

SIEMENS

Forword

Glossary

SIMATIC D7-SYS

Glossary

Manual

Edition 12.2004

Safety guidelines

This Manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the Manual by a warning triangle and are marked as follows according to the level of danger:



DANGER

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state.

Correct usage

Note the following:

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

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Disclaimer of liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Foreword

Purpose of this Manual

This Manual explains the principle use and functions of the STEP 7 automation software with the main focus on the appropriate technological and drive control components T400, FM 458-1 DP, SIMADYN D, SIMATIC TDC or D7-SYS.

TDC: Technology and Drives Control

Basic knowledge required

This Manual addresses programmers and commissioning engineers. General knowhow regarding automation technology is required in order to understand the contents of the Manual

Validity of the Manual

This Manual is valid for SIMATIC D7-SYS Version 6.2.

Additional support

If you have questions relating to the use of the products described in the Manual, which cannot be answered here, then please contact your local Siemens office. You can also call the Hotline:

- **Tel.:** +49 (180) 5050-222
- **Fax:** +49 (180) 5050-223
- **e-mail:** adsupport@siemens.com

Training Center

Appropriate training courses are available in order to make it easier to get to know the SIMADYN D automation system. Please contact the central Training Center in D-Erlangen (I&S IS INA TC):

- **Tel.:** +49 (9131) 7-27689, -27972
- **Fax:** +49 (9131) 7-28172
- **Internet:** www.siemens.de/sibrain
- **Intranet:** <http://info-tc.erlm.siemens.de/>

NOTE

This user part of the Manual does not include any detailed information/instructions with individual descriptions, but is only intended to provide a basic procedure. More detailed information on the dialog boxes in the software and how they are handled is provided in the appropriate online help.

Information overview

This manual is part of the overall documentation for the technological and drive control components T400, FM 458, SIMADYN D, SIMATIC TDC and SIMATIC D7-SYS:

Title	Content
System and communications configuring D7-SYS	<p>The first project in a few steps</p> <p>This Section provides an extremely simple entry into the methodology when assembling and programming the SIMATIC TDC/SIMADYN D control system. It is especially conceived for first-time users of a control system.</p> <p>System software</p> <p>This Section provides basic know-how about the structure of the operating system and an application program of a CPU. It should be used to obtain an overview of the programming methodology, and basis for configuring user programs.</p> <p>Communications configuring</p> <p>This section provides you with basic know-how about the communication possibilities and how you configure links to the communication partners.</p> <p>Changeover from STRUC V4.x to D7-SYS</p> <p>Essential features are included in this section, which have changed over STRUC V4.x with the introduction of SIMATIC D7-SYS.</p>
STEP 7 option packages for D7-SYS	<p>Basis software</p> <p>This section explains the essential use and the functions of the STEP 7 automation software. For first users, it provides an overview on configuring, programming and commissioning a station.</p> <p>When working with the basis software, you can access the online help which provides you with support when it comes to detailed questions on using the software.</p> <p>CFC</p> <p>The CFC language (Continuous Function Chart) allows you to graphically interconnect blocks.</p> <p>When working with the particular software, you can also use the online help which can answer detailed questions regarding the use of the editors/compiler.</p> <p>SFC</p> <p>Configuring sequence controls using SFC (Sequential Function Chart) of SIMATIC S7.</p> <p>In the SFC editor, you generate a sequence chart using graphic resources. The SFC elements of the chart are then positioned according to specific rules.</p>
Hardware	<p>The complete hardware spectrum is described as reference in this Manuals.</p>
Function blocks	<p>These Reference Manuals provide you with an overview of selected function blocks for the associated technological and drive control components T400, FM 458-1 DP, SIMADYN D and SIMATIC TDC.</p>

Guide

As first time user, we recommend that this Manual is used as follows:

- Please read the first section on using the software in order to get to know some of the terminology and basic procedure.
- Then use the particular sections of the Manual if you wish to carry-out certain processing steps (e.g. loading programs).

If you have already executed a small project, and have gained some experience, then you can read individual sections of the Manual in order to get up to speed about a specific subject.

A&D Technical Support

Can be accessed globally at any time of the day:



World-wide (Nürnberg) Technical Support Local time: 0:00 to 24:00 / 365 days Phone: +49 (180) 5050-222 Fax: +49 (180) 5050-223 E-Mail: adsupport@siemens.com GMT: +1:00		
Europe / Africa (Nürnberg) Authorization Local time: Mo.-Fr. 8:00 to 17:00 Phone: +49 (180) 5050-222 Fax: +49 (180) 5050-223 E-Mail: adsupport@siemens.com GMT: +1:00	United States (Johnson City) Technical Support and Authorization Local time: Mo.-Fr. 8:00 to 17:00 Phone: +1 (423) 262 2522 Fax: +1 (423) 262 2289 E-Mail: simatic.hotline@sea.siemens.com GMT: -5:00	Asia / Australia (Peking) Technical Support and Authorization Local time: Mo.-Fr. 8:00 to 17:00 Phone: +86 10 64 75 75 75 Fax: +86 10 64 74 74 74 E-Mail: adsupport.asia@siemens.com GMT: +8:00
Technical Support and Authorization speak generally German and English.		

