# **AC500** Key features



04

#### AC500 CPUs

- 2 internal serial interfaces, RS232 / RS485 configurable
- Display and 8 function keys for diagnosis and status
- Centrally expandable with up to 10 I/O modules, 320 I/Os (S500 and/or S500-eCo modules allowed)
- Simultaneous operation of up to 4 external communication modules in any desired combination
- Optional SD card for data storage and program backup
- Can also be used as slave on PROFIBUS DP, CANopen or PROFINET IO using CM582-DP, CM588-CN, CM589-PNIO or CM589-PNIO-4 communication modules
- Ethernet version provides web server and IEC 60870-5-104 remote control protocol

Program memory kB	Cycle time in µs per instruction min. Bit/Word/Float. point	e time in µs Integrated communication nstruction min. Vord/Float. point (0.09 (0.7 2 y serial		Order code	Price	Weight (1 pce) kg
128	0.06 / 0.09 / 0.7	2 x serial	PM572	1SAP130200R0200		0.135
512	0.06 / 0.09 / 0.7	Ethernet (1), 2 x serial	PM573-ETH	1SAP130300R0271		0.150
512	0.05 / 0.06 / 0.5	2 x serial	PM582	1SAP140200R0201		0.135
1024	0.05 / 0.06 / 0.5	Ethernet (1), 2 x serial	PM583-ETH	1SAP140300R0271		0.150
1024	0.004 / 0.008 / 0.008	Ethernet (1), 2 x serial	PM585-ETH	1SAP140500R0271		0.150
2048	0.002 / 0.004 / 0.004	Ethernet (1), 2 x serial	PM590-ETH	1SAP150000R0271		0.150
2048	0.002 / 0.004 / 0.004	ARCNET BNC, 2 x serial	PM590-ARCNET	1SAP150000R0261		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (1), 2 x serial	PM591-ETH	1SAP150100R0271		0.150
4096	0.002 / 0.004 / 0.004	2 x Ethernet (1), 1 x serial	PM591-2ETH (3)	1SAP150100R0277		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (1), 2 x serial	PM592-ETH (2)	1SAP150200R0271		0.150

#### AC500 Machine controller kits

Complete product bundle providing all the needed devices for a machine controller delivered under one single order code

Program memory kB	Cycle time in µs per instruction min. Bit/Word/Float. point	ycle time in µs Contents / Integrated communication T er instruction min. it/Word/Float. point		Order code	Price	Weight (1 pce) kg
1024	0.004/0.008/0.008	PM585-ETH, CM579-ETHCAT, TB511-ETH Ethernet (1), 2 x serial, EtherCAT Master	PM585-MC-KIT	1SAP140500R0379		0.500
2048	0.002 / 0.004 / 0.004	PM590-ETH, CM579-ETHCAT, TB521-ETH, TA524 Ethernet (1), 2 x serial, EtherCAT Master	PM590-MC-KIT	1SAP150000R0379		0.500

(1) Provides integrated web server and IEC 60870-5-104 remote control protocol on each interface independently.

(2) Provides integrated 4 GB flashdisk for user data storage and data logging.

(3) Only to be used with dedicated terminal base TB523-2ETH.





PM572

PM592



PM585-MC-KIT

Ordering data

#### AC500 CPU PM595

- 2 Ethernet interfaces with integrated switch and software configurable protocol (PROFINET, EtherCAT or Ethernet e.g. Modbus TCP)
- 2 independent Ethernet interfaces for programming, online access, web server, Modbus TCP, IEC 60870-5-104 protocol e.g.
- 2 serial interfaces, RS232 / RS485 configurable
- Centrally expandable with up to 10 I/O modules (S500 and/or S500-eCo modules allowed)
- Simultaneous operation of up to 2 external communication modules in any desired combination, no need of additional terminal base

Program memory MB	Cycle time in µs Integrated communication per instruction min. Bit/Word/Float. point		Туре	Order code	Price	Weight (1 pce) kg
16	0.0006/0.001/0.001	2 x Ethernet for Fieldbus (2 Ports switch), 2 x Ethernet (1), 2 x serial	PM595-4ETH-F (2)	1SAP155500R0279		1.050

(1) Provides integrated web server and IEC 60870-5-104 remote control protocol on each interface independently.
 (2) Provides integrated 4 GB flashdisk for user data storage and data logging.



PM595-4ETH-F

Ordering data

#### Terminal base

- For mounting and connection of the CPUs and communication modules, not needed for PM595
- 1 to 4 plug-in communication modules
- Connection for communication coupler integrated in the CPU
- I/O interface for direct connection of up to 10 expansion modules
- Fieldbus-neutral FieldBusPlug-Slave interface not for TB523-2ETH
- Connection COM1: 9-pole pluggable terminal block
- Connection COM2: D-Sub 9 (not for TB523-2ETH).

Number of coupler slots	Connection for coupler integrated in the CPU	Туре	Order code	Price	Weight (1 pce) kg
1	ARCNET BNC	TB511-ARCNET (2)	1SAP111100R0260		0.215
2	ARCNET BNC	TB521-ARCNET (2)	1SAP112100R0260		0.215
1	Ethernet RJ45	TB511-ETH	1SAP111100R0270		0.215
2	Ethernet RJ45	TB521-ETH	1SAP112100R0270		0.215
2	2x Ethernet RJ45	TB523-2ETH (1)	1SAP112300R0277		0.250
4	Ethernet RJ45	TB541-ETH	1SAP114100R0270		0.215

Note: These TBs are compatible with previous AC500 CPU versions (R01xx) and new ones (R02xx).

(1) Can only be used together the PM591-2ETH.

(2) Can be only used with PM590-ARCNET CPU.



TB511-ETH



TB541-ETH

Ordering data

#### AC500 Condition Monitoring CMS

- PLC integrated condition monitoring and fast protection for high frequency signals (vibration, current, voltage, speed/encoder)
- FM502-CMS module needs function module terminal base TF5x1 for direct interfacing to CPU, communication couplers, other I/O
- for stand-alone or control/safety integrated condition monitoring
- PM592 CPU to be used on same TF5x1 for data storage and signal processing or communication
- C-code interface for own complex diagnosis algorithmns, 4GB Flash disk for raw fingerprints and indicator trending
- FM502-CMS module:
- 16 fast, precise analog inputs, all synchronously sampled; configurable as IEPE or +-10V
- individual measurement configuration (start, stop, trigger) per channel
- per channel up to 50ksamples/s and 24bit ADC resolution, adjustable sampling
- encoder inputs (5V or 24V) up to 300kHz counter; 12 modes, incl. absloute SSI (1MHz)
- fast data logging, compact WAV-Files delivered automatically to CPU, incl. synchronized encoder signal if configured
- analogue values always available for fast protection in I/O image of CPU
- Included in Automation Builder: Configuration, libraries for CMS control and wav file handling, examples
- Available download package: Signal processing library, example programs with simple diagnosis, logging and automated triggering (2)

Number of coupler slots	Description	Туре	Order code	Price	Weight (1 pce) kg
n.a.	Function Module for Condition Monitoring Systems, 16AI, 2DI, 2DC, 1x Encoder (A, B, Z)	FM502-CMS	1SAP260400R0001		0.215
0	Function module terminal base for FM502, no coupler slots, 1x ETHERNET, 1x serial, spring terminals, 24 V DC	TF501-CMS (1)	1SAP117000R0271		0.350
2	Function module terminal base for FM502, 2x coupler slots, 1x ETHERNET, 1x serial, spring terminals, 24 V DC	TF521-CMS (1)	1SAP117200R0271		0.400

(1) Can only be used together with FM502 and PM592-ETH

(2) Download of Package under "Application Examples" at www.abb.com/plc





FM502-CMS





TF521-CMS

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### AC500

Ordering data

#### AC500 V3 CPUs

- 1x internal serial interface, RS232 / RS485 configurable (ACSII or Modbus RTU Master/Slave)
- 2x independant Ethernet interfaces which can also be used as switch and software configurable protocols like ModbusTCP, PROFINET IO Controller (2)(3), Ethernet IP Adapter (2)(3), EtherCAT Master (2)(3), IEC60870-5-104 or IEC61850 (3)
- Web server with WebVisu HTML5 Remove RTV for use with CP600 with Web interface
- 1x internal CAN interface, with CANopen Master/Slave (2), CAN 2A/2B and J1939 protocols
- Display and 8 function keys for diagnosis and status
- Centrally expandable with up to 10 I/O modules, 320 I/Os (S500 and/or S500-eCo modules allowed)
- · Simultaneous operation of several external communication modules in any desired combination
- To be used exclusivelly with new TB56xx-2ETH
- Optional SD card for data storage and program backup
- To be used only with Automation Builder 2.x

Program and Data memory MB	Cycle time in µs per instruction min. Bit/Word/Float. point	Integrated communication	Туре	Order code	Price	Weight (1 pce) kg
8	0.020 / 0.020 / 0.120	2 x Ethernet with configurable protocols PROFINET IO Controller (2)(3) / EtherCAT Master (2)(3) or EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5630-2ETH (1) (4)	1SAP131000R0278		0.135
80	0.010 / 0.010 / 0.010	2 x Ethernet with configurable protocols PROFINET IO Controller (2)(3) / EtherCAT Master (2)(3) or EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5650-2ETH (1) (4)	1SAP141000R0278		0.135
160	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocols PROFINET IO Controller (2) / EtherCAT Master (2) or EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5670-2ETH (1) (4)	1SAP151000R0278		0.135
160 / 8GB Flash disk	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocols PROFINET IO Controller (2) / EtherCAT Master (2) or EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5675-2ETH (1) (4)	1SAP151500R0278		0.150

(1) Ethernet communication provides integrated web server, IEC 60870-5-104 remote control protocol and OPC UA Server on each interface independently.

(2) In preparation

(3) Some communication protocols are licensed see following lines

(4) Only to be used with dedicated terminal base TB56xx-2ETH







— РМ5630-2ЕТН

PM5650-2ETH

PM5670**-**2ETH



PM5675-2ETH

#### **Feature licenses**

Some HW or FW features need to be licensed to be used on the new CPU. Which allows:

more flexibility

better adaptation to the needs

License Type	CPU runtime license to be used on internal Ethernet interface	Туре	Order code
HW	Modbus TCP HA runtime license	PS5601-HA-MTCP	1SAP195400R0101
HW	IEC 61850 protocol runtime license	PS5602-61850	1SAP195600R0101
HW	Runtime license for KNX controller	PS5604-KNX	1SAP195800R0101
нw	BACnet protocol B-BC; runtime license (1)	PS5607-BACnet-BC	1SAP195550R0101

(1) In preparation

Ordering data

#### AC500 V3 Terminal base

- For mounting and connection of the AC500 V3 CPUs only and communication modules
- 0, 1, 2, 4 or up to 6 (2) plug-in communication modules
- Connection for communication coupler integrated in the CPU
- I/O interface for direct connection of up to 10 expansion modules
- Connection COM1: 9-pole pluggable spring terminal block
- Connection CAN: 2x 5-pole pluggable spring terminal block
- 2x RJ45 Ethernet interfaces with configurable switch functionality

Number of coupler slots	Connection for coupler integrated in the CPU	Туре	Order code	Price	Weight (1 pce) kg
0	2x RJ45 for Ethernet, 1x serial COM1 with	TB5600-2ETH	1SAP110300R0278		0.165
1	pluggable spring connector and 1x2x5 poles	TB5610-2ETH	1SAP111300R0278		0.190
2	interface	TB5620-2ETH	1SAP112300R0278		0.215
4		TB5640-2ETH	1SAP114300R0278		0.265
6	-	TB5660-2ETH (2)	1SAP116300R0278		0.315

2) In preparation









TB5600-2ETH

TB5610-2ETH

TB5620-2ETH

TB5640-2ETH

### **AC500** Ordering data

#### **Communication modules**

Protocol	Connections	CPU V3 Support	Туре	Order code	Price	Weight (1 pce) kg
PROFIBUS DP V0/V1 master	D-Sub 9	-	CM592-DP	1SAP173200R0001		0.115
PROFIBUS DP V0/V1 slave	D-Sub 9	-	CM582-DP	1SAP172200R0001		0.115
Ethernet (TCP/IP, UDP/IP, Modbus TCP)	2 x RJ45 - integrated switch	-	CM597-ETH	1SAP173700R0001		0.115
CANopen master	Terminal block 2 x 5 poles spring	(1)	CM598-CN	1SAP173800R0001		0.115
CANopen slave	Terminal block 2 x 5 poles spring	-	CM588-CN	1SAP172800R0001		0.115
PROFINET I/O RT controller	2 x RJ45 - integrated switch	Yes	CM579-PNIO	1SAP170901R0101		0.115
PROFINET IO RT device	2 x RJ45 - integrated switch	(2)	CM589-PNIO	1SAP172900R0011		0.115
PROFINET IO RT with 4 devices	2 x RJ45 - integrated switch	(2)	CM589-PNIO-4	1SAP172900R0111		0.115
EtherCAT master	2 x RJ45	Yes	CM579-ETHCAT	1SAP170902R0101		0.115
Serial + co-processor	2 x RS-232/485 on spring terminal blocks	-	CM574-RS	1SAP170400R0201		0.115
Serial RCOM	2 x RS-232/485 (1 x RCOM/1 x Console)	-	CM574-RCOM	1SAP170401R0201		0.115

(1) Only with CAN 2A/2B protocol(2) In preparation







CM592-DP

CM574-RCOM

CM574-RS

CM579-PNIO

#### I/O modules

- Hot swap capable when mounted on hot swap terminal unit
- For central expansion of the AC500 or AC500-eCo CPUs
- For decentralized expansion in combination with communication interface modules on CS31, PROFINET IO, EtherCAT, Modbus TCP, PROFIBUS DP, CANopen modules
- DC and AC: Channels can be configured individually as inputs or outputs
- Plug-in electronic modules, terminal unit required (refer to table below).

#### Digital I/O

Number of	Input signal	Output type	Output signal	Terminal units	Туре	Order code	Price	Weight
DI/DO/DC				Screw / Spring				(1 pce) kg
32/-/-	24 V DC	-	-	TU515 / TU516	DI524	1SAP240000R0001		0.200
-/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC522	1SAP240600R0001		0.200
-/-/24	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC523	1SAP240500R0001		0.200
16/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC532	1SAP240100R0001		0.200
8/8/-	24 V DC	Relay	230 V AC, 3 A (2)	TU531 / TU532	DX522	1SAP245200R0001		0.300
8/4/-	230 V AC	Relay	230 V AC, 3 A (2)	TU531 / TU532	DX531	1SAP245000R0001		0.300
-/32/-	-	Transistor	24 V DC, 0.5 A	TU515 / TU516	DO524	1SAP240700R0001		0.200
-/8/-	-	Transistor	24 V DC, 2 A	TU541 / TU542	DO526	1SAP240800R0001		0.200
(2) Delau autor								

(2) Relay outputs, changeover contacts



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Ordering data

### Analog I/O

Number of	Input signal	Output signal	Terminal units Screw / Spring	Туре	Order code	Price	Weight (1 pce)
AI/AO/AC							kg
16/0/0	010 V, ±10 V	-	TU515 / TU516	AI523	1SAP250300R0001		0.200
4/4/0	0/420 mA, PT100, PT1000, Ni1000	±10 V	TU515 / TU516	AX521	1SAP250100R0001		0.200
0 / 0 / 8 (max. 4 current outputs)		0/420 mA	TU515 / TU516	AC522 (1)	1SAP250500R0001		0.200
8 / 8 / 0 (max. 4 current outputs)			TU515 / TU516	AX522	1SAP250000R0001		0.200
0 / 16 / 0 (max. 8 current outputs)	-	-	TU515 / TU516	AO523	1SAP250200R0001		0.200
8/0/0	05 V, 010 V, ±50 mV, ±500 mV, 1 V, ±5 V, ±10 V, 0/420 mA, ±20 mA, PT100, PT1000, Ni1000, Cu50, 050 kΩ, S, T, N, K, J	-	TU515 / TU516	AI531	1SAP250600R0001		0.200
(4) 1							

(1) In preparation

#### Analog/digital mixed I/O

Number of	Input signal	Output type	Output signal	Terminal unit Screw / Spring	Туре	Order code	Price	Weight (1 pce)
AI/AO/DI/DO/DC								kg
4/2/16/-/8	24 V DC/010 V, -10+10 V, 020 mA, 420 mA,	Transistor	24 V DC, 0.5 A/ -10+10 V,	TU515 / TU516	DA501	1SAP250700R0001		0.200
4/2/-/16/8	PT100, PT1000, Ni100, Ni1000		020 mA, 420 mA	TU515 / TU516	DA502 (1)	1SAP250800R0001		0.200

(1) In preparation

#### Multifunctional modules

#### • Not hot swap capable

Functionality	Number of	Input signal	Output type	Output signal	Terminal units Screw / Spring	Туре	Order code	Price	Weight (1 pce)
	DI/DO/DC								kg
Encoder and PWM module	2/-/8	24 V DC and 2 encoder inputs A/B/C differential	2 PWM outputs	24 V DC, 0.1 A	TU515 / TU516	CD522	1SAP260300R0001		0.125
Positioning module	0/8/0	4 inputs 010 V for position feedback	4 H-bridge outputs	24 V DC, 4 A	TU541 / TU542	PD501-4CH (1)	1SAP260100R0001		0.200

(1) In preparation

#### Fast I/O module for direct mounting on the terminal base of the AC500 CPU

Functionality	Number of	Input signal	Output type	Output signal	Terminal unit	Туре	Order code	Price	Weight (1 pce)
	DI/DO/DC								kg
Interrupt I/O and fast counter	-/-/8	24 V DC	Transistor	24 V DC, 0.5 A	N/A (2)	DC541-CM (1)	1SAP270000R0001		0.100

Multifunctional module, refer to table on page 110 for details. Terminal block for I/O signal connection included.
 Occupies a communication module slot.











