MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7312-5BE03-0AB0

CPU 312C COMPACT CONTROLLER

Used with the applicable SIMATIC S7-300 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens CPU 31xC and CPU 31x Specifications, A5E00105475-08, June 2008; CPU 312C pages 163-169.

7.2 CPU 312C

Technical data

Table 7- 3 Technical data of CPU 312C

Technical data	
CPU and version	
Order no. [MLFB]	6ES7 312-5BE03-0AB0
• Hardware version	01
• Firmware version	V2.6
• Associated programming package	STEP 7 V5.4 + SP3 and higher, or STEP 7 V5.3 + SP2 and higher with HSP 0123
Memory	
Work memory	
• Integrated	32 KB
• Expandable	No
Load memory	Pluggable by means of Micro Memory Card (max. 4 MB)
Data storage life on the Micro Memory Card (following final programming)	At least 10 years
Buffering	Guaranteed by Micro Memory Card (maintenance-free)
Execution times	
Processing times of	
• Bit operations	Min. 0.2 µs
• Word instructions	Min. 0.4 µs
• Fixed-point arithmetic	Min. 5 µs
• Floating-point arithmetic	Min. 6 µs
Timers/counters and their retentive address areas	
S7 counters	128
• Retentivity	Configurable
• Default	From C 0 to C 7
• Counting range	0 to 999
IEC Counters	Yes
• Type	SFB
• Number	Unlimited (limited only by work memory size)
S7 timers	128
• Retentivity	Configurable
• Default	Not retentive
• Timer range	10 ms to 9990 s

Technical data	
IEC timers	Yes
• Type	SFB
• Number	Unlimited (limited only by work memory size)
Data areas and their retentive address areas	
Bit memory	128 bytes
• Retentivity	Configurable
• Preset retentive address areas	MB0 to MB15
Clock flag bits	8 (1 memory byte)
Data blocks	Max. 511 (in the 1 to 511 range of numbers)
• Size	Max. 16 KB
• Non-retain support (configurable retentivity)	Yes
Local data per priority class	Max. 256 bytes
Blocks	
Total	1024 (DBs, FCs, FBs) The maximum number of blocks that can be loaded may be reduced if you are using another Micro Memory Card.
OBs	See the Instruction List
• Size	Max. 16 KB
• Number of free-cycle OBs	1 (OB 1)
• Number of time-of-day interrupt OBs	1 (OB 10)
• Number of time-delay interrupt OBs	1 (OB 20)
• Number of watchdog interrupts	1 (OB 35)
• Number of process interrupt OBs	1 (OB 40)
• Number of startup OBs	1 (OB 100)
• Number of asynchronous error OBs	4 (OB 80, 82, 85, 87)
• Number of synchronous error OBs	2 (OB 121, 122)
Nesting depth	
• Per priority class	8
• Additional within an error OB	4
FBs	
• Number, max.	1024 (in the 0 to 2047 range of numbers)
• Size	Max. 16 KB
FCs	
• Number, max.	1024 (in the 0 to 2047 range of numbers)
• Size	Max. 16 KB

Technical data	
Address areas (I/O)	
Total I/O address area	
• Inputs	1024 bytes (user-specific addressing)
• Outputs	1024 bytes (user-specific addressing)
I/O process image	
• Inputs	128 bytes
• Outputs	128 bytes
Digital channels	
• Integrated channels (DI)	10
• Integrated channels (DO)	6
• Inputs	266
• Outputs	262
• Inputs, central	266
• Outputs, central	262
Analog channels	
• Integrated channels (AI)	None
• Integrated channels (AO)	None
• Inputs	64
• Outputs	64
• Inputs, central	64
• Outputs, central	64
Removal	
Racks	Max. 1
Modules per rack	Max. 8
Number of DP masters	
• Integrated	None
• Via CP	4
Operable function modules and communication processors	
• FM	Max. 8
• CP (PtP)	Max. 8
• CP (LAN)	Max. 4
Time	
Clock	Yes (SW clock)
• Buffered	No
• Accuracy	Deviation per day < 15 s
• Behavior of the realtime clock after POWER ON	The clock keeps running, continuing at the time-of-day it had when power was switched off.

