## **SIEMENS**

## **Data sheet**

## 6ES7677-2FA41-0FL0



SIMATIC ET 200SP Open Controllers, CPU 1515SP PC F +HMI 512PT, 4 GB RAM, 30 GB CFAST with WES 7 P 64 bit pre-installed, mit S7-1500 Fail-safe SWC CPU 1505SP F pre-installed with WinCC Runtime Advanced V14 pre-installed with 512 PowerTags license, Interfaces: 1x slot CFAST, 1x slot SD/MMC, 1x connection for ET 200SP bus adapter PROFINET 1x 10/100/1000 Mbit/s Ethernet, 3x USB, 1x DVI-I graphics card connection, Documentation on DVD, Restore DVD

General information	
Product type designation	CPU 1515SP PC F
HW functional status	FS02
Firmware version	V2.1
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V14 SP1
Installed software	
<ul> <li>Visualization</li> </ul>	WinCC Runtime Advanced V14 SP1
<ul> <li>Control</li> </ul>	S7-1500 Software Controller CPU 1505SP F
Configuration control	
via dataset	Yes
Control elements	
Mode selector switch	1
Supply voltage	
Type of supply voltage	24 V DC
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
Input current	
Current consumption (rated value)	1.5 A; Full processor load, incl. ET 200SP modules and using USB
Current consumption (in no-load operation), typ.	0.6 A
Inrush current, max.	4.7 A; Rated value
Power	
Active power input, max.	36 W; incl. ET 200SP modules and using USB
Infeed power to the backplane bus	8.75 W
Power loss	
Power loss, typ.	15 W; without ET 200SP modules and without using USB
Processor	
Processor type	Dual-Core 1 GHz, AMD G Series APU T40E
Memory	
Type of memory	DDR3-SDRAM
Main memory	4 GB RAM
CFast memory card	Yes; 30 GB flash memory
SIMATIC memory card required	No

Work memory	
<ul><li>integrated (for program)</li></ul>	1.5 Mbyte
<ul><li>integrated (for data)</li></ul>	5 Mbyte
<ul> <li>integrated (for CPU function library of CPU</li> </ul>	10 Mbyte
Runtime)	
Load memory	
integrated (on PC mass storage)	320 Mbyte
Backup	
<ul><li>with UPS</li></ul>	Yes; all memory areas declared retentive
<ul> <li>with non-volatile memory</li> </ul>	Yes
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
DB	Constants, etc. are also regarded as elements
	5 000: Number range: 1 to 65525
Number, max.     Size max.	5 999; Number range: 1 to 65535
• Size, max.	5 Mbyte
FB	5 000 N
Number, max.	5 998; Number range: 1 to 65535
• Size, max.	512 kbyte
FC	
<ul><li>Number, max.</li></ul>	5 999; Number range: 1 to 65535
• Size, max.	512 kbyte
OB	
<ul><li>Size, max.</li></ul>	1 048 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	100
<ul> <li>Number of time alarm OBs</li> </ul>	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	1
Number of technology synchronous alarm OBs	2
Number of technology synchronous diarm CBs     Number of startup OBs	100
Number of startup OBs     Number of asynchronous error OBs	4
•	
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
adiustable	V
— adjustable	Yes
IEC counter	Yes
	Any (only limited by the main memory)
IEC counter	
IEC counter  • Number Retentivity	
IEC counter  ● Number  Retentivity  — adjustable	Any (only limited by the main memory)
IEC counter	Any (only limited by the main memory) Yes
IEC counter	Any (only limited by the main memory)
IEC counter  Number Retentivity — adjustable  S7 times Number Retentivity	Any (only limited by the main memory)  Yes 2 048
IEC counter  ● Number  Retentivity  — adjustable  S7 times  ● Number  Retentivity  — adjustable	Any (only limited by the main memory) Yes
IEC counter  Number Retentivity — adjustable  S7 times Number Retentivity	Any (only limited by the main memory)  Yes 2 048

Yes
410 kbyte; For storage in NVRAM; for storage in mass storage 5 242
020 bytes
4011.4
16 kbyte
8; 8 clock memory bit, grouped into one clock memory byte
Yes
No
190
64 kbyte; max. 16 KB per block
of hoyte, max. To his per shook
8 192
0 132
32 kbyte; All inputs are in the process image
32 kbyte; All outputs are in the process image
oz hayto, i iii outpute ure iii the process intage
8 kbyte
8 kbyte
32
Yes
20
1
64; CPU 1515SP PC + 64 modules + server module
1
the number of connectable PtP CMs is only limited by the number of available slots
Hardware clock
Yes; Resolution: 1 s
6 wk; At 40 °C ambient temperature, typically
10 s; Typ.: 2 s
Yes
No
Yes
Yes
_ 2
1
1
1; Via CM DP module
3; 3x USB 2.0 on the front, 500 mA each - of which 2x 500 mA and 1x 100 mA simultaneously
1
1x DVI-I

Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
— Transmission rate, max.	100 Mbit/s
— Industrial Ethernet status LED	Yes
<ul> <li>Number of ports</li> </ul>	2
integrated switch	Yes
BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Protocols	, , , , , , , , , , , , , , , , , , ,
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
PROFINET IO Controller	100
Services	
