the required application and make sure that the available resources, CPU RAM and CPU performance, are adequate. The measurement of the CPU cycle times in "STEP 7" and the BRAUMAT/SISTAR time slice loads ("CyclMeas" class) under "PLCSim" leads to incorrect results.

Upgrading existing plants

When upgrading from PCU V6 to PCU V7, a dedicated assessment and evaluation of the following points is necessary:

- Upgrading with or without using new functionalities and configuration limits (now and in the future)
- Complexity of the previous configuration
- Continued use of existing CPU types

For questions regarding performance requirements and CPU selection, get in touch with your representative in Product Management (DF FA AS HMI-PRM 2) or SIMATIC Customer Support.

Table 3-1 Performance data CPU version 05:

CPU type	Work memory code / data	Max. number of DBs / FBs / FCs	CPU processing times Bit-Word-INT / REAL
CPU 414-3 PN/DP	2.0 MB / 2.0 MB	6000 / 3000 / 3000	45 ns / 135 ns
CPU 416-2	2.8 MB / 2.8 MB	10000 / 5000 / 5000	30 ns / 90 ns
CPU 416-3	5.6 MB / 5.6 MB	10000 / 5000 / 5000	30 ns / 90 ns
CPU 416-3 PN/DP	8.0 MB / 8.0 MB	10000 / 5000 / 5000	30 ns / 90 ns
CPU 417-4	15.0 MB / 15.0 MB	16000 / 8000 / 8000	18 ns / 54 ns

Table 3-2 Performance data CPU version 07:

CPU type	Work memory code / data	Max. number of DBs / FBs / FCs	CPU processing times Bit-Word-INT / REAL
CPU 414-3 PN/DP	2.0 MB / 2.0 MB	6000 / 3000 / 3000	18.75 ns / 37.5 ns
CPU 416-2	4.0 MB / 4.0 MB	10000 / 5000 / 5000	12.5 ns / 25 ns
CPU 416-3	8.0 MB / 8.0 MB	10000 / 5000 / 5000	12.5 ns / 25 ns
CPU 416-3 PN/DP	8.0 MB / 8.0 MB	10000 / 5000 / 5000	12.5 ns / 25 ns
CPU 417-4	16.0 MB / 16.0 MB	16000 / 8000 / 8000	7.5 ns / 15 ns

The following table provides a guide for the memory requirements of typical BRAUMAT/ SISTAR applications:

(Information on earlier CPU versions can be found in earlier Readme files)

Table 3-3 Requirements for CPU version 05

Memory requirement for data	**CPU 414-3 PN/DP**	**CPU 416-2**	**CPU 416-3**	**CPU 416-3 PN/DP**	**CPU 417-4**
CPU RAM data	2000 KB	2800 KB	5600 KB	8000 KB	15000 KB
Basic System PCU V7 static / without control recipe DBs	1750 KB	1750 KB	1750 KB	1750 KB	1750 KB
Option RCS	Not possible	300 KB (30 routes)	700 KB (150 routes)	700 KB (150 routes)	1200 KB (300 routes)
Reserve for user and control recipe DBs **without RCS**	**250 KB**	**1050 KB**	**3850 KB**	**6250 KB**	**13250 KB**
Reserve for user and control recipe DBs **With RCS option**	**Not possible**	**800 KB**	**3150 KB**	**5550 KB**	**12050 KB**

Table 3-4 Requirements for CPU version 07

Memory requirement for data	**CPU 414-3 PN/DP**	**CPU 416-2**	**CPU 416-3**	**CPU 416-3 PN/DP**	**CPU 417-4**
CPU RAM data	2000 KB	4000 KB	8000 KB	8000 KB	16000 KB
Basic System PCU V7 static / without control recipe DBs	1750 KB	1750 KB	1750 KB	1750 KB	1750 KB
Option RCS	Not possible	300 KB (30 routes)	700 KB (150 routes)	700 KB (150 routes)	1200 KB (300 routes)
Reserve for user and control recipe DBs **without RCS**	**250 KB**	**2250 KB**	**6250 KB**	**6250 KB**	**14250 KB**
Reserve for user and control recipe DBs **With RCS option**	**Not possible**	**1950 KB**	**5550 KB**	**5550 KB**	**13050 KB**

Additional information

PCS 7 catalog Internet link (https://www.automation.siemens.com/mcms/infocenter/content/en/Pages/order_form.aspx?HTTPS=REDIR&nodeKey=key_518272&infotype=1&linkit=null)

3.2.2.2 Settings in HW Config

Settings in HW Config/ CPU properties / memory

The CPU local data of the priority classes should be set according to the table below depending on the CPU type:

Priority class	CPU 414-x Default / recommended	CPU 416-x Delivery project	CPU 417-4 Default
Priority 1	758 / 1024	1024	1024
Priority 2	256 / 256	1024	1024
Priority 3	256 / 256	256	1024
Priority 4	256 / 256	256	1024
Priority 5	256 / 256	256	1024
Priority 6	256 / 256	256	1024
Priority 7	0 / 0	1024	1024
Priority 8	0 / 0	1024	1024
Priority 9	758 / 1024	1024	1024
Priority 10	758 / 1024	1024	1024
Priority 11	256 / 1024	1024	1024
Priority 12	758 / 1024	1024	1024
Priority 13	0 / 0	1024	1024
Priority 14	0 / 0	1024	1024
Priority 15	0 / 0	1024	1024
Priority 16	256 / 256	1024	1024
Priority 17	256 / 256	256	1024
Priority 18	256 / 256	256	1024
Priority 19	256 / 256	256	1024
Priority 20	0 / 0	256	1024
Priority 21	0 / 0	256	1024
Priority 22	0 / 0	256	1024
Priority 23	0 / 0	256	1024
Priority 24	256 / 256	1024	1024
Priority 25	256 / 256	1024	1024
Priority 26	758 / 1024	1024	1024
Priority 27	758 / 1024	1024	1024
Priority 28	256 / 1024	1024	1024
Priority 29	256 / 256	256	1024
Occupies xxx bytes	8132 / 11264	20480	29696
of max. bytes	8192 / 16384 *)	22000	32768