Glossar

A

Acknowledge button	Button on the front panel of a SIMATIC TDC/SIMADYN D CPU/FM 458-1 DP which is used to acknowledge an error message displayed on the 7-segment or LED display.
Address book	The address book links display variables of the operator control and visualization systems COROS LSB as well as SIMATIC WinCC to the block I/O in the CFC charts for SIMADYN D. When compiling, the charts are generated if the "create address book" field is activated in the dialog box "Options for compilation". The "Options for compilation" dialog box is opened in the CFC by selecting the menu command Options > Settings > Compilation .
Address connection	Connection AT, AR or US at the function blocks. Address parameters are specified at the address connection.
Address parameters	Identifies the communication partner at the address connection of a send- or receive block. It consists of a channel name and depending on the coupling type, several address stages.
Address stage	Part of an address parameter (address stages 1 and 2). Address stages only have to be configured for serial couplings; an address stage does not have to be configured for parallel couplings "rack coupling", "buffer memory coupling" and "CPU-local coupling". <i>Also refer to: Channel name</i>
Autorouting	The autorouter is a program section to automatically generate connecting lines, connectors and margin entries.

B

Background processing	If there are no tasks from the user program to be processed in the SIMATIC TDC/SIMADYN D-CPU/FM 458-1 DP, then it goes into the background processing mode to execute the background task.
Background task	The background task consists of: <ul style="list-style-type: none">• the test mode of the operating system in which for example, memory test routines run• and simultaneously a local service at the CPU front panel via the diagnostics interface.
Backplane bus	SIMADYN D subracks have an L bus and if required, a C bus. They include the power supply- and data lines for the modules.
Basic sampling time, basic clock cycle	The cycle time of the CPU/FM 458-1 DP time generator is derived from the sampling times of the individual cyclic tasks.
Basic clock synchronization	The basic sampling times of several CPUs are synchronized. In this case, a CPU acts as master and sends its basic clock cycle along the backplane bus. The synchronized CPUs do not generate their basic clock cycle themselves, but take it from the backplane bus. <i>Also refer to: Interrupt synchronization</i>
BICO technique	Using BICO technique, interconnections between I/Os of blocks can be changed using Masterdrive operator control devices. This means that configured software can be modified without CFC. Interconnections on a technology CPU or SIMADYN D CPU module can be changed. <i>Also refer to: Technology connectors</i>
Block	Blocks are parts of the user program which are clearly defined as a result of their function, structure or application. The CFC operates with pre-configured block types, which are inserted in a chart. When inserting, an instance is generated from a block type. These instances and their graphic representation are blocks in the sense of the CFC. <i>Also refer to: Function block</i>
Block body	Lower part of the block, which contains the I/Os.
Block class	The function blocks which can be called-up in the CFC, are sub-divided into block classes, which include the functionality associated with the particular blocks (e.g. closed-loop control blocks).
Block header	The upper part of the block, which among other things, contains the name and the task assignment (run-time properties).
Block I/O, I/O	Block input or block output
Block input, input	Block I/O which can be connected with a block output or global operand having the same data type, or which can also be parameterized with values.
Block interface	This consists of the I/Os of a block.

Block library	<p>A block library includes a number of block types. A block library must be imported into the CFC before its function blocks can be used in the CFC.</p> <p><i>Also refer to: User library, System library, Code library</i></p>
Block output, output	<p>Block I/O which can be connected with block inputs and global operands having the same data type.</p>
Block type	<p>Block types are pre-defined program sections which can be inserted into a block library and into a CFC chart. Instances are generated. As many instances as required can be set-up from a block type. For SIMATIC TDC/SIMADYN D and FM 458-1 DP there are:</p> <ul style="list-style-type: none">• Function blocks• Block types generated from charts. <p><i>Also refer to: Block</i></p>
Boot interface	<p>The boot interface is the upper CF7 module connection, which is located to the far left in the subrack.</p> <p>Conditions for using the boot interface:</p> <ul style="list-style-type: none">– An SS4- or SS52 sub-module is inserted in the boot interface– The CPUs of the subrack are in the STOP condition after a boot error.
Buffer memory module, buffer memory	<p>Module to transfer data between several CPUs within a subrack.</p>