AO523

AI531

DA501

CD522

DC541-CM

Ordering data

### Communication interface modules

Transis Transis +10 V, 20 mA, 00, Ni100, Transis +10 V, 20 mA, 00, Ni100, Transis	tor 24 V DC, 0.1 tor 24 V DC, 0.1 tor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA tor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA tor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA	5 A TU551-CS31 TU552-CS31 5 A TU551-CS31 TU552-CS31 5 A/ TU551-CS31 TU552-CS31 5 A/ TU552-CS31 5 A/ TU509/TU51 TU517/TU51 1)	<ul> <li>/ DC551-CS31</li> <li>/ CI590-CS31-HA</li> <li>/ CI592-CS31</li> <li>/ CI592-CS31</li> <li>CI541-DP</li> </ul>	1SAP220500R0001 1SAP221100R0001 1SAP221200R0001 1SAP224100R0001		0.200
Transis Transis +10 V, 20 mA, 00, Ni100, Transis +10 V, 20 mA, 00, Ni100, Transis	ttor 24 V DC, 0.1 ttor 24 V DC, 0.1 ttor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA ttor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA ttor 24 V DC, 0.1 -10+10 V, 020 mA, 420 mA	5 A TU551-CS31 TU552-CS31 5 A TU551-CS31 TU552-CS31 5 A/ TU551-CS31 TU552-CS31 5 A/ TU552-CS31 5 A/ TU509/TU51 TU517/TU51 1)	<ul> <li>/ DC551-CS31</li> <li>/ CI590-CS31-HA</li> <li>/ CI592-CS31</li> <li>/ CI592-CS31</li> <li>CI541-DP</li> </ul>	1SAP220500R0001 1SAP221100R0001 1SAP221200R0001 1SAP224100R0001		0.200
Transi: +10 V, 20 mA, 00, Ni100, 20 mA, 20 mA, 00, Ni100, Transi:	ttor 24 V DC, 0.9 -10+10 V, 020 mA, 420 mA -10+10 V, 020 mA, 420 mA -10+10 V, 020 mA, -10+10 V, 020 mA, 420 mA	5 A TU551-CS31 TU552-CS31 5 A/ TU551-CS31 TU552-CS31 5 A/ TU509/TU51 TU517/TU51 1)	<ul> <li>/ CI590-CS31-HA</li> <li>/ CI592-CS31</li> <li>/ CI592-CS31</li> <li>CI541-DP</li> </ul>	1SAP221100R0001 1SAP221200R0001 1SAP224100R0001		0.200
Transi: +10 V, 20 mA, 00, Ni100, Transi: +10 V, 20 mA, 00, Ni100, Transi:	ttor 24 V DC, 0. -10+10 V, 020 mA, 420 mA ttor 24 V DC, 0. -10+10 V, 020 mA, 420 mA ttor 24 V DC, 0. ttor 24 V DC, 0.	5 A/ TU551-CS31 TU552-CS31 5 A/ TU509/TU51 TU517/TU51 1)	<ul> <li>/ CI592-CS31</li> <li>10/ CI541-DP</li> <li>8</li> </ul>	1SAP221200R0001		0.200
Transi: +10 V, 20 mA, 00, Ni100, Transi:	ttor 24 V DC, 0.9 -10+10 V, 020 mA, 420 mA (	5 A/ TU509/TU51 TU517/TU51 1)	10/ CI541-DP 8	1SAP224100R0001		0.200
Transi: +10 V, 20 mA, 00, Ni100, Transi:	ttor 24 V DC, 0.9 -10+10 V, 020 mA, 420 mA ( 	5 A/ TU509/TU51 TU517/TU51 1)	10/ CI541-DP 8	1SAP224100R0001		0.200
Transis	tor 24 V DC, 0.					0.200
		5 A TU509/TU51 TU517/TU51	10/ CI542-DP 8	1SAP224200R0001		0.200
Transi: +10 V, 20 mA, 00, Ni100,	tor 24 V DC, 0.: -10+10 V, 020 mA, 420 mA	5 A/ TU509/TU51 TU517/TU51	10/ CI581-CN 8	1SAP228100R0001		0.200
Transi	tor 24 V DC, 0.	5 A TU509/TU51 TU517/TU51	10/ CI582-CN 8	1SAP228200R0001		0.200
therCAT						
Transi: +10 V, 20 mA, 00, Ni100,	tor 24 V DC, 0.: -10+10 V, 020 mA, 420 mA	5 A / TU507-ETH , TU508-ETH	/ CI511-ETHCAT	1SAP220900R0001		0.200
Transi	tor 24 V DC, 0.	5 A TU507-ETH , TU508-ETH	/ CI512-ETHCAT	1SAP221000R0001		0.200
ROFINET IO RT						
Transi: +10 V, 20 mA, 00, Ni100,	tor 24 V DC, 0.3 -10+10 V, 020 mA, 420 mA	5 A/ TU507-ETH , TU508-ETH	/ CI501-PNIO	1SAP220600R0001		0.200
Transi	tor 24 V DC, 0.	5 A TU507-ETH , TU508-ETH	/ CI502-PNIO	1SAP220700R0001		0.200
1odbus TCP						
Transis .+10 V, 20 mA, 00, Ni100,	tor 24 V DC, 0. -10+10 V, 020 mA, 420 mA	5 A/ TU507-ETH , TU508-ETH	CI521-MODTCP	1SAP222100R0001		0.200
Transi	tor 24 V DC, 0.	5 A TU507-ETH , TU508-ETH	CI522-MODTCP	1SAP222200R0001		0.200
0 1	Transis +10 V, .20 mA, 0, Ni100, Transis odbus TCP Transis +10 V, .20 mA, 0, Ni100, Transis	Transistor         24 V DC, 0.           +10 V,         -10+10 V,           .20 mA,         020 mA,           .0, Ni100,         420 mA           Transistor         24 V DC, 0.           odbus TCP         Transistor           +10 V,         -10+10 V,           .20 mA,         020 mA           0, Ni100,         420 mA           +10 V,         -10+10 V,           .20 mA,         020 mA,           0, Ni100,         420 mA           Transistor         24 V DC, 0.	Transistor         24 V DC, 0.5 A/ -10+10 V, .20 mA,         TU507-ETH, TU508-ETH,           .20 mA,         020 mA, 0, Ni100,         420 mA           Transistor         24 V DC, 0.5 A         TU507-ETH, TU508-ETH,           odbus TCP         Transistor         24 V DC, 0.5 A/ TU507-ETH,           *10 V, .20 mA,         020 mA, 020 mA,         TU507-ETH, TU508-ETH           .20 mA,         020 mA, 020 mA,         TU507-ETH, TU508-ETH           Transistor         24 V DC, 0.5 A/ 120 mA         TU507-ETH, TU508-ETH           Transistor         24 V DC, 0.5 A         TU507-ETH, TU508-ETH	Transistor         24 V DC, 0.5 A/ -10+10 V, 20 mA, 0, Ni100,         TU507-ETH/ 020 mA, 420 mA         CI501-PNIO           Transistor         24 V DC, 0.5 A         TU507-ETH/ TU508-ETH         CI502-PNIO           odbus TCP         Transistor         24 V DC, 0.5 A/ TU508-ETH         CI501-PNIO           Transistor         24 V DC, 0.5 A/ TU508-ETH         TU507-ETH/ TU508-ETH         CI502-PNIO           odbus TCP         Transistor         24 V DC, 0.5 A/ TU508-ETH         TU507-ETH/ TU508-ETH         CI521-MODTCP           .20 mA, 0, Ni100,         420 mA, 420 mA         TU507-ETH/ TU508-ETH         CI522-MODTCP           Transistor         24 V DC, 0.5 A         TU507-ETH/ TU508-ETH         CI522-MODTCP	Transistor       24 V DC, 0.5 A/ -10+10 V, 020 mA, 0, Ni100,       TU507-ETH / 020 mA, 420 mA       CI501-PNIO       1SAP220600R0001         Transistor       24 V DC, 0.5 A       TU507-ETH / TU508-ETH       CI502-PNIO       1SAP220700R0001         odbus TCP       Transistor       24 V DC, 0.5 A/ TU508-ETH       TU507-ETH / TU508-ETH       CI502-PNIO       1SAP220700R0001         odbus TCP       Transistor       24 V DC, 0.5 A/ 020 mA, 020 mA, 0.Ni100,       TU507-ETH / 420 mA       CI521-MODTCP       1SAP222100R0001         Transistor       24 V DC, 0.5 A       TU507-ETH / TU508-ETH       CI522-MODTCP       1SAP222200R0001         Transistor       24 V DC, 0.5 A       TU507-ETH / TU508-ETH       CI522-MODTCP       1SAP222200R0001	Transistor       24 V DC, 0.5 A/ -10+10 V, 020 mA, 0, Ni100,       TU507-ETH / 020 mA, 420 mA       CI501-PNIO       1SAP220600R0001         Transistor       24 V DC, 0.5 A       TU507-ETH / TU508-ETH       CI502-PNIO       1SAP220700R0001         odbus TCP       Transistor       24 V DC, 0.5 A/ TU507-ETH / TU508-ETH       CI502-PNIO       1SAP220700R0001         odbus TCP       Transistor       24 V DC, 0.5 A/ US08-ETH       TU507-ETH / TU508-ETH       CI521-MODTCP       1SAP222100R0001         intervention       A20 mA, U20 mA, U20 mA, U20 mA       TU507-ETH / TU508-ETH       CI522-MODTCP       1SAP222200R0001         Transistor       24 V DC, 0.5 A       TU507-ETH / TU508-ETH       CI522-MODTCP       1SAP222200R0001

— CI511-ETHCAT

CI501-PNIO

CI521-MODTCP

### **AC500** Ordering data

#### **Communication interface modules**

From	То	Output signal	Terminal units	Туре	Order code	Price	Weight (1 pce) kg
Gateway on Eth	ernet based protocol -	PROFINET IO RT					
PROFINET I/O	-	3 x RS232/422/485 ASCII serial interfaces	TU520-ETH	CI504-PNIO	1SAP221300R0001		0.200
PROFINET I/O	1x CAN 2A/2B or CANopen Master	2 x RS232/422/485 ASCII serial interfaces	TU520-ETH	CI506-PNIO	1SAP221500R0001		0.200



CI504-PNIO

#### Hot swap terminal units

For loadless hot swapping of digital and analog expansion modules, when used in configurations with communication interface modules or AC500 CPU supporting hot swap. Hot swapping of attached expansion module mounted on hot swap terminal unit is supported by AC500 V3 CPU modules as of PM5630-2ETH, AC500 V2 CPU modules as of PM585-ETH, CI501-PNIO, CI502-PNIO, CI541-DP, CI542-DP, CI521-MODTCP and CI522-MODTCP. AC500-S safety I/O modules cannot be used in configurations containing hot swap terminal units. Mixed configurations of hot swap terminal units with normal terminal units for digital and analog expansion modules are possible. In the installation hot swap terminal units can be idenfied by the word Hot Swap and a white frame around the connection terminal area.

For	Supply	Connection type	Туре	Order code	Price	Weight (1 pce) kg
I/O modules - for Hot Swap (1)	24 V DC	Spring	TU516-H	1SAP215000R0001		0.300
I/O modules AC / relay - for Hot Swap (1)	230 V AC	Spring	ТU532-Н	1SAP215100R0001		0.300
High current I/O module - for Hot Swap (1)	24 V DC	Spring	ТU542-Н	1SAP215200R0001		0.300

(1) I/O module as of index F0 needed for Hot Swap





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### **AC500** Ordering data

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### Terminal units

For digital and analog expansion modules and interface modules. Please note: for modules with relay outputs, terminal units for 230 V AC (TU531 / TU532) are required.

For	Supply	Connection type	Туре	Order code	Price	Weight (1 pce) kg
Ethernet communication interface modules	24 V DC	Screw	TU507-ETH	1SAP214200R0001		0.300
		Spring	TU508-ETH	1SAP214000R0001		0.300
Ethernet gateway modules	24 V DC	Spring	TU520-ETH	1SAP214400R0001		0.300
CANopen / PROFIBUS DP (1) communication	24 V DC	Screw	TU517	1SAP211400R0001		0.300
interface modules		Spring	TU518	1SAP211200R0001		0.300
PROFIBUS DP / CANopen communication	24 V DC	Screw	TU509	1SAP211000R0001		0.300
interface modules		Spring	TU510	1SAP210800R0001		0.300
I/O modules	24 V DC	Screw	TU515	1SAP212200R0001		0.300
		Spring	TU516	1SAP212000R0001		0.300
I/O modules AC / relay	230 V AC	Screw	TU531	1SAP217200R0001		0.300
		Spring	TU532	1SAP217000R0001		0.300
High current I/O module (DO526, PD501-4CH)	24 V DC	Screw	TU541	1SAP213000R0001		0.300
	24 V DC	Spring	TU542	1SAP213200R0001		0.300
CS31 interface modules	24 V DC	Screw	TU551-CS31	1SAP210600R0001		0.300
		Spring	TU552-CS31	1SAP210400R0001		0.300

(1) TU517/TU518 Terminal units can also be used with PROFIBUS DP CI54x modules up to 1 Mbit/s.











TU515

TU520-ETH

TU510

TU518

TU508-ETH

Ordering data

#### Terminal units compatibility

Туре	For I/O mod	lules		For communi	For communication interface modules					
	TU515 TU516 TU516-H	TU541 TU542 TU542-H	TU531 TU532 TU532-H	TU507-ETH TU508-ETH	TU509 TU510	TU517 TU518	TU520-ETH	TU551-CS31 TU552-CS31		
DA501	•									
DA502	•									
DC522	•									
DC523	•									
DC532	•									
DI524	•									
DX522			•							
DX531			•							
D0524	•									
D0526		•								
CD522	• (2)									
AC522	•									
AI523	•									
AI531	•									
AO523	•									
AX521	•									
AX522	•									
PD501-4CH		• (2)								
DC551-CS31								•		
CI590-CS31-HA								•		
CI592-CS31								•		
CI501-PNIO				•						
CI502-PNIO				•						
CI504-PNIO							•			
CI506-PNIO							•			
CI511-ETHCAT				•						
CI512-ETHCAT				•						
CI521-MODTCP				•						
CI522-MODTCP				•						
CI541-DP					•	• (1)				
CI542-DP					•	• (1)				
CI581-CN					•	•				
CI582-CN					•	•				

(1) Can be used with baud rate up to 1 Mbaud.
 (2) CD522 cannot be used on TU516-H and PD501-4CH cannot be used on TU542-H.

### **AC500** Ordering data

#### Accessories for AC500

For	Description	Туре	Order code	Price	Weight (1 pce) kg
AC500 CPUs COM1	Programming cable Sub-D / terminal block, length 5 m	TK502	1SAP180200R0101		0.400
AC500 CPUs COM2	Programming cable Sub-D / Sub-D, length 5 m	TK501	1SAP180200R0001		0.400
AC500 CPUs	Memory card (2 GB SD card)	MC502	1SAP180100R0001		0.020
	Lithium battery for data buffering	TA521	1SAP180300R0001		0.100
I/O modules	Pluggable marker holder for I/O modules, packing unit incl. 10 pcs. Template available in the AC500 online help	TA523	1SAP180500R0001		0.300
AC500 CPU's, interface module, communication module and I/O modules	White labels, packing unit incl.10 pcs.	TA525	1SAP180700R0001		0.100
Terminal base	Communication Module, blind cap	TA524	1SAP180600R0001		0.120
CPU terminal base	Accessories for screw mounting, packing unit includes 10 pcs	TA526	1SAP180800R0001		0.200
	5-pole power plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit includes 5 pcs	TA527	1SAP181100R0001		0.200
	9-pole COM1 plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1 or on TU520-ETH. Packing unit includes 5 pcs	TA528	1SAP181200R0001		0.200
Communication modules	9-pole spring plug for CM574-RS/RCOM. Spare part. Packing unit includes 10 pcs	TA532	1SAP182000R0001		
	5-pole spring plug for CM575-DN/CM578-CN. Spare part. Packing unit includes 5 pcs	TA533	1SAP182100R0001		
	2x5-pole spring plug for CM588-CN and CM598-CN. Spare part. Packing unit includes 5 pcs.	TA534	1SAP182200R0001		
	10-pole spring plug for DC541-CM. Spare part. Packing unit includes 10 pcs.	TA536	1SAP183100R0001		
AC500 V2 training case	PM583-ETH + TB521-ETH + CM579-PNIO + DA501 + CI502-PNIO + CP6607 + Case + 115-230 V AC power supply + Ethernet cables + demo program + SD memory card + simulation stand	TA515-CASE	1SAP182400R0002		7.000
AC500 V3 training case	PM5630-2ETH + TB5620-2ETH + CM579-PNIO + DA501 + CI502-PNIO + CP6607 + Case + 115-230 V AC power supply + Ethernet cables + demo program + SD memory card + simulation stand	TA5450-CASE	1SAP187700R0001		7.000
AC500 CPUs PM595	Protective cap, spare-parts. Packing unit includes 3 pcs	TA540	1SAP182600R0001		0.200
	Lithium battery for real-time-clock buffering	TA541	1SAP182700R0001		0.030
	Accessories for screw-mounting. Packing unit includes 20 pcs	TA543	1SAP182800R0001		0.100