— Isochronous mode	Yes
— shortest clock pulse	500 μs
— IRT	Yes
Prioritized startup	Yes; Max. 32 PROFINET devices
Number of connectable IO Devices, max.	128
Of which IO devices with IRT, max.	64
— of which in line, max.	64
	128
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	120
— of which in line, max.	128
Number of IO Devices that can be	8
simultaneously activated/deactivated, max.	
<ul> <li>— IO Devices changing during operation (partner ports), supported</li> </ul>	Yes
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
With IRT and parameterization of "odd" send	Update time = set "odd" send clock (any multiple of 125 μs: 375 μs, 625
cycles	μs 3 875 μs)
Update time for RT	
— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	Yes
Prioritized startup	Yes
	Yes
— Shared device	
Shared device     Number of IO Controllers with shared device.	4
<ul> <li>Shared device</li> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
<ul> <li>Number of IO Controllers with shared device,</li> </ul>	4
Number of IO Controllers with shared device, max.  Interface	
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	Integrated Ethernet interface Yes

Autocrossing	Yes
Interface types	100
• RJ 45 (Ethernet)	Yes; Integrated
— Transmission rate, max.	1 000 Mbit/s
— Industrial Ethernet status LED	No
	1
Number of ports	
3. Interface	PROFINIO W OM PR
Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
Interface types	
• RS 485	Yes
Protocols	
PROFIBUS DP master	Yes
<ul> <li>PROFIBUS DP slave</li> </ul>	Yes
SIMATIC communication	Yes
PROFIBUS DP master	
Number of DP slaves, max.	125
Services	
— Equidistance	No
<ul> <li>Isochronous mode</li> </ul>	No
Interface types	
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
Number of connections	
Number of connections, max.	88
Number of connections reserved for ES/HMI/web	10
Number of S7 routing paths	16
Redundancy mode	10
Media redundancy	
— MRP	Yes
— MRPD	Yes
Switchover time on line break, typ.	200 ms
	50
— Number of stations in the ring, max.	50
SIMATIC communication	Von
PG/OP communication     S7 souting	Yes
• S7 routing	Yes
S7 communication, as server	Yes
S7 communication, as client	Yes
User data per job, max.	64 kbyte
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
• ISO-on-TCP (RFC1006)	Yes
<ul><li>— Data length, max.</li></ul>	64 kbyte
• UDP	Yes
<ul><li>Data length, max.</li></ul>	1 472 kbyte
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Via Windows and PROFINET interface
• HTTPS	Yes; Only via PROFINET interface
OPC UA	
OPC UA Client	No
OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
Application authentication	Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,
P.P	Basic256Sha256

Further protocols  • MODBUS  • MODBUS  **Treassage functions  **Number of login stations for message functions, max.**  **Number of login stations for messages, max.**  **Number of simultaneously active program alarms  • Number of alarms for system diagnostics  • Number of alarms for motion technology objects  **Test commissioning functions*  Joint commission (Team Engineering)  Status blook  **Status Stook  **Status Stook  **Status Stook  • Variables  • Variables  • Number of variables, max.  — of which status variables, max.  — of which control variables, max.  — of which powerfail-groof  • Forcing,  • Forcing,  • Forcing, variables, max.  — of which powerfail-groof  **Number of entries, max.  — of which powerfail-groof  **Number of configurable Traces  • Number of configurable Traces  • Number of configurable Notion Control resources for technology objects  **Number of variables Motion Control resources for technology objects  **Number of variables Motion Control resources for technology objects  **Memory size per trace, max.  — of which powerfail-groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which powerfail groof  **Pes  • Number of variables, max.  — of which grow have the wave power po	— Security policies	Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
**MODBUS**  **MODBUS**  **Tracessage functions**  **Number of login stations for message functions, max.**  **Program alarms**  **Number of login stations for messages, max.**  **Number of login stations for messages, max.**  **Number of oringurable program messages, max.**  **Number of alarms for system diagnostics and incomplete of alarms for system diagnostics and incomplete of alarms for system diagnostics and incomplete original materials.**  **Joint commission (Team Engineering)**  **Joint commission (Team Engineering	— User authentication	Yes; "anonymous" or by user name & password
Number of login stations for message functions, max.  Number of login stations for message, max.  Number of configurable program messages, max.  