C

C bus	One of the two backplane buses of a SIMADYN D subrack. Not all of the subrack types have a C bus (refer to the subrack catalog in HWConfig). <i>Also refer to: L bus</i>
Central block	Function block to initialize and monitor couplings.
CFC, CFC editor	Continuous Function Chart. Configuring tool to define continuous sequences in a user-friendly fashion by graphically interconnecting complex function in the form of blocks.
CFC chart, chart	Special graphic unit, which is generated using the CFC configuring tool. A CFC chart comprises 1 to 26 chart partitions, each with 6 sheets, which may contain overflow sheets.
Change memory	The change memory is a memory area in which the configuring changes, made with the CFC in the test mode are saved. It is located in the memory module inserted in the CPU/FM 458-1 DP.
Channel	Area in a data interface, which is reserved for two or more communication partners. The area can be set-up from the sender or from the receiver. When firmware is the coupling partner, the area is always set-up from a SIMADYN D CPU (and not from the firmware). A channel always consists of a channel manager and one or two net data buffers. Configuring engineers cannot directly access these areas.
Channel administration	Part of a channel, via which two coupling partners can communicate how the net data buffers are to be interpreted. For instance, this indicates whether new net data have just been entered or were already entered, or if the last net data have already been read etc. Configuring engineers cannot directly access this area.
Channel name	Part of an address parameter. Channel names must always be specified and allow senders and receivers to find their communication partner. Thus, channel names must be uniquely assigned at each data interface. <i>Also refer to: Address stage</i>
Chart container	Refer to chart folder.
Chart folder	Container in the project structure; contains the charts of the user program of a CPU/FM 458-1 DP.
Chart interface	A CFC chart can include an interface, which allows input- and output parameters to be assigned to a chart. This means that the chart can be used just like a block or can be compiled to create a block type.
Chart nesting	A max. of 8 CFC charts can be nested. Charts generated in this fashion are called nested charts.
Chart partition	Part of the CFC chart. A CFC chart is sub-divided into a maximum of 26 chart partitions (designated: A ... Z), each with 6 sheets.
Code library	A file, which includes the executable code for all block types of a block library.

Comment	<p>Possible comments at block I/O are:</p> <ul style="list-style-type: none">• Pseudo comments• Comments text: Comment texts can be as long as required and comprise any number of characters, but they may not start with @. <p>A comment can include several pseudo comments, separated by blanks, followed by "standard" comments text, e.g. "@TP_H089 @DATX ...".</p>
Communications partner	<p>Partner, which further processes the net data. This can be a sender/receiver within SIMADYN D or also in another system/device.</p> <p><i>Also refer to: Channel, Coupling partner</i></p>
Communications protocol	<p>Defines the data transfer mechanism and telegram structure for data transfer between two communication partners.</p>
Communications-utility, utility	<p>Configurable autonomous functions with one or several access possibilities to data interfaces (e.g. message system). A communications utility consists of one or several function blocks.</p>
Compiling	<ul style="list-style-type: none">• When compiling from the charts of a chart folder, either• a runnable user program is generated, which can be downloaded into a CPU/FM 458-1 DP,• or a user library is generated, which includes block types generated from charts. <p><i>Also refer to: Consistency check, Loading</i></p>
Connector	<p>Break point in the CFC chart and connecting point to the block with reference to the I/O to be connected. Connectors are used if connecting lines cannot be drawn due to too much information on the sheet. Complex CFC structures (extending over several sheets) can be completely represented using the connectors.</p> <p><i>Also refer to: Interconnection, Block I/O</i></p>
Consistency check	<p>Checks the complete data of a chart container for errors without generating code which can be executed.</p> <p><i>Also refer to: Compilation</i></p>
Coupling	<p>Refer to coupling module</p>
Coupling module	<p>Module with memory or direct access to memory (rack coupling) on which a SIMADYN D CPU can save or retrieve net data to be transferred. Coupling modules are all coupling memories, all firmware modules (including the carrier modules) and the rack-coupling modules.</p> <p><i>Also refer to: Data interface</i></p>
Coupling partner	<p>Partner in SIMADYN D, with which data can be exchanged via a data interface, but where it cannot be processed. These can include sender, receiver or coupling modules.</p>

	<i>Also refer to: Channel, Communications partner</i>
Coupling type	Designates the coupling, e.g. SINEC H1, rack coupling, DUST 1. <i>Also refer to: Coupling module</i>
CPU	Module, on which an open-loop/closed-loop control program is executed. A SIMADYN D station can have a maximum of 8 CPUs.
CPU local coupling	A coupling whose data interface is available locally on the the SIMATIC TDC/SIMADYN D CPU/FM 458-1 DP. <i>Also refer to: Coupling module</i>
CPU number	The CPUs in a SIMADYN D station, which are consecutively numbered from left to right.
Creation mode	Operating mode of the CFC, in which blocks are inserted, deleted, renamed, parameterized or interconnected. <i>Also refer to: Test mode</i>
Cross reference	Elements in the margin of a CFC chart, which refers to a interconnection to another block on another chart sheet. <i>Also refer to: Connector</i>
Cyclic task	Task, whose processing is initiated in uniform, time intervals - its sampling time. SIMADYN D CPUs/FM 458-1 DP modules can process several cyclic tasks.