MC502

— AC500 training case CPU, I/Os, HMI

Technical data

### AC500 CPUs

Type		PM572	PM573-FTH	PM582	PM583-FTH	PM585-FTH
Supply voltage		24 V DC				
Supply voltage		24 0 00				
Current consumption on 24 V	DC	0.050.4	0.110.0	0.050.4	0.110.0	0 1 5 0 4
Min. (module alone)		0.050 A	0.110 A	0.050 A	0.110 A	0.150 A
Max. (all couplers and I/C	)s)	0.750 A	0.810 A	0.750 A	0.810 A	0.850 A
User program memory – Flash	h EPROM and RAM	128 kB	512 kB	512 kB	1024 kB	1024 kB
Integrated user data memory	/	128 kB thereof 12 kB saved	512 kB thereof 288 kB saved	416 kB thereof 288 kB saved	1024 kB thereof 288 kB saved	2560 kB thereof 1536 kB saved
User Flashdisk (Data-storage external with FTP)	, programm access or also	-				
Plug-in memory card		Depending on SE	-Card used : no SI	D-HC card allowed,	use MC502 access	ory
Web server's data for user RA	M disk	_	1 024 kB	-	4 096 kB	4 096 kB
Data buffering		battery				
Real-time clock (with battery	back-up)	•				
Cycle time for 1 instruction (	minimum)					
Binary		0.06 µs	0.06 µs	0.05 µs	0.05 µs	0.004 µs
Word		0.09 µs	0.09 µs	0.06 µs	0.06 µs	0.008 µs
Floating-point		0.7 us	0.7 us	0.5 us	0.5 us	0.008 µs
Max, number of centralized in	nouts/outputs		• p.e		p	pic
Max number of extension mo	dules on I/O bus	up to max 10 (SP	00 and /or \$500-e	Co modules allowe	ad)	
Digital	ipputs (outputs	220/220	00 and/01 5500-e	comodules allowe	.u)	
Applog	inputs/outputs	160/160				
Max number of decentralize	dipputs (outputs	depends on the l	used standard Fiel	dhuc (1)		
Max. Humber of decentralize		depends on the t	ised standard Fiel			
Program execution						
Cyclical / Time controlled / M	lulti tasking	•/•/•				
User program protection by p	bassword	•				
Internal interfaces						
COM1						
RS232 / RS485 configura	ıble	•				
Connection (on terminal I	bases or CPU module)	pluggable spring	) terminal block, us	se TK502 cable in a	ccessory	
Programming, Modbus R	TU, ASCII, CS31 master	•				
COM2						
RS232 / RS485 configura	ble	•				
Connection (on terminal I	bases or CPU module)	D-Sub 9 female, (	use TK501 cable in	accessory		
Programming, Modbus R	TU, ASCII	•				
FieldBusPlug						
Serial neutral interface		•				
Connection (on terminal I	bases)	M12 male, 5 pole				
Functions		programming ca (PROFIBUS DP, C	ble UTF-21-FBP, sl ANopen, DeviceNe	ave communicatio	n depending on Fie	ldBusPlug used
Ethernet						
Ethernet connection (on t	terminal bases)	_	RJ45	-	RJ45	RJ45
Ethernet functions: Prog	ramming, TCP/IP, UDP/IP,	_	•	_	•	•
Modbus TCP, integrated	Web server, IEC60870-5-104					
remote control protocol, I Time Protocol), DHCP, FT	MQTT, SNTP (simple Network P server HTTP, SMTP, PING					
Ethernet based Fieldbus						
Ethernet connection (on (	CPU module)	-				
Downloadable protocols RT Controller / EtherCAT	like: PROFINET IO Master	-				
CPU display		LC display and 8	function keys			
Function		RUN / STOP, stat	us, diagnosis			
LEDs for various status disals		Run Ston Error				
Timer/Counter	uy	unlimited/unlimi	ted			
Approvals		See detailed page	e 248 or www.abb	.com/plc		
Appiorais .		see decaned pay		.com/pic		

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(1) e.g. CS31 Fieldbus: up to 31 stations with up to 120 DIs / 120 DOs or up to 32 AIs / 32 AOs per station.

Technical data

#### AC500 CPUs

Туре	PM590-ETH	PM591-ETH	PM591-2ETH	PM592-ETH	PM595-4ETH-F
Supply voltage	24 V DC				
Current consumption on 24 V DC					
Min. (module alone)	0.150 A	0.150 A	0.150 A	0.150 A	0.400 A
Max. (all couplers and I/Os)	0.850 A	0.850 A	0.850 A	0.850 A	1.2 A
User program memory – Flash EPROM and RAM	2048 kB	4096 kB	4096 kB	4096 kB	16384 kB
Integrated user data memory	3072 kB thereof	5632 kB thereof	5632 kB thereof	5632 kB thereof	16384 kB thereof
	1536 kB saved	1536 kB saved	1536 kB saved	1536 kB saved	3072 kB saved
User Flashdisk (Data-storage, programm access or also external with FTP)	-			Yes, 4 GB Flash n	on removable
Plug-in memory card	Depending on SD	-Card used : no SE	D-HC card allowed,	use MC502 access	ory
Web server's data for user RAM disk	8 MB				32 MB
Data buffering	battery				
Real-time clock (with battery back-up)	•				
Cycle time for 1 instruction (minimum)					
Binary	0.002 μs	0.002 µs	0.002 µs	0.002 μs	0.0006 µs
Word	0.004 μs	0.004 µs	0.004 µs	0.004 µs	0.001 μs
Floating-point	0.004 µs	0.004 µs	0.004 µs	0.004 µs	0.001 µs
Max. number of centralized inputs/outputs		•		•	<u> </u>
Max, number of extension modules on I/O bus	up to max, 10 (S5	00 and/or S500-e	Co modules allowe	d)	
Digital inputs/outputs	320/320				
Analog inputs/outputs	160/160				
Max, number of decentralized inputs/outputs	depends on the u	used standard Field	dbus (1)		
Program execution	depends on the t				
Cyclical / Time controlled / Multi tacking	a/a/a				
User program protection by password	•				
Internal interfaces	•				
RS2327 RS485 configurable	•				
	pluggable spring	terminal block, us	e TK502 cable in a	ccessory	
Programming, Modbus RTO, ASCII, CS31 master	•				
RS232 / RS485 configurable		. TKEOT - LL 's			
Connection (on terminal bases or CPU module)	D-Sub 9 female, l	use i K501 cable in	accessory		
Programming, Modbus RTU, ASCII	•				
FieldBusPlug					
Serial neutral interface	•				-
Connection (on terminal bases)	M12 male, 5 pole				-
Functions	FieldBusPlug use	ble UTF-21-FBP, sla d (PROFIBUS DP C	ave communication	n depending on	-
Ethernet	Therabasi ing use		Anopen, Devicent		
Ethernet connection (on terminal bases)	D1/15	D1//5	2 v D1/15	D1/15	2 v D1/15
Ethernet functions: Programming, TCP/IP, LIDP/IP	RJ45	RJ45	2 X KJ45	RJ45	2 X KJ45
Modbus TCP, integrated Web server, IEC60870-5-104	•	•	•	•	•
remote control protocol, MQTT, SNTP (simple Network					
Time Protocol), DHCP, FTP server HTTP, SMTP, PING					
Ethernet based Fieldbus					
Ethernet connection (on CPU module)	_				4 x R145 (2 x
					interfaces with
					2-port switch)
Downloadable protocols like: PROFINET IO RT Controller / EtherCAT Master or Ethernet like ModbusTCP	-				•
CPU display	LC display and 8	function keys			
Function	RUN / STOP, stat	us, diagnosis			RUN / STOP,
		-			status,
					diagnosis, RESET
LEDs for various status display	Run, Stop, Error				•
Timer/Counter	unlimited/unlimi	ted			
Approvals	See detailed pag	e 248 or www.abb	.com/plc		

(1) e.g. CS31 Fieldbus: up to 31 stations with up to 120 DIs / 120 DOs or up to 32 AIs / 32 AOs per station. (2) Availability on demand

Technical data

#### AC500 V3 CPUs

Туре		PM5630-2ETH	PM5650-2ETH	PM5670-2ETH	PM5675-2ETH
Supply voltage		24 V DC			
Current consumption on 24	4 V DC				
Min. typ. (module alon	le)	0.150 A	0.200 A	0.250 A	0.250 A
Max. typ. (all couplers	and I/Os)	0.850 A	0.900 A	0.950 A	0.950 A
User program memory / User program memory / User between the server's data – Flash E	ser Data memory PROM and DRAM	8 MB	80 MB	160 MB	160 MB
User data memory saved		256 KB	256 KB	1.5 MB	1.5 MB
User Flashdisk (Data-stora	ge, programm access or also external with FTP)				8 GB Flash non removable
Plug-in memory card		Depending on SI preferably acces	D-Card used : SD / S sory	SDHC supported, u	se MC502
Web server's data for user	RAM disk	8 MB	No limitation, in Data memory	cluded into the glo	bal User Program/
Data buffering		battery			
Real-time clock (with batte	ery back-up)	•			
Cycle time for 1 instructio	n (minimum)				
Binary		0.02 µs	0.01 µs	0.002 µs	0.002 µs
Word		0.03 µs	0.01 µs	0.002 µs	0.002 µs
Floating-point		0.12 µs	0.01 µs	0.002 µs	0.002 µs
Communication modules	supported				
Max. number of communic	up to 2	Up to 6 dependir	ng on available terr	ninal bases (2)	
Type of communication mo	odule supported	CM579-PNIO, CM589-PNIO, CM579-ETHCAT, CM582-DP (2), CM592-DI (2) , CM597-ETH (2) and CM598-CN (2)			DP (2), CM592-DP
Max. number of centralize	d inputs/outputs				
Max. number of extension	modules on I/O bus	up to max. 10 (S	500 and/or S500-e	Co modules allowe	ed)
Digital	inputs/outputs	320/320			
Analog	inputs/outputs	160/160			
Max. number of decentrali	ized inputs/outputs	depends on the	used standard Field	dbus (1)	
Program execution					
Cyclical / Time controlled /	′ multi tasking	●/●/●			
User program protection b	by password	•			
Internal interfaces					
COM1					
RS232 / RS485 config	urable	•			
Connection (on termin	nal bases or CPU module)	pluggable spring	g terminal block, us	e TK502 cable in a	ccessory
Modbus RTU Master/S	Slave, ASCII	•			
CANopen					
Serial interface		CAN serial interf	ace		
Connection (on termin	nal bases)	Pluggable spring	g terminal block, 2x	5 poles	
Functions		CANopen Maste	r / Slave (2) commu	inication, CAN 2A/	2B, J1939 protocol

e.g. CANopen Fieldbus: up to 127 stations with up to 320 Digital channels or up to 160 Analog channels per station.
 In preparation
 Feature is licensed

Technical data

### AC500 V3 CPUs

Туре	PM5630-2ETH	PM5650-2ETH	PM5670-2ETH	PM5675-2ETH	
Ethernet	2x independent	Ethernet interfaces	s for several uses		
Ethernet connection (on terminal bases)	2x RJ45 with 2x s 2-port switch wi	separated interfact th 1x interface	es and MAC-Addres	ss, could be used as	
Ethernet functions:					
Online Access, ICMP (Ping), DHCP	•				
IP configuration protocol	•				
UDP data exchange, Network variables	•				
Modbus TCP Client / Server	•				
IEC60870-5-104 remote control protocol	•				
HTTP / HTTPs (integrated Web server)	•				
SNTP (Time synchronization)	•				
FTP / FTPs server	•				
SMTP client	•				
Socket programming	•				
WebVisu for data visualisation on webserver HTML5	•				
Valid for all CPU before OPC UA MQTT protocol	•				
OPC UA Server (Micro Embedded Device Server) with security	•				
Ethernet Switch on ETH1 / ETH2	•				
Ethernet based Fieldbus					
Downloadable protocols (licensed feature):	available on one sometimes used	Ethernet interface I as switch	, the other interfac	e can be	
IEC 61850 server	• (3)	• (3)	• (3)	• (3)	
PROFINET IO RT Controller	• (2)(3)	• (2)(3)	• (2)	• (2)	
EtherCAT Master	• (2)(3)	• (2)(3)	• (2)	• (2)	
EthernetIP Adapter	• (2)(3)	• (2)(3)	• (2)(3)	• (2)(3)	
CPU display	LC display and 8	function keys			
Function	RUN / STOP, stat	tus, diagnosis			
LEDs for various status display	•				
Timer/Counter	unlimited/unlim	ited			
Approvals	See detailed page 248 or www.abb.com/plc				

(1) e.g. CANopen Fieldbus: up to 127 stations with up to 320 Digital channels or up to 160 Analog channels per station.
(2) In preparation
(3) Feature is licensed

Technical data

### Digital S500 I/O modules

Type		DI524	DC522	DC522	DC532
Type		DI324	DCJEE	DC323	00332
Number of channels per moo	lule				
Digital	inputs	32	-	-	16
	outputs	-	-	-	-
Configurable channels DC		-	16	24	16
(configurable as inputs or ou	tputs)				
Additional configuration of	channels as				
Fast counter		configuration of max.	. 2 channels per modu	le, operating modes see	e table on page 126
Occupies max. 1 DO or DC wh	nen used as counter	-	•	•	•
Connection via terminal unit		•	•	•	•
Digital inputs					
Input signal voltage		24 V DC			
Input characteristic acc. to El	N 61132-2	Type 1			
O signal		-3 +5 V DC			
Undefined signal state		-5+5 V DC			
Under med signal state		515 V DC			
1 signal	•	1530 V DC	11.6		
Input time delay (0 -> 1 or 1 ->	> 0)	8 ms typically, configu	urable from 0.1 up to	32 ms	M
Input current per channel					
At input voltage	24 V DC	5 mA typically			
	5 V DC	> 1 mA			
	15 V DC	> 5 mA			
	30 V DC	< 8 mA			
Digital outputs					
Transistor outputs 24 V DC, 0	).5 A	-	•	•	•
Readback of output		-	•	•	•
Switching of load 24 V		-	•	•	•
Output voltage at signal stat	e 1	_	process voltage UF	Pminus 0.8 V	
Output current			procession		
Nominal current per channel		_	0.5.4		
Maximum (total current of all	channels)		0.5 A		
Maximum (total current of all		-	6A (0.5 m)		
Residual current at signal sta		-	< 0.5 IIIA	-	
inductive loads	ining off	-	by internal variator	5	
Switching frequency			0.5.1		
For inductive load		-	0.5 Hz max.		
For lamp load		-	11 Hz max. at max.	5 W	
Short-circuit / overload proo	fness	-	•	•	•
Overload indication (I > 0.7 A)	)	-	after approx. 100 r	ns	
Output current limiting		-	yes, with automati	c reclosure	
Proofness against reverse fee	eding of 24 V signals	-	•	•	•
Process voltage UP					
Nominal voltage		24 V DC			
Current consumption on UP					
Min. (module alone)		0.150 A	0.100 A	0.150 A	
Max. (min. + loads)		0.150 A	0.100 A + load	0.150 A + load	
Reverse polarity protection		•	•	•	•
Fuse for process voltage LIP		10 A fast acting fuse			
Connections for sensor volta	a supply Terminal	-	8	1	
24 V and 0 V for each connect	tion Permitted load for		0	7	
each group of 4 or 8 connecti	ions: 0.5 A				
Short-circuit and overload pr	oof 24 V DC sensor	-	•	•	
supply voltage	oor Er v De sensor		-	-	
Maximum cable length for co	onnected process signal	ls			
Cable	shielded	1000 m			
Cable	silielded	1000111			
Descriptional states	unsnielded				
Potential isolation					
Per module		•	•	•	•
Between channels	input	-	-	-	-
	output	-	-	-	-
Voltage supply for the modul	e	internally via extensio	on bus interface (I/O b	ous)	
Fieldbus connection		via AC500 CPU or all c	communication interfa	ace modules	
Address setting		automatically (interna	al)		

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Technical data

### Digital S500 I/O modules

Туре		DX522	DX531	D0524	D0526
Number of channels per modul	le	DAJEL	0,551	DOJL4	00320
Digital	inpute	0	0		
Digital	inputs	0	0 4 ralava	-	-
	outputs	orelays	4 relays	32	0
(configurable as inputs or outp	uts)	-	-	-	-
Additional configuration of ch	annels as				
Fast counter		configuration of	-	-	-
		max. 2 channels per			
		module, operating modes see page 126			
Occupies max 1 DO or DC when	nused as counter		_	_	_
Connection via terminal unit	rused as counter	•	•	•	•
Digital inputs		-	-	-	•
		24.V.DC	230 V AC or 120 V AC		
Frequency range		-	47 62 H7		
Input characteristic acc. to EN	61132_2	Type 1	Type 2		
O signal	51152-2				
Undefined signal state		5 15 V DC		_	_
1 signal		15 30 V DC	74 265 V AC		
I signal	))	8 ms typically	20 ms typically		
	<i>''</i>	configurable from 0.1 up to 32 ms	20 ms typically		
Input current per channel					
At input voltage	24 V DC	5 mA typically	-	-	-
	5 V DC	> 1 mA	-	-	-
	15 V DC	> 5 mA	-	-	-
	30 V DC	< 8 mA	-	-	-
	40 V AC	-	< 5 mA	-	_
	74 V AC	-	> 6 mA	-	-
Digital outputs					
Transistor outputs 24 V DC		-	-	•	•
Readback output		-	-	-	-
Relay outputs, supplied via pro	cess voltage UP,	•	٠	-	-
Switching of load	24 V	•	•	•	•
Switching of load	230 V	•	•	_	-
Output voltage at signal state 1	L	-	-	process voltage UP minus 0.8 V	process voltage UP minus 0.4 V
Output current					
Nominal current per channel		-	-	0.5 A	2 A
Maximum (total current of all ch	nannels)	-	-	8 A	16 A
Residual current at signal state	0	-	-	< 0.5 mA	< 0.1 mA
Demagnetization when switchi	ng off inductive loads	-	-	yes	yes
Switching frequency					
For inductive load		2 Hz		0.5 Hz max.	2 Hz max.
For lamp load		11 Hz max. at max. 5 W	V		11 Hz max. 48 W
Short-circuit / overload proofn	ess	by external fuse / circo per channel	uit breaker. 6 A gL/gG	•	by external fuse 10A fast
Overload indication (I > 0.7 A)		-	-	after approx. 100 ms	-
Output current limiting		-	-	yes, with automatic reclosure	-
Resistance against reverse feed	ding of 24 V signals	-	-	•	•

Technical data

### Digital S500 I/O modules

Туре		DX522	DX531	DO524	DO526			
Contact rating								
For resistive load, max.		3 A at 230 V AC 2 A at 24 V DC		-	-			
For inductive load, max.		1.5 A at 230 V AC 1.5 A at 24 V DC		-	-			
For lamp load		60 W at 230 V AC 10 W at 24 V DC		-	-			
Lifetime (switching cycles)								
Mechanical lifetime		300 000		-	-			
Lifetime under load (DC13)		300 000 at 24 V DC 200 000 at 120 V A 100 000 at 230 V A	/2A C/2A C/3A	-	-			
Spark suppression for inductive AC load		external measure c switched load	lepending on the	-	-			
Demagnetization for inductive DC load		external measure: free-wheeling diod to the load	e connected in parallel	-	-			
Process voltage UP								
Nominal voltage		24 V DC	24 V DC					
Current consumption on UP								
Min. (module alone)		0.050 A	0.150 A	0.050 A	0.050 A			
Max. (module + loads)		0.050 A + load	0.050 A + load 0.150 A + load		0.100 A + load			
Reverse polarity protection		•	• •		•			
Fuse for process voltage UP		10 A						
Maximum cable length for c	onnected process si	gnals						
Cable	shielded	1000 m						
	unshielded	600 m	600 m					
Potential isolation								
Per module		•	• •		•			
Between the channels	input	-	• (per 2)	-	-			
	output	•	•	-	-			
Voltage supply for the modu	le	internally via exten	internally via extension bus interface (I/O bus)					
Fieldbus connection		via AC500 CPU or a	via AC500 CPU or all communication interface modules					
Address setting		automatically (inte	automatically (internal)					

