SIEMENS

Data sheet

6ES7314-6EH04-0AB0



SIMATIC S7-300, CPU 314C-2PN/DP Compact CPU with 192 KB work memory, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 4 high-speed counters (60 kHz), 1st interface MPI/DP 12 Mbit/s, 2nd interface Ethernet PROFINET, with 2-port switch, Integr. power supply 24 V DC, Front connector (2x 40-pole) and Micro Memory Card required

General information	
Product type designation	CPU 314C-2 PN/DP
HW functional status	01
Firmware version	V3.3
Product function	
Isochronous mode	Yes; For PROFINET only
Engineering with	
 Programming package 	STEP 7 V5.5 or higher with HSP 191
Supply voltage	
Rated value (DC)	24 V
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	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1 s
Load voltage L+	
Digital inputs	
- load voltage / at digital input / at DC / rated value	24 V
- Reverse polarity protection	Yes
Digital outputs	
— Rated value (DC)	24 V
- Reverse polarity protection	No
Input current	
Current consumption (rated value)	850 mA
Current consumption (in no-load operation), typ.	190 mA
Inrush current, typ.	5 A
l²t	0.7 A ² ·s
Digital inputs	
 from load voltage L+ (without load), max. 	80 mA
Digital outputs	
 from load voltage L+, max. 	50 mA
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
integrated	192 kbyte
expandable	No
Load memory	

	N
Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
 Data management on MMC (after last programming), min. 	10 a
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	res, riogram and data
	0.06 µs
for bit operations, typ. for word operations, typ.	0.12 µs
· · · · · · · · · · · · · · · · · · ·	0.12 µs
for fixed point arithmetic, typ for floating point arithmetic, typ.	
CPU-blocks	0.59 μs
	1.024: (DBa, ECa, EBa); the maximum number of leadable blocks can be
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 DPV1 alarm OBs	3; OB 55, 56, 57
Number of isochronous mode OBs	1; OB 61; only for PROFINET
Number of startup OBs	1; OB 100
Number of asynchronous error OBs	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
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	200
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	Chining of the the only by to we capacity)
Number	256
Retentivity	
— adjustable	Yes
-	No retentivity
— preset Time range	No recentivity
— lower limit	10 ms
	10 110

— upper limit	9 990 s
IEC timer	3 350 5
• present	Yes
	SFB
TypeNumber	Unlimited (limited only by RAM capacity)
	Oninnited (infitted only by RAW capacity)
Data areas and their retentivity	04 liberta
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	
• Size, max.	256 byte
Retentivity available	Yes; MB 0 to MB 255
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	Ver vie nen retein argentet en DD
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	20 libeta Marc 2040 ketaa aas blaak
• per priority class, max.	32 kbyte; Max. 2048 bytes per block
Address area	
I/O address area	0.040 hida
Inputs	2 048 byte
Outputs furbick distributed	2 048 byte
of which distributed	0.002 hits
— Inputs	2 003 byte
— Outputs	2 010 byte
Process image	0.040 h to
Inputs	2 048 byte
Outputs	2 048 byte
Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
Inputs, default	256 byte
• Outputs, default	256 byte
Default addresses of the integrated channels	400.04-400.7
— Digital inputs	136.0 to 138.7
— Digital outputs	136.0 to 137.7
— Analog inputs	800 to 809
— Analog outputs	800 to 803
Subprocess images	1: With DDOEINET IO, the length of the user date is limited to 1600 bytes
Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels Inputs 	16 048
— of which central	1 016
Outputs Outputs of which central	16 096 1 008
Analog channels Inputs 	1 006
 Inputs — of which central 	253
Outputs	1 007
 Outputs — of which central 	250
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
integrated	1
• via CP	4
Number of operable FMs and CPs (recommended)	
FM	8
• CP, PtP	8
• CP, LAN	10
Rack	
Racks, max.	4
Modules per rack, max.	4 8; In rack 3 max. 7
· modulos por ruor, max.	