D

Daisy-chain connector	Connectors, which are used to jumper empty slots at the backplane bus of a SIMADYN D subrack, where a module is not inserted. The slots which require daisy-chain connectors can be seen in the detailed view of HWConfig.
Data block (DB)	Data blocks are interfaces in the user program and are used to address variables. Data blocks do not require any additional memory space. There are <ul style="list-style-type: none"> • instance data blocks, which are used to transfer data to WinCC, and • data blocks, which include a user data area, to realize communications with SIMATIC-OPs.
Data consistency	For interconnections and \$ signals between different cyclic tasks, D7-SYS guarantees that all of the transferred data are consistent. This means that data, transferred from a task T_i , are taken from the same computation cycle of this task. If a signal is to be transferred without deadtime, it is possible to bypass data consistency (\$ signal, "Fast" type or by interconnecting with a pseudocomment DATX). <i>Also refer to: Process image</i>
Data interface	Permanently structured memory medium (e.g. dual port RAM), which two coupling partners can access to transfer data. The structure defines how the data interface is configured (e.g. where general initialization data are deposited, the data memory size and what is still available). The data interface structure is the same for all couplings. The contents of the data interface structure are of no importance for the user, because when configuring couplings, memory areas do not have to be explicitly addressed.
Data transfer mode	Configurable data transfer mechanism for senders and receivers. Handshake, refresh, select and multiple modi can be selected. Senders and receivers must have the same configured data transmission mode; otherwise, they will not be able to synchronize with one another and exchange data. <i>Also refer to: Channel</i>
Data type	Each I/O of a block is assigned a particular data type. It defines the value range, resolution, display and interpretation of values at this input or output. "BOOL" defines, for example, a binary variable, "INT" defines a 16-bit fixed-point variable.
DATX	If a connected block input is to receive its values from a connected output, bypassing the data consistency mechanisms, then it must be marked with a pseudocomment "@DATX". <i>Also refer to: Data consistency</i>
Delay time	When synchronizing the basic clock, the delay time between the initiating process interrupt and when the cyclic tasks is started. This time can be configured.

Diagnostics buffer	The diagnostics buffer is a buffered memory area for CPU/FM 458-1 DP-modules CPU, which is structured as a ring buffer. Diagnostic events are saved in the sequence in which they occurred.
Diagnostics event	<p>A diagnostics event makes an entry into the diagnostics buffer of the CPU/FM 458-1 DP. A differentiation is made between diagnostics events as follows:</p> <ul style="list-style-type: none">• Errors while initializing ("0" or IF-LED)• Monitoring errors ("b" or MF-LED)• Communication errors ("C" or CF-LED)• Task administration errors ("E" or TF-LED)• User errors ("A" or UF-LED) (with function block USF diagnostics event defined by the user)• Operating mode transitions (e.g. from RUN to STOP)
Diagnostics interface	Serial interface at the front panel of a SIMADYN D-CPU module. This interface permits local access to this CPU with the CFC in the test mode for troubleshooting, testing and start-up.
Display device	Display devices are used in order to intervene in the process and display the current process status.
\$ signal	<p>A \$ signal is used to interconnect function blocks, which run on different CPUs within the same SIMADYN D station.</p> <p>When configuring a \$ signal, its signal name as well as type and bus assignment must be specified.</p> <p>The \$ signal type determines whether data transfer is to be consistent ("standard") or should bypass the data consistency mechanisms ("Fast").</p> <p>The bus assignment defines which of the two backplane buses are used for data transfer.</p> <p><i>Also refer to: Global operand, Virtual connection, Data consistency</i></p>
Dynamic value display, dynamic update	Displays the current values at the block I/O in the CFC in the test mode. The displayed values are continuously updated. The configuring PC must in this case access the automation unit via a communications link.

E**Enable attribute**

The enable attribute is a run-time attribute. It activates and de-activates a run-time group. While de-activated, the group is not executed, independent of all other conditions.

When you interconnect a block output, data type BOOL with the run-time group, the value of this block output then decides as to whether the group is activated or de-activated.

Equivalent sampling time

Contrary to cyclic tasks, interrupt tasks are not started at equidistant time intervals, but when a process interrupt occurs.

Certain function blocks (e.g. control blocks) are configured so that they are called-up at regular time intervals. If these are to be configured in an interrupt task, then an equivalent sampling time must be configured in HWConfig. for this interrupt task. This should correspond to the average time between two consecutive process interrupts.

If the basic clock is not generated by an internal clock generator, but from a process interrupt, or if it is synchronized to the basic clock of another CPU (basic clock synchronization), then an equivalent sampling time can be specified for the basic clock.

Also refer to: Sampling time

Error field

Errors/faults related to the hardware, operating systems and the user program are recorded in the error field of a CPU/FM 458-1 DP. In the test mode of the CFC, this error field can be read-out and analyzed for diagnostics.

Exception buffer

In the exception buffer of a CPU/FM 458-1 DP (this is not available for type T400 CPUs) when goes into the STOP condition, information is recorded, which permits the error cause to be identified. The exception buffer can be read-out and analyzed in the test mode of the CFC.

The contents of the exception buffer are retained, even if a subrack is reset, or is isolated from the power supply, under the assumption, that a battery is inserted in the subrack.