Technical data	
Operating hours counter	1
• Number	0
• Value range	2 31 hours (if SFC 101 is used)
• Granularity	1 hour
• Retentive	Yes; must be manually restarted after every restart
Clock synchronization	Yes
• In the AS	Master
• On MPI	Master/slave
S7 message functions	
Number of stations that can be logged on for signaling functions	Max. 6 (depends on the number of connections configured for PG / OP and S7 basic communication)
Process diagnostics messages	Yes
• Simultaneously enabled interrupt S blocks	Max. 20
Test and startup functions	
Status/control variables	Yes
• Variable	Inputs, outputs, memory bits, DBs, timers, counters
• Number of variables – Of those as status variable – Of those as control variable	Max. 30 Max. 30 Max. 14
Force	Yes
• Variable	Inputs, outputs
• Number of variables	Max. 10
Block status	Yes
Single-step	Yes
Breakpoint	2
Diagnostics buffer	Yes
• Number of entries (not configurable)	Max. 100
Communication functions	
PG/OP communication	Yes
Global data communication	Yes
• Number of GD circuits	4
• Number of GD packets – Sending stations – Receiving stations	Max. 4 Max. 4 Max. 4
• Length of GD packets – Consistent data	Max. 22 bytes 22 bytes

Technical data	
S7 basic communication	Yes
• User data per job • Consistent data	Max. 76 bytes 76 bytes (for X_SEND or X_RCV) 64 bytes (for X_PUT or X_GET as the server)
S7 communication	
• As server	Yes
• User data per job – Consistent data	Max. 180 bytes (with PUT/GET) 64 bytes
S5-compatible communication	Yes (via CP and loadable FCs)
Number of connections	Max. 6
Can be used for	
• PG communication – Reserved (default) – Configurable	Max. 5 1 From 1 to 5
• OP communication – Reserved (default) – Configurable	Max. 5 1 From 1 to 5
• S7-based communication – Reserved (default) – Configurable	Max. 2 0 From 0 to 2
Routing	No
Interfaces	
1st interface	
Type of interface	Integrated RS485 interface
Physics	RS 485
Electrically isolated	No
Interface power supply (15 to 30 VDC)	Max. 200 mA
Functionality	
• MPI	Yes
• PROFIBUS DP	No
• Point-to-point connection	No

Technical data	
MPI	
Services	
• PG/OP communication	Yes
• Routing	No
• Global data communication	Yes
• S7 basic communication	Yes
• S7 communication – As server – As client	 Yes No
• Transmission rates	Max. 187.5 kbps
Programming	
Programming language	LAD/FBD/STL
Instruction set	See the Instruction List
Nesting levels	8
System functions (SFC)	See the Instruction List
System function blocks (SFB)	See the Instruction List
User program protection	Yes
Integrated I/O	
• Default addresses of the integrated – Digital inputs – Digital outputs	 124.0 to 125.1 124.0 to 124.5
Integrated functions	
Counters	2 channels (see the Manual *Technological Functions*)
Frequency counters	2 channels, max. 10 kHz (see the Manual *Technological Functions*)
Cycle duration measurement	2 channels (see the Manual *Technological Functions*)
Pulse outputs	2 channels for pulse width modulation, max. 2.5 kHz (see the Manual *Technological Functions*)
Controlled positioning	No
Integrated "Controlling" SFB	No
Dimensions	
Mounting dimensions W x H x D (mm)	80 x 125 x 130
Weight	409 g

Technical data	
Voltages and currents	
Power supply (rated value)	24 VDC
• Permissible range	20.4 V to 28.8 V
Current consumption (no-load operation)	Typically 60 mA
Inrush current	Typically 11 A
Power consumption (nominal value)	500 mA
I^2t	0.7 A^2s
External fusing of power supply lines (recommended)	LS switch Type C min. 2 A, LS switch Type B min. 4 A
Power loss	Typically 6 W

Reference

In Chapter *Specifications of the integrated I/O* you can find

- Under *Digital inputs of CPUs 31xC* and *Digital outputs of CPUs 31xC* the technical data of integrated I/Os.
- the block diagrams of the integrated I/Os under *Arrangement and usage of integrated I/Os*.