*) Maximum value must be adjusted prior to changing the priority classes

Settings in HW Config/ CPU properties / diagnostics / clock

- "Acknowledgment-triggered reporting of SFB 33-35" option → disable

Settings in HW Config/ CPU properties / cycle clock memory

- "OB1 Update process image cyclically" option → enable
- Scan cycle monitoring time → 6000 ms
- Size of the process image of the inputs/outputs → 512
- "Clock memory" option → enable / MB 0

3.2.3 AS S7-1500 hardware

3.2.3.1 HW versions

AS S7-1500 CPU types

The following CPU types of the S7-1500 series are approved for the PCU (Programmable Control Unit):

- CPU 1518-4 PN/DP 6ES7 518-4AP00-0AB0 (FW version as of V2.5)
- CPU 1516-3 PN/DP 6ES7 516-3AN01-0AB0 (FW version as of V2.5)

Note

Dependence of the configuration limits on the CPU type

Note the following differences:

- CPU 1518-4 PN/DP → Support of the full PCU configuration limits (identical to CPU type S7-400)
- CPU 1516-3 PN/DP → Reduced PCU configuration limits.
  The requirements for CPU performance and work memory (data) can only be met with reduced configuration limits for the "Sequences" (units) and "Tank" classes. For these reasons, the following measures are required when using this CPU type:
  - Sequences class: Restriction to instances 1 ... 32
  - Sequences class: Restriction to the user blocks BmUsrSeq001FC [FC3001] ... BmUsrSeq032FC [FC3032] in the STEP 7 TIA portal project
  - Tank class: Restriction to instances 1 ... 32
  - Class BLR: Unused BLR groups should be disabled (set parameter assignment / "BLR1"..."BLR9" class / Global data / "DS_CountAct" = 0)

Using the "Replay mode" feature with CPU 1516-3 PN/DP

Due to the high performance requirements for communication, the maximum possible number of data points (20000 RT and 20000 ENG) per PCU **cannot** be used here. For these reasons, the following measures are required when using this CPU type:

- The selection of the process diagrams for the process data logging should be defined in such a way that the following values are not exceeded: **Number of data points: Max. 3000 runtime / max. 1000 configuration**
- Settings of device configuration / CPU properties / Communication load:
  The value for **"Cycle load from communication"** should be set to **30% ... 40%**.

Conversion of the delivery project to other CPU types

- The STEP 7 delivery project for the S7-1500 contains the full configuration limits with a CPU of type CPU 1518-4 PN/DP.
- The conversion to type CPU 1516-3 PN/DP and the recommended measures for reducing the configuration limits are described in section "System installation and configuration/AS installation/Creating an S7-1500 user project".

Buffering in case of power failure

The retentive memory allocated to the complete system program of the delivery project is greater than the retentive memory volume provided by the CPU alone. To prevent data loss in the event of a power failure, use of the special **backup power supply "PS 60W 24/48/60VDC HF" is strongly recommended**. This is already taken into consideration in the device configuration of the delivery project.

3.2.3.2 HW device configuration

Settings in the CPU properties

CPU property	Setting
PROFINET interfaces [X1] ... [X3]	• The IP address and subnet mask of the process bus connection must be in accordance with the PCU settings in the IOS server configuration and must be adapted to the respective project requirements. • Time synchronization (NTP) must be disabled in the standard scenario, since it is performed by the IOS server with the corresponding configuration.
Communication load: "Cycle load from communication"	• CPU 1518-4 PN/DP → 20% (Standard) • CPU 1516-3 PN/DP → should be set to 30% ... 40%
System and clock memory	Not required by the system itself
Web server	Not required by the system and should remain disabled for security reasons
Time of day	The CPU time zone and the daylight saving time settings are set to the time zone of the location of use (in Germany: Set UTC +01:00 ... S/W difference = 60min). The same setting as in the IOS server must be made here as well
OPC UA	Not used by the system
System power supply	Since the use of the buffer power supply "PS 60W 24/48/60VDC HF" is obligatory, the "No connection to supply voltage L+" option should be activated.

3.3 Software requirements/installation

3.3.1 Software installation

3.3.1.1 Requirements

Released operating systems

The following operating systems are supported in BRAUMAT/SISTAR V7.5 :

- Windows Embedded Standard 7 SP1 (32Bit)
- Windows 7 Ultimate/Enterprise SP1 (64Bit)
- Windows 10 Enterprise 2015 LTSB (64Bit)
- Windows 10 Enterprise 2016 LTSB (64Bit)
- Windows Server 2008 R2 SP1 Standard Edition (64 Bit)
- Windows Server 2012 R2 Standard Edition (64 Bit)
- Windows Server 2016 Standard Edition (64 Bit)

Not all station types are suitable for every operating system. The following table shows the assignment of the station types to the operating systems.

BRAUMAT/SISTAR PC Station	Windows Embedded Standard 7 32bit SP1	Windows 7 Ultimate / Enterprise 64bit SP1	Windows 10 Enterprise LTSB 64bit	Windows Server Standard 64bit
IOS-Single Station		X	X	X
IOS-Lean Station AS & OS (IPC 427D / WinAC RTX 2010 SP2)	X			
IOS-Server				X
IOS-Client		X	X	X
SQL-DB Host				X

Released Simatic SW versions

Note:

The SIMATIC software mentioned here is **not** part of the product package and must be provided and installed by the customer.

BRAUMAT/SISTAR V7.5 has been tested with the following versions:

- SIMATIC STEP 7 V5.5 (as of SP4) / V5.6 (Windows 10 / Server 2012 / Server 2016)
- SIMATIC STEP 7 Professional (TIA Portal) V15
- SIMATIC NET IE-Softnet S7 as of V14 SP1
  - Required on IOS Server or IOS Lean / single station for connection of the process bus for IOS ↔ AS communication
  - When the SIMATIC STEP 7 or SIMATIC STEP 7 Professional (TIA Portal) package is installed on this IOS, SIMATIC NET IE-Softnet S7 is **not required.**

Microsoft SQL Server 2012 SP1 (64-bit) / Microsoft SQL Server 2014 (64-bit)

Note:

The Microsoft SQL Server software is **not** part of the "SQL Adapter Server" or "MES API" add-on package and must be provided and installed by the customer.

