



Figure similar

spare part SIPLUS S7-300 CPU 312C based on 6ES7312-5BF04-0AB0 with conformal coating, -25...+60 °C, compact CPU with MPI, 10 DI/6 DQ, 2 high-speed counters (10 kHz) integrated power supply 24 V DC, work memory 64 KB, front connector (1x 40-pole) and Micro Memory Card required

General information	
Engineering with	
<ul style="list-style-type: none"> Programming package 	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
Supply voltage	
Rated value (DC)	24 V; A power supply according to EN 50155 shall be used
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Mains buffering	
<ul style="list-style-type: none"> Mains/voltage failure stored energy time Repeat rate, min. 	5 ms 1 s
Load voltage L+	
Digital outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	No
Input current	
Current consumption (rated value)	570 mA
Current consumption (in no-load operation), typ.	90 mA
Inrush current, typ.	5 A
I ² t	0.7 A ² ·s
Digital outputs	
<ul style="list-style-type: none"> from load voltage L+, max. 	25 mA
Power loss	
Power loss, typ.	8 W
Memory	
Work memory	
<ul style="list-style-type: none"> integrated expandable 	64 kbyte No
Load memory	
<ul style="list-style-type: none"> Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), min. 	Yes 8 Mbyte 10 y
Backup	
<ul style="list-style-type: none"> present without battery 	Yes; Guaranteed by MMC (maintenance-free) Yes; Program and data

CPU processing times	
for bit operations, typ.	0.1 µs
for word operations, typ.	0.24 µs
for fixed point arithmetic, typ.	0.32 µs
for floating point arithmetic, typ.	1.1 µs
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
• Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
• Number, max.	see instruction list
• Size, max.	64 kbyte
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of delay alarm OBs	2; OB 20, 21
• Number of cyclic interrupt OBs	4; OB 32, 33, 34, 35
• Number of process alarm 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	16
• additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	
<ul style="list-style-type: none"> • Size, max. • Retentivity available • Retentivity preset • Number of clock memories 	256 byte Yes; MB 0 to MB 255 MB 0 to MB 15 8; 1 memory byte
Data blocks	
<ul style="list-style-type: none"> • Retentivity adjustable • Retentivity preset 	Yes; via non-retain property on DB Yes
Local data	
<ul style="list-style-type: none"> • per priority class, max. 	32 kbyte; Max. 2048 bytes per block
Address area	
I/O address area	
<ul style="list-style-type: none"> • Inputs • Outputs 	1 024 byte 1 024 byte
of which distributed	
<ul style="list-style-type: none"> — Inputs — Outputs 	none none
Process image	
<ul style="list-style-type: none"> • Inputs • Outputs • Inputs, adjustable • Outputs, adjustable • Inputs, default • Outputs, default 	1 024 byte 1 024 byte 1 024 byte 1 024 byte 128 byte 128 byte
Default addresses of the integrated channels	
<ul style="list-style-type: none"> — Digital inputs — Digital outputs 	124.0 to 125.1 124.0 to 124.5
Digital channels	
<ul style="list-style-type: none"> • Inputs <ul style="list-style-type: none"> — of which central • Outputs <ul style="list-style-type: none"> — of which central 	266 266 262 262
Analog channels	
<ul style="list-style-type: none"> • Inputs <ul style="list-style-type: none"> — of which central • Outputs <ul style="list-style-type: none"> — of which central 	64 64 64 64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
<ul style="list-style-type: none"> • integrated • via CP 	none 4
Number of operable FMs and CPs (recommended)	
<ul style="list-style-type: none"> • FM • CP, PtP • CP, LAN 	8 8 4
Rack	
<ul style="list-style-type: none"> • Racks, max. • Modules per rack, max. 	1 8
Time of day	
Clock	
<ul style="list-style-type: none"> • Software clock • retentive and synchronizable • Deviation per day, max. • Behavior of the clock following POWER-ON 	Yes No; Buffered: No, Can be synchronized: Yes 10 s; Typ.: 2 s the clock continues at the time of day it had when power was switched off
Operating hours counter	
<ul style="list-style-type: none"> • Number 	1

