

Demo-Rack Overview

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Power Supply / Switches 24 V

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Supply

24 V DC max. 4 A

S01

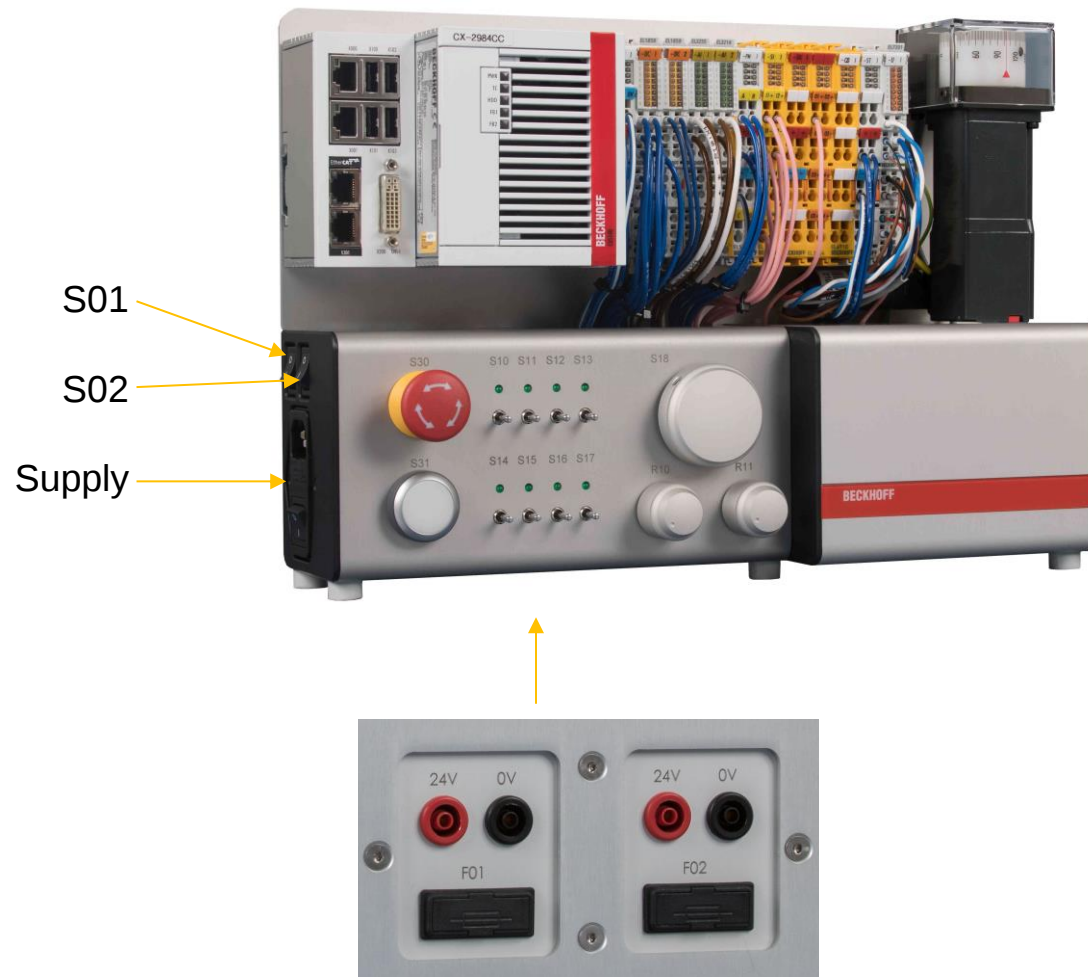
CX5140 (24 V) on/off

Fuse F01 (4 A)

S02

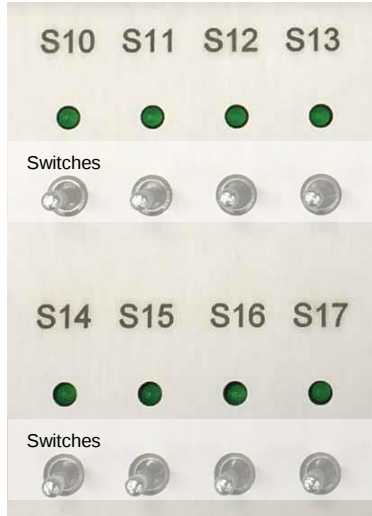
I/O (24 V) on/off

Fuse F02 (4 A)