Time of day	
Clock	
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Backup time	6 wk; At 40 °C ambient temperature
Deviation per day, max.	10 s; Typ.: 2 s
Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
-	-
Behavior of the clock following expiry of backup period	the clock continues at the time of day it had when power was switched off
Operating hours counter	
Number	1
Number/Number range	0
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
retentive	Yes; Must be restarted at each restart
Clock synchronization	
 supported 	Yes
 to MPI, master 	Yes
• on MPI, device	Yes
• to DP, master	Yes; With DP slave only slave clock
• on DP, device	Yes
• in AS, master	Yes
• in AS, device	Yes
• on Ethernet via NTP	Yes; As client
Digital inputs	
Number of digital inputs	24
of which inputs usable for technological functions	16
integrated channels (DI)	24
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
	24
— up to 40 °C, max.	24
— up to 60 °C, max.	12
vertical installation	
— up to 40 °C, max.	12
Input voltage	
 Rated value (DC) 	24 V
 for signal "0" 	-3 to +5V
• for signal "1"	+15 to +30 V
Input current	
● 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.	8 μs; Minimum pulse width/minimum pause between pulses at maximum counting frequency
Cable length	
 shielded, max. 	1 000 m; 50 m for technological functions
• unshielded, max.	600 m; for technological functions: No
for technological functions	
— shielded, max.	50 m; at maximum count frequency
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	16
of which high-speed outputs	4; Notice: You cannot connect the fast outputs of your CPU in parallel
integrated channels (DO)	4, Notice. For cannot connect the last outputs of your CFO in parallel
Short-circuit protection	Yes; Clocked electronically
-	
Response threshold, typ.	1 A

Limitation of inductive shutdown voltage to	$1 \pm (48 M)$
Limitation of inductive shutdown voltage to Controlling a digital input	L+ (-48 V) Yes
· · · ·	res
Switching capacity of the outputs on lamp load, max. 	5 W
Load resistance range	5 W
lower limit	48 Ω
upper limit	46 Ω 4 kΩ
Output voltage	177 +
• for signal "1", min.	L+ (-0.8 V)
Output current	2. (0.0 V)
for signal "1" rated value	500 mA
 for signal "1" permissible range, min. 	5 mA
• for signal "1" permissible range, max.	0.6 A
 for signal "1" minimum load current 	5 mA
 for signal "0" residual current, max. 	0.5 mA
Parallel switching of two outputs	
• for uprating	No
 for redundant control of a load 	Yes
Switching frequency	
with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
 on lamp load, max. 	100 Hz
 of the pulse outputs, with resistive load, max. 	2.5 kHz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	
 shielded, max. 	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	5
 For voltage/current measurement 	4
 For resistance/resistance thermometer measurement 	1
integrated channels (AI)	5; 4x current/voltage, 1x resistance
permissible input voltage for current input (destruction limit), max.	5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Electrical input frequency, max.	400 Hz
No-load voltage for resistance-type transmitter, typ.	3.3 V
Constant measurement current for resistance-type transmitter, typ.	1.25 mA
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
• Voltage	Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ
• Current	Yes; ±20 mA / 100 Ω ; 0 mA to 20 mA / 100 Ω ; 4 mA to 20 mA / 100 Ω
Resistance thermometer	Yes; Pt 100 / 10 MΩ
Resistance	Yes; 0 Ω to 600 Ω / 10 MΩ
Input ranges (rated values), voltages	Vee
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 kΩ
Input ranges (rated values), currents	Voc
• 0 to 20 mA	Yes 100 Ω
 Input resistance (0 to 20 mA) 	Yes
 -20 mA to +20 mA 	