- The Microsoft SQL Server must be installed before one of these add-on packages is installed. The "Standard" and "Enterprise" editions are tested and recommended.
- The computer name must be set before SQL Server is installed.
- The computer name should not be changed afterwards.
  (if this is absolutely necessary then special knowledge of SQL is required for this)

Microsoft .NET 4.5.2

The "SQL Adapter Server" or "MES API Server" add-on package requires Microsoft ".NET 4.5.2". If necessary, this is included in the installation automatically by the Setup program.

Notes on installation of the Windows operating system

If a released Windows version is not yet installed on the PC station, reinstall the PC. This requires the operating system to be changed. The use of tools such as Windows Easy Transfer to transfer data and settings between different operating systems or to perform a direct upgrade from Windows Vista to Windows 7 has not been approved.

The following Windows features are not released for use with BRAUMAT:

- XP mode (only available with Windows 7)
- HomeGroup (only available with Windows 7 and Windows 10)
- Parental Control (only available with Windows 7 and Windows 10)
- Bit Locker
- Fast user switching
  The use of this feature can be disabled by the administrator via a group policy. Additional information on the procedure is available in the function manual section 3.1.1.6 "How to disable user switching"

Operating multiple monitors

Very long process diagram changing time were observed for some PC stations with multiple monitors when more than three process diagrams with numerous graphic objects were opened at the same time.

The cause is related to HW acceleration of the graphics card.

Remedy:

- For Windows 7:
  Control Panel / Adaptation / Select Aero Design Windows 7 and assign the Braumat background picture once again.
- For Windows Server 2008 R2:
  Control Panel / Administrative Tools / Services / Start "Designs" or "Themes" service and set Startup type to "Automatic".
  Control Panel / Adaptation / Select Aero Design Windows 7 and assign the Braumat background picture once again.
- For Multi-VGA configurations with extensive graphical configuration, we recommend a relatively high CPU clock frequency. Deactivation of hyper threading in the BIOS of the OS client can result in a better performance during graphical output.

Windows Software Update Service (WSUS)

The WSUS cannot install software versions that are not described in this document as a minimum system requirements. This includes service packs for Microsoft operating systems, SQL Server, Office or new versions of Internet Explorer.

For patch management of plant computers running Windows 10, Windows Server 2012 R2 and Windows Server 2016 operating systems, the WSUS server must run on at least Windows Server 2012 R2.

Operating system languages

We recommend the following Windows MUI operating systems (Multilingual User Interface) with the following languages and corresponding regional settings:

- German
- English
- Spanish
- Chinese (PRC)

To use it, you need to set the desired target language and region consistently at all points in the Windows language settings. This affects all the settings available under "Regional and Language Options".

If you are using BRAUMAT/SISTAR in Chinese, make the following settings in the Windows region and language options:

- For the "Language version of the non-Unicode programs" select "Chinese (PRC)"
- For the "Language used in menus and dialog", select "English" if you have set the BRAUMAT/SISTAR language to English.

- For the "Language used in menus and dialog", select "English" or "Chinese (simplified, PRC)" if you have set the BRAUMAT/SISTAR language to Chinese.
- For the "Standards and formats", select "Chinese (PRC)".

You must make these settings before installing the BRAUMAT/SISTAR software.

Rules for computer names

The selection of the computer name is critical for the entire project configuration:

- Invalid characters: . , ; : ! ? " ' ^ ´ ` ~ - + = / \ ¦ @ * # $ % & § ° ( ) [ ] { } < > space character, underscore ("_")
- Max. 15 characters
- The first character must be a letter.

It is always advisable that only alphanumeric characters are used for the computer name. You should choose a name consisting of uppercase Latin letters (A-Z) and digits (0-9) only, starting with a letter and containing a maximum of 15 characters.

Security settings

You can find information on the security settings in the function manual section 3.1.1.4 "Security settings for the PC configuration".

Settings need to be made in the registry and the exception list of the Windows firewall for the BRAUMAT/SISTAR software to operate correctly.

Before the installation begins, the "Setup - System Settings" dialog appears. There, the system settings to be changed are listed. To continue the setup, you need to agree to the change to these system settings.

Note

Please note the following:

- The settings in the exception list of the Windows firewall are applied to the area of the local network (subnet). If your PC stations are located in different networks (subnets), you need to change this area.
- If you need to make individual changes to any of the firewall settings, they should be adapted afterwards.
- The settings in the exception list of the Windows firewall are made when the Windows firewall is disabled.

See also

Download Link Manual (http://support.automation.siemens.com/WW/view/en/60119725)

KB3156387 (https://support.microsoft.com/en-US/kb/3156387)

3.3.1.2 Notes on installing the software

Requirements

Note the following before installing:

- If BRAUMAT/SISTAR software from a previous version prior to V7.0 has already been installed, the following components must be uninstalled via the Windows Control Panel "Programs and Features":
  - BRAUMAT/SISTAR Classic V6.0 SP... Upd ...
  - BRAUMAT/SISTAR Classic SQL V6.0 + SP2
  - ILS RCS OFFLINE SERVER V6.0.
    The dialog box "Remove shared file?" appears during the uninstall process - confirm this with "Yes to All" / confirm check query again
- If BRAUMAT/SISTAR software V7.0 or higher is already installed, the new version V7.5 can be installed over it.
- The Windows Firewall must be active = Windows standard setting
- The Windows UAC ("User Account Control") must be active = Windows standard setting, third stage
- Important: Both the setup as well as subsequent operation should be executed in all cases as a Windows standard user and not as administrator. A user of this type must be created if not already present.
- The Admin User prompt is displayed automatically for all installation/configuration actions that require Admin rights.
- Make sure that no updates are being performed for antivirus software or the Windows Software Update Services (WSUS) during the installation. You can ensure this by temporarily disabling the corresponding options in each program.
- A Windows UAC query should appear shortly after executing "Setup.exe".
  If it does not appear then there is something wrong with the call environment and the setup may not be able to execute all system registrations.
- The setup installs the required sub-components (Microsoft VC/.NET Runtime Libraries as well as Siemens Automation License Manager ALM).
- However, the process bus connection (via STEP 7 or SIMATIC NET Softnet IE) must be installed separately.
- Earlier BRAUMAT/SISTAR SoftCP drivers are no longer supported and should be uninstalled in the Windows LAN Connections / Properties.
- Documentation
  - The current manual is located on the installation media in the folder "<lw>:...._Manuals \English\BraumatSistar_Manual_b.pdf" (for viewing prior to installation).
  - For further information on the Windows installation see manual section 3.1.1.
  - For additional information on the BRAUMAT/SISTAR installation, see manual section 3.1.2.
  - For information on starting the system and the active project, see manual section 3.1.3.