Expansion module

Peripheral module to input and/or output process signals such as analog-, digital inputs/outputs or speed sensing signals. When connected directly to a CPU board, bypassing the backplane bus they relieve the backplane bus and allow process signals to be sensed at extremely high data rates.

A maximum of two expansion modules can be inserted to the right of a planned for that module.

F

FBSLIB This is a standard-block library included in the scope of supply of the D7-SYS option package. It includes over 200 block types to realize most of the open-loop and closed-loop control tasks.

Also refer to: System library

Firmware Software which is to be configured on a coupling module, e.g. CSH11, but not using D7-SYS configuring resources. A firmware converts the net data from the data interface into a telegram corresponding to the particular communications protocol.

Flag Flags are used in D7-SYS as address information at block I/O. SIMATIC Operator Panels can access the block I/O via these flags.

Also refer to: Global operand

Function block (FB) Pre-configured block types from Siemens which are saved in a system library.

Also refer to: Block

G

Generic block

Block, where the number of inputs can be changed by appropriate parameterization.

Also refer to: Block type

Global operand

Global operands are objects which can be addressed from function blocks. For D7-SYS software, these are: \$ signals, virtual connections, hardware addresses, virtual connection information as well as name references.

Also refer to: Interconnection, OP connection

H

Hardware address Symbolic designation of one or several terminals which are functionally associated with one another on a module. The hardware address is defined in HWConfig. The terminal can be addressed in the CFC under this designation.

Also refer to: Global operand

Hardware catalog HWConfig window, from which the configurable hardware objects (subrack, modules and submodules) can be copied into a station.

Also refer to: SIMADYN D station

HWConfig Configuring tool to define the hardware configuration of the automation units in a user-friendly fashion; for example,. SIMATIC TDC/SIMADYN D stations.

I

Initialization value	<p>An initialization value can be specified at block outputs. This value is at the output, if the block is calculated for the first time in the INIT operating status.</p> <p>It may be necessary and practical to specify an initialization value, if:</p> <ul style="list-style-type: none">– an output is connected to the input of a block, which is executed first, or– the status of the block output defines the internal status of the block (e.g. the Q output of a flipflop block). <p><i>Also refer to: Run-time properties, Parameters (1)</i></p>
Input/output module, I/O module	<p>Peripheral module to input and/or output process signals.</p>
Instance	<p>When a block is instanced, this ensures that the instance of the block type (block) can run in its configured environment.</p>
Instance data block	<p>Using an instance data block, display devices can access block I/O. An instance data block is automatically generated in the CFC and is permanently assigned to a block.</p>
Interconnection	<p>Connecting a block output or block input with another element:</p> <ul style="list-style-type: none">• Block output - block input• Block output - global operand• Block output - run-time group• Global operand - block input <p>The value of the connected input is retrieved from the other end of the connection during the run-time.</p>
Interface	<p>The interface comprises interconnectable and parameterizable I/O of a block (block interface) or a chart (chart interface).</p>
Interface module	<p>Communications submodule, on which one or several communication protocols are implemented.</p> <p><i>Also refer to: Communications protocol</i></p>
Interrupt synchronization	<p>Synchronizes the interrupt tasks of several CPUs, so that a process interrupt, which is identified on a CPU, can initiate that an interrupt task is executed on several CPUs.</p> <p><i>Also refer to: Basic clock cycle synchronization</i></p>
Interrupt task	<p>An interrupt task is a task which is executed by a process interrupt.</p>

L

L bus

One of the two backplane busses of a SIMADYN D subrack.

Also refer to: C bus

Loading

General term for online load and offline load.

Load-relevant change

A change in the CFC chart is relevant as far as loading is concerned, if it results in a change in the user program on the CPU/FM 458-1 DP (e.g. modified interconnection). Changes which are not relevant for loading are, for example, block positions and comments.

M

- Maplisting** The maplisting contains additional information about a user program (the type of blocks used, reference lists of the \$ signals and the virtual connections, expected computation time of the CPU, ...). It is generating when compiling the charts of a CPU/FM 458-1 DP if the "create map listing" option switch is enabled in the dialog extras: settings > compilation.
- Margin** Margin on the lefthand and righthand side of a sheet. The margins contain, on one hand the cross-references to a connected object (block, run-time group, global operand) which is not located on the actual sheet. It also includes the number of the connector, if the autorouter cannot draw the connecting line to the margin due to an overfilled chart.
- Memory module** Check-card format memory module which is used as program memory for a SIMATIC TDC/SIMADYN D CPU or FM 458-1 DP. The operating system, user program and change memory of the CPU are saved in the memory module.
SIMADYN D memory modules conform to the PCMCIA standard, memory modules for the FM 458-1 DP are MMC cards.
Also refer to: Sub-module
- Module name** The module name at a communications module defines which coupling module is used for data transfer.