Number of configurable program messages, max.  Number of program alarms  Number of program alarms  Number of program alarms  Number of alarms for motion technology objects  Test commission (Team Engineering)  Joint commission (Team Engineering)  Yes; Parallel online access possible for up to 8 engineering systems  Status shock  Yes; up to 8 simultaneously  No  Status/control variable  Variables  Number of variables, max.  — of which status variables, max.  — of which control variables, max.  — of which control variables, max.  — of which control variables, max.  — Forcing  Percing, variables  Number of variables, max.  — of which powerfall-proof  Number of configurable Traces  Number of configurable Traces  Number of configurable Traces  Number of variables nex.  — of which powerfall-proof  Traces  Number of variables of configurable Traces  Number of variables of variable	Further protocols	
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of configurable program alarms Number of program alarms Number of program alarms Number of program alarms Number of alarms for motion technology objects Number of alarms for motion technology objects  Test commission (Team Engineering) Joint commission (Team Engineering) Ves: Parallel online access possible for up to 8 engineering systems Status block Yes; up to 8 simultaneously Single step No Status/control variable Variables Number of variables, max. of which status variables, max. of which status variables, max. 200 Forcing Forcing Forcing Forcing, variables Number of variables, max. 200 Diagnostic buffer Persent Number of variables, max. 1000  Diagnostic buffer Persent Persent Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of variables information  Diagnostics indication LED RINNSTOP LED RINNST	MODBUS	Yes; MODBUS TCP
Program alarms Number of configurable program messages, max. Number of configurable program messages, max. Number of program alarms Number of program alarms Number of program alarms Number of alarms for motion technology objects Number of alarms for motion technology objects Number of alarms for motion technology objects Sunder of motion for motion technology objects  Fest commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 8 engineering systems Yes; up to 8 simultaneously Status block Yes; up to 8 simultaneously Status control variable Yes Status control variable Status control variables Number of variables, max. Of which status variables, max. Of which ontrol variables, max. Of which powerfall-proof Office of entries, max. Of which powerfall-proof Office of entries, max. Office of entries, max. Of which powerfall-proof Office of entries, max. Office of entries, max	S7 message functions	
Number of configurable program messages, max.  Number of simultaneously active program alarms  Number of program alarms  Number of program alarms  Number of alarms for system diagnostics  Number of alarms for system diagnostics  Number of alarms for motion technology objects  Fost commissioning functions  Joint commission (Team Engineering)  Yes: Parallel online access possible for up to 8 engineering systems  Yes; up to 8 simultaneously  No  Status block  Status block  Single step  No  Status/control variable  Variables  Number of variables, max.  — of which status variables, max.  — of which control variables, max.  — of which status variables, max.  — of which ontrol variables, max.  — of which status variables, max.  — of which ontrol variables, max.  Procing  Forcing  Forcing, variables  Number of variables, max.  — of which powerfall-proof  Traces  Number of configurable Traces  Nemony size per trace, max.  Horupts/diagnostics/status information  Diagnostics indication LED  RUNSTOP LED  RUNSTOP LED  RUNSTOP LED  RUNSTOP LED  RUNSTOP LED  RUNSTOP LED  RERGRED  Number of available Motion Control resources for technology objects  Motion Control  Number of available Motion Control resources for technology objects  Required Motion Control resources for technology objects  Per speed-controlled axis  — per speed-controlled axis  — per synchronous axis  — per synchronous axis  — per external encoder  — per output cam  — per cam track — per probe  Postitoring axis  Postitoring axis  Per probe  Postitoring axis	Number of login stations for message functions, max.	32