Installation via network

When performing a network installation on computers with an operating system based on Windows 7 and Windows Server 2008, ensure that access to the setup is guaranteed, even if the computer reboots during the setup. There the computer is not in a domain, you must enter the sign-in information of the user in order to access the network share for the server in the Windows Credential Manager.

After the installation

Note

Before starting the system, note the following:

- Information on separating the system from the project and on taking over projects from previous versions with the **"Management / System settings"** tool can be found in section 3.1.3 of the manual.
  → Failure to observe this information may cause System components of the earlier system version on the PC. These can interfere with the operation of the new version.
- The following entries are available in the Start menu following the installation:
  - Start→Siemens Automation→BRAUMAT/SISTAR→Application Center (=previously "NewMenu.exe")
  - Start→Siemens Automation→BRAUMAT/SISTAR SQL Adapter→ Service Tool (with corresponding selection in Setup)
- The desktop icon is named "Application Center". Icons from previous installations should be deleted.
- In principle, licensing is performed via ALM licenses (see section 3.1.4.).
- If there are no ALM licenses available then DEMO mode is activated (with an indication). This is limited to 4 hours.
- The system is located in the Windows programs folder (by default 'c:\Program Files (x86)\Siemens\Braumat' or 'c:\Program Files (x86)\Siemens\Sistar').

3.3.2 Shutting down Windows, standby mode / hibernation

If you shut down Windows, use the "Shutdown" or "Restart" modes on your PC stations in the "Start > Power" menu bar.
Do not use "standby mode" and "idle state".

3.3.3 Use of virus scanners

Approved virus scanners

The following virus scanners have been tested for compatibility with BRAUMAT/SISTAR V7.5 and can be installed subsequently even with an existing installation:

- Trend Micro OfficeScan V11.0 **SP1** (Windows 10 clients are only supported as of this service pack)

You can find more detailed information on the administration of virus scanners in the "Industry Online Support" under the following entry:

- Internet link (https://support.industry.siemens.com/cs/ww/en/view/38625951)

Statements regarding "PCS 7 and WinCC" also apply to BRAUMAT/SISTAR.

Here you need to pay special attention to the section "Configuration of virus scanners".

3.3.4 Using Microsoft Office

The following Microsoft Office versions have been tested for compatibility with BRAUMAT/ SISTAR V7.5.

- Microsoft Office Professional 2010 32-bit SP2 (Excel)
- Microsoft Office Professional 2016 32-bit (Excel)

Note:

Note

Using MS Excel

- For the "Excel import/export for external configuration" function, only the 32-bit version of Microsoft Office is supported. This can also be executed on 64-bit operating systems.
- Access to project archive files in dBase format (*.dbf) with MS Excel should always be avoided.
  Reason:
  dBase files opened with MS Excel cannot be simultaneously used by IOS server processes (protocol handlers) and there is a risk of data loss.
- MS Office should not be used on IOS servers (recipe and RCS servers) since it will significantly lower the performance.
- The operation of MS Office applications can also cause significantly lower performance on IOS client systems.

Notes on Use

4

4.1 What's new as of V7.5 ?

4.1.1 PCU type S7-1500

Core statement

In addition to the previously supported S7-400 PCU type, the new CPU generation, S7-1500, is supported from product version V7.5.

- In addition to new and extended functions, the S7-1500 CPU also offers configuration with the new STEP 7 software for TIA Portal.
- Thanks to new editors and central data storage, this enables more efficient and simpler engineering.
- The current S7-1500 system delivery project is configured for the STEP 7 version for TIA Portal V15.

Functional restrictions in the first release stage with S7-1500

"Route Control System" option is not available for the S7-1500 PCU type

- The configuration does not contain any RCS objects
- In RCS engineering, the use of the AS-1500 PCU type is excluded

Cross-coupling not available for the S7-1500 PCU type

- The configuration does not contain any objects XC_ASTA_RCV, XC_JOB_32, XC_PCU_32
- Note: However, a cross-coupling S7-400 <-> S7-1500 can be configured in the application.

Status S7 for the S7-1500 PCU type not available

- The disassembly procedure of the MC7 machine code used with S7-400 is not available for the S7-1500
- Online status display (without BLR logic) can only take place in the TIA Portal via monitoring and force tables.
- The application itself and all calls of Status S7 (SeqCtrl, Unit-Ctrl, ICM-OCX, ESG variable) therefore exclude the S7-1500 PCU type.

"Weighing and scales" function not available for the S7-1500 PCU type

- The GF weigher blocks and parameter assignment (= basic weigher function) are missing in the delivery project
- The TF weigher blocks (= technological function) are missing in the delivery project
- The recipe editor and batch management do not support the process input list and component weighing for this PCU type.

Limited availability of synchronization symbol table for the S7-1500 PCU type

The SEQ/EOP names are completely missing from the TIA Portal symbol table. As a result, the FB/FC names are also not available in the "ZL Synchronizer" application.

Limited availability of "Simulation" coupling type for the S7-1500 PCU type

- The "Simulation" coupling type can be enabled in the PCU server for PCUs of the S7-1500 type, but a simulation similar to the S7-400 is not currently supported.
- For example, it is not possible to release the units or start batch processes.

4.1.2 Other new features

Core statement

Here you will find a short description of the other product innovations in the current version, V7.5.

Division into product versions BRAUMAT and SISTAR

In addition to the BRAUMAT control system for control and monitoring of brewing processes, the scope of delivery additionally contains an industry-neutral variant of the control system named SISTAR.