Input ranges (rated values), resistance thermometer Yes - Input resistance (Pt 100) Yes - Input resistance (Pt 100) Yes - Input resistance (Pt 100) Yes - Input resistance (Pt 000) Yes - Input resistance (Yo 600 ohms) Yes parameterizable No Characteristic linearization or resistance thermometer - or resistance thermometer Pt 100 Cable length - for resistance thermometer Pt 100 Cable length - inforgrade channels (AO) 2 Voltage outputs integrade channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit protection Yes Output ranges, voltage Voltage output, short-circuit protectio
• Pt 100 Yes — Input resistance (P1 100) 10 MΩ Input ranges (rated values), resistons Yes • 0 to 600 ohms Yes — Input resistance (0 to 600 ohms) 10 MΩ Thermocouple (TC) Transpersative compensation — parameterizable No Otheracteristic linearization Yes; by software — for resistance thermometer Pt 100 Cable length Yes • shielded, max. 100 m Analog outputs Yes Integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage Yes • 0 to 10 V Yes • 0 to 10 V Yes • 0 to 20 mA Yes • 0 to 20 mA Yes • 0 to 20 mA Yes • 0 root of actuators Yes Connection of actuators Yes Connection of actuators Yes • or ont dage output four-wire connection Yes </td
Input resistance (Pt 100) 10 MΩ Input ranges (rated values), resistors Yes - Input resistance (0 to 600 ohms) 10 MΩ Thermocouple (TC) Temperature compensation parameterizable No Characteristic linearization For resistance thermometer - prior resistance thermometer Pt 100 Cable length 100 m Analog outputs 100 m Current output, short-circuit protection Yes Voltage output, short-circuit protection Yes Current output, no-load voltage, max. 14 V Output ranges, current Yes • 0 to 10 V Yes • 0 to 20 mA Yes • 0 to rovitage output two-wire connection Yes • 0 to 20 mA Yes • 0 to 20 mA Yes • 0 to 10 V Yes • 0 to 20 mA Yes • 0 to 10 V Yes • 0 to 20 mA Yes • 0 to 20 mA Yes • 0
Input ranges (rated values), resistors • 0 to 600 ohms Yes Input resistance (0 to 600 ohms) 10 MΩ Thermocouje (TC) Temperature compensation parameterizable No Characteristic linearization - parameterizable Yes, by software for resistance thermometer Pt 100 Cable length - • shielded, max. 100 m Analog outputs - integrated channels (AO) 2 Voltage output, short-circuit protection Yes • 0 to 10V Yes • 0 to 10V Yes • 0 to 20 mA Yes • 0 to 10V Yes • 0 to 20 mA Yes • 0 to 10V Yes • 0 to 20 mA Yes • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes
• 0 to 600 ohms Yes - Input resistance (0 to 600 ohms) 10 MΩ Thermocouple (TC) Inperature compensation - parameterizable No Characteristic linearization No - for resistance thermometer Pt 100 Cable length 100 m Analog outputs 100 m Integrated channels (AC) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, short-circuit current, max. 55 mA Current output, short-circuit current, max. 55 mA Output ranges, outputs Yes • 0 to 10 V Yes • 10 V to +10 V Yes Output ranges, outgate Yes • Outo 20 mA Yes • 20 mA Yes • 10 V to +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • 10 V ta +10 V Yes Output ranges, outgae output two-wire connection Yes • 10 V ta +10 V Yes • 10 V ta +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • 10 V tage output two-wire connection Yes •
Thermocouple (TC) Temperature compensation parameterizable No Characteristic linearization for resistance thermometer Pt 100 Cable length for resistance thermometer Valtage output, short-circuit protection Yes Voltage output, short-circuit protection Yes - O to 10 V Current output, no-load voltage, max. - 0 to 20 mA - 20 mA to + 20 mA - 20 mA to + 20 mA - 4 m A to 20 mA - 6 ro voltage output two-wire connection Yes Connection of actuators - for voltage output two-wire connection
Temperature compensation - parameterizable No Characteristic linearization - • parameterizable Yes; by software for resistance thermometer Pt 100 Cable length - • shielded, max. 100 m Analog outputs - integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage - • 0 to 10 V Yes • 0 to 20 mA Yes Output ranges, current - • 0 to 20 mA Yes Output ranges, current - • 0 to 20 mA Yes Connection of actuators - • for voltage output two-wire connection Yes Connection of actuators - • for voltage output scenaction Yes Load impedance (in rated range of output) - • with voltage outputs, capacitive load, max. 0.1 µF • with current outputs, max. 300 Ω <t< td=""></t<>
Characteristic linearization Yes; by software - for resistance thermometer Pt 100 Cable length - • shielded, max. 100 m Analog outputs - integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage - • 0 to 10 V Yes • 0 to 20 mA Yes Output ranges, current - • 0 to 20 mA Yes • 20 mA to +20 mA Yes • 20 mA to 20 mA Yes • 20 mA to 20 mA Yes • 20 mA to 20 mA Yes • Connection of actuators - • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes Load impedance (in rated range of output) - • with voltage outputs, max. 300 Q • with current outputs, inductive load, max. 0.1 µF • with current
$\begin{tabular}{ c c c c c } \hline \end{tabular} Ves; by software & Pt 100 & & & & & & & & & & & & & & & & & &$
— for resistance thermometer Pt 10 Cable length
Cable length 100 m Analog outputs 100 m Integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage - • 0 to 10 V Yes • 0 to 20 mA Yes Connection of actuators Yes Connection of actuators Yes • for voltage output two-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) IkQ • with voltage outputs, max. 0.1 μ F
• shielded, max. 100 m Analog outputs Integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage - • 0 to 10 V Yes • -10 V to +10 V Yes • -10 V to +10 V Yes • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 20 mA to +20 mA Yes • 10 voltage output two-wire connection Yes • 6 ro voltage output two-wire connection Yes • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes • for current output two-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) I kΩ • with voltage outputs, min. 1 kΩ • with voltage outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltage
Analog outputs integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage • • 0 to 10 V Yes • -10 V to +10 V Yes Output ranges, current • • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 20 mA to +20 mA Yes • Connection of actuators • • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes • for current output two-wire connection Yes • for current output two-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) • • with voltage output, capacitive load, max. 0.1 µF • with outputs, capacitive load, max. 0.1 mH Destruction limits against externally applied voltages and currents •
integrated channels (AO) 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage • 0 to 10 V • 0 to 10 V Yes • 10 V to +10 V Yes Output ranges, current • 0 to 20 mA • 0 to 20 mA Yes • 20 mA to +20 mA Yes • 10 voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes • for current output two-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents 0.1 mH
Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage 14 V • 0 to 10 V Yes • -10 V to +10 V Yes • -10 V to +10 V Yes • 0 to 20 mA Yes • 20 mA to +20 mA Yes • 4 mA to 20 mA Yes • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes • for voltage output four-wire connection Yes • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents 0.1 mH
Voltage output, short-circuit current, max. 55 mA Current output, no-load voltage, max. 14 V Output ranges, voltage 14 V • 0 to 10 V Yes • -10 V to +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • -20 mA to +20 mA Yes • -20 mA to +20 mA Yes • A mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes Load Impedance (in rated range of output) +//es • with voltage outputs, min. 1 kQ • with voltage outputs, max. 0.1 μ F • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents 0.1 mH
Current output, no-load voltage, max.14 VOutput ranges, voltage $4 V$ $0 \text{ to } 10 V$ Yes $-10 V \text{ to } +10 V$ Yes $0 \text{ to } 20 \text{ mA}$ Yes $0 \text{ to } 20 \text{ mA}$ Yes $-20 \text{ mA} \text{ to } +20 \text{ mA}$ Yes $-4 \text{ mA to } 20 \text{ mA}$ Yes $0 \text{ torustage output two-wire connection}$ Yes; Without compensation of the line resistances $0 \text{ for current output two-wire connection}$ Yes $0 \text{ torustage outputs, min.}$ $1 \text{ k}\Omega$ $0 \text{ with voltage outputs, capacitive load, max.}$ 0.1 µF $0 \text{ with current outputs, max.}$ 0.1 mH $0 \text{ bestruction limits against externally applied voltages and currents}$ 0.1 mH
Output ranges, voltage 0 to 10 V -10 V to +10 V Yes Output ranges, current 0 to 20 mA -20 mA to +20 mA Yes -20 mA to +20 mA Yes Connection of actuators $for voltage output two-wire connection Yes; Without compensation of the line resistances for voltage output four-wire connection Yes Load impedance (in rated range of output) \cdot with voltage outputs, min. \cdot with outrent outputs, capacitive load, max. 0.1 \ \muF \cdot with current outputs, inductive load, max. 0.1 \ \muF Destruction limits against externally applied voltages and currents $
• 0 to 10 VYes• -10 V to +10 VYesOutput ranges, current-0 to 20 mA• 0 to 20 mAYes• -20 mA to +20 mAYes• 4 mA to 20 mAYes• 6 ro voltage output two-wire connectionYes; Without compensation of the line resistances• for voltage output two-wire connectionNo• for current output two-wire connectionYesLoad impedance (in rated range of output)1 kΩ• with voltage outputs, capacitive load, max.0.1 μF• with current outputs, inductive load, max.0.1 mHDestruction limits against externally applied voltages and currents0.1 mH
• -10 V to +10 V Yes Output ranges, current • 0 to 20 mA • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes • 6 ro voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output four-wire connection Yes; Without compensation of the line resistances • for voltage output four-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) • • with voltage outputs, min. 1 kΩ • with voltage outputs, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH
Output ranges, current 0 to 20 mA -20 mA to ±20 mA +20 mA 4 mA to 20 mA Yes • 4 mA to 20 mA Yes • 6 mA to 20 mA Yes • Connection of actuators Yes; Without compensation of the line resistances • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output four-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) with voltage outputs, min. 1 kΩ with voltage outputs, capacitive load, max. 0.1 μF with current outputs, max. 0.1 mH Destruction limits against externally applied voltages and currents
• 0 to 20 mAYes• -20 mA to +20 mAYes• 4 mA to 20 mAYesConnection of actuatorsYes; Without compensation of the line resistances• for voltage output two-wire connectionYes; Without compensation of the line resistances• for voltage output four-wire connectionNo• for current output two-wire connectionYesLoad impedance (in rated range of output)Yes• with voltage outputs, min.1 kΩ• with voltage outputs, capacitive load, max.0.1 μF• with current outputs, max.300 Ω• with current outputs, inductive load, max.0.1 mHDestruction limits against externally applied voltages and currents
• -20 mA to +20 mAYes• 4 mA to 20 mAYesConnection of actuatorsYes; Without compensation of the line resistances• for voltage output two-wire connectionYes; Without compensation of the line resistances• for current output two-wire connectionNo• for current output two-wire connectionYes• for current output two-wire connectionYes• with voltage output, min.1 kΩ• with voltage outputs, capacitive load, max.0.1 μF• with current outputs, max.300 Ω• with current outputs, inductive load, max.0.1 mHDestruction limits against externally applied voltages and currents
• 4 mA to 20 mA Yes Connection of actuators - • for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output four-wire connection No • for current output two-wire connection Yes • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents Vestortent
Connection of actuators Yes; Without compensation of the line resistances • for voltage output four-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) Yes • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• for voltage output two-wire connection Yes; Without compensation of the line resistances • for voltage output four-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) Yes • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• for voltage output four-wire connection No • for current output two-wire connection Yes Load impedance (in rated range of output) I kΩ • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• for current output two-wire connection Yes Load impedance (in rated range of output) 1 kΩ • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH
Load impedance (in rated range of output) • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
Load impedance (in rated range of output) • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• with voltage outputs, capacitive load, max. 0.1 μF • with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
• with current outputs, max. 300 Ω • with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents
Destruction limits against externally applied voltages and currents
Current, max. 50 mA; Permanent
Cable length
• shielded, max. 200 m
Analog value generation for the inputs
Measurement principle Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel
Resolution with overrange (bit including sign), max.
Interference voltage suppression for interference frequency f1 in Hz 50 / 60 Hz
• Time constant of the input filter 0.38 ms
Basic execution time of the module (all channels 1 ms
released)
Analog value generation for the outputs
Integration and conversion time/resolution per channel
Resolution with overrange (bit including sign), max.
Conversion time (per channel)
Settling time
for resistive load 0.6 ms
for capacitive load 1 ms
for inductive load 0.5 ms