Technical data

### Analog S500 I/O modules

Туре		AX521	AX522	AC522	AI523	AO523	Al531
Number of channels per mod	lule						
Individual configuration,	inputs	4	8	_	16	_	8
analog	outputs	4	8	_	_	16	-
	configurable	_	_	8	_	_	-
Signal resolution for channe	l configuration						
-10+10 V	5	12 bits + si	an				15 bits + sign
010 V		12 bits	5				15 bits
020 mA. 420 mA		12 bits					15 bits
Temperature: 0.1 °C		•	•	•	•	_	0.1/0.01
Monitoring configuration pe	er channel						,
Plausibility monitoring		•	•	•	•	•	•
Wire break & short-circuit mo	nitoring	•	•	•	•	•	•
Analog Inputs Al							
Signal configuration per Al		max. numb (depending	er per module ar 9 on the use of 2/	nd with regard to /3-wire connecti	o the configurati	ion: Als / Measu al input)	ring points
-50+50 mV, -500+500 mV, -1+1 V, -5+5 V, 0+5 V		-	-	-	_	_	8/8
010 V		4/4	8/8	8/8	16/16	_	8/8
-10+10 V		4/4	8/8	8/8	16/16	_	8/8
020 mA		4/4	8/8	8/8	16/16	_	8/8
420 mA		4/4	8/8	8/8	16/16	_	8/8
-20+20 mA		-	-	-	-	_	8/8
Pt100							- / -
-50+400 °C (2-wire)		4/4	8/8	8/8	16/16	_	8/8
-50+400 °C (3-wire), 2 c	hannels	4/2	8/4	8/4	16/8	_	8/8
-50 +400 °C (4-wire)		-	-	-	-	_	8/8
-50 +70 °C (2 - wire)		4/4	8/8	8/8	16/16	_	8/8
-50. +70 °C (3-wire), 2 ch	annels	4/2	8/4	8/4	16/8	_	8/8
-50 +70 °C (4-wire)		-	-	-	-	_	8/8
Pt1000							-,-
-50+400 °C (2-wire)		4/4	8/8	8/8	16/16	-	8/8
-50+400 °C (3-wire), 2 c	hannels	4/2	8/4	8/4	16/8	_	8/8
-50+400 °C (4-wire)		_	_	-		_	8/8
Ni1000							
-50+150 °C (2-wire)		4/4	8/8	8/8	16/16	_	8/8
-50+150 °C (3-wire), 2 c	hannels	4/2	8/4	8/4	16/8	_	8/8
-50+150 °C (4-wire)		_	_	_	_	_	8/8
Cu50 -200+200 °C		_	_	_	_	_	8/8
Resistor 050 kΩ		_	_	_	_	_	8/8
Thermocouples of types J, K,	T, N, S	-	-	_	-	-	•
010 V using differential inp	uts, 2 channels	4/2	8/4	8/4	16/8	-	8/8
-10+10 V using differential i	nputs, 2 channels	4/2	8/4	8/4	16/8	-	8/8
Digital signals (digital input)		4/4	8/8	8/8	16/16	-	8/8
Input resistance per channel		voltage: > 1 current: ap	voltage: > 100 kΩ current: approx. 330 Ω				voltage: > 100 kΩ current: approx. 330 Ω
Time constant of the input fi	lter	voltage: 10 current: 10	0 μs 0 μs	-	voltage: 100 μs current: 100 μs		
Conversion cycle		2 ms (for 8 1 s for Pt10	AI + 8 AO), 0/1000, Ni1000			-	1 ms 1 s for Pt100/1000 Ni1000
Overvoltage protection		•	•	•	•	_	•

Technical data

### Analog S500 I/O modules

Туре		AX521	AX522	AC522	AI523	AO523	Al531
Data when usir	ng the AI as digital input						
Input	time delay	8 ms typically, from 0.1 up to	configurable 32 ms			-	8 ms typically, configurable from 0.1 up to 32 ms
	signal voltage	24 V DC				_	24 V DC
Signal	0	-30+5 V				-	-30+5 V
	1	1330 V				-	1330 V
Analog output	s AO						
Possible config	guration per AO	Max. number o	f AOs per modul	e and with rega	ard to the config	uration:	
-10+10 V		4	8	8	-	16	-
020 mA		4	4	4	-	8	-
420 mA		4	4	4	-	8	-
Output	resistance (burden) when used as current output	0500 Ω			-	0500 Ω	-
	loading capability when used as voltage output	Max. ±10 mA			-	Max. ±10 mA	-
Process voltag	le UP						
Nominal voltag	je	24 V DC					
Current consur	nption on UP						
Min. (mod	ule alone)	0.150 A					0.130 A
Max. (min.	. + loads)	0.150 A + load	0.150 A + load		-	0.150 A + load	
Reverse polarit	y protection	•	•	•	•	•	•
Max. line length conductor cros	h of the analog lines, ss section > 0.14 mm²	100 m					
Conversion error of analog values caused by non-linearity, calibration errors ex works and the resolution in the nominal range		0.5 % typically,	1 % max.				Voltage: 0.1 % typically, current/ resistor 0.3 % typically
Potential isola	tion						
Per module		•	•	•	•	•	-
Fieldbus conne	ection	Via AC500 CPU	or all communic	ation interface	modules		
Voltage supply	for the module	Internally via e		_			

 Voltage supply for the module
 International

 (1) Half can be used on current (the other half remains available).
 International

Technical data

#### CD522 encoder module

The CD522 module offers accuracy and dynamic flexibility for a customized solution. It has two independent encoder inputs onboard and is easily configured using the Automation Builder software for 10 different operation modes and for frequencies up to 300 kHz (depending on CPU cycle time). The CD522 module also integrates outputs for pulses and for PWM as well as normal inputs and outputs, depending on selected encoder mode.

Туре		CD522			
Functionality					
Digital inputs/outputs		24 V DC, dedicated inputs/outputs can be used for specific counting functions. All unused inputs/outputs can be used as input/output with standard specification.			
	Input options	Catch/Touch operation, counter value stored in separate variable on external event (rising or falling)			
		Set to preset counter register with predefined value			
		Set to reset counter register			
	End value output	Output set when predefined value is reached			
	Reference point initialization (RPI) input for relative encoder initialization	•			
High-speed counter/encoder					
Integrated counters	Counter characteristics	2 counters (24 V DC, 5 V DC, differential and 1 Vpp sinus input)			
	Counter mode	one 32 bits or two 16 bits			
	Relative position encoder	X1, X2, X4			
	Absolute SSI encoder	•			
	Time frequency meter	•			
	Frequency input	up to 300 kHz			
PWM/pulse outputs					
Output mode specification	Number of outputs	2			
	Push pull output	24 V DC, 100 mA max			
	Current limitation	Thermal and overcurrent			
PWM mode specification	Frequency	1100 kHz			
	Value	0100 %			
Pulse mode specification	Frequency	115 kHz			
	Pulse emission	165535 pulses			
	indicator	0100 %			
Frequency mode	Frequency output	100 kHz			
specification	Duty Cycle	Set to 50 %			
Number of channels per module					
Digital	input	2			
	output	2			
Configurable channels DC (confi	gurable as inputs or outputs)	8			
Additional configuration of cha	nnels as				
Fast counter		Integrated 2 counter encoders			
Connection via terminal unit		•			
Digital Inputs	- <u>.</u>				
Input	signal voltage	24 V DC			
	time delay	8 ms typically configurable from 0.1 up to 32 ms			
Input current per channel					
At input voltage	24 V DC	Typically 5 mA			
	5 V DC	21ma			
	15 V DC	2 5 IIIA			
Disital autouta	30 V DC	NO IIIA			
output voltage at signal state 1					

Technical data

### CD522 encoder module

Туре		CD522
Output current		
Nominal current per cha	Innel	0.5 A
Maximum (total current	of all channels)	8 A
Residual current at sign	al state 0	< 0.5 mA
Demagnetization when	switching off inductive loads	By internal varistors
Switching frequency		
For inductive load		Max. 0.5 Hz
For lamp load		Max. 11 Hz with max. 5 W
Short-circuit / Overload	l proofness	•
Overload indication (I >	0.7 A)	After approx. 100 ms
Output current limiting		•
Proofness against rever	se feeding of 24 V signals	•
Maximum cable length	for connected process signals	
Cable	shielded	1000 m
	unshielded	600 m
Potential isolation		
Per module		•
Technical data of the hi	gh-speed inputs	
Number of channels per	module	6
Input type		24 V DC, 5 V DC / Differential / Sinus 1 Vpp
Frequency		300 kHz
Technical data of the fa	st outputs	
Number of channels		2
Indication of the output	signals	Brightness of the LED depends on the number of pulses emitted (0 % to 100 %) (pulse output mode only)
Output current		
Rated value, per channe	I	100 mA
Maximum value (all char included)	nnels together, configurable outputs	8 A
Leakage current with sig	gnal 0	< 0.5 mA
Rated protection fuse o	n UP	10 A fast
De-magnetization when	inductive loads are switched off	with varistors integrated in the module
Overload message (I > 0	.1 x A)	Yes, after ca. 100 ms
Output current limitatio	n	Yes, automatic reactivation after short-circuit/overload
Resistance to feedback	against 24 V signals	Yes
Process voltage UP		
Nominal voltage		24 V DC
Maximum ripple		5 %
Current consumption or	ו UP	
Min. (module alone)	)	0.070 A
Max. (min. + loads)		0.070 A + load
Reverse polarity protect	tion	•
Fuse for process voltage	e UP	10 A miniature fuse

Technical data

#### Analog/digital mixed I/O expansion modules

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bit + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits.

Туре		DA501	DA502		
Number of Channels per M	odule				
Digital	inputs	16	_		
Digital	outputs	-	16		
Analog	inputs	4	4		
,		2	2		
Digital configurable change		8	8		
(configurable as inputs or c	outouts)	0	0		
Additional configuration of	f channels as				
Fast counter		Voc			
Occupios max 1 DO or DC v	when used as counter	Configuration of max 2 channels nor module	Operating modes see table on page 126		
Connection via terminal uni	t THEYY	Configuration of max. 2 channels per module.	Operating modes see table on page 126		
Disital inputs	11 10 322	•			
Input signal voltage	e	24 V DC			
characteristi	c acc. to EN 61132-2	lype 1			
0 signal		-3+5 V DC			
Undefined signal state		515 V DC			
1 signal	- · · · ·	1530 V DC			
Residual ripple, range for	U signal	-3+5 V DC			
· · · · · · · · · · · ·	1 signal	1530 V DC			
Input time delay (0 -> 1 or 1	-> 0)	8 ms typically, configurable from 0.1 up to 32 r	ns		
Digital outputs					
Transistor outputs 24 V DC	, 0.5 A	•			
Readback of output		•			
Outputs, supplied via proce	ess voltage UP	•			
Switching of 24 V load		•			
Output voltage at signal sta	ate 1	Process voltage UP - 0.8 V			
Output current					
Nominal current per channe	el	0.5 A			
Maximum (total current of a	all channels)	4 A			
Residual current at signal s	tate 0	< 0.5 mA			
Demagnetization when swi	tching off inductive loads	By internal varistors			
Analog inputs Al		Max. number per module and with regard to th	ne configuration: Als / Measuring points		
Signal configuration per Al		•	5 , 51		
010 V / -10 +10 V		4/4			
020 mA / 420 mA		4/4			
RTD using 2/3 wire needs 1	/2 channel(s)	4/2			
010 V using differential in	puts, needs 2 channels	4/2			
-10+10 V using differentia	al inputs, needs 2 channels	4/2			
Digital signals (digital input	t)	4/4			
Data when using the Al as o	digital input	,			
Input	time delay	8 ms typically configurable from 0.1 up to 32	ms		
mpac	signal voltage	24 V DC	113		
Outputs single configuration					
	AQ				
rossible configuration per	AU				
-10+10 V		•			
		0.500.0			
Output resistance (load) wi	nen used as current output				
Output loading capability w	vnen used as voltage output	IIU MA Max.			
Potential isolation					
Per module		•			
Process voltage UP					
Nominal voltage		24 V DC			
Maximum ripple		5 %			
Current consumption on UF	>				
Min. (module alone)		0.070 A			
Max. (min. + loads)		0.070 A + load			
Reverse polarity protection	1	•			
Fuse for process voltage UF	>	10 A fast			
Approvals		See detailed page 248 or www.abb.com/plc			

Technical data

#### Positioning module PD501-4CH

The module is intended for positioning with 24 V DC motors. The movement of 4 motors can be controlled in forward and reverse direction. One analog input per axis is provided to read back the position.

Туре	PD501-4CH	
Number of channels per module		
Digital outputs	4	
Analog inputs	4	
Sensor supply output	1	
Digital outputs		
Type of outputs	Full H bridge with transistor	
Rating of outputs	24 V DC, 4 A	
Analog inputs		
Input type	Voltage	
Input range	0 to 10 V	
Error at 25°C	0.5 %	
Resolution	12 bit	
Sensor supply output		
Output voltage	10 V DC	
Accuracy	0.1 %	
Max. load current	90 mA	
Overload protection	•	
Process voltage UP		
Nominal voltage	24 V DC	
Potential isolation		
Per module	•	
Between digital output channels	In groups of 2 outputs	
Between analog and digital channels	•	

Technical data

#### DC541-CM interrupt I/O and fast counter module

In the operating mode counter, the channels can be configured as follows: Input, Output, 32-bit up/down counter (uses C0...C3) as a 32-bit counter without limit, 32-bit periodic counter as a 32-bit counter with a limit, limiter for a 32-bit counter (limit channel 0), 32-bit up counter (forward counter) with the frequencies 50 kHz, 5 kHz and 2.5 kHz, pulse-width modulation (PWM) with a resolution of 10 kHz, time and frequency measurement, frequency output.

Туре			DC541-CM			
Number o	of channels per module					
Configura (configura	able channels DC able as inputs or outputs)		8			
Additiona	al configuration of channels as					
Fast coun	ter		Yes			
Connectio communi	on via CPU terminal base. Occupies cation module slot	one	•			
Digital in	puts					
Input	signal voltage		24 V DC			
	characteristic acc. to EN 61132	2-2	Type 1			
0 signal			-3+5 V DC			
Undefine	d signal state		515 V DC			
1 signal			530 V DC			
Input time delay (0 -> 1 or 1 -> 0)			20 μs Clamp to clamp - 300 μs with interrupt task			
Input curi	rent per channel					
At input v	oltage	24 V DC	5 mA typically			
		5 V DC	> 1 mA			
		15 V DC	> 5 mA			
		30 V DC	< 8 mA			
Digital ou	itputs					
Transisto	r outputs 24 V DC, 0.5 A		•			
Readback	of output		•			
Switching of 24 V load			•			
Output voltage at signal state 1			Process voltage UP minus 0.8 V			
Output cu	urrent					
Nominal c	current per channel		0.5 A			
Maximum	n (total current of all channels)		4 A			
Residual o	current at signal state 0		< 0.5 mA			
Demagne	tization when switching off induct	ive loads	yes			

•

#### Interrupt I/O table

Potential isolation Per module

Voltage supply for the module

Configuration as		Configuration for channel no.				o.	Max. no. of	Remarks and notes regarding possible
		Chan. 0	Chan. 1	Chan. 2	Chan. 3	Chan. 4-7	channels for this function	alternative combinations of the remaining channels (a and b)
Mode 1: Interrupt fur	ctionality							
Interrupt	Digital input	1	1	1	1	4	8	Each channel can be configured individually as
	Digital output	1	1	1	1	4	8	interrupt input or output
Mode 2: Counting fur	nctionality							
Digital I/Os PWM (1)	Digital input	1	1	1	1	4	8	Usual input
	Digital output	1	1	1	1	4	8	Usual output
	PWM, resolution 10 kHz	1	1	1	1	4	8	Outputs and pulsed signal with and adjustable on-off ratio

Internally via backplane bus

(1) Counter and fast counter data available on technical documentation.

Technical data

#### AC500 Condition Monitoring CMS: FM502-CMS

The FM502-CMS function module offers precision and dynamic flexibility for customized solutions in condition monitoring, precise measurement or fast data logging applications. It has 16 fast, precise and synchronized analog inputs with 50k Samples/s (SPS), 24bit ADC resolution, completed with encoder inputs (incremental or absolute) with counter and additional DI and DC inputs/outputs onboard. It is easily configured using the Automation Builder software and the special libraries. Overall it has 12 different operation modes. One FM502 function module can be placed on the right side of PM592-ETH CPU with a special function module terminal base TF5x1, to interface directly to the CPU. While long measurements can be flexibly configured, started and stopped, all inputs are available in the I/O Image of CPU for immediate use (measurement, protection, control, ...)