The two product versions differ in the following ways:

- By running the corresponding setup program from the data storage medium, SISTAR can be installed alternatively to BRAUMAT.
- The setup checks whether the selected product variant is suitable for pre-installation (if available). If this is not the case, a message about uninstallation is displayed and the setup is terminated.
  For more information, refer to the respective installation descriptions in the manual.
- Installation directories:
  - "...Program Files (x86)\SIEMENS\Braumat\..."
  - "...Program Files (x86)\SIEMENS\Sistar\..."
  - "...Program Files (x86)\SIEMENS\Sistar_SQL\..." ← applies to BRAUMAT and SISTAR
  - "...ProgramData\SIEMENS\Sistar_SQL\..." ← applies to BRAUMAT and SISTAR

- Windows Start menu commands:
  - ... Siemens Automation / BRAUMAT / Application Center
  - ... Siemens Automation / SISTAR / Application Center
- Application Center icon (desktop, Start menu, etc.): Individual BRAUMAT and SISTAR icon
- Application Center plant logo: Individual BRAUMAT and SISTAR default logo
- Windows user group (created by Setup)
  - "BRAUMAT Group" for BRAUMAT installation
  - "SISTAR Group" for SISTAR installation
- S7-400 delivery project:
  - No difference in block name/icons, block title, block family
- S7-1500: Delivery project
  - Block name "Bm....." → independent of product version
  - Block family: "BRAUMAT/SISTAR"
  - Folder structures in the TIA Portal: "...\Braumat/Sistar\..."
- OS SW resource properties:
  File description, Product name → "BRAUMAT/SISTAR"

BRAUMAT/SISTAR Lean - new license model

For the entry-level product, the number of supported units has been changed as follows:

- BRAUMAT/SISTAR Lean (4 Units) → basic package, supports up to 4 units
- BRAUMAT/SISTAR Lean PowerPack +12 Units → increases the number of units by 12. The PowerPack can be used up to 3 times (max. 16, 28, 40 units).

For more information, see section Licenses and configuration limits (Page 9).

Process diagrams: Diagram switching times and number of objects per diagram have been optimized

Several measures in resource management for the "Controls" diagram objects have resulted in a faster diagram switching compared to the previous version. This is particularly effective when changing diagrams in complex process diagrams with many diagram objects and when several process diagram instances are opened simultaneously (multi-monitor operation).

The number of objects per diagram (controls and static variables) has been increased from 512 → 1024.

Excel template for external configuration

The logic configuration of all BLR instances is stored as a hexadecimal string for each instance in the Excel sheet and can be saved together with the other configuration data for each PCU.

The INKU class has been retrofitted.

Process data logging/replay mode

The process data logging for line recipes has been extended. DFMs and BLRs for parallel lines are now logged.

Batch management

When creating a new batch for an order category for which the manual specification of the batch year is blocked, the batch year is now automatically set to the current year.

New DFM type: Function 12: "Bit mask setpoint/actual"

Function 12 has been added to DFM groups DFM1 - DFM4 - Times, Limits, Decoders (DINT):

- When the EOP starts, the setpoint is loaded into the setpoint cell.
- The source of the actual value is set in the `ActualValueRef` parameter.
- Difference to mode 6 "Bit mask": The result of the comparison is displayed via the Result parameter (= DFM flag bit):
  - Result - TRUE: Actual value = Setpoint
  - Result - FALSE: Actual value ≠ Setpoint

Sequencer interface: Material compatibility check even when the sequence is not running

A material check can now be processed via the sequencer data record interface even if the sequence is not in the "Running" state.

4.1.3 Obsolete functions

Discontinued functions

The following functions and contents of the previous versions are no longer supported on newly installed IOS stations as of BRAUMAT/SISTAR V7.5:

Example application "Free protocols for display and evaluation"

- The template directory "<sys-path>\!BM_Proj\Access32\..." with the MS Access example "Pi_cha32.mdb" is no longer included.
- Microsoft MS Access Runtime 2003 is no longer included in the product package.

4.1.4 S7 AS blocks

Core statement

All changes made to blocks of the S7-400 AS since the last product version BRAUMAT V7.1.1 are listed below.

Update information V7.5

Block folder BM_USR

PCU V7 user FCs / DBs, which may already contain user configurations. Please apply any user configurations:

- DB689 "BmCurveGroupData"
  new "`byBatchYear`" attribute in UDT502
  No transfer to the project required, since there are no interface changes
- DB725 "SEQ"
  new "`SEQ".u.CTRL.xMatCheckReset`" attribute in UDT725
  Transfer to project only when using the new function "Reset material check"
  Notice: Update in the project is required → see text section below
- DB727 "AIN"
  new "`bDecimalPoints`" attribute in UDT727
  No transfer to the project required, since there are no interface changes

Block folder BM_SYS

PCU V7 FBs, FCs, UDTs, which have been adapted or newly added:

Number	Name	Last modified	AS stop
FB714	BmSeqRunEopFB	2017-11-21	No
FB725	BmSeqFB	2017-11-21	No
FB727	BmMessFB	2018-02-21	No
FB730	BmPidFB	2018-04-16	No
FB737	BmDfm1FB	2017-11-17	No
FB747	BmCurveSetpointsFB	2018-02-05	No
FB750	BmVmonFB	2018-03-09	No
FC505	BmCallMain	2018-03-12	No
FC689	BmTriggerCurveGroupFC	2018-03-12	No
FC695	BmTriggerCurveGroupUsrFC	2018-03-12	No
FC716	BmMsgToFifoFC	2018-01-08	No
FC717	BmSeqXChangeMsgDataFC	2017-11-20	No
UDT502	BmCurveGroupDataUDT	2018-03-12	No
UDT714	BmSeqStatusUDT	2018-11-21	No
UDT715	BmSeqInternUDT	2018-11-21	No
UDT716	BmSeqCtrlUDT	2018-11-21	No
UDT725	SEQ_UDT	2018-11-21	No
UDT727	AIN_UDT	2018-02-21	No

Update of DB725 ("SEQ") in the project

If the DB725 is already configured, the following update procedure is recommended:

Notice: No unit may be running in the PCU involved for the following steps

- Make sure that DB 725 is up-to-date on the IOS (offline DBs); if necessary, save it with block transfer PCU→IOS
- The existing configuration of DB 725 must be imported in the MS Excel configuration / "Sequences" sheet
- Copy DB 725 from the V7 AS delivery project into the STEP 7 project/into the block folder and load it into the AS
- Backup the new DB 725 with block transfer from PCU→IOS
- Export to Excel configuration / "Sequences" sheet, i.e. transfer configuration to the new offline DB 725
- Download new offline DB 725 including the configuration with block transfer from IOS→PCU

4.2 SQL adapter option

4.2.1 Notes on Use

SQL adapter on the IOS server

- After installation/update of the IOS server, a new "Configuration" application with SQL adapter settings and the IOS component "SQL adapter" itself is available.
- The IOS component is not launched until the system has been configured and restarted.
- The SQL adapter reads data from dBase files in the project directory. Be sure to avoid opening these files during operation with independent programs such as Microsoft Excel, since such programs lock the files against write access by the IOS server processes, which can lead to data loss.