Encoder	
Connection of signal encoders	
for voltage measurement	Yes
 for current measurement as 2-wire transducer 	Yes; with external supply
for current measurement as 4-wire transducer	Yes
 for resistance measurement with two-wire connection 	Yes; Without compensation of the line resistances
 for resistance measurement with three-wire connection 	No
 for resistance measurement with four-wire connection 	No
Connectable encoders	
2-wire sensor	Yes
permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input	0.06 %
range), (+/-)	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), $(+/-)$	0.1 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.06 %
Operational error limit in overall temperature range	
 Voltage, relative to input range, (+/-) 	1 %
 Current, relative to input range, (+/-) 	1 %
 Resistance, relative to input range, (+/-) 	1 %
 Voltage, relative to output range, (+/-) 	1 %
Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
 Voltage, relative to input range, (+/-) 	0.8 %; Linearity error ±0.06 %
• Current, relative to input range, (+/-)	0.8 %; Linearity error ±0.06 %
 Resistance, relative to input range, (+/-) 	0.8 %; Linearity error ±0.2 %
• Resistance thermometer, relative to input range, (+/-)	0.8 %
 Voltage, relative to output range, (+/-) 	0.8 %
 Current, relative to output range, (+/-) 	0.8 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interfer	rence frequency
 Series mode interference (peak value of interference < rated value of input range), min. 	30 dB
Common mode interference, min.	40 dB
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch) RJ45
Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Interface types	
• RS 485	Yes
 Output current of the interface, max. 	200 mA
Protocols	
• MPI	Yes
PROFIBUS DP master	Yes
PROFIBUS DP device	Yes
Point-to-point connection	No
MPI	
• Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
Routing	Yes
— Global data communication	Yes