When configuring the (fixed or optional) network, all module names must be precisely 6 characters long, and the 6th character must correspond to a specific convention.
Also refer to: Global operand
- MPI address** In an MPI network each node must be assigned its own MPI address.
- Multiple insertion** For the SIMATIC S7 and SIMATIC M7 target systems, a function block can be incorporated in several tasks.
This is not possible for SIMADYN D.
Also refer to: Run-time properties
- Multi Point Interface (MPI)** The multi-point interface is the SIMATIC TDC/SIMADYN D and SIMATIC S7-400 service interface. CPU and FM 458-1 DP-Modules can be handled from a central location. Display devices can be connected to the multi-point interface. The nodes in an MPI sub-network can communicate with one another.
- Multiprocessing** By being able to multiprocess, SIMADYN D can distribute the solution to technology tasks over several user programs, and run on several CPUs.

N

Name reference	<p>Name of a message system. Central block, message entry- and message evaluation blocks of a message system are connected with one another via this name.</p> <p><i>Also refer to: Global operand</i></p>
Nested chart	<p>A CFC chart, which is inserted in another CFC chart (nested chart or top chart) just like a block. Contrary to a real block, a nested chart can be opened. Nested charts are not visible in the SIMATIC Manager.</p>
Net	<p>A net connects net nodes (stations) through a connecting cable to establish a communications network.</p>
Net data	<p>Values which are transferred from the sender to the receiver. The net data do not contain information regarding the type, sequence or contents of the quantities to be processed.</p> <p><i>Also refer to: Channel</i></p>
Net data buffer, buffer	<p>Part of a channel, in which net data is transferred. Configuring engineers do not have access to this area.</p>
Net data structure	<p>Information about the structure of the net data to be transferred. The net data structure describes the quantity and type of net data.</p> <p><i>Also refer to: Data type, Sequence number</i></p>
Network	<p>The network provides the user with transparent data transfer extending beyond subrack- and communication protocol limits. A differentiation is made between the freely selectable network and the fixed network.</p>
Network transition	<p>Transition between sub-networks of a complete network. It can involve the transition between (sub) networks with difference characteristics (e.g. transition between Profibus and Industrial Ethernet).</p>

O

- Offline** For offline, there is no data connection between the automation system and the configuring PG/PC.
- Offline loading** Loads the user program and operating system of the SIMATIC TDC/SIMADYN D CPU or FM 458-1 DP into the memory module, which is inserted for this purpose into a corresponding slot in the configuring PGs/PCs or external Prommers.
Also refer to: Online loading
- Online** For online, there is a data connection between the automation system and the configuring PG/PC.
- Online loading** Loads the user program and operating system of a SIMATIC TDC/SIMADYN D CPU or FM 458-1 DP via a data link to the corresponding station.
Also refer to: Offline loading, Memory module
- OP connection** An OP connection connects function block I/O to SIMATIC Operator Panels. A symbol name and a flag number must be specified to configure an OP connection.
Also refer to: Global Operand
- Operating mode** The SIMATIC TDC/SIMADYN D and FM 458-1 DP target systems can identify the operating modes INIT, RUN and STOP.
- Operating mode INIT** The initialization phase between powering-up and transition into the RUN operating mode.
The 7-segment display indicates '0' or the RUN-LED of the FM 458-1 DP is flashing.
It is not possible to access online in this status.
Also refer to: User program
- Operating mode RUN** The user program is processed and the process image is cyclically updated in the RUN operating mode. All of the module outputs are enabled.
The 7-segment display displays the CPU number or an error code ('C', 'E', 'b' or 'A'). The RUN-LED or the Error-LEDs CF, TF, MF and/or UF of the FM 458-1 DP are on.
It is possible to access the CPU online via the diagnostics interface of the CPU and all configured service interfaces.

Operating mode STOP The system goes into the STOP operating mode due to a fatal CPU/FM 458-1 DP error. The user program is not processed in the STOP operating mode. The modules are switched into a safe condition.

There are three sub-sets of the statuses in the STOP operating mode:

Sub-status	7-segment or LED display	Behavior
User stop	'd'/STOP-LED on	Can be accessed online via the diagnostics interface and all configured service interfaces.
Stop after initialization error	'0'/IF- and STOP-LED on	Can be accessed online via the diagnostic interface and initialization interface.
Stop after fatal system error	'H'/ INTF- and STOP-LED on	Can be accessed online via the diagnostics interface.

Operating system This is a collective term for all of the functions, which control and monitor the execution of user programs, the distribution of operating resources to the individual user programs and maintain the operating mode in conjunction with the hardware.

Operator Panel (OP) Display device to make an intervention at the machine, e.g. enter setpoints, output machine data.

Operator Station (OS) An operator station is used to make interventions in the process and to display the current process status. Generally, an operator station comprises a PC with software for operator control- and visualization functions (HMI).

Overflow sheet An overflow sheet is automatically set-up, if the number of margin entries on a sheet means that there is no more space. An overflow sheet only consists of the margins and does not contain other objects.