SQL adapter on the database server

The following configuration tools are available in the Start menu following installation on the DB host:

- Start→Siemens Automation→SISTAR Proxy Manager
- Start→Siemens Automation→SISTAR Service Configuration

Using the SQL database

- The structure of the SQL database (tables, columns, data types, etc.) is created by the system services and may not be modified by the user; otherwise, there is a risk of data loss, inconsistencies, and failed data transfer using the SQL adapter.
- User applications may only have read access to the system SQL database; otherwise, there is a risk of data loss, inconsistencies and failed data transfer.
- Since the system SQL tables may change as a result of product enhancements, user applications and reports should not access these tables directly. Defining views is recommended instead for example, so that only these views need to be amended in the event of any changes.

IT security

→ Notes on Windows system and user accounts as well as SQL server settings are available in the "SQL DB Host" manual, chapter "Installation and configuration / Setup program".

Configuration changes

Note

Changing instance names and identifiers in the configuration

- In BRAUMAT/SISTAR, names are never used as unique identifiers for recipes, units, etc. They can be changed at random and at any time because identification always takes place by means of unique instance IDs.
- We generally recommend that you only use these instance IDs as identifiers in higher-level systems (MIS/MES/ERP).
- We also recommend that you do not change the instance names after commissioning because the non-unique and non-constant names may be used for reporting.

Renaming of BRAUMAT_SQL → SISTAR_SQL

With the current system version, the installation directory of the "BRAUMAT, SISTAR SQL Adapter Server" add-on package has been changed as follows:

- The add-on package is installed in "...Program Files (x86)\SIEMENS\Sistar_SQL\...", regardless of the product version, BRAUMAT or SISTAR.
- If you have pre-installed BRAUMAT_SQL, you will be prompted during setup to uninstall it, since previously only "BRAUMAT_SQL" was used and in future only "SISTAR_SQL" will be used.
- The configuration settings of the "Sistar Services" and the "Proxy Manager" can be carried over from the previous installation.
  For this, copy the "…ProgramData\Siemens\Braumat_SQL\Sys*.config" files to "… ProgramData\Siemens\Sistar_SQL\Sys*.config". after the installation

4.2.2 Upgrading earlier project solutions

Compatibility, upgrading earlier project solutions

Before the version BRAUMAT/SISTAR V6.0 SP2, certain systems/customers used the following database connections that were **not released as products:**

1. the so-called CIS interface
2. BRAUMAT MIS interface (SISTAR SQL connection) - a project-specific predecessor variant of the "BRAUMAT/SISTAR SQL Adapter" product option presented here.
3. BRAUMAT MES Interface (SISTAR API) - transfer of data from an MES system to BRAUMAT/SISTAR.

These application solutions used before BRAUMAT/SISTAR V6.0 SP2 are explicitly incompatible with the product option released here due to changes to the interface and database.

For 1 and 2:

- When upgrading such a system to the current system version, an existing database connection must be migrated to the current "SQL Adapter" product option. Any customer-specific database application must be adapted accordingly.
- No automatic migration of the database application or of the database itself can be offered for upgrades.

For 3:

- The previous MES interface has not been adapted or tested for the current system version.
- For the time being, upgrading a system to the current system version is only possible without use of the earlier MES interface.

General:

Upgrades for plants with the listed MIS/MES connections (**prior to V6.0 SP2**) require customer-specific implementation and must be supported by the Support Center for Breweries where necessary.

For questions about upgrading database connections before BRAUMAT/SISTAR V6.0 SP2, contact SIMATIC Customer Support.

Internet link to support pages (https://support.automation.siemens.com)

4.3 BRAUMAT/SISTAR on IPC427D Microbox RTX

4.3.1 Basics

What is BRAUMAT/SISTAR Lean on IPC 427D Microbox RTX ?

BRAUMAT/SISTAR Lean on IPC427D Microbox RTX is a complete process control system consisting of the following components:

- Hardware: SIMATIC IPC427D Microbox PC with pre-installed software bundle:
  Windows Embedded Standard 7, 32-bit operating system
  WinAC RTX 2010 SP2 automation system (internal AS)
  SIMATIC NET V12 SP2
- Software: BRAUMAT/SISTAR Lean (IOS, PCU, ES) - contains 1x IOS, 1x PCU and 1x Engineering in a limited form.
- Optional: Distributed I/O

This configuration lets you implement a complete process control system with all necessary components and the standard software at a reasonable price.

Areas of application

This product variant is suitable for the following areas of application:

- Autonomous small plants in which multiple AREAs and server redundancy are not required
- Package units with integrated operator control and monitoring unit
- Testing and training plants
- Technical center

Due to the full integration of all standard features, you can take advantage of all the benefits offered by BRAUMAT/SISTAR . This mainly applies to the following applications:

- Construction of a complete "all-in-one" solution consisting of an IOS single station and a PCU V7
- Connection of an external SIMATIC STEP 7 engineering station
- Structure of AS-AS cross-coupling via process bus

Connection to the process bus

With the "all-in-one" solution described here, GB ports available as standard (RJ45) of the IPC427D Microbox PC are required for the connection between the IOS and PCU. These must be connected either over a switch (when connecting additional process bus stations) or by means of a crossover patch cable.

A process bus connection as "double bus" is not possible with this solution.

Connection to a separate terminal bus

If a separate terminal bus is to be used to connect additional IOS clients to a BRAUMAT/ SISTAR Lean Microbox RTX, the Microbox PC must be equipped with an additional PCIe interface with an Ethernet LAN adapter. Two additional PCIe interfaces with so-called "teaming capable" Intel LAN adapters are required for a redundant terminal bus.

Note:

This must be taken into consideration when ordering the IPC427D Microbox PC because PCIe interface cards cannot be installed at a later time.

4.3.2 Installation and configuration

Installation and configuration - IPC427D Microbox PC

Usually the IPC427D Microbox PC is delivered with the pre-installed system configuration "SIMATIC Embedded Bundles RTX" ready for operation. The special features of this system configuration are described in the supplied operating manual "embedded_bundles_ipc_4x7d_operating_manual_<language>.pdf". Only the "Preconfiguration RTX" is valid for operation with BRAUMAT/SISTAR.