— S7 communication	Yes
- S7 communication	No; but via CP and loadable FB
— S7 communication, as server	Yes
PROFIBUS DP master	100
Transmission rate, max.	12 Mbit/s
max. number of DP devices	124
Services	
— PG/OP communication	Yes
- Routing	Yes
— Global data communication	No
- S7 basic communication	Yes; I blocks only
- S7 communication	Yes
- S7 communication, as client	No
- S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	No
- SYNC/FREEZE	Yes
 activation/deactivation of DP devices 	Yes
 max. number of DP devices that can be activated/deactivated at the same time 	8
 Direct data exchange (slave-to-slave communication) 	Yes; as subscriber
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
1st interface / PROFIBUS DP device / header	
 Transmission rate, max. 	12 Mbit/s
automatic baud rate search	Yes; only with passive interface
Address area, max.	32
User data per address area, max.	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
 Global data communication S7 basic communication 	No
- S7 basic communication	Yes
 S7 communication, as client S7 communication, as server 	No Ves: Connection configured on one side only
 — S7 communication, as server — Direct data exchange (slave-to-slave 	Yes; Connection configured on one side only Yes
- Direct data exchange (slave-to-slave communication) - DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
2. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Interface types	
RJ 45 (Ethernet)	Yes
Number of ports	2
 integrated switch 	Yes
Protocols	
• MPI	No
PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality

