

| Details | Type: | Small PLC AC31 series 40..50 | | | | | | Slot-PLC AC31 series 90 |
|--|-------|---|----------------------------|---------------------------------|---------------------------------|---|---------------------------------|---|
| | | CR41 | CT41 | CR42 | CT42 | KR51 | KT51 | SL97 |
| Program memory Flash EPROM and RAM [KByte] | | 32 | | | | 32 | | 480 |
| Supply voltage 24 V DC 120 / 230 V AC | | x x | x - | x x | x - | x x | x - | |
| Pug-in Smart Media Card | | - | | | | - | | x |
| Cycle time for 1 KByte [ms] 100% binary values 65% binary values and 35% text | | 0.4 1.2 | | | | 0.4 1.2 | | - 0.22 |
| Number of inputs and outputs Integrated (DI / DO / DC) DI/DO maximum integrated (AI / AO) AI/AO maximum | | 8 / 6 / - 110 - / - 36 | | 8 / 6 / - 110 3 / - 36 | | 8 / 6 / - 1000 - / - 222 | | - / - / - 992 - / - 224 / 224 |
| Digital inputs 24 V DC | | x | | | | x | | - |
| Digital outputs: Transistor (T) 24 V DC, 0,5 A Relays (R) 120 / 230 V AC, 2 A | | - x | x - | - x | x - | - x | x - | - - |
| Analogue input range ± 10 V 0 ... 10 V, 0 ... 5 V, ± 5 V 0 ... 20 mA, 4 ... 20 mA PT100 (- 50 °C ... + 400 °C) PT100 (- 30 °C ... + 70 °C) PT100 (- 100 °C ... + 524 °C) configurable as DI | | - - - - - - | - - - - x - | x - - - - x - | - - - - - - - | - - - - - - - | - - - - - - - | |
| Analogue output range ± 10 V 0 ... 20 mA, 4 ... 20 mA | | - | | | | - | | - - |
| Data buffering via battery | | integrated | | | | integrated | | optional |
| Real-time clock | | x | | | | x | | x |
| Programming package 907 AC 1131 907 PC 331 AC31GRAF | | x x x | | | | x x x | | x - - |
| Program execution cyclical or time driven multitasking | | x x | | | | x x | | x x |
| user program protection password | | x | | | | x | | x |
| Serial interfaces RS232 (programming, MODBUS, ASCII) RS485 (CS31 as MODBUS) | | 1 - | | | | 1 (RS232 or RS485) 1 | | 1 - |
| Integrated potentiometer | | 2 | | | | 2 | | - |
| Data memory [KByte] | | 2 | | | | 2 | | 256, incl. 16 KB RETAIN |
| Timers | | unlimited (42 at the same time) | | | | unlimited (42 at the same time) | | unlimited |
| Counters | | unlimited (function) | | | | unlimited (function) | | unlimited |
| High-speed counters (number/frequency) | | 2 / 7 kHz | | | | 2 / 7 kHz | | - |
| Interfaces / Protocols CS31 ASCII MODBUS® Ethernet ARCNET PROFIBUS-DP CANopen DeviceNet AC31Safety-Fieldbus RCOM (additional coupler) | | - x x - - - - - - - | | | | x x x - - - - - - | | x x x - x x - x - |
| Note: | | centrally expandable with 6 I/O modules of series 40 ... 50, max. Up to 110 digital or up to 36 analogue or mixed. | | | | | | |