Number of simultaneously active program alarms  Number of program alarms  Number of alarms for system diagnostics  Number of alarms for system diagnostics  Number of alarms for motion technology objects  Test commission (Team Engineering)  Joint commission (Team Engineering)  Joint commission (Team Engineering)  Status block  Yes; Parallel online access possible for up to 8 engineering systems  Yes; up to 8 simultaneously  Status control  Status control variable  No  Status control variable  Number of variables, max.  - of which status variables, max.  - of which control variables, max.  Porcing  Forcing  Forcing  Forcing, variables  Number of variables, max.  200  Diagnostic buffer  Number of entries, max.  - of which powerfail-proof  Number of configurable Traces  Nemory size per trace, max.  Number of configurable Traces  Number of configurable Traces  Number of configurable Traces  Number of variables Motion Control variables  Number of variables Motion Control variables  Number of possible for the variables of the variable	Program alarms	Yes
Number of program alarms or system diagnostics 200 Number of alarms for motion technology objects 160  Test commissioning functions Joint commission (Team Engineering) Status block Yes; up to 8 simultaneously Single step No Status/control  Status/control variable  Variables Number of variables, max.  - of which status variables, max.  - of which control variables, max.  - of which ontrol variables, max.  - of which ontrol variables, max.  - of which process of variables, max.  - of which powerfail-proof  - present  - Number of configurable Traces  - Number of parallable Motion Control resources for technology objects  Motion Control  - Per specificing axis  - per specificing axis  - per specificing axis  - per synchronous axis  - per output cam  - per cam track  - per probe  - Positioning axis  - Per probe  - Positioning axis	Number of configurable program messages, max.	10 000
Number of alarms for system diagnostics Number of alarms for motion technology objects  Joint commission (Team Engineering)  Joint commission (Team Engineering)  Status block Single step No  Status/control Status/control variable Number of variables, max. — of which status variables, max. — of which other variables, max. — of which control variables, max. — of which other variables, max. — of which problem variables, max. — of which powerfail-proof  Process Number of variables, max. — of which powerfail-proof  Number of configurable Traces  Number of configurable Number of configurabl	Number of simultaneously active program alarms	
Number of alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step  No  Status/control  Status/control variable  Ves  Variables  Number of variables, max.  — of which status variables, max.  — of which control variables, max.  — of which status variables, max.  — of which status variables, max.  — of which control variables, max.  — of which status variables, max.  — of which status variables, max.  — of which control variables, max.  — of which ontrol variables, max.  — of which ontrol variables, max.  — of which powerfail-proof  Porcing, variables  Number of variables, max.  — of which powerfail-proof  Porcing-variables  Number of configurable Traces  Number o	<ul> <li>Number of program alarms</li> </ul>	1 000
Joint commission (Team Engineering)  Joint commission (Team Engineering)  Yes; Parallel online access possible for up to 8 engineering systems  Yes; up to 8 simultaneously  No  Status/scontrol variable  Variables  Number of variables, max.  of which status variables, max.  Forcing  Forcing  Forcing, variables  Number of variables, max.  of which control variables, max.  200  Forcing  Forcing, variables  Number of variables, max.  1000  Inputs, outputs  Number of variables, max.  200  Forcing, variables  Number of variables, max.  1000  Ves  Number of variables, max.  1000  Ves  Number of onfigurable Traces  Number of configurable Traces  Number of configurable Traces  Number of configurable Traces  Number of variables, max.  512 kbyte  Interrupts/diagnostics/status information  Diagnostics indication LED  RUNKSTOP LE	<ul> <li>Number of alarms for system diagnostics</li> </ul>	200
Joint commission (Team Engineering)  Status blook Yes; up to 8 simultaneously  Single step  No  Status/control  Status/control variable  Ves  Number of variables, max.  Of which status variables, max.  Of which control variables, max.  Of which control variables, max.  Of which status variables, max.  Of which control variables, max.  Percing  Forcing  Forcing, variables  Number of variables, max.  200  Forcing  Forcing, variables  Number of variables, max.  200  Diagnostic buffer  Of which powerfail-proof  Traces  Number of configurable Traces  Nemory size per trace, max.  512 kbyte  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED	<ul> <li>Number of alarms for motion technology objects</li> </ul>	160