The necessary steps for manual installation are described in the supplied operating instructions "winac_rtx_2010_manual_<language>.pdf".

In both cases, the recommended settings for operation with BRAUMAT/SISTAR are described below:

SIMATIC NET settings:

- In the Windows Control Panel / "Set PG/PC Interface" , set the S7ONLINE access point to "TCP/IP(Auto) -> Intel(R) 82574LM Gigabit Network Connection". This is the standard connection method for automation systems based on WinAC RTX.

Settings in the station configuration editor:

- The WinLC RTX controller must be installed in slot 2. An Ethernet controller (e.g. "IF2 - Intel(R) 82574L Gigabit Network Connection for WinLC RTX") must be configured in the submodules of this controller.
- The station name must correspond to the Windows computer name of the IPC427D.
- The Windows LAN Adapter (e.g. "Intel(R) 82574LM Gigabit Network Connection") must be installed as "IE General" in slot 3.
- Any OPC server in slot 1 that may have been pre-installed can remain here, but this is not required for BRAUMAT/SISTAR.

Settings in the WinLC RTX Control Panel

The settings for operation of the soft PLC can be made in the menu CPU / Properties... The available settings or properties are also described in the operating instructions "winac_rtx_2010_manual_<language>.pdf". Only the special features for operation with BRAUMAT/SISTAR are described below:

General tab

- none

Data Storage tab

- Activate the option "Save to disk....".
  Reason: The retentive data cannot be saved to NVRAM because the BRAUMAT PCU system blocks already take up more than 128 KB. This means the retentive data can only be saved to a hard disk with BRAUMAT.
- For data security, a UPS is mandatory when saving the retentive data to the hard disk. All steps required for buffering in case of a power failure with SITOP DC UPS are described in the Simatic Online Support portal FAQ entry ID 52311477.

PLC memory tab

- none

Security tab

- none

Submodule tab

- The submodules are best configured in the station configuration editor (see above).

Installation and configuration - BRAUMAT/SISTAR

Installation takes place with the setup program and is the same as for other IOS stations.

The following components must be configured within the Administration / Configuration application:

- IOS with the settings:
  Name = Windows computer name = station name in the station configuration editor
  The TCP/IP address of the Windows network adapter (identical to KoKo IE General in slot 3) must be used.
  Route control = inactive, additional options depending on project requirements
- PCU with the settings:
  Route control = inactive
  Connection / slot = 2
  Type of connection = TCP/IP
  Use the TCP/IP address of the Ethernet controller of the WinLC RTX submodule (e.g. "IF2 - Intel(R) 82574L Gigabit Network Connection for WinLC RTX").
- Factory settings
  Notice: The "Use CRC" option should be activated in the "S7" tab.

Note

The number of active UNITs is limited under this license (see section Licenses and configuration limits (Page 9)).

To comply with this licensing condition, you need to reduce the sequences in the configuration of the PCU involved. Verification takes place during the recipe server run-up.

If the parameter assignment is incorrect, the message "License Error" appears in the "Recipe control" diagnostics window of the PCU server.

For this reason, ensure the following parameter assignment before starting:

- Parameterization application / "Sequences" class / Data source "Online (PCU)" / Global data / set "Count" attribute to the number of LEAN UNITs available in the ALM.

Configuration in the STEP 7 project

- The IPC427D Microbox PC must be inserted as "SIMATIC PC station" component into the project.
- Its station/computer name must be used as object name for the SIMATIC PC station.
- The slot and address information in HW Config must match the settings in the station configuration editor.
- A controller of the type "WinLC RTX" must be installed in slot 2 with the same submodules as in the station configuration editor (without OPC server).
- The Windows LAN adapter must be installed as CP Industrial Ethernet of the type "IE General" in slot 3.
- The TCP/IP addresses of the two LAN adapters (Windows and WinLC RTX) can be adjusted in the respective setting dialogs.

Note

Settings for the CPU properties of the "WinLC RTX" controller for operation with BRAUMAT/ SISTAR

The "Acknowledgment-triggered reporting of SFB33-35" option must not be selected.

- Open the properties dialog of WinLC RTX and select the tab [Diagnostics/Clock].
- If necessary, disable the option [Acknowledgement-triggered reporting of SFB 33-35].

Connection configuration with NetPro

You can configure the required subnets with NetPro as well as any required AS-AS cross connections for the WinLC RTX automation system in the usual way.

Setting the PG/PC interface

For the download function of STEP 7, HW Config and NetPro on the engineering PC, it is important that the target address on the IPC427D Microbox PC can also be reached.

- If S7ONLINE is set to TCP/IP, one of the two TCP/IP addresses of the Microbox PC can be selected during downloading.
- If S7ONLINE is set to ISO, only the MAC address of the Windows LAN adapter can be selected during downloading.

AS installation

Only the PCU version V7 has been tested and released for the "WinLC RTX" controller.

When assembling the AS software, proceed in the same way as described in the function manual for the SIMATIC S7-400 standard CPUs (see section "3.2 AS Installation").

Note

Components of the S7-400 delivery project not supported by the "WinLC RTX" controller

The following blocks are not supported by the soft PLC controller:

- OB 81 PS_FLT
- OB 87 COMM_FLT
- OB 101 RESTART

After copying the blocks from the source folder (e.g. Delivery project/"BM_SYS" folder) to the target folder of the "WinLC RTX" controller, these blocks should be deleted to prevent error messages during loading.

Virtualization 5

5.1 General

Fundamentals

BRAUMAT/SISTAR V7.5 is approved for use on virtual machines running VMware vSphere 6.0.

Scope of the release

Virtualization enables several independent virtual machines (VM) to be realized on a physical computer (host system), each with its own virtual hardware components. VMs behave like real computers and can run applications themselves.

The following station types are approved for virtual operation based on BRAUMAT/SISTAR V7.5:

- IOS clients
- IOS server
- IOS single stations
- SQL DB host

Important information

Problems that occur during operation on virtual machines are corrected by Siemens if they can be reproduced in the standard runtime environment (real, non-virtual operating environment) approved for BRAUMAT/SISTAR. Otherwise we have to assume that the problem was caused by the virtualization software or the hardware components. In this case, Siemens unfortunately will not be able to solve the problem. Make sure to take this aspect into consideration during plant configuration, and contract for the corresponding support services with your supplier of hardware components and virtualization software.