Туре	FM502-CMS				
Data storage					
Fast user data memory of FM502	128 MB (ca. 33 million Samples: e.g 40 s r h record lenght on 16 channels at 100 SPS	ecord length on 16 channels at 50k SPS or 5.8 5 or 93 h on 1 channel at 100 SPS)			
File Format delivered to PM592 flash	WAV (compact binary) per channel, all cha	annels in one *.zip w. time stamp			
Analog inputs					
Number of channels	16 (synchronous sampled)				
Resolution	24 bit ADC, stored in DINT in WAV file (4b	yte per value)			
Accurracy at +25 °C	< +/- 0.1 %				
Accurracy over operating temperature and vibration	< +/- 0.5 %				
Sample rate / Bandwidth (High, 0 dB)	50k SPS / 20 kHz to 100 SPS / 40 Hz (digi	tally downsampled, selectable per channel)			
Indication of the input signal	One bicolor LED per channel for configura	ation, measurement status, error messages			
Input option:	IEPE (with Sensor supply current)	+ - 10 V			
Bandwidth low (- 3 dB)	digital < 0.1 Hz	digital < 0.1 Hz or DC (selectable)			
Pass band high (- 3 dB)	analog > 90 kHz, digital > 24.5 kHz				
Stop band high (> - 100 dB)	analog > 1 MHz, digital > 27.5 kHz				
Dynamic Range (SFDR)	> 100 dB				
SINAD (300 Hz/1 kHz sine, 50 k SPS) 0dB from full scale	< -90 dB	< - 95 dB			
IEPE Current Source per channel	Typ. 4.2 mA (+/- 7 % over temperature) (n.a.)				
Resistance AI- to M (ground)	Typ ~ 27Ohm (PTC)				
Channel input impedance (AI+/AI-):					
< 1kHz	> 1 MOhm	> 2 MOhm			
5kHz	> 100 kOhm	> 40 kOhm			
10kHz	> 60 kOhm	> 25 kOhm			
20kHz	> 40 kOhm	> 8 kOhm			
Error detection	Short circuit, open wire				
Max. cable length, shielded (depending on sensor)	100 m				
Digital inputs/outputs					
	24 V DC, dedicated inputs/outputs can b	e used for specific counting functions.			
	All unused inputs/outputs can be used as specification.	normal input/output with standard			
Channels and types	2 DI + 2 DC (configurable inputs/outputs)	); Type 1, LED indication			
Input options	Catch/Touch operation, counter value sto (rising or falling)	ored in separate variable on external event			
	Set to preset counter register with prede	fined value			
	Set to reset counter register				
End value output	Output set when predefined value is read	hed			
Reference point initialization (RPI) input for relative encoder initialization	•				
Input current p. channel @ V DC					
24 V DC	Typically 5 mA				
5 V DC	> 1 mA				
15 V DC	> 5 mA				
30 V DC	< 8 mA				