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	Van Alas simultanoouslu with 10 Controllas functionality
PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
PROFINET CBA	Yes
PROFIBUS DP master	No
PROFIBUS DP device	No
Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
- PG/OP communication	Yes
- Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32
— Isochronous mode	Yes; OB 61
— IRT	Yes
— Shared device	Yes
— Prioritized startup	Yes
 — Number of IO devices with prioritized startup, max. 	32
 — Number of connectable IO Devices, max. 	128
 — Of which IO devices with IRT, max. 	64
— of which in line, max.	64
 — Number of IO Devices with IRT and the option "high flexibility" 	128
— of which in line, max.	61
 — Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	128
 Activation/deactivation of IO Devices 	Yes
 — Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 IO Devices changing during operation (partner ports), supported 	Yes
 — Number of IO Devices per tool, max. 	8
 — Device replacement without swap medium 	Yes
— Send cycles	250 $\mu s,$ 500 $\mu s,$ 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)
— Updating time	$250~\mu s$ to $512~m s$ (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details)
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
 — Number of IO Controllers with shared device, max. 	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
— User data per submodule, max.	1 024 byte
PROFINET CBA	
acyclic transmission	Yes
cyclic transmission	Yes

Open IE communication	
•	8
 Number of connections, max. Local port numbers used at the system end 	8 0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532,
Keep-alive function, supported	65533, 65534, 65535 Yes
Protocols	
PROFIsafe	No
Redundancy mode	
Media redundancy	
— Switchover time on line break, typ.	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
— Data length for connection type 01H, max.	1 460 byte
— Data length for connection type 11H, max.	32 768 byte
- several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
— Data length, max.	1 472 byte
Web server	
supported	Yes
User-defined websites	Yes
Number of HTTP clients	5
communication functions / header	.
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
	Yes
supported	8
Number of GD loops, max.	8
Number of GD packets, max.	8
Number of GD packets, transmitter, max.	
Number of GD packets, receiver, max.	8 20 http:
Size of GD packets, max.	22 byte
Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• supported	Yes
User data per job, max.	76 byte
 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	
supported	Yes
• as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB
• User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
S5 compatible communication	
supported	Yes; via CP and loadable FC
communication functions / PROFINET CBA (with set target commu	unication load) / header
 Setpoint for the CPU communication load 	50 %
Number of remote interconnection partners	32
 number of master/device functions 	30
 total of all master/device connections 	1 000
 data length of all incoming master/device connections, max. 	4 000 byte
 data length of all outgoing master/device connections, max. 	4 000 byte
 Number of device-internal and PROFIBUS interconnections 	500