Also note the following aspects when using the software in virtual operating environments:

- Increased system complexity
- Additional administrative overhead
- Possibly increased security expenditures for the virtual environment (e.g. authorization concept, data security, patch management)
- Risk of a single point of failure (if there is no hardware redundancy in ESX host systems)
- Additional license costs for virtualization depending on the range of functions

Hardware and software requirements

The hardware requirements of VMware vSphere 6.0 apply to the host systems. The host system is the real hardware on which the ESXi server (hypervisor) runs for the operation of the virtual machines. This host system makes its resources available to the virtual machines.

Virtualization using "SIMATIC Virtualization as a Service (SIVaaS)"

"SIMATIC Virtualization as a Service (SIVaaS)", for example, allows you to simplify the use of BRAUMAT/SISTAR in virtual operating environments. Here you obtain an approved complete system with coordinated sub-components and a comprehensive service package, also for the components from third-party suppliers.

For sales questions, please contact your Siemens sales representative. Additional information is available at www.siemens.com/sivaas (https://www.siemens.com/sivaas).

5.2 Hardware and software requirements

Virtualization environment

The infrastructure required for the virtualization of BRAUMAT/SISTAR is based on "server-based virtualization" with the following VMware products:

- VMware ESXi V6.0 or higher with VMware vCenter Server V6.0 or higher
- VMware vSphere Client V6.0 or higher

ESX server

The ESX server provides the necessary or allocated hardware resources for operation of the virtual machines. Virtual machines can be created, cloned and configured with the "VMware vCenter Server" management tool.

The ESX server should meet the following hardware requirements:

- Sufficient main memory for the operation of all virtual machines without memory swapping.
- Sufficient hard disk space for the operation of all virtual machines.
- Sufficient number of network adapters to distribute the communication load and configure isolated pools of related virtual machines.

The ESX server should have at least two network adapters to separate the communication load on the client bus on the one hand and on the process bus on the other.

- Network adapter 1: VMware client bus and terminal bus communication
- Network adapter 2: Process bus

Joint operation on a common LAN adapter can lead to interference of the IOS client / IOS server / process bus communication and is therefore not recommended.

VMware vSphere client

The VMware vSphere client software is installed and executed on a standard Windows PC. Any machine from the inventory list of the ESX server can be switched on and operated with this application. Furthermore, the VM-specific settings can also be changed.

Thin Client

A "Thin Client" can be used as alternative to the Windows PC with VMware vSphere client software. This is a basic system with screen, keyboard and mouse that can be used to visualize and operate a specific VM. The internal configuration of the Thin Client determines which virtual machine is going to be connected.

Virtual network

A virtual network mainly consists of a pool of related VMs, a virtual switch and a real network card of the ESX server. The configuration of the ESX server determines which elements belong to the virtual network.

Virtualization with BRAUMAT/SISTAR

Basically, the software and hardware requirements of a virtualized IOS station correspond to those of a real IOS station.

In addition, the following requirements and restrictions apply to virtualized IOS stations:

Configuration of the VMs

The following table shows the minimum configuration of the VMs using the data listed in the section Recommended PC hardware configuration (Page 12).

	Hard disk vHDD	Virt. Core vCPU	vRAM [GB]	Network adapter
IOS client	C:\ 100GB D:\ 10GB	1 (2) [1]	4	1: Terminal bus
IOS server IOS single station	C:\ 100GB D:\ 50GB [3]	2 (4) [2]	8	1: Terminal bus 2: Process bus [4]
SQL DB host	C:\ 100GB D:\ 1TB [3]	4	16	1: Terminal bus

[1] A second virtual core (vCPU) is recommended for multi-monitor operation and intensive use of several process diagram instances.

[2] 4 virtual cores are recommended for simultaneous operation of OS/recipe/RCS server, process data logging and process diagrams/replay mode.

[3] The memory expansion for the data partition must be adapted to the requirements of the project. When using the "Replay mode" feature, a size >= 1 TB is recommended for the archive path.

[4] Process bus communication to the automation system is exclusively via the (virtual) standard network adapter (SoftNet-IE S7 coupling).

Host operating system

For virtualized IOS stations, the Windows versions listed in the section Requirements (Page 22) are supported as host operating systems. However, the special "Microsoft Software License Terms" regarding virtualization for the respective operating system version must be taken into account.

Installation on a VM

Basically, installation and configuration are performed on a virtual machine in the same way they are on a real computer. A requirement is that the virtual machine can be connected to a CD/DVD drive and a USB port. This connection can either be made by using USB drives on the ESX server or locally on the client device.

Technical restrictions and further Information in the context of virtualization

- Only the hardware certified in the VMware Compatibility Guide can be used for the ESXi server and its components: http://www.vmware.com/go/hcl (http://www.VMware.com/go/hcl)
- Communication modules (e.g. CP1623), multi-monitor graphics card and signal modules thus cannot be used in the host system.
- The host system must provide the virtual machines with sufficient resources even with increased resource requirements.

- Virtual IOS stations are to be treated like real IOS stations. It follows that:
  - The virtual stations must be protected as described in the "Security information" manual in the function manual.
    This means, for example, the use of network segmentation, firewalls, virus scanners and update mechanisms (patch installation via WSUS) must be integrated and configured as in real installations.
    A plant-specific security concept must be implemented.
  - Virtual stations may not be paused.
  - The use of snapshots is not permitted during system operation.
- VMware options such as vMotion and High Availability (HA) are only supported when using SIVaaS. Fault tolerance (FT) is not supported in general.
- All operating stations can be operated through exactly one open remote connection. This applies to a remote desktop connection, a RealVNC connection and a connection via a vSphere Client.
- The current Windows session of the locally logged in user must be used for a remote desktop connection.
- Audio signals cannot be transmitted via a RealVNC connection.
- No support for redundant terminal bus configurations.

5.3 Licensing

In regard to licensing, a BRAUMAT/SISTAR software installation on a virtual machine does not differ from an installation on real hardware (SIMATIC Industrial Workstation).

Therefore, each SIMATIC software installation on a virtual machine, e.g. BRAUMAT/SISTAR and other SIMATIC applications, must also be licensed.