Overview mode View in the CFC, where all six sheets of a chart partition are displayed.
Also refer to: Sheet mode, CFC chart

P

- Parameters (1)** Constant value at a block input.
- Parameters (2), device parameters** A parameter (2)/device parameter is a freely selectable operator control or visualization quantity of a drive converter (basic drive converter parameter), a technology CPU (technology parameter) or CPU module in a SIMADYN D subrack. It is identified by its number.
Also refer to: Pseudocomments
- Parameterization** Setting parameter values.
Also refer to: Parameters (1)
- PCMCIA** Personal Computer Memory Card International Association. Memory modules in accordance with the PCMCIA standard are used in portable PCs and many industrial applications.
- Pre-assignment** Pre-assigned value for a parameter value.
Also refer to: Parameter (1)
- Process image** Instantaneous image of all interface signals to/from the process when a cyclic task is being started.
Basic concept of digital closed-loop control systems.
Also refer to: Data consistency
- Process interrupt** An asynchronous event ("interrupt"), which interrupts the processing of a cyclic task. An interrupt task is started when a process interrupt has been identified. The assignment between process interrupts and the interrupt task to be started, is realized in HWConfig.
Also refer to: Global operand
- Project** A container for all objects of an automation solution independent of the number of stations, modules and their networking.
- Protocol** List of the CFC error messages when compiling or during consistency checks.
Also refer to: Compiling
- Pseudo comment** Comments at the block I/O, which start with "@", are pseudo comments and are taken into account when compiling data for the SIMATIC TDC/SIMADYN D and FM 458-1 DP target systems. Pseudo comments influence the user program function:
- | | |
|-----------|--|
| @DATX: | Input is connected, bypassing the consistency mechanisms. |
| @TP_bnnn: | I/O is a parameter (with range ID "H", "L", "c" or "d" and a three-digit parameter number nnn, e.g. @TP_H089). |
| @TC_nnnn: | I/O is a technology connector (identified by a four-digit connector number nnnn, e.g. @TC_0034) |
- No more than one parameter and one technology connector may be configured as pseudo comment for each block I/O.
Also refer to: Parameters (2)

R

- Rack coupling** Module, which permits efficient communications to other SIMADYN D subracks.
- Receiver** Function block which can read one or several data interfaces (e.g. function block CRV).
Also refer to: Coupling, Address parameter, Coupling module, Sender
- Reference data** Reference data are data which the user additionally has for graphically representing the CFC chart in list form, e.g. list of accesses to global operands.
- Registration, registration database** Essential configuring data of STEP 7 configuring tools are stored in the registration database of Windows.
Refer to the online help for Windows when you run into problems with the registration database.
- Reorganization** Re-formatting a data interface during operation. The coupling is inhibited for a positive edge at the connection of a central block, its data interface is re-formatted and the coupling is then re-enabled.
Also refer to: Network
- Repeater** Coupling element to connect two segments of a sub-network.
- Run-time properties** The configuring engineer defines the run-time properties of a block by assigning it to a task or run-time group and defining the position within the task or run-time group.
These characteristics are decisive for the behavior of the target system regarding response times, deadtimes or the stability of time-dependent structures, e.g. control loops.
- Run-time group** Run-time groups structure and sub-divide tasks. The blocks are sequentially integrated into the run-time groups. Run-time groups can be separately activated and de-activated. If a run-time group is de-activated via a block output which is connected to it, all of the blocks, contained in the run-time group, are no longer activated.
Also refer to: Run-time properties, Interconnection

S

Sampling time	The sampling time of a cyclic task is the time interval between two task calls. The sampling times must be to the power of 2 of the basic sampling time.
SAVE area	Battery-buffered memory area of SIMATIC TDC/SIMADYN D CPU (not available for type T400 CPUs) or FM 458-1 DP, where data is kept even during a power failure, under the assumption that a battery is inserted in the subrack. Configuring data can be saved in a non-volatile fashion in the SAVE area using special function blocks.
Scaling factor	Factor, which can be configured at the block I/O data type REAL. The parameter values are therefore computed, internally normalized (per unit), but are displayed as absolute value. For drives, the scaling factor is also known as "nominal value" or "rated quantity". <i>Also refer to: Units, Parameters (1)</i>
Sender	Function block, which writes into one or several data interfaces (e.g. function block MSI). <i>Also refer to: Coupling, Address parameters, Coupling module, Firmware</i>
Sequence number	Refer to virtual connection
7-segment display	Display on the front panel of a SIMADYN D CPU, which displays the current CPU number in the subrack when the system is working perfectly, and, under fault conditions, indicates the fault/error type. <i>Also refer to: Acknowledge button</i>
Sheet	Subset of a chart partition. A chart partition comprises 6 sheets. The sheet is a work area with sheet bars. Blocks can be located, parameterized and interconnected in the work area. <i>Also refer to: CFC chart</i>
Sheet-view mode	CFC view in which an individual sheet of chart can be displayed in detail. <i>Also refer to: Overview mode</i>
SIMADYN D program	Contrary to an S7 or M7 program, a D7-SYS program only has one chart folder and the symbol table.
SIMADYN D station	Automation unit from the Siemens SIMADYN D series. It consists of exactly one subrack.
SIMATIC Manager	The SIMATIC Manager is the graphical user interface for D/-SYS users under Windows (for organisation of STEP 7 projects).
Slot	A subrack slot.
Sub-module	A sub-module is inserted in/on a module. General term for interface module and memory module.
Sub network	A sub network includes all network nodes which are connected with one another without any network transitions. A sub network can include a repeater.