 Data length of device-internal und PROFIBUS interconnections, max. 	4 000 byte
Data length per connection, max.	1 400 byte
performance data / PROFINET CBA / remote interconnection	•
— Sampling interval, min.	500 ms
— Number of incoming interconnections	100
 Number of outgoing interconnections 	100
 — Data length of all incoming interconnections, max. 	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	1 400 byte
performance data / PROFINET CBA / remote interconnection /	
— Transmission frequency: Transmission interval, min.	10 ms
— Number of incoming interconnections	200
— Number of outgoing interconnections	200
 Data length of all incoming interconnections, max. 	
	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte
— Data length per connection, max.	450 byte
performance data / PROFINET CBA / HMI variables via PROF	
 — Number of stations that can log on for HMI variables (PN OPC/iMap) 	3; 2x PN OPC/1x iMap
— HMI variable updating	500 ms
— Number of HMI variables	200
— Data length of all HMI variables, max.	2 000 byte
performance data / PROFINET CBA / PROFIBUS proxy function	
— supported	Yes
— Supported — Number of linked PROFIBUS devices	16
	240 byte; Slave-dependent
— Data length per connection, max. Number of connections	240 byte, Slave-dependent
	10
overall	12
usable for PG communication	11
- reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	11
usable for OP communication	11
 reserved for OP communication 	1
 — adjustable for OP communication, min. 	1
 adjustable for OP communication, max. 	11
 usable for S7 basic communication 	8
 reserved for S7 basic communication 	0
 adjustable for S7 basic communication, min. 	0
 adjustable for S7 basic communication, max. 	8
 usable for S7 communication 	10
- reserved for S7 communication	0
— adjustable for S7 communication, min.	0
— adjustable for S7 communication, max.	10
• total number of instances, max.	32
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max.
	14; X2 as PROFINET: 24 max.
S7 message functions	
Number of login stations for message functions, max.	12; 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	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
- of which status variables, max.	30
or milon otatuo vanabioo, max.	