<ul style="list-style-type: none"> • Number/Number range • Range of values • Granularity • retentive 	<p>0</p> <p>0 to 2³¹ hours (when using SFC 101)</p> <p>1 h</p> <p>Yes; Must be restarted at each restart</p>
Clock synchronization	
<ul style="list-style-type: none"> • supported • to MPI, master • to MPI, slave • in AS, master • in AS, slave 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>No</p>
Digital inputs	
Number of digital inputs	10
<ul style="list-style-type: none"> • of which inputs usable for technological functions 	8
integrated channels (DI)	10
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	10
— up to 60 °C, max.	5
vertical installation	
— up to 40 °C, max.	5
Input voltage	
<ul style="list-style-type: none"> • Rated value (DC) • for signal "0" • for signal "1" 	<p>24 V</p> <p>-3 to +5V</p> <p>+15 to +30 V</p>
Input current	
<ul style="list-style-type: none"> • for signal "1", typ. 	8 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms (You can reconfigure the input delay of the standard inputs during program runtime. Please note that under certain circumstances your newly set filter time may not be effective until the next filter cycle.)
— Rated value	3 ms
for technological functions	
— at "0" to "1", max.	48 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency
Cable length	
<ul style="list-style-type: none"> • shielded, max. • unshielded, max. 	<p>1 000 m; 100 m for technological functions</p> <p>600 m; for technological functions: No</p>
for technological functions	
— shielded, max.	100 m; at maximum count frequency
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	6
<ul style="list-style-type: none"> • of which high-speed outputs 	2; Notice: You cannot connect the fast outputs of your CPU in parallel
integrated channels (DO)	6
Short-circuit protection	Yes; Clocked electronically
<ul style="list-style-type: none"> • Response threshold, typ. 	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> • on lamp load, max. 	5 W
Load resistance range	
<ul style="list-style-type: none"> • lower limit • upper limit 	<p>48 Ω</p> <p>4 kΩ</p>
Output voltage	
<ul style="list-style-type: none"> • for signal "1", min. 	L+ (-0.8 V)
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value 	500 mA

<ul style="list-style-type: none"> • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. 	5 mA 0.6 A 5 mA 0.5 mA
Parallel switching of two outputs	
<ul style="list-style-type: none"> • for uprating • for redundant control of a load 	No Yes
Switching frequency	
<ul style="list-style-type: none"> • with resistive load, max. • with inductive load, max. • on lamp load, max. • of the pulse outputs, with resistive load, max. 	100 Hz 0.5 Hz 100 Hz 2.5 kHz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	2 A
— up to 60 °C, max.	1.5 A
vertical installation	
— up to 40 °C, max.	1.5 A
Cable length	
<ul style="list-style-type: none"> • shielded, max. • unshielded, max. 	1 000 m 600 m
Analog inputs	
Number of analog inputs	0
integrated channels (AI)	0
Analog outputs	
Number of analog outputs	0
integrated channels (AO)	0
Encoder	
Connectable encoders	
<ul style="list-style-type: none"> • 2-wire sensor — permissible quiescent current (2-wire sensor), max. 	Yes 1.5 mA
Interfaces	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	No
Interface types	
<ul style="list-style-type: none"> • RS 485 • Output current of the interface, max. 	Yes 200 mA
Protocols	
<ul style="list-style-type: none"> • MPI • PROFIBUS DP master • PROFIBUS DP slave • Point-to-point connection 	Yes No No No
MPI	
<ul style="list-style-type: none"> • Transmission rate, max. 	187.5 kbit/s
Services	
— PG/OP communication	Yes
— Routing	No
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes; Only server, configured on one side
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes
Protocols	