Hardware features

| Compact PLC AC31 series 90 | | | | Safety PLC AC31 series 90 |
|--|---------------------------------------|---|---|--|
| KT95 | KT96 | KT97 | KT98 | KT94-S |
| 480 | 480 | 480 | 1000 | 240 |
| x | x | x | x | x |
| - | - | - | - | - |
| x | x | x | x | x |
| - | - | - | - | - |
| 0.22 | 0.22 | 0.22 | 0.07 | 0.22 |
| 12 / 8 / 0 1012 4 / 2 228 / 226 | 24 / 16 / 0 1032 - 224 / 224 | 24 / 16 / 8 1040 8 / 4 232 / 228 | 24 / 16 / 8 1040 8 / 4 232 / 228 | 24 / 16 / 8 992 8 / 4 224 / 224 |
| x | x | x | x | x |
| x | x | x | x | x |
| - | - | - | - | - |
| x | - | x | x | x |
| x | - | x | x | x |
| - | - | x | x | x |
| - | - | x | x | x |
| - | - | - | - | - |
| - | - | x | x | x |
| x | - | x | x | x |
| - | - | x | x | x |
| optional | optional | optional | optional | optional |
| x | x | x | x | x |
| x | x | x | x | - |
| - | - | - | - | x |
| - | - | - | - | - |
| x | x | x | x | - |
| x | x | x | x | - |
| x | x | x | x t | x |
| 2 | 2 | 2 | 2 | 2 |
| - | - | - | - | - |
| - | - | - | - | - |
| 256, incl. 16 KB RETAIN | 256, incl. 16 KB RETAIN | 256, incl. 16 KB RETAIN | 1256, incl. 256 KB RETAIN | 256, incl. 16 KB RETAIN |
| unlimited | unlimited | unlimited | unlimited | unlimited (80 at the same time) |
| unlimited | unlimited (function) | unlimited (function) | unlimited | unlimited |
| 2 / 50 kHz | 2 / 50 kHz | 2 / 50 kHz | 2 / 50 kHz | 2 / 50 kHz |
| x | x | x | x | x |
| x | x | x | x | x |
| x | x | x | x | x |
| - | - | x | x | - |
| - | - | x | x | - |
| - | - | x | x | - |
| - | - | x | x | - |
| - | - | x | x | - |
| - | - | - | - | x |
| - | - | - | - | x |
| x | x | x | x | x |

Note:

Connection of safety-related-I/O and standard-I/O

Digital I/O modules

| | Bus modules series 50 ① | | | Series 40 .. 50 Only in connection with bus modules or CPU | | | | | | | |
|--|-------------------------|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------|
| | ICMK 14 F1 | ICMK 14 F1 | ICMK 14 N1 | XI 16 E1 | XO 16 N1 | XO 08 Y1 | XO 08 R1② | XO 08 R2 | XC 08 L1 | XK 08 F1 | XC 32 L1③ |
| Supply voltage 24 V DC 230 V AC | x - | - x | x - | x x | x x | x x | x x | x x | x x | x x | x x |
| Number of digital I/Os (DI / DO / DC) | 8 / 6 / - | 8 / 6 / - | 8 / 6 / - | 16 / - / - | - / 16 / - | - / 8 / - | - / 8 / - | - / 8 / - | - / - / 8 | 4 / 4 / - | - / - / 32 |
| Digital inputs 24 V DC | | | | - | - | - | - | - | x | x | x |
| Digital outputs : relay (R) 120 / 230 V AC, 2 A transistor (T) 24 V DC, 2 A transistor (T) 24 V DC, 0.5 | x - - | x - - | - - x | - - - | - - - | - - - | x - - | x - - | - - x | x - - | - - x |
| Short circuit- / overload-proof | x | x | x | x | x | x | x | x | x | x | x |
| Interfaces / protocols CS31 field bus PROFIBUS-DP | x - | x - | x - | - - | - - | - - | - - | - - | - - | - - | - - |
| Connection type (1=1-cond., 3=3-cond.) spring-type terminal screw terminal M12 | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | 1 1 - | with HE10 connector |
| Protection class IP67 | - | - | - | - | - | - | - | - | - | - | - |

Analogue I/O modules

| | Series 40 .. 50 only with bus module or CPU | | | | Series 90 | | S500 only with bus module | | |
|---|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | XM 06 B5 | XE 08 B5 | XTC 08 ④ | XC 32 L2 ⑤ | 07 AI 91 | 07 AC 91⑥ | AI511 | AI512 | AX511 |
| Supply voltage 24 V DC 230 V AC | x x | x x | x x | x x | x - | x - | x - | x - | x - |
| Number of analogue I/Os AI / AO / AC | 4 / 2 / - | 8 / - / - | 8 intern. | 8 / - / - | 8 / - / - | - / - / 16 | 4 / - / - | 8 / - / - | 4 / 4 / - |
| Analogue input signals 0 ... 10 V ± 10 V ± 20 mA 0 ... 20 mA 4 ... 20 mA ± 50 mV, ± 500 mV, ± 5 V PT100, PT1000 thermo-couple | - x x - x - x - | - x x - x - x - | - - - - - - - - | x - - - - - - - | - x - x - x - x | - x - x - x - - | x x x x x - - | x x x x x - - | x x x x x - - |
| Analogue output signals ± 10 V 0 ... 20 mA, 4 ... 20 mA ± 20 mA | x x - | - - - | - - - | - - - | - - - | x x - | - - - | - - - | x x x |
| Short-circuit- / overload-proof | x | x | x | x | x | x | x | x | x |
| Interfaces/ Protocols CS31-Feldbus PROFIBUS DP | - - | - - | - - | - - | x - | x - | - x | - x | - x |
| Connection type (1=1-cond., 3=3-cond.) spring-type terminal screw terminal | 1 1 | 1 1 | 1 | with HE10 connection | 1 1 | 1 1 | 3 3 | 3 3 | 3 3 |
| Display channel number / value | x | x | x | - | - | - | - | - | - |

④ Display for 8 internal channels

⑤ plus 24 configurable digitals (DC). Same as XC 32 L1 but 8 out of 32 DC can be used for AI.