Status block Single step No Status/control Status/control variable Variables Number of variables, max. Of which control variables, max. Of which powerfalles, max. Of which powerfalles Number of variables, max. Of which powerfalles, max. Of wes Number of configurable Traces Number of configurable Traces Of which powerfalles, max. Of wes Of we	Test commissioning functions	
Single step Status/control  Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max. — of which powerfailes, max.	Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Single step  Status/control  Status/control variable Variables Number of variables, max. — of which status variables, max. — of which control variables, max.  Porcing Forcing For	Status block	Yes; up to 8 simultaneously
Status/control  Status/control variable  Vas Variables  Number of variables, max.  of which control variables, max.  Porcing Forcing Forcing Forcing, variables Number of variables, max.  of which powerfail-proof Number of entries, max.  of which powerfail-proof  Number of configurable Traces  Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED  REROR LED  MAINT LED  Per Supported technology objects  Motion Control  Number of available Motion Control resources for technology objects  Per synchronous axis  per external encoder  per cam track  per per probe  Positioning axis  A00  Pago  Positioning axis  Loop  Inputs, outputs, memory bits, DB, times, counters  alinputs, outputs, memory bits, DB, times, counters  alinputs, outputs, memory bits, DB, times, counters  alinputs, outputs, memory bits, DB, times, counters  200  200  Forcing  Pyes  Pes  Noutputs, memory bits, DB, times, counters  200  Forcing  Inputs, outputs, outputs  Pyes  1000  Pes  Pes  Number of variables, max.  200  Diagnostics unique and pounts  Yes  Supported technology objects  A0; per axis  A0; per probe  Positioning axis	Single step	
Variables     Number of variables, max.     — of which status variables, max.     — of which status variables, max.     — of which control variables, max.      Forcing     ■ Forcing, variables     ● Number of variables, max.     □ of which powerfail-proof     □ of which powerfail		
Number of variables, max.  of which status variables, max.  of which control variables, max.  Porcing Forcing Forcing Forcing Forcing, variables Number of variables, max.  Number of variables, max.  of which powerfailes, max.  of which powerfaile Traces Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of entries, max.  Status information  Diagnostics indication LED RUN/STOP LED RUN/STOP LED MAINT LED MAINT LED Supported technology objects  Motion Control Required Motion Control resources for technology objects Per speed-controlled axis per specificoning axis per synchronous axis per synchronous axis per came track per came track per cyen came per of which status variables, max.  200  Ves Supported technology objects  4 0, per axis per synchronous axis per synchronous axis per synchronous axis per came track per came track per probe Positioning axis Positioning axis Positioning axis	Status/control variable	Yes
Number of variables, max.  of which status variables, max.  of which control variables, max.  Porcing Forcing Forcing Forcing, variables Number of variables, max.  present Number of entries, max.  of which powerfail-proof  Number of configurable Traces Number of configurable Traces Number of configurable Traces Number of entries, max.  Traces Number of configurable Traces Number of entries, max. Status information  Diagnostics indication LED  RUN/STOP LED RUN/STOP LED Nes Nam T LED Yes Nam T LED Yes Number of available Motion Control resources for technology objects  Required Motion Control resources Per speed-controlled axis Per per per positioning axis Per synchronous axis Per synchronous axis Per synchronous axis Per synchronous axis Per external encoder Per cam track Per cam track Per probe Positioning axis	<ul><li>Variables</li></ul>	Inputs, outputs, memory bits, DB, times, counters
Forcing  Forcing Forcing Forcing Forcing Forcing Forcing, variables Inputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Forcing, variables Inputs, outputs Inputs, outputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Inputs, output	<ul> <li>Number of variables, max.</li> </ul>	
Forcing  Forcing Forcing Forcing Forcing Forcing Forcing, variables Inputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Forcing, variables Inputs, outputs Inputs, outputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Inputs, outputs Inputs, output	·	200