PROFIsafe	No
communication functions / header	
PG/OP communication	Yes
Data record routing	No
Global data communication	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> Number of GD loops, max. 	8
<ul style="list-style-type: none"> Number of GD packets, max. 	8
<ul style="list-style-type: none"> Number of GD packets, transmitter, max. 	8
<ul style="list-style-type: none"> Number of GD packets, receiver, max. 	8
<ul style="list-style-type: none"> Size of GD packets, max. 	22 byte
<ul style="list-style-type: none"> Size of GD packet (of which consistent), max. 	22 byte
S7 basic communication	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> User data per job, max. 	76 byte
<ul style="list-style-type: none"> User data per job (of which consistent), max. 	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> as server 	Yes
<ul style="list-style-type: none"> as client 	Yes; Via CP and loadable FB
<ul style="list-style-type: none"> User data per job, max. 	180 byte; (with PUT/GET)
<ul style="list-style-type: none"> User data per job (of which consistent), max. 	240 byte; as server
S5 compatible communication	
<ul style="list-style-type: none"> supported 	Yes; via CP and loadable FC
Number of connections	
<ul style="list-style-type: none"> overall 	6
<ul style="list-style-type: none"> usable for PG communication <ul style="list-style-type: none"> reserved for PG communication adjustable for PG communication, min. adjustable for PG communication, max. 	5 1 1 5
<ul style="list-style-type: none"> usable for OP communication <ul style="list-style-type: none"> reserved for OP communication adjustable for OP communication, min. adjustable for OP communication, max. 	5 1 1 5
<ul style="list-style-type: none"> usable for S7 basic communication <ul style="list-style-type: none"> reserved for S7 basic communication adjustable for S7 basic communication, min. adjustable for S7 basic communication, max. 	2 0 0 2
S7 message functions	
Number of login stations for message functions, max.	6; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Status/control	
<ul style="list-style-type: none"> Status/control variable 	Yes
<ul style="list-style-type: none"> Variables 	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> Number of variables, max. <ul style="list-style-type: none"> of which status variables, max. of which control variables, max. 	30 30 14
Forcing	
<ul style="list-style-type: none"> Forcing 	Yes
<ul style="list-style-type: none"> Forcing, variables 	Inputs, outputs
<ul style="list-style-type: none"> Number of variables, max. 	10
Diagnostic buffer	
<ul style="list-style-type: none"> present 	Yes

<ul style="list-style-type: none"> • Number of entries, max. <ul style="list-style-type: none"> — adjustable — of which powerfail-proof • Number of entries readable in RUN, max. <ul style="list-style-type: none"> — adjustable — preset 	500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10
Service data	
<ul style="list-style-type: none"> • can be read out 	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
<ul style="list-style-type: none"> • Status indicator digital input (green) • Status indicator digital output (green) 	Yes Yes
Integrated Functions	
Counter <ul style="list-style-type: none"> • Number of counters • Counting frequency, max. 	2; See "Technological Functions" manual 10 kHz
Frequency measurement <ul style="list-style-type: none"> • Number of frequency meters 	Yes 2; up to 10 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	No
PID controller	No
Number of pulse outputs	2; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz
Potential separation	
Potential separation digital inputs	
<ul style="list-style-type: none"> • Potential separation digital inputs • between the channels • between the channels and backplane bus 	Yes No Yes
Potential separation digital outputs	
<ul style="list-style-type: none"> • Potential separation digital outputs • between the channels • between the channels and backplane bus 	Yes No Yes
Isolation	
Isolation tested with	500V AC for 1 minute
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
<ul style="list-style-type: none"> • ATEX 	No
Railway application	
<ul style="list-style-type: none"> • EN 50155 	Yes; Sections 4, 5 and 12; no further agreements apply; T1, Category 1, Class A/B, EN 50155:2007
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> • min. • max. 	-25 °C; = Tmin 60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Ambient temperature during storage/transportation	
<ul style="list-style-type: none"> • min. • max. 	-40 °C 70 °C
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude 	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	

<ul style="list-style-type: none"> • With condensation, tested in accordance with IEC 60068-2-38, max. 	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
<ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-3 — to chemically active substances according to EN 60721-3-3 — to mechanically active substances according to EN 60721-3-3 	<p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</p> <p>Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 3S4 incl. sand, dust, *</p>
Use on land craft, rail vehicles and special-purpose vehicles	
<ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-5 — to chemically active substances according to EN 60721-3-5 — to mechanically active substances according to EN 60721-3-5 	<p>Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request</p> <p>Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *</p> <p>Yes; Class 5S3 incl. sand, dust; *</p>
Remark	
<ul style="list-style-type: none"> — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 	* The supplied plug covers must remain in place over the unused interfaces during operation!
configuration / header	
Configuration software	
<ul style="list-style-type: none"> • STEP 7 • STEP 7 Lite 	<p>Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203</p> <p>No</p>
configuration / programming / header	
<ul style="list-style-type: none"> • Command set • Nesting levels • System functions (SFC) • System function blocks (SFB) 	<p>see instruction list</p> <p>8</p> <p>see instruction list</p> <p>see instruction list</p>
Programming language	
<ul style="list-style-type: none"> — LAD — FBD — STL — SCL — GRAPH — HiGraph® 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Know-how protection	
<ul style="list-style-type: none"> • User program protection/password protection • Block encryption 	<p>Yes</p> <p>Yes; With S7 block Privacy</p>
Dimensions	
Width	80 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	410 g
last modified:	7/28/2021 