⑥ incl. 1 x DI for shut-off of all AO of module.

with 2 modes of operation:

(1) 8 AI and 8 AO with 12 Bit resolution or (2) in pairs as AI or AO with 8 Bit.

① centrally expandable with up to 6 I/O modules of series 40...50. (Max. 8 AI and 4 AO)

② 4 normally open outputs + 4 normally open and normally closed outputs

③ 4 counters 20 kHz / 4 frequency meters can be connected to the pre-wiring system INTERFAST

Hardware features

| Series 90 | | | | | | | Bus modules S500 ⑥ | | S500 only in connection with bus module | | |
|------------|------------|-----------|-----------|------------|------------|---------------------|--------------------|-----------|--|------------|------------|
| 07 DI 92 | 07DI93-I | 07DO93-I | 07DK93-I | 07 DC 91 | 07 DC 92 | 07 TC90 / TC91 ⑥ | DX501-DP | DX502-DP | DX511 | DI511 | DO511 |
| X - | X - | X - | X - | X - | X - | X - | X - | X - | X - | X - | X - |
| 32 / - / - | 16 / - / - | - / 8 / - | 8 / 4 / - | 16 / 8 / 8 | - / - / 32 | 32 / 32 / - | 8 / 8 / - | 8 / 8 / - | 8 / 8 / - | 16 / - / - | - / 16 / - |
| X - | X - | - - | X - | X - | X - | - - | X - | X - | X - | X - | - - |
| - - | - - | - X | - X | - - | - - | - - | - - | - - | - - | - - | - - |
| X - | - - | - - | - - | X - | X - | - - | X - | X - | X - | - - | X - |
| X - | X - | X - | X - | X - | X - | - - | X - | X - | X - | X - | - - |
| X - | X - | X - | X - | X - | X - | X - | - X | - X | - - | - - | - - |
| - 1 | - - | - - | - - | - 1 | - 1 | - - | 3 3 | 3 3 | 3 3 | 3 3 | 3 3 |
| - - | X - | X - | X - | - - | - - | - - | - - | - - | - - | - - | - - |
| - - | X - | X - | X - | - - | - - | - - | - - | - - | - - | - - | - - |

| Safety-related I/O modules | 07 DI 90-S | 07 DO 90-S | 07 AI 90-S |
|--|---|------------|------------|
| Supply voltage 24 V DC | x | x | x |
| Number of safety-related digital I/Os (DI / DO) | 8 / - / - | - / 8 / - | - / - / - |
| Number of safety-related analogue I/Os (AI / AO) | - / - | - / - | 4 / - |
| Digital inputs 24 V DC | x | - | - |
| Digital outputs: transistor (T) 24 V DC, 0.5 A | - | x | - |
| Analogue outputs: 4 ... 20 mA | - | - | x |
| Short circuit- / overload-proof | x | x | x |
| Interfaces / protocols AC31 Safety field bus | x | x | x |
| Connection type (1=1-cond., 3=3-cond.) screw terminal | 1 | 1 | 1 |
| Protection class IP67 | - | - | - |
| Fault detection: | | | |
| short circuit | x | x | x |
| overload | - | x | - |
| breakd in cicuits | x | - | x |
| forbidden signal level | x | - | x |
| area over-, underrun | - | - | x |
| passive error | x | x | x |
| internal error | x | x | x |
| Internal 2-channel structures | x | x | x |
| Requirement class 4 (DIN19250) | x | x | x |
| Category 3 (EN954-1) | x | x | X |
| Note: | only in connection with safety-related CPU KT94-S | | |

⑥ Special key pad for the connection of operating panels with up to S500, 32 buttons / switches and 32 LEDs at the CS31 field bus.

⑥ Centrally expandable with up to 7 I/O modules of series up to four of which can be analogue. Additional extension box available (digital or analogue channels in 1-conductor technology)