Forcing Forcing Forcing, variables Forcing, variables Number of variables, max.  Diagnostic buffer  present Present Number of entries, max.  Of which powerfail-proof  Traces Number of configurable Traces Number of variable Number of version Number of version Number of available Motion Control resources for technology objects Required Motion Control resources Per speed-controlled axis Per per speed-controlled axis Per prositioning axis Notion Control Number of available Motion Control resources for technology objects Required Motion Control resources Per speed-controlled axis Per gracial encoder Per output cam Per external encoder Per output cam Per cam track Per probe Positioning axis	<ul> <li>of which control variables, max.</li> </ul>	200
Forcing, variables Number of variables, max.  Diagnostic buffer  present Number of entries, max. 1000  of which powerfail-proof 300  Traces  Number of configurable Traces Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED RUN/STOP LED RROR LED MAINT LED Yes Malint LED Supported technology objects  Motion Control Required Motion Control resources for technology objects  Required Motion Control resources Per per speed-controlled axis Per speed-controlled axis Per speed-controlled axis Per synchronous axis Per external encoder Per output cam Per cam track Per probe Positioning axis Per probe Positioning axis Per probe Positioning axis Per probe Positioning axis Positioning axis Per probe Positioning axis		
Number of variables, max.  Diagnostic buffer  present Number of entries, max. pof which powerfail-proof  Number of configurable Traces Number of suit information  Diagnostics indication LED  RUN/STOP LED Yes RROR LED Yes Number of available Motion Control resources for technology objects  Required Motion Control resources Per speed-controlled axis Per per speed-controlled axis Per per speed-controlled axis Per per speed-controlled axis Per per per speed-controlled axis Per per per speed does not control to the	Forcing	Yes
Number of variables, max.  Diagnostic buffer  present Number of entries, max. pof which powerfail-proof  Number of configurable Traces Number of suit information  Diagnostics indication LED  RUN/STOP LED Yes RROR LED Yes Number of available Motion Control resources for technology objects  Required Motion Control resources Per speed-controlled axis Per per speed-controlled axis Per per speed-controlled axis Per per speed-controlled axis Per per per speed-controlled axis Per per per speed does not control to the	Forcing, variables	Inputs, outputs
Diagnostic buffer		200
Number of entries, max. — of which powerfail-proof  Traces  Number of configurable Motion Control  Regular of available Motion Control resources for technology objects  Required Motion Control resources  Required Motion Control resources  Per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe  Positioning axis  Per probe  Positioning axis		
Traces  Number of configurable Traces Nemory size per trace, max.  Titerrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED REROR LED MAINT LED  Supported technology objects  Motion Control Required Motion Control resources for technology objects Required Motion Control daxis per speed-controlled axis per per speed-controlled axis per synchronous axis per external encoder per output cam per probe Positioning axis	• present	Yes
Traces  Number of configurable Traces Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED RUN/STOP LED MAINT LED  Supported technology objects  Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources Per speed-controlled axis Per speed-controlled axis Per per positioning axis Per external encoder Per output cam Per cam track Per probe Positioning axis  Number of available Motion Control resources for technology objects  Au; per axis Bo; per axis Bo; per axis Bo; per external encoder Bo; per cam track Au; per probe Au; per probe Au; per probe Au; per probe	Number of entries, max.	1 000
Traces  Number of configurable Traces Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED RUN/STOP LED MAINT LED  Supported technology objects  Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources Per speed-controlled axis Per speed-controlled axis Per per positioning axis Per external encoder Per output cam Per cam track Per probe Positioning axis  Number of available Motion Control resources for technology objects  Au; per axis Bo; per axis Bo; per axis Bo; per external encoder Bo; per cam track Au; per probe Au; per probe Au; per probe Au; per probe	— of which powerfail-proof	300
Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED REROR LED MAINT LED  Supported technology objects  Motion Control Number of available Motion Control resources for technology objects  Required Motion Control resources Per speed-controlled axis Per positioning axis Per external encoder Per output cam Per cam track Per probe Positioning axis  Interrupts/diagnostics/status information  Yes Yes  2 400  40; per axis 80; per axis 160; per axis 160; per external encoder Per cam track Per probe Positioning axis  Notice The Author  Yes  400  40; per axis 40; per axis 40; per external encoder 40; per cam track 40; per cam track 40; per probe	Traces	