Technical data

Productions         Productions           Output voitage at signal state 1         (L+) – 0.8 V           Output voitage at signal state 1         (L+) – 0.8 V           Output voitage at signal state 1         (L+) – 0.8 V           Output voitage at signal state 1         0.5 A           Residual current taignal state 0         -0.5 FnA           Demagnetization when switching off inductive loads         By internal variators           Switching frequency         Max. 0.5 Hz           For inductive load         Max. 0.5 Hz           Short-Circut / Overload proof ness         •           Overhead indication (1 > 0.7 A)         After approx. 100 ms           Output current limiting         •           Resistrance againet reverse feeding of 24 v signals         •           Shided duitoff         000 m           unshided         000 m           unshided soconter/encoder         •           High-aped counter/encoder         •           Counter soconters         2 bits or two counters 10 bits           Relative position encoder         X, X, X, X           Additioal configuration of channels us         •           Frequency input         up to 300 kitz           Input reguency mode         2 (A, B, Z), type 1           Input reguency mou	Tuno	EMEO2 CMS			
Upper Volzage at signal state 1         (L+) = 0.8 V           Output volzage at signal state 0         0.5 A           Residual current at signal state 0         0.5 A           Residual current at signal state 0         0.5 A           Switching frequency         For inductive load           Sort inductive load         Max. 0.5 Hz           For inductive load         Max. 11 Hz with max. 5 W           Short-Hrcuit / Overload proofness         =           Overload indication (1 > 0.7 A)         After approx. 100 ms           Output output dependences         =           Resistance against reverse feeding of 24 V signals         =           Resistance against reverse feeding of 24 V signals         =           Maximum cable length for connected process signals         =           Maximu cable length for connected process signals         =           Nigh-apped counters         2 counters (24 V DC, 5 V DC, differential R5422.5 V or 1 Vpp sinus input)           Counter mode         one counter 32 bits or two counters 18 bits           Residue position encoder         Xi, X, Xi           Additional configuration of chanels as         Integrated 2 counter encoders           High-apped inputs         =           Additional configuration of chanels as         Integrated 2 counter encoders           High-apped	Disital outputs	FM302-CM3			
Output durants Norminal current per channel Output durants Residual current taignal state 1 Output durants Bernagnetization when switching off inductive loads By internal variators Switching frequency For inductive load Max. 0.5 H2 For inductive load Max. 0.5 H2 For inductive load Max. 0.5 H2 For inductive load Max. 11 H2 with max. 5 W Short-circuit / Overload proofness Autor muthing Counter durants Autor muthing Resistance against reverse feeding of 24 V signals Autor muthing tength for connected process signals while ded Maximum cable length for connected process signals while ded Maximum cable length for connected process signals while ded Migh-speed counter/ancoder Integrated counter/ancoder Migh-speed not Resistance of channels signals Autor muthing Autor					
Output current         0.5 A           Residual current at signal state 0         0.5 A           Residual current at signal state 0         0.5 nA           Sinternal variators         Sinternal variators           Sinternal variators         Sinternal variators           Sinternal variators         Sinternal variators           For langue to bad         Max. 11 Hz with max. 5 W           Short-Ircuit / Overload proofness         •           Overbad indication (1 + 0.7 A)         #           Seatsance agains reverse feeding of 24 V signals         •           Seatsance agains reverse feeding of 24 V signals         •           Seatsance agains reverse feeding of 24 V signals         •           Maximum cable length for connected process signals         •           Hielded         1000 m         •           unshielded         600 m         •           High-speed counter         Counter size (24 VDC, 5 V DC, differential R5422. 5 V or 1 Vpp sinus input)           Counter mode         one counter 32 bits or two counters 16 bits           Regulary Distribution encoder         X, X, X 3           Abs/lut S5 encoder         •           Time frequency meter         •           Frequency meter         •           Frequency max. (frequency max. (frequency ma		(L+)=0.8 V			
Nomma lutrer per channel         0.5 A           Bemagnetization when sixtching off inductive loads         by internal variators           Sixtching frequency         For inductive load           For inductive load         Max. 0.5 Hz           For inductive load         Max. 0.5 Hz           Short-forul / Overhoad proofness         P           Overhoad indication (1 > 0.7 A)         After approx. 100 ms           Output current limiting         P           Resistance against reverse feeding of 24 V signals         P           Maximum cable length for connected process signal         P           Sinterdent         Solon multive signal status           Integrated counter/encoder         Solon multive signal status           Integrated counter/encoder         Solon SUC, SV DC, differential 85422; 5V or 1 Vpp sinus input)           Counter characteristics         2 counters (24 V DC, SV DC, differential 85422; 5V or 1 Vpp sinus input)           Counter mode         one counter s2 bits or two counters 16 bits           Relative position encoder         X1, X2, X3           Absolute SS encoder         9           Inter ferquency mate         9           Frequency input         up to 300 kHz           Additional configuration of channels as         9 VD C / Differential / Sinus 1 Vpp           Input treque	Output current	0.5.4			
Additional corrent at signal state 0 < 4.0.5 MA Periagnetization when switching off inductive loads Switching frequency For languine load Max. 0.5 Hz For languine load Max. 0.5 Hz For languine load Max. 0.1 Hz with max. 5 W Short-kriter (/ Verdead proofiess) Overload indication (1 - 0.7 A) After approx. 100 ms Output current limiting Baistance againest reverse feeding of 24 V signals Resistance againest reverse feeding of 24 V signals Maximum able length for connected process signals shielded 1000 m unshielded 1000 m Unshielded 1000 m Unshielded 1000 m Unshielded 1000 m Unshielded 1000 m Unshielded 1000 m Unshielded 1000 m Unshielded 1000 m 1000 m 100 m 1000 m 100	Nominal current per channel	0.5 A			
Demagnetization when switching off inductive loads By internal Variators Switching frequency For inductive load Max. 0.5 Hz For inductive load Max. 0.5 Hz For inductive load After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Overload indication (1 > 0.7 A) After approx. 100 ms Ax. X 3 Absolute SI encoder At X, X, X, X 3 Absolute SI encoder Additional configuration of channels as Fast counter Additional configuration of channels as After approx. 100 KHz (accuracy on %/4.7 %) Max. cable length, shielded (depending on sensor) 300 m 100 m Fast output SI CLK output. B  Fin. 0.1 Aver approx. 100 KHz (accuracy on %/4.7 %) Max. cable length, shielded (depending on sensor) 300 m 100 m Fast output SI CLK output. B  Fin. 0.1 Class approx. 100 KHz (accuracy on %/4.7 %) Max. cable length, shielded (depending on sensor) 300 m  Overload HMZ (Accuracy on %/4.7 %) Max. cable length, shielded (depending on sensor) 300 m  Overload HMZ (Accuracy on %/4.7 %) Max. cable length, shielded (depending on sensor) 300 m  Fin. 3.1.4  Overload Addition After approx. 100 m  Fin. 3.1.4  Max. cable length, shielded (depending on sensor) 100 kHz (accuracy on	Residual current at signal state 0	< 0.5 mA			
Switching frequency For induct to load Max. 0.5 Hz For induct to load Max. 11 Hz with max. 5 W For induct to load A Max. 11 Hz with max. 11 Hz wit	Demagnetization when switching off inductive loads	By internal varistors			
For inductive load     Max. 0.5 Hz       For lamp load     Max. 11 Hz with max. 5 W       Short-circuit / Overload prociness     •       Overload indication (1 > 0.7 A)     After approx. 100 ms       Output current limiting     •       Resistance against reverse feeding of 24 V signals     •       Maximur cable length for connected process signals     1000 m       shielded     600 m       High-speed counter/encoder     •       Integrated counters     2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)       Counter dranzteristics     2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)       Counter dranzteristics     2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)       Counter dranzteristics     2 counters 2b bits or two counters 16 bits       Relative position encoder     X1, X2, X3       Absolute SSI encoder     •       Time frequency meter     •       Frequency input     up to 300 kHz       Additioal configuration of channels as     •       Fast counter     Integrated 2 counter encoders       high-speed inputs     •       Number of channels, type per module     3 (A, B, Z), type 1       Input frequency max. (frequency measurement only)     100 kHz (accuracy -0 %/+3 %)       Max. cable length, shileded (depending on sensor)     300 m   <	Switching frequency				
For Lamp load     Max. 11 Hz with max. 5 W       For Lamp Link     Vereload proofness       Overload Indication (1 > 0.7 A)     After approx. 100 ms       Output current limiting     •       Resistance against reverse feeding of 24 V signals     •       Maximum cable length for connected process signals     •       Shielded     600 m       High-speed counter/encoder     1000 m       Integrated Counters     Counter size bits or two counters 16 Bts       Counter mode     one counter 32 bits or two counters 16 bits       Relative position encoder     X1, X2, X3       Absolute 55 In encoder     Y1, X2, X3       Additional configuration of channels as     Frequency input       Frequency input     up to 300 kHz       Additional configuration of channels as     Fast counter encoders       Number of channels, type per module     3 (A, B, Z), type 1       Singer Si	For inductive load	Max. 0.5 Hz			
Short-Crick / Overload proofness         •           Overbad indication (1 = 0.7. A)         After approx. 100 ms           Autionur cable length for connected process signals         •           Maximur cable length for connected process signals         1000 m           Indication (2 = 0.7. A)         600 m           High-speed counter/encoder         600 m           High-speed counters         2 counters (24 V DC, 5 V DC, 01 (Ferential R5422; 5 V or 1 Vpp sinus input)           Counter dracteristics         2 counters (24 V DC, 5 V DC, 01 (Ferential R5422; 5 V or 1 Vpp sinus input)           Counter mode         one counters 22 bits or two counters 16 bits           Rolative position encoder         X1, X2, X3           Absolute SSI encoder         •           Time frequency meter         •           Frequency input         up to 300 kHz           Additional configuration of channels as         Integrated 2 counter encoders           Frequency input         up to 300 kHz (facuracy - 0 %/43%)           Max. cable length, shielded (depending on sensor)         300 m         100 m           SI CLK output B         f. optical Interface (according SSI): Pin 1.3         Pin 1.3.1.4           Output durient limitation         Yes, automatic reactivation after short-circuit/overdoad           Si D mA         Si D mA         Si D mA	For lamp load	Max. 11 Hz with max. 5 W			
Overlaad indication (1 > 0.7 A)         After approx. 100 ms           Output current limiting         •           Resistance against reverse feeding of 24 V signals         •           Maximum cable length for connected process signals         •           High-speed counter/encoder         000 m           High-speed counter/encoder         •           Counter of connet/encoder         •           Counter of connet/encoder         •           Subsolute 51 me coder         ×           Counter of connets         •           Time frequency meter         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Number of channels, type per module         3 (A, B, Z), type 1           Input type         24 V DC         5 V DC / Differential / Sinus 1 Vpp           Frequency max. (frequency measurement only)         100 kHz (cacuracy -0 %/+3 %)           Max. cable length, shielded (depending on sensor)         300 m         100 m           Stot Lotput Length         •	Short-circuit / Overload proofness	•			
Output current limiting         •           Resistance against reverse feeding of 24 V signal         •           Maximum cable length for connected process signals         •           unshielded         600 m           High-speed counter/encoder         •           Integrated counters         Counter size (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)           Counter mode         one counter 32 bits or two counters 16 bits           Relative position encoder         X1, X2, X3           Absolute SSI encoder         •           Time frequency input         up to 300 kHz           Additional configuration of channels as         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Frequency input         up to 300 kHz           Value         Y AV DC         S V DC / Differential / Sinus 1 Vpp           Frequency         input treguency masurement only)         100 kHz (accuracy -0 %/-3 %)           Max. cable length, shielded (depending on sensor)         300 m         100 m           Fast counter         f. optical Interface (according SSI):         RS-422 differential (according SSI)           Pin 1.3         Pin 1.3         Pin 1.3, 1.4         Output duract worention sentesistance to feedback against reverse polarity	Overload indication (I > 0.7 A)	After approx. 100 ms			
Resistance against reverse feeding of 24 V signals e Maximum cable length for connected process signals shielded 1000 m unshielded 600 m High-speed counter/encoder Integrated counter/encoder Counter node 0 counter 32 bits or two counters 16 bits Relative position encoder X1, X2, X3 Absolute S1 encoder  Frequency input up to 300 kHz Additional configuration of channels as Fast counter node 3 (A, B, Z), type 1 Integrated 2 counter encoders High-speed counter, the set of	Output current limiting	•			
Maximum cable length for connected process signals         1000 m           unshielded         600 m           unshielded         600 m           High-speed counter/encoder         Integrated counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)           Counter node         one counters 32 bits or two counters 16 bits           Relative position encoder         X1, X2, X3           Absolute SSI encoder         4           Time frequency meter         0           Frequency input         up to 300 kHz           Additioal configuration of channels as         Time frequency meter           Fast counter         Integrated 2 counter encoders           high-speed inputs         V           Number of channels, type per module         3 (A, B, Z), type 1           Input type (encry measurement only)         100 kHz (according SS):         KS + 422 differential (according SS):           Fast outputs         J00 m         I00 m         SI (A, C), 33 (B)           SI (LK output B)         Fig. Signal (A, C), 33 (B)         Integrated 2 (Counter short-circuit/overload           Kas cable length, shielded (depending on sensor)         300 m         100 m           SI (LK output B)         Fig. Signal (A, C), 33 (B)         Integrated Counter short-circuit/overload           Kas cable length, shielded (depending	Resistance against reverse feeding of 24 V signals	•			
shielded 000 m unshielded 600 m High-speed counter/encoder Integrated counter/encoder Counter characteristics 2 counters (24 V DC, S V DC, differential RS422; S V or 1 Vpp sinus input) Counter characteristics 2 counter 32 bits or two counters 16 bits Relative position encoder X1, X2, X3 Absolute SS in encoder 4, X1, X2, X3 Absolute SS in encoder 5, X1, X2, X3, X3,	Maximum cable length for connected process signals				
unshelded 600 m Hgh-speed counter/encoder Hgh-speed counter/encoder Hgh-speed counter/encoder Counter characteristics 2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input) Counter mode one counter 32 bits or two counters 16 bits Relative position encoder X1, X2, X3 Absolute SSI encoder X1, X2, X3 time frequency meter Frequency input up to 300 kHz Additional configuration of channels as Fast counter in Integrated 2 counter encoders Hgh-speed inputs Number of channels, type per module 3 (A, B, Z), type 1 Input frequency max. (frequency measurement only) 100 kHz (input filter: 50, 500, 5 k, 20 k Hz) Input frequency max. (frequency measurement only) 100 kHz (accuracy -0 %/+3 %) Max. cable length, shielded (depending on sensor) S0 C Max. cable length, shielded (depending on sensor) S0 C Max. cable length, shielded (depending on sensor) S0 C Max. cable length, shielded (depending on sensor) S0 C Max. cable length, shielded (depending on sensor) S1 CLK output B S1 CLK output B S0 CLK output C S1 CLK output C	shielded	1000 m			
High-speed counter/necder           Integrated counters           Counter characteristics         2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)           Counter mode         one counter 32 bits or two counters 16 bits           Relative position encoder         X1, X2, X3           Absolute S5 lencoder         •           Time frequency meter         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Frast counter         Integrated 2 counter encoders           high-speed inputs         VDC           Number of channels, type per module         3 (AB, 2), type 1           Input type         24 V DC         5 V DC / Differential / Sinus 1 Vpp           Frequency         up to 300 kHz (input filter: 50, 500, 5 k, 20 k Hz)           Input frequency mas. (frequency measurement only)         100 kHz (accuracy-0 %/43 %)           Max. cable length, shielded (depending on sensor)         300 m         100 m           Sig LLS output B         f. optical Interface (according SSI): Pin 1.3<	unshielded	600 m			
Integrated counters           Counter characteristics         2 counters (24 V DC, 5 V DC, differential R5422: 5 V or 1 Vpp sinus input)           Counter onde         one counter 32 bits or two counters 16 bits           Relative position encoder         X1, X2, X3           Absolute SSI encoder         •           Time frequency meter         •           Frequency input         up to 300 kHz           Additional configuration of channels as         •           Fast counter         Integrated 2 counter encoders           high-speed inputs         •           Number of channels, type per module         3 (A, B, Z), type 1           Input type         24 V DC         5 V DC / Differential / Sinus 1 Vpp           Frequency         up to 300 kHz (anput filter: 50.500, 5 k, 20 k Hz)           Input frequency max. (frequency measurement only)         100 kHz (accuracy - 0 %/43 %)           Max. cable length, shielded (depending on sensor)         300 m         100 m           Fast outputs         F         -         Fins 1.3, 1.4           Output delay (0->1 or 1>>0)         Max. 0.35 µS         Set 2.22 differential (according SSI)         Pins 1.3, 1.4           Output current         ≤ 10 mA         Switching frequency (selectable)         200 kHz, 500 kHz and 1 MHz           Short-circuit proof / vees	High-speed counter/encoder				
Counter characteristics       2 counters (24 V DC, 5 V DC, differential RS422; 5 V or 1 Vpp sinus input)         Counter mode       one counter 32 bits or two counters 16 bits         Relative position encoder       X1, X2, X3         Absolute SSI encoder       •         Time frequency meter       •         Frequency input       up to 300 kHz         Additional configuration of channels as       Integrated 2 counter encoders         Figh-speed inputs       3 (A, B, Z), type 1         Number of channels, type per module       3 (A, B, Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency input       up to 300 kHz (input filter: 50, 500, 5 k, 20 kHz)       Input type         Input frequency mass. (frequency measurement only)       100 kHz (accuracy -0 %/+3 %)       Max. cable length, shielded (depending on sensor)         SI CLK output B       f. optical Interface (according SSI):       Rs-422 differential (according SSI)         Pin 1.3       Pin 1.3       Pins 1.3, 1.4         Output delay (0~1 or 1~0)       Max. 0.35 µS       Output current         Suitching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit prof / overload proof       Yes         Max. cable length, shielded (depending on sensor)       100 m         Resistance to fee	Integrated counters				
Counter mode     one counter 32 bits or two counters 16 bits       Relative position encoder     X1, X2, X3       Absolute S51 encoder     ●       Time frequency meter     ●       Additional configuration of channels as     Integrated 2 counter encoders       Fast counter     Integrated 2 counter encoders       high-speed inputs     V       Number of channels, type per module     3 (A, B, Z), type 1       Input type     24 V DC     5 V DC / Differential / Sinus 1 Vpp       Frequency     up to 300 kHz (input filter: 50, 500, 5 k, 20 k Hz)       Input frequency max. (frequency measurement only)     100 kHz (accuracy -0 %/43 %)       Max. cable length, shielded (depending on sensor)     300 m     100 m       Fast outputs     f. optical Interface (according SSI): Pin 1.3     Pis - 422 differential (according SSI)       SSI CLK output B     f. optical Interface (according SSI): Pin 1.3     RS-422 differential (according SSI)       Output delay (0->1 or 1->0)     Max. 0.35 µS     Unput current [mitation       Ves.     atomatic reactivation after short-circuit/overload       Resistance to feedback against reverse polarity     Yes       Resistance to feedback against reverse polarity     Yes       Max. cable length, shielded (depending on sensor)     100 m       Process voltage L+     Nomial voltage     24 V DC       Current timitation	Counter characteristics	2 counters (24 V DC, 5 V DC, differential RS	5422: 5 V or 1 Vpp sinus input)		
Relative position encoder       X1, X2, X3         Absolute SSI encoder       •         Absolute SSI encoder       •         Time frequency meter       •         Frequency input       up to 300 kHz         Additional configuration of channels as       •         Fast counter       Integrated 2 counter encoders         high-speed inputs       •         Number of channels, type per module       3(A, B, Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)         Input frequency max. (frequency measurement only)       100 kHz (accuracy -0 %/+3 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       Footical Interface (according SSI):       R5-422 differential (according SSI)         Output delay (0->1 or 1->0)       Max. 0.35 µS       00 kHz, 500 kHz, 500 kHz and 1 MHz         Sourcerter       510 mA       Switching frequency (saginst reverse polarity       Yes         Resistance to feedback against reverse polarity       Yes       Nessistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m       Imput reverse reverse polarity       Yes         Max.	Counter mode	one counter 32 bits or two counters 16 bit	S		
Absolute SSI encoder       •         Time frequency meter       •         Frequency input       up to 300 kHz         Additional configuration of channels as       Fast counter         Fast counter       Integrated 2 counter encoders         high-speed inputs       Number of channels, type per module       3 (A,B,Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)       Input frequency max. (frequency measurement only)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       SI CLK output B       f. optical Interface (according SSI):       R5-422 differential (according SSI)         SI CLK output B       f. optical Interface (according SSI):       R5-422 differential (according SSI)       Plins 1.3 L 4         Output delay (0->1 or 1->0)       Max. 0.35 µs       Output current       S10 mA       S00 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Ves       Ves       Ves       Ves         Resistance to feedback against z4V signals       Yes       Ves	Relative position encoder	X1, X2, X3			
Time frequency input       up to 300 kHz         Additional configuration of channels as       Integrated 2 counter encoders         high-speed inputs       Integrated 2 counter encoders         Number of channels, type per module       3 (A,B,Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)         Input frequency mas. (frequency measurement only)       100 kHz (accuracy -0 %/+3 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       f. optical Interface (according SSI): Pin 1.3       RS-422 differential (according SSI)         Output delay (0->1 or 1>0)       Max. 0.35 µS       Output urrent       510 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz       Source (according SSI):       RS-422 differential (according SSI)         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz       Source (according SSI)       Source (a	Absolute SSI encoder	•			
Frequency input     up to 300 kHz       Additional configuration of channels as     Integrated 2 counter encoders       Fast counter     Integrated 2 counter encoders       Number of channels, type per module     3 (A,B,Z), type 1       Input type     24 V DC     5 V DC / Differential / Sinus 1 Vpp       Frequency     up to 300 kHz (input filter: 50,500,5 k, 20 k Hz)       Input trequency max. (frequency measurement only)     100 kHz (accuracy -0 %/+3 %)       Max. cable length, shielded (depending on sensor)     300 m     100 m       Fast outputs     f. optical Interface (according SSI):     RS-422 differential (according SSI)       SSI CLK output B     f. optical Interface (according SSI):     RS-422 differential (according SSI)       Pin 1.3     Pins 1.3, 1.4       Output delay (0->1 or 1->0)     Max. 0.35 µs       Output current     51 0 m A       Switching frequency (selectable)     200 kHz, 500 kHz and 1 MHz       Short-circuit proof     Yes       Resistance to feedback against z4V signals     Yes       Max. cable length, shielded (depending on sensor)     100 m       Process outgas L4     Yos       Nominal voltage     24 V DC       Current consumption from L+ (EM502 and PM592, no communication module)     1.2 A*s       no communication module)     Max. 0.43 A + max. 0.5 A per output no communication module)	Time frequency meter	•			
Additional configuration of channels as         Fast counter       Integrated 2 counter encoders         high-speed inputs         Number of channels, type per module       3 (A,B,Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)         Input frequency max. (frequency measurement only)       100 kHz (accuracy -0 %/+3 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       f. optical Interface (according SSI):       R5-422 differential (according SSI)         Pin 1.3       Pins 1.3, 1.4       Output delay (0->1 or 1->0)       Max. 0.35 µs         Output current       \$ 10 mA       Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Resistance to feedback against 24V signals         Resistance to feedback against 24V signals       Yes       Resistance to feedback against 24V signals       Yes         Process outsget L+       Nominal voltage       24 V DC       Max. 0.43 A + max. 0.5 A per output         Norminal voltage       24 V DC       Max. 0.43 A + max. 0.5 A per output       Imput summation modules         Innush current from L+ (at power up, FM502 and PM592, no communication module)	Frequency input	up to 300 kHz			
Fast counter       Integrated 2 counter encoders         high-speed inputs       3 (A,B,Z), type 1         Number of channels, type per module       3 (A,B,Z), type 1         Input type       24 V DC       5 V DC / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)         Input frequency max. (frequency measurement only)       100 kHz (accuracy -0 %/43 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       f. optical Interface (according SSI):       R5-422 differential (according SSI)         Pin 1.3       Pin 1.3       Pin 1.3       Pin 1.3, 1.4         Output delay (0->1 or 1->0)       Max. 0.35 µs       Output current       \$10 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz       Short-circuit proof / overload proof       Yes         Resistance to feedback against 24V signals       Yes       Resistance to feedback against 24V signals       Yes         Max. cable length, shielded (depending on sensor)       100 m       Process outage L+       Process outage L+         Nominal voltage       24 V DC       Current torsumption from L+ (FM502 and PM592, no communication module)       Nax. 0.43 A + max. 0.5 A per output no communication module)       Current torsumption from L+ (FM502 and PM592, no communication module)       Si A Singer A Si	Additional configuration of channels as				
Number of channels, type per module       3 (A,B,Z), type 1         Number of channels, type per module       3 (A,B,Z), type 1         Input type       24 V D C       5 V D C / Differential / Sinus 1 Vpp         Frequency       up to 300 kHz (incurrent of the second	Fast counter	Integrated 2 counter encoders			
Number of Channels, type per module 3 (A,B,Z), type 1 Input type 24 V DC 5 V DC / Differential / Sinus 1 Vpp Frequency up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz) Input frequency max. (frequency measurement only) 100 kHz (accuracy -0 %/+3 %) Max. cable length, shielded (depending on sensor) 300 m 100 m Fast outputs SSI CLK output B f. optical Interface (according SSI): RS-422 differential (according SSI) Pin 1.3 Pins 1.3, 1.4 Output delay (0->1 or 1->0) Max. 0.35 µS Output current 510 mA Switching frequency (selectable) 200 kHz, 500 kHz and 1 MHz Short-circuit proof / overload proof Yes Output current limitation Yes, automatic reactivation after short-circuit/overload Resistance to feedback against reverse polarity Yes Max. cable length, shielded (depending on sensor) 100 m Frocess voltage L+ Nominal voltage 24 V DC Current consumption from L+ (FM502 and PM592, no communication module) Inrus furmer trom L+ (at power up, FM502 and PM592, no communication module) Inrus current from L+ (at power up, FM502 and PM592, no communication module) Electrical isolation Yes, (PM592 and FM592 to other I/O-Bus modules) Max. power dissipation within the FM502 module 6.5 W (outputs unloaded) S-vencoder supply output	high-speed inputs				
Input type 24 V DC 5 V DC / Differential / Sinus 1 Vpp Frequency up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz) Input frequency max. (frequency measurement only) 100 kHz (accuracy -0 %/+3 %) Max. cable length, shielded (depending on sensor) 300 m 100 m Fast outputs SSI CLK output B f. optical Interface (according SSI): RS-422 differential (according SSI) Pin 1.3 Pins 1.3, 1.4 Output delay (0->1 or 1->0) Max. 0.35 µs Output current ≤ 10 mA Switching frequency (selectable) 200 kHz, 500 kHz and 1 MHz Short-circuit proof / overload proof Yes Output current limitation Yes, automatic reactivation after short-circuit/overload Resistance to feedback against 24V signals Yes Resistance to feedback against 24V signals Yes Max. cable length, shielded (depending on sensor) 100 m Process voltage L+ Nominal voltage 24V DC Current consumption from L+ (FM502 and PM592, no communication module) Inrush current from L+ (at power up, FM502 and PM592, no communication module) Inrush current find the FM502 module 6.5 W (outputs unloaded) 5-V PC (4/, 5 %) 100 mA max.	Number of channels, type per module	3 (A B Z) type 1			
Frequency       up to 300 kHz (input filter: 50,500, 5 k, 20 k Hz)         Input frequency max. (frequency measurement only)       100 kHz (accuracy -0 %/+3 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       f. optical Interface (according SSI):       RS-422 differential (according SSI)         Pin 1.3       Pins 1.3, 1.4         Output delay (0->1 or 1->0)       Max. 0.35 μs         Output current       ≤ 10 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes         Output turrent limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       Nominal voltage         Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       1.2 A <sup>8</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>8</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-Vec(4 / 5 %) 100 mA may       Store Amay <td></td> <td>24 V DC</td> <td>5 V DC / Differential / Sinus 1 Vpp</td>		24 V DC	5 V DC / Differential / Sinus 1 Vpp		
Input frequency max. (frequency measurement only)       100 kHz (accuracy - 0%/+3%)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       F. optical Interface (according SSI):       RS-422 differential (according SSI)         SSI CLK output B       f. optical Interface (according SSI):       RS-422 differential (according SSI)         Pin 1.3       Pins 1.3, 1.4         Output delay (0->1 or 1->0)       Max. 0.35 μs         Output current       ≤ 10 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes         Output current limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       Process voltage L+         Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (a power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s <td>Frequency</td> <td>up to 300 kHz (ipput filter: 50 500 5 k 201</td> <td></td>	Frequency	up to 300 kHz (ipput filter: 50 500 5 k 201			
Input requercy ineasurement only       100 kHz (accuracy -0 %/ 5 %)         Max. cable length, shielded (depending on sensor)       300 m       100 m         Fast outputs       f. optical Interface (according SSI):       RS-422 differential (according SSI)         SSI CLK output B       f. optical Interface (according SSI):       RS-422 differential (according SSI)         Output delay (0->1 or 1->0)       Max. 0.35 μs       Pins 1.3, 1.4         Output current       ≤ 10 mA       Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes       Sold kHz, 500 kHz and 1 MHz         Sold kHz, sold k	Input frequency max (frequency measurement only)	100 kHz (accuracy, 0.% (+2.%)	(12)		
Max. cable length, shielded (depending on sensor) is soon for a s	Max, cable length, chielded (depending on concer)	200 m	100 m		
Fast outputs       F. optical Interface (according SSI):       RS-422 differential (according SSI)         SSI CLK output B       f. optical Interface (according SSI):       Pins 1.3, 1.4         Output delay (0->1 or 1->0)       Max. 0.35 µs       Pins 1.3, 1.4         Output current       \$ 10 mA       Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes         Output current limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against 24V signals       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       VC         Nominal voltage       24 V DC         Current from L+ (FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Invush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Invush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         S-Vencoder supply output       6.5 W (outputs unloaded)		300 11	100111		
SSICLR output B       1. optical interface (according SSI):       RS-422 differential (according SSI)         Pin 1.3       Pins 1.3       Pins 1.3, 1.4         Output delay (0->1 or 1->0)       Max. 0.35 μs       Pins 1.3, 1.4         Output current       ≤ 10 mA       Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes       Yes         Output current limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against 24V signals       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       Nominal voltage         Nominal voltage       24 V DC         Current from L+ (FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. ower dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       FVDC (b/ ( 5 %) 100 mA max	Fast outputs		DC 422 differential (according CCI)		
Output delay (0->1 or 1->0)       Max. 0.35 µs         Output current       ≤ 10 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes         Output current limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against 24V signals       Yes         Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       VDC         Nominal voltage       24 V DC         Current from L+ (FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       FMC (4/ £ %) 100 mA may	SSI CLK output B	Pin 1.3	Pins 1.3, 1.4		
Output current       ≤ 10 mA         Switching frequency (selectable)       200 kHz, 500 kHz and 1 MHz         Short-circuit proof / overload proof       Yes         Output current limitation       Yes, automatic reactivation after short-circuit/overload         Resistance to feedback against 24V signals       Yes         Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       VC         Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       5. VDC (x/ (5.%) 100 mA max	Output delay (0->1 or 1->0)	Max. 0.35 μs			
Switching frequency (selectable)200 kHz, 500 kHz and 1 MHzShort-circuit proof / overload proofYesOutput current limitationYes, automatic reactivation after short-circuit/overloadResistance to feedback against 24V signalsYesResistance to feedback against reverse polarityYesMax. cable length, shielded (depending on sensor)100 mProcess voltage L+24 V DCNominal voltage24 V DCCurrent consumption from L+ (FM502 and PM592, no communication module)Max. 0.43 A + max. 0.5 A per outputInrush current from L+ (at power up, FM502 and PM592, no communication module)1.2 A² sElectrical isolationYes, (PM592 and FM502 to other I/O-Bus modules )Max. power dissipation within the FM502 module6.5 W (outputs unloaded)5-V-encoder supply outputFVDC (hr ( 5 %) 100 mA max	Output current	≤ 10 mA			
Short-circuit proof / overload proofYesOutput current limitationYes, automatic reactivation after short-circuit/overloadResistance to feedback against 24V signalsYesResistance to feedback against reverse polarityYesMax. cable length, shielded (depending on sensor)100 mProcess voltage L+Nominal voltage24 V DCCurrent consumption from L+ (FM502 and PM592, no communication module)Max. 0.43 A + max. 0.5 A per outputInrush current from L+ (at power up, FM502 and PM592, no communication module)1.2 A²sElectrical isolationYes, (PM592 and FM502 to other I/O-Bus modules )Max. power dissipation within the FM502 module6.5 W (outputs unloaded)5-V-encoder supply outputFVDC (r/ ( 5 %) 100 mA max	Switching frequency (selectable)	200 kHz, 500 kHz and 1 MHz			
Output current limitationYes, automatic reactivation after short-circuit/overloadResistance to feedback against 24V signalsYesResistance to feedback against reverse polarityYesMax. cable length, shielded (depending on sensor)100 mProcess voltage L+Nominal voltage24 V DCCurrent consumption from L+ (FM502 and PM592, no communication module)Max. 0.43 A + max. 0.5 A per outputInrush current from L+ (at power up, FM502 and PM592, no communication module)1.2 A²sElectrical isolationYes, (PM592 and FM502 to other I/O-Bus modules )Max. power dissipation within the FM502 module6.5 W (outputs unloaded)5-V-encoder supply output5.V DC (4/ 5 %) 100 mA max	Short-circuit proof / overload proof	Yes			
Resistance to feedback against 24V signals       Yes         Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+          Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       Max. 0.43 A + max. 0.5 A per output         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       FVDC (r/ ( 5 %) 100 mA max	Output current limitation	Yes, automatic reactivation after short-cir	cuit/overload		
Resistance to feedback against reverse polarity       Yes         Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       Nominal voltage         Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       Max. 0.43 A + max. 0.5 A per output         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       FVDC (4/ 5 %) 100 mA max	Resistance to feedback against 24V signals	Yes			
Max. cable length, shielded (depending on sensor)       100 m         Process voltage L+       Image: Comparison of the sensor of the sen	Resistance to feedback against reverse polarity	Yes			
Process voltage L+         Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       Max. 0.43 A + max. 0.5 A per output         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       5.4 DC (4/ 5 %) 100 mA max	Max, cable length, shielded (depending on sensor)	100 m			
Nominal voltage       24 V DC         Current consumption from L+ (FM502 and PM592, no communication module)       Max. 0.43 A + max. 0.5 A per output         Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       5.4 DC (4/ 5 %) 100 mA max	Process voltage L+				
Current consumption from L+ (FM502 and PM592, Max. 0.43 A + max. 0.5 A per output Current consumption from L+ (FM502 and PM592, no communication module) Inrush current from L+ (at power up, FM502 and PM592, no communication module) Electrical isolation Yes, (PM592 and FM502 to other I/O-Bus modules ) Max. 0.43 A + max. 0.5 A per output Electrical isolation module Electrical isolation Yes, (PM592 and FM502 to other I/O-Bus modules ) 6.5 W (outputs unloaded) 5-V-encoder supply output Electrical isolation	Nominal voltage	24 V DC			
Inrush current from L+ (at power up, FM502 and PM592, no communication module)       1.2 A <sup>2</sup> s         Electrical isolation       Yes, (PM592 and FM502 to other I/O-Bus modules )         Max. power dissipation within the FM502 module       6.5 W (outputs unloaded)         5-V-encoder supply output       5.4 DC (4 ( 5 %) 100 mA max	Current consumption from L+ (FM502 and PM592, no communication module)	Max. 0.43 A + max. 0.5 A per output			
Electrical isolation Yes, (PM592 and FM502 to other I/O-Bus modules ) Max. power dissipation within the FM502 module 6.5 W (outputs unloaded) 5-V-encoder supply output Electrical voltage EV.DC (+(	Inrush current from L+ (at power up, FM502 and PM592, no communication module)	1.2 A <sup>2</sup> s			
Max. power dissipation within the FM502 module 6.5 W (outputs unloaded) 5-V-encoder supply output 5-V-encoder supply outpu	Electrical isolation	Yes. (PM592 and EM502 to other I/O-Busin	nodules )		
5-V-encoder supply output	Max. power dissipation within the FM502 module	6.5 W (outputs unloaded)			
	5-V-encoder supply output				
	Nominal voltage	5 V DC (+/- 5 %), 100 mA max.			