Symbol	<p>A symbol is a user-defined name which observes specific syntax rules. This name stands for a variable and is used for operator control and monitoring.</p>
Symbol table	<p>The symbol table is used to assign symbols to variable addresses (e.g. flags).</p>
System charts	<p>Several CFC charts, in which specific system responses of a SIMADYN D CPU are configured (7-segment display control, handling the acknowledge button, ...). The system chart is automatically available in a D7-SYS-program contained in an again put on modul and may not be deleted</p> <p><i>Also refer to: Chart folder</i></p>
System exception signal	<p>If a SIMADYN D CPU identifies a fatal system error, it goes into the STOP condition, and informs the other modules in the station using a system exception signal. Another module can ignore this system exception signal, and continue to operate, or it can also go into the STOP condition.</p> <p><i>Also refer to: Exception buffer</i></p>
System exception message TDC	<p>If a SIMATIC TDC module identifies a critical system fault/error, then it goes into the STOP operating mode. It then sends a system exception message to the first CPU of the station. As a response, it can be defined as to whether the remaining modules in the station continue to operate or the complete station should go into the STOP condition.</p> <p><i>Also refer to: Exception buffer</i></p>
System library	<p>A block library supplied by Siemens.</p>

T

Target system	The automation system or a component of it on which the user program runs, is known as the target system. Target systems are, for example, SIMATIC S7, M7 and SIMADYN D.
Task	The sequence in which the user program is processed is defined in the tasks. <i>Also refer to: Run-time properties, Interrupt task, Cyclic task</i>
Task manager	The task manager coordinates the execution of tasks, corresponding to their priority. The processing sequence is defined by the task type. <i>Also refer to: Cyclic task, Interrupt task</i>
Technology connector	A technology connector at a block output can be interconnected using the BICO technique with a parameter at a block input. A technology connector is identified by its number. <i>Also refer to: Pseudo comment</i>
Technology CPU	Module which is used in a drive converter (6SE70) electronics box or the SRT400 subrack. It includes many I/O.
Test mode	CFC operating mode to test and optimize the user program, which runs, online on the CPU. <i>Also refer to: Creation mode</i>
Top chart	CFC chart that is not nested in another chart and is displayed in the SIMATIC Manager. <i>Also refer to: Nested chart</i>
TSAVE area	Battery-buffered memory area of a SIMATIC TDC/SIMADYN D-CPU or FM 458-1 DP, whose contents should be kept even after a power failure or the program is downloaded again – assuming that a battery is used in the subrack. Using special function blocks, configuring data can be retentatively saved in the TSAVE area. Data in the TSAVE area, contrary to the SAVE area, is kept until it is explicitly deleted (with the appropriate command in the download dialog box).

U

- Units, units text** Text, which can be configured for a module I/O, in order to assign physical dimensions to values at this I/O (e.g. m, kVA).
Also refer to: Scaling factor
- Update cycle** In the test mode this specifies in which time intervals the block I/O, which are to be monitored, are updated.
- User data area** User data areas are used to transfer data between SIMATIC TDC/SIMADYN D or FM 458-1 DP and SIMATIC-OP. The data areas are written into and read from the operator panel and the user program. By evaluating the data saved there, the user program and operator panel initiate defined actions.
- User library** A block library generated by the user himself.
- User program** The user program includes all instructions and declarations as well as data for signal processing which can be controlled by a system or a process. It is assigned a programmable module (e.g. CPU, FM). For the SIMATIC TDC/SIMADYN D and FM 458-1 DP target systems, the user program is obtained when compiling the CFC charts of this programmable module. It is loaded in the CFC, together with the operating system in the memory module of the programmable module.
Also refer to: Loading

V

Variable	A variable defines data with variable contents, which can be addressed from display devices.
Virtual connection	<p>A virtual connection transfers process data between function blocks via various couplings.</p> <p>A virtual connection must be specified or a sequence number specified when configuring a virtual connection.</p> <p>If several process data are transferred via a sender, their sequence within the channel is defined using the sequence numbers of the individual, virtual connections.</p> <p><i>Also refer to: Global operand</i></p>
Virtual connection data, receive	Refer to virtual connection data
Virtual connection data, send	Refer to virtual connection data
Virtual connection data	<p>The virtual connection data establishes the connection to the send-or receive block, via which data is to be transferred.</p> <p>They are specified at the senders and receivers and when configuring the virtual connection.</p> <p><i>Also refer to: Global operand</i></p>
Visibility	<p>Attribute at the block I/O, which defines as to whether the block I/O is to be displayed in the CFC (visible) or not. Connected I/O are always visible.</p> <p><i>Also refer to: Interconnection</i></p>

W

Work area

The work area is the area of the CFC window in which the function blocks and margins are displayed.