Memory size per trace, max.  Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED REROR LED MAINT LED  Supported technology objects  Motion Control Number of available Motion Control resources for technology objects  Required Motion Control resources Per speed-controlled axis Per positioning axis Per external encoder Per output cam Per cam track Per probe Positioning axis  Interrupts/diagnostics/status information  Yes Yes  2 400  40; per axis 80; per axis 160; per axis 160; per external encoder Per cam track Per probe Positioning axis  Notice The Author  Yes  400  40; per axis 40; per axis 40; per external encoder 40; per cam track 40; per cam track 40; per probe	Number of configurable Traces	4
Interrupts/diagnostics/status information  Diagnostics indication LED  RUN/STOP LED REROR LED MAINT LED Yes  Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis		512 kbyte
Diagnostics indication LED  RUN/STOP LED  ERROR LED  MAINT LED  Supported technology objects  Motion Control  Number of available Motion Control resources for technology objects  Required Motion Control resources  Required Motion Control resources  per speed-controlled axis  per positioning axis  per external encoder  per output cam  per cam track  per probe  Positioning axis		
<ul> <li>RUN/STOP LED</li> <li>ERROR LED</li> <li>MAINT LED</li> <li>Yes</li> </ul> Supported technology objects Motion Control <ul> <li>Number of available Motion Control resources for technology objects</li> <li>Required Motion Control resources</li> <li>per speed-controlled axis</li> <li>per positioning axis</li> <li>per positioning axis</li> <li>per synchronous axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam track</li> <li>per probe</li> <li>Positioning axis</li> </ul>		
ERROR LED     MAINT LED     Yes  Supported technology objects  Motion Control     Number of available Motion Control resources for technology objects     Required Motion Control resources     Per speed-controlled axis     Per positioning axis     Per synchronous axis     Per external encoder     Per output cam     Per cam track     Per probe     Positioning axis  Positioning axis  Positioning axis  Main Yes  Yes  2 400  40; per axis  40; per axis  80; per axis  160; per axis  160; per cam  160; per cam  160; per cam track  40; per probe  40; per probe		Yes
■ MAINT LED     Supported technology objects  Motion Control      ■ Number of available Motion Control resources for technology objects      ■ Required Motion Control resources      □ per speed-controlled axis      □ per positioning axis      □ per synchronous axis      □ per synchronous axis      □ per external encoder      □ per output cam      □ per cam track      □ per probe      ■ Positioning axis		
Supported technology objects  Motion Control  ● Number of available Motion Control resources for technology objects  ● Required Motion Control resources  — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe  ● Positioning axis  Yes  2 400  40; per axis  80; per axis  80; per axis  160; per axis  160; per cam  160; per cam  160; per cam track  40; per probe		
Motion Control  ■ Number of available Motion Control resources for technology objects  ■ Required Motion Control resources  — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe  ■ Positioning axis   Yes  2 400  40; per axis  40; per axis  40; per axis  40; per axis  80; per axis  160; per cam  20; per cam  160; per cam  160; per cam track  40; per probe		
<ul> <li>Number of available Motion Control resources for technology objects</li> <li>Required Motion Control resources</li> <li>— per speed-controlled axis</li> <li>— per positioning axis</li> <li>— per synchronous axis</li> <li>— per external encoder</li> <li>— per output cam</li> <li>— per cam track</li> <li>— per probe</li> <li>Positioning axis</li> <li>2 400</li> <li>40; per axis</li> <li>80; per axis</li> <li>80; per axis</li> <li>90; per cam</li> <li>160; per cam</li> <li>160; per cam track</li> <li>40; per probe</li> </ul>		Voc
technology objects  Required Motion Control resources  — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe  Positioning axis  Positioning axis  40; per axis 80; per axis 80; per axis 20; per cam 160; per cam 40; per cam track 40; per probe		
<ul> <li>Required Motion Control resources</li> <li>— per speed-controlled axis</li> <li>— per positioning axis</li> <li>— per synchronous axis</li> <li>— per external encoder</li> <li>— per output cam</li> <li>— per cam track</li> <li>— per probe</li> <li>Positioning axis</li> </ul> 40; per axis 80; per axis 80; per external encoder 20; per cam 160; per cam track 40; per probe 40; per probe		£ 100