Technical data

### AC500 communication modules

- Up to 4 communications modules can be used on an AC500 CPU
- No external power supply required.

Туре	CM592-DP	CM582-DP	CM597-ETH	CM598-CN	CM588-CN	CM579-PNIO
Communication int	erfaces					
RJ45	-	-	• (x 2) (2)	-	-	• (x 2) (2)
RS-232 / 485	-	-	-	-	-	-
Terminal blocks (1)	-	-	-	•	•	-
Sub-D socket	•	•	-	-	-	-
Protocols	PROFIBUS DP V0/V1 master	PROFIBUS DP V0/V1 slave	Ethernet (TCP/IP, UPD/IP, Modbus TCP)	CANopen master	CANopen slave	PROFINET IO controller
CPU interface	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory
Transfer Rate	9.6 kbit/s to 12 Mbit/s	9.6 kbit/s to 12 Mbit/s	10 / 100 Mbit/s	10 kbit/s to 1 Mbit/s	10 kbit/s to 1 Mbit/s	100 Mbit/s
Co-processor						
Memory	-	_	-	-	-	-
Additional features	Multi master functionality Max. Number of subscribers: • 126 (V0) • 32 (V1)	-	Online access, ICMP (Ping), DHCP, IP configuration protocol, UDP data exchange, Modbus TCP	CAN 2.0A CAN 2.0B CANopen	NMT Slave PDO SDO server Heartbeat Nodeguard	RTC - Real-time Cyclic Protocol, Class 1 RTA - Real-time Acyclic Protocol DCP Discovery and Configuration Protocol CL-RPC - Connectionless Remote Procedure Call

Туре	CM589-PNIO	CM589-PNIO-4	CM579-ETHCAT	CM574-RS	CM574-RCOM
Communication int	erfaces				
RJ45	• (x 2) (2)	• (x 2) (2)	• (x 2)	-	-
RS-232 / 485	-	-	-	• (x 2)	• (x 2)
Terminal blocks (1)	-	_	-	• (x 2)	• (x 2)
Sub-D socket	-	-	-	-	-
Protocols	PROFINET IO device	PROFINET IO 4 x devices	EtherCAT master	Serial COM ASCII, Modbus RTU, CS31	Serial RCOM/RCOM+
CPU interface	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory
Transfer Rate	100 Mbit/s	100 Mbit/s	10 / 100 Mbit/s	9.6 kBit/s up to 187.5 kBit/s	2,4 kBit/s to 19.2 kBit/s
Co-processor				Programmable CPU like PM57x with PowerPC 50 MHz processor	
Memory	-	-	-	256 kB program memory 384 kB data memory	-
Additional features	RTC - Real-time Cyclic Protocol, Class 1 RTA - Real-time Acyclic Protocol DCP Discovery and Configuration Protocol LLDP - Link Layer Discovery Protocol	RTC - Real-time Cyclic Protocol, Class 1 RTA - Real-time Acyclic Protocol DCP Discovery and Configuration Protocol LLDP - Link Layer Discovery Protocol	CoE (Can over Ethercat) process data (PDO) (cyclic) CoE Mailbox data (SDO) (acyclic) Distributed Clock (32-bit, 64-bit)	<ul> <li>Stand alone CPU in coupler module housing allowing to be used as standard serial interface or as free programmable serial interface coupler.</li> <li>Independant internal CPU programmable for own communication protocol or data processing.</li> <li>2 x CS31 master, Modbus master/slave, free configurable, protocols ASCII.</li> </ul>	-

(1) Plug-in terminal block included. (2) 10 / 100 Mbit/s, full/half duplex with auto-sensing, 2-port switch integrated

Technical data

#### Communication interface modules

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bits + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits. Temperature: 0.1 °C.

Туре		DC551-CS31	CI590-CS31-HA (1)	CI592-CS31	
Communication Interface	e				
Protocol		Proprietary CS31 bus	protocol on RS485 interface		
ID configuration		Per rotary switches on front face from 00d to 99d			
Field bus connection on te	erminal units	CS31 field bus, via ter	minal / redundant for CI590-CS31-H	A on TU551-CS31 or TU552-CS31	
Number of Channels per I	Module				
Digital	inputs	8	_	8	
	outputs	-	_	_	
Analog	inputs	-	_	4	
	outputs	-	_	2	
Digital configurable chan	nels DC	16	16	8	
(configurable as inputs or	routputs)				
Additional configuration	of channels as				
Fast counter		Configuration of max	. 2 channels per module		
Occupies max. 1 DO or DO	when used as counter	•	•	•	
Connection					
Via terminal unit TU5xx		•	•	•	
Local I/O extension					
Max. number of extensior	n modules	max. 7 x S500 extensi or up to 32 Als/32AOs	on modules (standard or eCo), up to per station	31 stations with up to 120 DIs/120 DOs	
			not for S500-eCo I/O mo	dules	
Digital inputs					
Input signal volta	ge	24 V DC			
characteris	tic acc. to EN 61132-2	Type 1			
0 signal		-3+5 V DC			
Undefined signal state		515 V DC			
1 signal		1530 V DC			
Residual ripple, range for	0 signal	-3+5 V DC			
	1 signal	1530 V DC			
Input time delay (0 -> 1 or	1 -> 0)	8 ms typically, configu	rable from 0.1 up to 32 ms		
Digital outputs					
Transistor outputs 24 V D	C, 0.5 A	•			
Readback of output		•			
Outputs, supplied via pro	cess voltage UP	•			
Switching of 24 V load		•			
Output voltage at signal s	itate 1	Process voltage UP - C	0.8 V		
Output current					
Nominal current per chan	nel	0.5 A			
Maximum (total current o	f all channels)	8 A	8 A	4 A	
Residual current at signal	state 0	< 0.5 mA			
Demagnetization when sw loads	witching off inductive	By internal varistors			
Analog inputs Al		Max. number per mod	ule and with regard to the configura	tion: Als / Measuring points	
Signal configuration per A	AI	-		•	
010 V / -10+10 V		-		4 / 4	
020 mA / 420 mA		-		4 / 4	
RTD using 2/3 wire needs	1/2 channel(s)	-		4 / 2	
010 V using differential needs 2 channels	inputs,	-		4/2	
-10+10 V using different needs 2 channels	ial inputs,	-		4 / 2	
Digital signals (digital inp	ut)	-		4/4	
(1) Dedicated to High Availabili	ty				

(1) D o High / oility.

Technical data

#### Communication interface modules

Туре		DC551-CS31	<b>Cl590-CS31-HA</b> (1)	CI592-CS31		
Data when	using the AI as digital input					
Input	time delay	_		8 ms typically, configurable from 0.1 up to 32 ms		
	signal voltage	-		24 V DC		
Outputs, si	ingle configurable as					
Possible co	nfiguration per AO	-		•		
-10+10 V		-		•		
020 mA /	420 mA	-		•		
Output	resistance (load) when used as current output	-		0500 Ω		
	loading capability when used as voltage output	_		±10 mA max.		
Potential is	solation					
Per module	1	•	•	•		
Between fie the module	eldbus interface against the rest of	•	•	•		
Voltage sup	oply for the module	By external 24 V DC voltage via terminal UP				
Process vo	ltage UP					
Nominal vo	ltage	24 V DC				
Current cor	nsumption on UP					
Min. (module alone)		0.100 A	0.100 A	0.070 A		
Max	. (min. + loads)	0.100 A + load	0.100 A + load	0.070 A + load		
Reverse po	larity protection	•				
Fuse for pro	ocess voltage UP	10 A miniature fuse				
Approvals		See detailed page 248 c	See detailed page 248 or www.abb.com/plc			

(1) Dedicated to High Availability.

Technical data

#### **PROFIBUS-DP** modules

Туре		CI541-DP	CI542-DP		
Communication	n Interface				
Protocol		PROFIBUS DP (DP-V0	and DP-V1 slave)		
D configuratio	า	Per rotary switches o	Per rotary switches on front face from 00h to FFh		
Field bus conne	ction on terminal units	Sub-D 9 poles on TU5 1Mbaud	Sub-D 9 poles on TU509, TU510 preferred but TU517/TU518 can be used with baud rate up to 1Mbaud		
Number of Cha	nnels per Module				
Digital	inputs	8	8		
-	outputs	8	8		
Analog	inputs	4	_		
	outputs	2	_		
Digital configur (configurable as	able channels DC s inputs or outputs)	-	8		
Additional conf	iguration of channels as				
Fast counter (or	nboard I/O)	Configuration of max	2 DI channels per module		
Occupies max 1	DO or DC when used as counter	•			
Connection					
Local I/O exten	sion	•			
Max. number of	extension modules	max. 10 x S500 extens modules can be also u	ion modules (standard or eCo modules allowed). Fast counter from digital IO sed.		
Via terminal uni	t TU5xx	•			
Digital inputs					
Input s	signal voltage	24 V DC			
-	characteristic acc. to EN 61132-2	Type 1			
0 signal		-3+5 V DC	-3+5 V DC		
Undefined sign	al state	515 V DC			
1 signal		1530 V DC			
Residual ripple,	range for 0 signal	-3+5 V DC			
	1 signal	1530 V DC			
Input time dela	y (0-> 1 or 1-> 0)	8 ms typically, config	rable from 0.1 up to 32 ms		
Digital outputs	i				
Transistor outp	uts 24 V DC, 0.5 A	•			
Readback of ou	tput	-	• (on DC outputs)		
Outputs, suppli	ed via process voltage UP	•			
Switching of 24	Vload	•			
Output voltage	at signal state 1	Process voltage UP - 0	.8 V		
Output current	•				
Nominal curren	t per channel	0.5 A			
Maximum (tota	current of all channels)	8 A			
Residual curren	t at signal state 0	< 0.5 mA			
Demagnetizatio loads	on when switching off inductive	By internal varistors			
Analog Inputs A	AI	Max. number per moc	ule and with regard to the configuration: Als / Measuring points		
Signal configura	ation per Al	4	-		
010 V / -10+	10 V	4/4	_		
020 mA / 42	20 mA	4/4	_		
RTD using 2/3 v	vire needs 1/2 channel(s)	4/2	-		
010 V using d needs 2 channe	ifferential inputs, Is	4/2	-		
-10+10 V using needs 2 channe	g differential inputs, Is	4 / 2	-		
Digital signals (	digital input)	4/4	-		
Data when usin	g the AI as digital input				
Input I	nput time delay	8 ms typically, config	rable from 0.1 up to 32 ms –		
5	signal voltage	24 V DC	-		

Technical data

### PROFIBUS-DP modules

Туре			CI541-DP	CI542-DP	
Outputs, s	ingle configura	ble as			
Possible co	onfiguration per	AO	•	-	
-10+10V			•	-	
020 mA /	/ 420 mA		•	-	
Output	resistance current out	(load) when used as put	0500 Ω	-	
	loading cap voltage out	ability when used as put	±10 mA max.	-	
Potential i	solation				
Per module			•	•	
Between fieldbus interface against the rest of the module		e against the rest of	•	0	
Between th	he channels	input	-	-	
		output	-	-	
Voltage su	pply for the mod	dule	By external 24 V DC voltage via terminal UP		
Process vo	oltage UP				
Nominal vo	oltage		24 V DC		
Current co	nsumption on U	P			
Min. (n	nodule alone)		0.260 A		
Max. (r	min. + loads)		0.260 A + load		
Reverse po	plarity protectio	n	•		
Fuse for pr	rocess voltage U	P	10 A miniature fuse		
Approvals			See detailed page 248 or www.abb.com/plc		

Technical data

### **CANopen modules**

Type		CI581-CN	CI582-CN	
Communication interface				
Protocol		CANopen slave DS401 profile selectable using rot	tary switches	
ID configuration		Per rotary switches on front face for CANopen ID node from 00h to 7Fh and 80h to FFh for CANopen DS401 profile		
Field bus connection on term	ninal units	Terminal blocks on TU517/TU518 or TU509/TU51	0	
Number of channels per mo	dule		-	
Digital	inputs	8	8	
Digital		8	8	
Analog	inputs	4	-	
, indiog		2	_	
Digital configurable channel		-	8	
(configurable as inputs or ou	utputs)		0	
Additional configuration of	channels as			
Fast counter (onboard I/O)		Configuration of max. 2 DI channels per module		
Occupies max. 1 DO or DC w	hen used as counter	•	•	
Connection				
Local I/O extension		•		
Max. number of extension m	odules	max, 10 x S500 extension modules (standard or e	Co modules are allowed)	
Via terminal unit TU5xx		•	•	
Digital inputs				
Input signal volta	ade	24 V DC		
characteris				
to EN 6113	2-2			
0 signal		-3+5 V DC		
Undefined signal state		515 V DC		
1 signal		1530 V DC		
Residual ripple, range for	0 signal	-3+5 V DC		
	1 signal	1530 V DC		
Input time delay (0 -> 1 or 1 -	·> 0)	8 ms typically, configurable from 0.1 up to 32 ms		
Digital outputs	-,			
Transistor outputs 24 V DC.	0 5 A	•		
Readback of output		-	• (on DC outputs)	
Outputs supplied via proces	ss voltage LIP	•		
Switching of 24 V load	ss voltage of	•		
Output voltage at signal stat	to 1			
Nominal current per channel		0.5.4		
Maximum (total current of a	ll channels)	84		
Residual current at signal sta	ate 0	< 0.5 mA		
Demagnetization when swit	ching off inductive	By internal varistors		
loads		by memal variators		
Analog Inputs Al		Max. number per module and with regard to the c	onfiguration: Als / Measuring points	
Signal configuration per Al		4	-	
010 V / -10+10 V		4/4	-	
020 mA / 420 mA		4/4	_	
RTD using 2/3 wire needs 1/2 channel(s)		4/2	_	
010 V using differential inp channels	outs, needs 2	4/2	-	
-10+10 V using differential 2 channels	inputs, needs	4/2	-	
Digital signals (digital input)	)	4 / 4	-	
Data when using the AI as d	igital input			
Input	time delay	8 ms typically, configurable from 0.1 up to 32 ms	-	
	signal voltage	24 V DC	-	

Technical data

### **CANopen modules**

Туре			CI581-CN	CI582-CN	
Outputs, si	ngle configurat	ole as			
Possible co	nfiguration per	AO	•	-	
-10+10 V			•	-	
020 mA /	420 mA		•	-	
Output	resistance as current	e (load) when used output	0500 Ω	_	
	loading ca as voltage	pability when used output	±10 mA max.	_	
Potential is	olation				
Per module			•	•	
Between fieldbus interface against the rest of the module		against the rest	•	•	
Between th	e channels	input	-	_	
		output	-	-	
Voltage sup	ply for the mod	ule	By external 24 V DC voltage via terminal UP		
Process vol	tage UP				
Nominal vol	ltage		24 V DC		
Current con	sumption on UF	0			
Min. (m	iodule alone)		0.260 A		
Max. (n	nin. + loads)		0.260 A + load		
Reverse pol	arity protection	1	•		
Fuse for pro	ocess voltage UP	>	10 A miniature fuse		
Approvals			See detailed page 248 or www.abb.com/plc		