Second	— of which control variables, max.	14
• corong Yes • corong Liquits.outputs • Number of variables, max. 10 • present Yes • number of orbites, max. 500 - adjustable No - of which powerfaile proof 100, Only the last 100 entries are retained • Number of orbites, max. 500 - adjustable No - of which powerfaile nRUN, max, 499 - adjustable Yes • ento bread out Yes • ento bread out Yes • fatter adjustable Yes <td></td> <td></td>		
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Dagenotic buffer - • Interset Yes • Number of entiles, max. 500 adjustable No • - of witch powerfail exord 100. Only the last 100 entiles are rehained • - of witch powerfail exord 100. Only the last 100 entiles are rehained • - adjustable Yes: From 10 be 499 preset 10 • And he read out Yes • Outrengts ediagnetize interaction fromation Intergrate ediagnetize interaction fromation • Status indector dyalin output (green) Yes • Status indector dyalin output (green) Yes • Status indector dyalin output (green) Yes • Number of frequency, max. 60 kHz Frequency measurement Yes • Number of frequency meters 4, See "Technological Functions" manual) • Outroting frequency. Yes • Number of frequency meters Yes • Number of puilse outputs Yes • Number of puilse outputs Yes • Determal separation digital inputs Yes • Potential separation digital inputs Yes <td< td=""><td></td><td></td></td<>		
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	-	
499		
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Service data Yes • can be read out Yes Diagnosticination IED • • Status indicator digital put (green) Yes • Status indicator digital put (green) Yes • Counter • Status indicator digital put (green) Yes • Number of counters • See "Technological Functions" manual • Counter frequency measurement Yes • Number of frequency measurement Yes • Number of pute outputs 4: up to 60 kHz Frequency measurement Yes • Number of pute outputs 4: Pute with modulation up to 2.5 kHz (see "Technological Functions" manual) • Discontroller (see sequence) Yes • Discontroller outputs 4: Pute with modulation up to 2.5 kHz (see "Technological Functions" manual) • Discontroller outputs 4: Pute with modulation up to 2.5 kHz (see "Technological Functions" manual) • Discontroller outputs Yes • Discontroli discont digital outputs Yes	-	
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Diagonalistics indicator digital input (green) Yes • Status indicator digital output (green) Yes • Number of counters 4; See "Technological Functions" manual • Counting 60 kHz • Number of frequency max 60 kHz • Number of frequency means 4; See "Technological Functions" manual • Countrill Yes • Number of frequency means 4; up to 80 kHz (see "Technological Functions" manual) • Countroller Yes • Number of frequency means 4; up to 80 kHz (see "Technological Functions" manual) Proteontoller Yes • Number of pulse outputs Yes • Umit frequency (use) 2.5 kHz (see "Technological Functions" manual) Potential separation digital inputs Yes • Potential separation digital inputs Yes • Deterement the channels and backplane bus Yes • Detertial separation digital outputs		
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Manual) Limit frequency (pulse) 2.5 kHz Potential separation 2.5 kHz Potential separation digital inputs Yes Potential separation digital inputs Potential separation digital inputs Ves Potential separation digital outputs Yes Potential separation analog inputs Yes; common for analog I/O between the channels and backplane bus Yes Potential separation analog inputs Yes; common for analog I/O between the channels No between the channels No Potential separation analog outputs Yes; common for analog I/O between the channels and backplane bus Yes Potential separation analog outputs Yes; common for analog		
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• Potential separation digital inputs Yes • between the channels No • between the channels and backplane bus Yes Potential separation digital outputs Yes • Potential separation digital outputs Yes • Potential separation digital outputs Yes • between the channels, in groups of & • between the channels, in groups of & • between the channels and backplane bus Yes • Potential separation analog inputs Yes; common for analog I/O • between the channels and backplane bus Yes; common for analog I/O • between the channels and backplane bus Yes; common for analog I/O • between the channels and backplane bus Yes; common for analog I/O • between the channels and backplane bus Yes; common for analog I/O • between the channels No • between the channels No • between the channels and backplane bus Yes; Potential separation analog outputs Yes; common for analog I/O • between the channels No • between the channels No • between the channels and backplane bus Yes Isolation 600 V DC Ambient conditions 0 °C • min. 0 °C • mix. 60 °C <td>Potential separation</td> <td></td>	Potential separation	
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• Potential separation analog outputs Yes; common for analog I/O • between the channels No • between the channels and backplane bus Yes Isolation Yes Isolation tested with 600 V DC Ambient conditions Ambient temperature during operation • min. 0 °C • max. 60 °C configuration / header 60 °C Configuration software Yes; V5.5 or higher • STEP 7 Yes; V5.5 or higher • Command set see instruction list	 between the channels and backplane bus 	Yes
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Isolation tested with 600 V DC Ambient conditions Ambient temperature during operation min. max. 60 °C configuration / header Configuration software STEP 7 Yes; V5.5 or higher configuration / programming / header Command set see instruction list 		Yes
Ambient conditions Ambient temperature during operation • min. 0 °C • max. 60 °C configuration / header Configuration software • STEP 7 Yes; V5.5 or higher configuration / programming / header • Command set see instruction list	Isolation	
Ambient temperature during operation • min. 0 °C • max. 60 °C configuration / header Configuration software • STEP 7 Yes; V5.5 or higher configuration / programming / header • Command set see instruction list		600 V DC
• min. 0 °C • max. 60 °C configuration / header 60 °C Configuration software Yes; V5.5 or higher • STEP 7 Yes; V5.5 or higher configuration / programming / header see instruction list	Ambient conditions	
• max. 60 °C configuration / header Configuration software • STEP 7 Yes; V5.5 or higher configuration / programming / header • Command set see instruction list	Ambient temperature during operation	
configuration / header Configuration software • STEP 7 Yes; V5.5 or higher configuration / programming / header • Command set see instruction list	● min.	0 °C
Configuration software • STEP 7 Yes; V5.5 or higher configuration / programming / header • Command set see instruction list	• max.	60 °C
	configuration / header	
configuration / programming / header • Command set see instruction list	Configuration software	
Command set see instruction list	• STEP 7	Yes; V5.5 or higher
	configuration / programming / header	
Nesting levels 8	Command sot	
		see instruction list

 System functions (SFC) 	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
 User program protection/password protection 	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	730 g
la cé ma difical	

last modified:

12/8/2024 🖸