<ul> <li>per speed-controlled axis</li> <li>per positioning axis</li> <li>per synchronous axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam track</li> <li>per probe</li> <li>Positioning axis</li> <li>40; per axis</li> <li>80; per axis</li> <li>80; per external encoder</li> <li>20; per cam</li> <li>160; per cam track</li> <li>40; per probe</li> </ul>		
<ul> <li>per positioning axis</li> <li>per synchronous axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam track</li> <li>per probe</li> <li>Positioning axis</li> </ul> <ul> <li>80; per axis</li> <li>80; per external encoder</li> <li>20; per cam</li> <li>160; per cam track</li> <li>40; per probe</li> </ul> <ul> <li>Positioning axis</li> </ul>	•	40; per axis
<ul> <li>per synchronous axis</li> <li>per external encoder</li> <li>per output cam</li> <li>per cam</li> <li>per cam track</li> <li>per probe</li> <li>Positioning axis</li> </ul>		
<ul> <li>— per external encoder</li> <li>— per output cam</li> <li>— per cam track</li> <li>— per probe</li> <li>Positioning axis</li> <li>80; per external encoder</li> <li>20; per cam</li> <li>40; per cam track</li> <li>40; per probe</li> </ul>		
<ul> <li>— per output cam</li> <li>— per cam track</li> <li>— per probe</li> <li>◆ Positioning axis</li> <li>20; per cam</li> <li>40; per cam track</li> <li>40; per probe</li> </ul>		
<ul> <li>— per cam track</li> <li>— per probe</li> <li>◆ Positioning axis</li> <li>160; per cam track</li> <li>40; per probe</li> </ul>		
<ul><li>— per probe</li><li>◆ Positioning axis</li></ul>	·	
Positioning axis	·	
		· , p · · · p · · · · ·
— Number of positioning axes at motion control 5	Number of positioning axes at motion control	5
cycle of 4 ms (typical value)		
Number of positioning axes at motion control		12
cycle of 8 ms (typical value)		
Controller	Controller	
PID_Compact     Yes; Universal PID controller with integrated optimization	<ul><li>PID_Compact</li></ul>	Yes; Universal PID controller with integrated optimization
PID_3Step     Yes; PID controller with integrated optimization for valves	<ul><li>PID_3Step</li></ul>	Yes; PID controller with integrated optimization for valves

PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Highest safety class achievable in safety mode	
<ul> <li>Performance level according to ISO 13849-1</li> </ul>	PLe
SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repa	ir time of 100 hours)
<ul> <li>Low demand mode: PFDavg in accordance with SIL3</li> </ul>	< 2.00E-05
High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
<ul><li>horizontal installation, min.</li></ul>	0 °C
<ul> <li>horizontal installation, max.</li> </ul>	60 °C
<ul> <li>vertical installation, min.</li> </ul>	0 ℃
vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Vibrations	Van
Operation, tested according to IEC 60068-2-6     Transport tested according to IEC 60068-2-6	Yes Yes
Transport, tested acc. to IEC 60068-2-6  Shock testing	165
tested according to IEC 60068-2-6	Yes
• tested according to IEC 60068-2-27	Yes
• tested according to IEC 60068-2-29	Yes
Storage/transport, tested acc. to IEC 60068-2-27	Yes
Operating systems	
pre-installed operating system	Windows Embedded Standard 7 P 64-bit
Configuration	Williams Embedded Standard 71 64 bit
Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	
	Yes
— CFC	No
— CFC	No
— CFC — GRAPH	No
— CFC — GRAPH Know-how protection	No Yes
— CFC — GRAPH  Know-how protection  • User program protection/password protection	No Yes
— CFC — GRAPH  Know-how protection  • User program protection/password protection • Copy protection	No Yes Yes
- CFC - GRAPH  Know-how protection  • User program protection/password protection  • Copy protection  • Block protection  Access protection  • Protection level: Write protection	No Yes Yes
— CFC — GRAPH  Know-how protection  • User program protection/password protection  • Copy protection  • Block protection  Access protection	No Yes Yes Yes
— CFC — GRAPH  Know-how protection  • User program protection/password protection • Copy protection • Block protection  Access protection  • Protection level: Write protection	No Yes Yes Yes
— CFC — GRAPH  Know-how protection  • User program protection/password protection  • Copy protection  • Block protection  Access protection  • Protection level: Write protection  • Protection level: Read/write protection	No Yes Yes Yes Yes

• upper limit	adjustable maximum cycle time
Open Development interfaces	
<ul> <li>Size of ODK SO file, max.</li> </ul>	3.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

last modified:

3/2/2021