Technical data

### **PROFINET IO RT device modules**

Туре		CI501-PNIO	CI502-PNIO	CI504-PNIO	CI506-PNIO	
Communication interface						
Ethernet Interface						
Main protocol		PROFINET IO RT device				
ID Device configuration		By rotary switch on the front side, from 00h to FFh				
Ethernet connection on	terminal units	2 x RJ45 with switch fur TU520-ETH	nctionality for simple dais	y chain on TU507-ETH or	TU508-ETH or	
Gateway Interface						
Gateway to		-	-	3 x RS232 / RS422 / RS485 ASCII serial interfaces	CAN / CANopen Master + 2 x RS232 / RS422 / RS485 ASCII serial interfaces	
Fieldbus Protocol used		-	-	-	CAN 2A/2B Master - CANopen Master (1)	
CAN physical interface		-	-	-	1 x 10 poles pluggable spring connector	
Baudrate		-	-	-	Baudrate up to 1 MBit/s, Support for up to 126 CANopen Slaves	
Serial interface		-	-	3 x RS232 / RS422 or RS485	2 x RS232 / RS422 or RS485	
Protocol used		-	-	ASCII	ASCII	
Baudrate		-	-	Configurable from 300	bit/s to 115200 bit/s	
Fieldbus or serial connection on terminal units		-	-	3 x pluggable terminal b TU520-ETH	plocks with spring on	
Number of channels per mod	ule					
Digital	inputs	8	8	_	_	
5	outputs	8	8	_	-	
Analog	inputs	4	_	_	-	
5	outputs	2	-	_	-	
Digital configurable channels DC		-	8	-	-	
Additional configuration of o	hannels as					
Fast counter (onboard I/O)		Configuration of max. 2	2 DI channels per module	_	_	
Occupies max. 1 DO or DC wh	en used as counter	•		_	-	
Connection						
Local I/O extension		•		•	•	
Max. number of extension mo	odules	max. 10 x S500 extension modules (standard or eCo modules allowed). Fast counter from digital IO modules can be also used.		Valid for CI501, 502, 504 and 506. All modules can have extension up to 10 modules		
Via terminal unit TU5xx		•	•	•	•	
Digital inputs						
Input signal volta	ge	24 V DC		-	-	
characterist to EN 61132	tic acc. -2	Type 1		-	_	
0 signal		-3+5 V DC		-	-	
Undefined signal state		515 V DC		-	-	
1 signal		1530 V DC		-	-	
Residual ripple, range for	0 signal	-3+5 V DC		_	-	
	1 signal	1530 V DC		-	-	
Input time delay (0 -> 1 or 1 ->	• 0)	8 ms typically, configur	able from 0.1 up to 32 ms	-	-	
Digital outputs						
Transistor outputs 24 V DC, 0	.5 A	•		-	-	
Readback of output		-	• (on DC outputs)	-	-	
Outputs, supplied via proces	s voltage UP	•		-	-	
Switching of 24 V load		•		-	-	
Output voltage at signal state	e 1	Process voltage UP - 0.8	3 V	-	-	

Technical data

### **PROFINET IO RT device modules**

Туре		CI501-PNIO	CI502-PNIO	CI504-PNIO	CI506-PNIO	
Output curren	nt	-				
Nominal curre	ent per channel	500 mA at UP = 24 V D	C	_	_	
Maximum (tot	tal current of all channels)	8 A		_	-	
Residual curre	ent at signal state 0	< 0.5 mA		_	-	
Demagnetizat loads	tion when switching off inductive	By internal varistors		-	-	
Analog inputs	s Al	Max. number per mod	ule and with regard t	o the configuration: Als /	Measuring points	
Signal configu	uration per Al	4	-	-	-	
010 V / -10	+10 V	4/4	-	-	-	
020 mA / 4.	20 mA	4/4	-	-	-	
RTD using 2/3	3 wire needs 1/2 channel(s)	4/2	-	-	-	
010 V using needs 2 chanr	differential inputs, nels	4/2	-	-	-	
-10+10 V usi needs 2 chanr	ng differential inputs, nels	4/2	-	-	-	
Digital signals	s (digital input)	4/4	-	-	-	
Data when us	ing the AI as digital input					
Input	time delay	8 ms typically, configurable from 0.1 up to 32 ms	_	-	-	
	signal voltage	24 V DC	-	-	-	
Outputs, sing	le configurable as					
Possible confi	iguration per AO	•	-	-	-	
-10+10 V		•	-	-	-	
020 mA / 4.	20 mA	•	-	-	-	
Output	resistance (load) when used as current output	0500 Ω	-	-	-	
	loading capability when used as voltage output	±10 mA max.	-	-	-	
Potential isol	ation					
Per module		•	•	•	•	
Between Ethe the module	rnet interface against the rest of	•	•	•	•	
Voltage supply for the module		By external 24 V DC voltage via terminal UP				
Process volta	ge UP					
Nominal volta	ge	24 V DC				
Current consu	Imption on UP					
min. (mo	dule alone)	0.260 A		0.150 A		
max. (miı	n. + loads)	0.260 A + load		0.150 A		
Reverse polar	ity protection	•				
Fuse for proce	ess voltage UP	10 A miniature fuse				
Approvals		See detailed page 248 or www.abb.com/plc				

(1) Not simultaneously.

Technical data

### EtherCAT modules

Type		CI511-ETHCAT	CI512-ETHCAT	
Communication interface				
Protocol		EtherCAT slave with CAM-Switch configurat	le function on the digital outputs	
ID Device configuration		- Address is defined by position on Ethernet bys		
Field bus connection on TUS		2 x B145 with switch functionality for simple	dajsvichajo op TU507-ETH or TU508-ETH	
Number of channels per mor	hule	2 × K3+5 with switch functionality for simple		
Digital	inputs			
Digital		0	<u> </u>	
Applog	inputs	0	0	
Analog		2	-	
Digital configurable channel		2		
as inputs or outputs)	SDC (configurable	-	0	
Additional configuration of	channels as			
Fast counter (onboard I/O)		-		
Occupies max 1 DO or DC wh	nen used as counter	_		
Connection				
Local I/O extension		•		
Max_number of extension m	odules	max_10 x \$500 extension modules (standar	d or eCo modules allowed) East counter from digital	
That hamber of extension in	oddies	IO modules can be also used.		
Via terminal unit TU5xx		•		
Digital inputs				
Input signal voltage		24 V DC		
Input characteristic acc. to E	N 61 132-2	Type 1		
0 signal		-3+5 V DC		
Undefined signal state		515 V DC		
1 signal		1530 V DC		
Residual ripple, range for	0 signal	-3+5 V DC		
	1 signal	1530 V DC		
Input time delay (0 -> 1 or 1 -	> 0)	8 ms typically, configurable from 0.1 up to 3	2 ms	
Digital outputs				
Transistor outputs 24 V DC, 0	).5 A	•		
Readback of output		_	• (on DC outputs)	
Outputs, supplied via proces	s voltage UP	•		
Switching of 24 V load		•		
Output voltage at signal stat	e 1	Process voltage UP - 0.8 V		
Output current				
Nominal current per channel		500 mA at UP = 24 V DC		
Maximum (total current of al	l channels)	8 A		
Residual current at signal sta	ite 0	< 0.5 mA		
Demagnetization when swite	ching off inductive	By internal varistors		
loads				
Analog inputs Al		Max. number per module and with regard to	the configuration: Als / Measuring points	
Signal configuration per Al		4	-	
010 V / -10 V +10 V		4 / 4	-	
020 mA / 420 mA		4 / 4	_	
RTD using 2/3 wire needs 1/3	2 channel(s)	4 / 2	-	
010 V using differential inp needs 2 channels	uts,	4/2	-	
-10+10 V using differential needs 2 channels	inputs,	4 / 2	-	
Digital signals (digital input)		4 / 4	-	
Data when using the AI as di	gital input			
Input	time delay	8 ms typically, configurable from 0.1 up to 3	2 ms –	
	signal voltage	24 V DC	-	

Technical data

### EtherCAT modules

Туре		CI511-ETHCAT	CI512-ETHCAT	
Outputs, single configura	ble as:			
Possible configuration per AO		•	-	
-10+10 V		•	-	
020 mA / 420 mA		•	-	
Output resistance (load) when used as current output		0500 Ω	-	
Output loading capability when used as voltage output		±10 mA max.	-	
Potential isolation				
Per module		•	•	
Between Ethernet interface against the rest of the module		•	•	
Between the channels	input	-	-	
	output	-	-	
Voltage supply for the mo	dule	By external 24 V DC voltage via terminal UP		
Process voltage UP				
Nominal voltage		24 V DC		
Current consumption on U	P			
min. (module alone)		0.260 A		
max. (min. + loads)		0.260 A + load		
Reverse polarity protection		•		
Fuse for process voltage UP		10 A miniature fuse		
Approvals		See detailed page 248 or www.abb.com/plc		

Technical data

### Modbus TCP modules

Туре		CI521-MODTCP	CI522-MODTCP	
Communication interface				
Ethernet Interface				
Main protocol		Modbus TCP		
ID Device configuration		By rotary switch on the front side, from 00h to F	Fh	
Ethernet connection on terminal units		2 x RJ45 with switch functionality for simple da	isy chain on TU507-ETH or TU508-ETH	
Number of channels per m	odule			
Digital	inputs	8	8	
	outputs	8	8	
Analog	inputs	4	-	
	outputs	2	-	
Digital configurable chann	els DC	-	8	
(configurable as inputs or o	outputs)			
Additional configuration of	of channels as			
Fast counter (onboard I/O)	l	Configuration of max. 2 DI channels per module		
Occupies max. 1 DO or DC	when used as counter	•		
Connection				
Local I/O extension		•		
Max. number of extension	modules	max. 10 x S500 extension modules (standard or IO modules can be also used.	eCo modules allowed). Fast counter from digital	
Via terminal unit TU5xx		•	•	
Digital inputs				
Input signal vol	tage	24 V DC		
character to EN 611	ristic acc. .32-2	Type 1		
0 signal		-3+5 V DC		
Undefined signal state		515 V DC		
1 signal		1530 V DC		
Residual ripple, range for	0 signal	-3+5 V DC		
	1 signal	1530 V DC		
Input time delay (0 -> 1 or 1	L -> 0)	8 ms typically, configurable from 0.1 up to 32 m	5	
Digital outputs				
Transistor outputs 24 V DC	C, 0.5 A	•		
Readback of output		-	• (on DC outputs)	
Outputs, supplied via proc	ess voltage UP	•		
Switching of 24 V load		•		
Output voltage at signal st	ate 1	Process voltage UP - 0.8 V		
Output current				
Nominal current per chann	el	500 mA at UP = 24 V DC		
Maximum (total current of	all channels)	8 A		
Residual current at signal s	state 0	< 0.5 mA		
Demagnetization when switching off inductive		By internal varistors		
		Max, number ner medule and with regard to the	configuration. Als (Massuring points	
Signal configuration por Al		Max. number per module and with regard to the	configuration: Als / Measuring points	
Signal configuration per Al		4	-	
010 V / -10 +10 V			-	
U 20 MA / 4 20 MA		4/2	-	
<pre>kiD using 2/3 wire needs 1/2 channel(s)</pre>		4/2		
needs 2 channels				
-10+10 V using differential inputs, needs 2 channels		4 / 2	-	
Digital signals (digital input)		4/4	-	

(1) Not simultaneously.

Technical data

### Modbus TCP modules

CI521-MODTCP	CI522-MODTCP	
8 ms typically, configurable from 0.1 up to 32 ms –		
24 V DC	-	
•	-	
•	-	
•	-	
0500 Ω	-	
±10 mA max.	-	
•	•	
•	•	
By external 24 V DC voltage via terminal UP		
24 V DC		
0.260 A		
0.260 A + load		
0		
10 A miniature fuse		
See detailed page 248 or www.abb.com/plc		
	CIS21-MODTCP  8 ms typically, configurable from 0.1 up to 32 ms 24 V DC	

(1) Not simultaneously.

Technical data

#### CS31 functionality

	AC500 CPU with integrated CS31 interface	S500 I/O with communication interface DC551-CS31 CI590-CS31-HA CI592-CS31	
Master	Yes, at COM1	-	
Slave	No	Yes / Redundant for CI590-CS31-HA	
Protocols supported	ABB CS31 protocol		
Diagnosis			
Error indication	On LCD display of the CPU / AC500-eCo error LED	Via module LEDs	
Online diagnosis	Yes		
Error code	Errors are recorded in the diagnosis system of the CPU		
Associated function blocks	Yes		
Physical layer	RS485 / 2 x RS485 for CI590-CS31-HA for redundancy		
Connection	Plug at COM1	Screw-type or spring-type terminals	
Baudrate	187.5 kbit/s		
Distance	AC500-eCo: up to 50 m and up to 500 m using the isolator TK506 / AC500: up to 500 m; up to 2000 m using a repeater		
Max. number of modules on fieldbus	31 modules max. Please note: The CS31 bus interface occupies one or two module addresses (if counters are configured onboard or if the module is a mixed digital analog module). Depending on the configuration, or if the module contains also mixed digital analog I/O, connected extension modules can occupy further module addresses.		
Configuration	Using configuration tool (included in Automation Builde	Using configuration tool (included in Automation Builder software suite)	
Station address configuration	No	Using rotary switches (99 max.)	

### Digital and mixed signal I/O modules, "Fast Counter" operating modes. Not applicable for DC541 or eCo-I/O modules (1)

Operating mode, configured in the user program of the AC500		Occupied inputs DI or DC	Occupied outputs DO or DC	Maximum counting frequency kHz
0	No counter	0	0	-
1	One count-up counter with "end value reached" indication	1	1	50
2	One count-up counter with "enable" input and "end value reached" indication	2	1	50
3	Two up/down counters	2	0	50
4	Two up/down counters with 1 counting input inverted	2	0	50
5	One up/down counter with "dynamic set" input	2	0	50
6	One up/down counter with "dynamic set" input	2	0	50
7	One up/down counter with directional discriminator For synchro transmitters using two counting pulses with an offset of 90° (track A and B)	2	0	50
8	-	0	0	-
9	One up/down counter with directional discriminator and double evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	30
10	One up/down counter with directional discriminator and fourfold evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	15

(1) See technical documentation for details.

System data

### **Environmental Conditions**

Process and supply voltages				
24 V DC Voltage		24 V (-15 %, +20 %)		
	Protection against reverse polarity	yes		
Allowed interruptions of power supply	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s, PS2		
Important: Exceeding the maximum modules, power supply units accord II, pollution degree 2.	n process and supply voltages could lea ling to PELV or SELV specifications mus	ad to unrecoverable damage of the system. The system could be destroyed. For the supply of the st be used. The creepage distances and clearances meet the requirements of the overvoltage category		
Assembly position				
Horizontal	•			
Vertical	•			
Temperature				
Operating	0 °C +60 °C	Preferred mounting position horizontal. Other mounting positions see manual.		
Storage / Transport	-40 °C +70 °C			
Humidity				
Operating / Storage		Max 95 % r. H. without condensation		
Air pressure				
Operating		-1000 m 2000 m (1080 hPa 800 hPa)		
Storage		<3500 m (>660 hPa)		
Electromagnectic Compatibil	ity			
Radiated emission (radio distu	irbances)	Yes, Yes, in accordance with CISPR 16-2-3		
Conducted emission (radio dis	turbances)	Yes, Yes, in accordance with CISPR 16-2-1, CISPR 16-1-2		
Electrostatic discharge (ESD)		Yes, in accordance with IEC 61000-4-2, zone B, criterion B		
		Electrostatic voltage in case of air discharge: 8 kV		
		Electrostatic voltage in case of contact discharge: 6 kV		
Fast transient interference vol	tages (burst)	Yes, in accordance with IEC 61000-4-4, zone B, criterion B		
		Supply voltage units (DC): 2 kV		
		Supply voltage units (AC): 2 kV		
		Digital inputs /outputs (24 V DC): 1 kV		
		Digital inputs /outputs (120 240 V AC): 2 kV		
		Analog inputs/outputs: 1 kV		
		Communication lines shielded: 1 kV		
		I/O supply (DC-out): 2 kV		
High energy transient interfere	ence voltages (surge)	Ves in accordance with JEC 61000-4-5 zone B criterion B		
rightenergy transient interfert	ence voltages (surge)	Supply voltage units (DC): 1 kV CM* / 0.5 kV DM*		
		Supply voltage units (AC): 2 kV CM* / 1 kV DM*		
		Digital inputs (outputs (24 V DC): 1 kV CM* / 0.5 kV DM*		
		Digital inputs /outputs (120 240 V AC) 2 kV CM* / 1 kV DM*		
		Analog inputs /outputs (1EV. CM* / 0.5 EV. DM*		
		Communication lines shielded: 1 kV CM*		
		* CM = Common Mode * DM = Differential Mode		
Influence of undiated disturber		Vos in accordance with IEC 61000 4.2, zone B. criterion A		
influence of radiated disturbal	ices	Test field strength 10 //m		
		Ver in consultance with IEC C1000, 4 C mans R, criterian A		
innuence of fine-conducted int	.errerences	Test voltage, 10 V		
		Ves is seered as a with IEC C1000, 4.9, sees D, with rise A		
innuence of power frequency r	nagnetic neius	70.4 /m EQ.117		

#### WARNING!

Risk of malfunctions and damages to persons! Unused slots for communication modules are not protected against contact discharge. Dust and Dirt may cause contact problems and malfunctions. Unused slots for Communication Modules must be covered with Dummy Communication Modules ("TA524 - Dummy Communication Module").

I/O-Bus connectors must not be touched during operation.

In order to prevent malfunctions, it is recommended that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.

System data

#### **Environmental Conditions**

Environmental Tests				
Storage		IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h		
		IEC 60068-2-2 Test Bb: dry heat withstand test +70 °C / 16 h		
Humidity		IEC 60068-2-30 Test Db: Cyclic (12 h / 12 h) Damp-Heat Test 55 °C, 93 % r. H. / 25 °C, 95 % r. H., 2 cycles		
Vibration resistance		IEC 61131-2 / IEC 60068-2-6: 15 Hz 150 Hz, 1 g (with SD Memory Card inserted)		
Shock resistance		IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal		
Mechanical Data				
Wiring method		Spring terminals / Screw terminals		
Degree of protection		IP 20		
Assembly on DIN rail	DIN rail type	According to IEC 60715		
		35 mm, depth 7.5 mm or 15 mm		
Assembly with screws	Screw diameter	4 mm		
	Fastening torque	1.2 Nm		

#### Main dimensions mm, inches

Туре	Nr communication modules	Length L	
		mm	inches
TB511-ETH	1	95.5	3.76
TB521-ETH / TB523-2ETH	2	123.5	4.86
TB541-ETH	4	179.5	7.07
TB5600-2ETH	0	67.5	2.66
TB5610-2ETH	1	95.5	3.76
TB5620-2ETH	2	123.5	4.86
TB5640-2ETH	4	179.5	7.07