Switches S10 – S17

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Switches
S10 – S17



latching

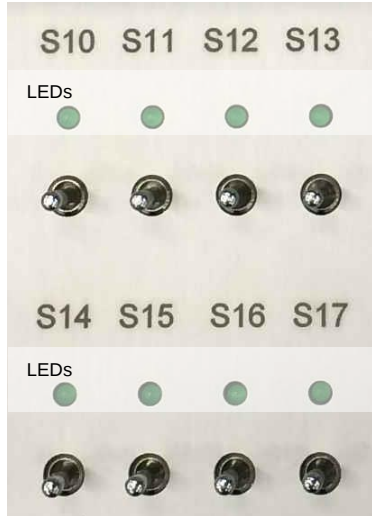


momentary

Control Element	Input (Digital)	Terminal Position	Signal Type
S10 N/O contact	EL1859 - Input 1 - Pin 1	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S11 N/O contact	EL1859 - Input 2 - Pin 2	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S12 N/O contact	EL1859 - Input 3 - Pin 3	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S13 N/O contact	EL1859 - Input 4 - Pin 4	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S14 N/O contact	EL1859 - Input 5 - Pin 5	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S15 N/O contact	EL1859 - Input 6 - Pin 6	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S16 N/O contact	EL1859 - Input 7 - Pin 7	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
S17 N/O contact	EL1859 - Input 8 - Pin 8	-A1 (CX5140) -> -DC1 (EL1859)	BOOL

LEDs H10 – H17

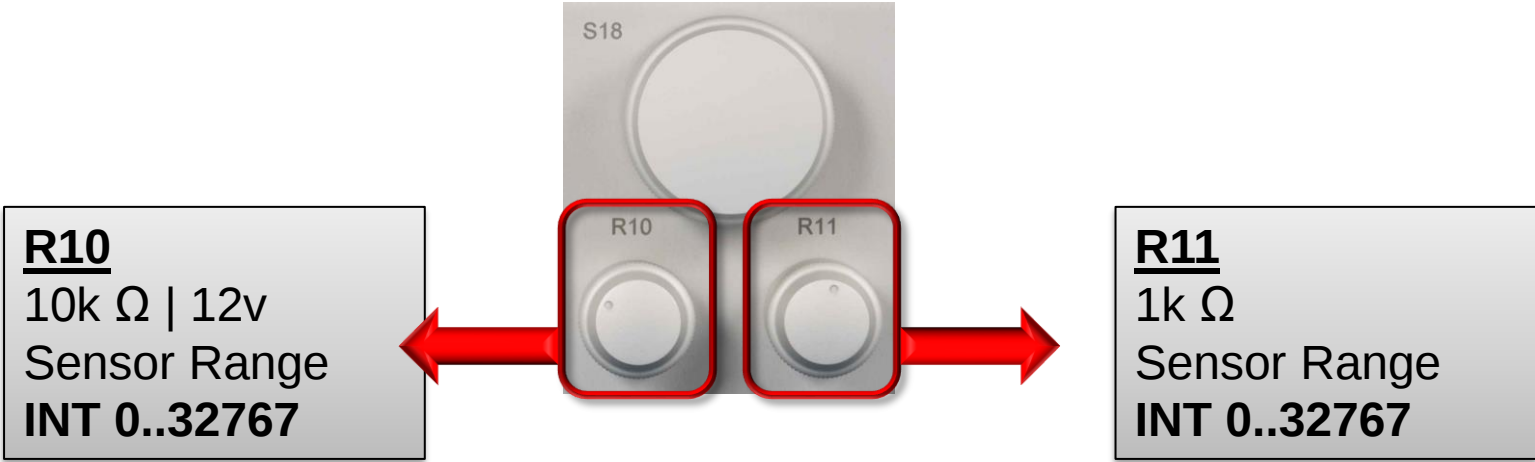
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LEDs
H10 - H17

Control Element	Output (Digital)	Terminal Position	Signal Type
H10	EL1859 - Output 1 - Pin 9	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H11	EL1859 - Output 2 - Pin 10	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H12	EL1859 - Output 3 - Pin 11	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H13	EL1859 - Output 4 - Pin 12	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H14	EL1859 - Output 5 - Pin 13	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H15	EL1859 - Output 6 - Pin 14	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H16	EL1859 - Output 7 - Pin 15	-A1 (CX5140) -> -DC1 (EL1859)	BOOL
H17	EL1859 - Output 8 - Pin 16	-A1 (CX5140) -> -DC1 (EL1859)	BOOL

Potentiometer R10 - R11



Control Element	Input (Analog)	Terminal Position	Signal Type
R10	EL3255 - Input 1 - Pin 2	-A1 (CX5140) -> -AI1 (EL3255)	INT
R11	EL3214-0090 - Input 1 - Pin 1	-A1 (CX5140) -> -AI2 (EL3214-0090)	INT (UINT)

Handwheel / Push Button S18

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S18

Handwheel
&
Push Button

24 Inc / Revolution
4-fold evaluation

96 Inc / Rev on EL5151

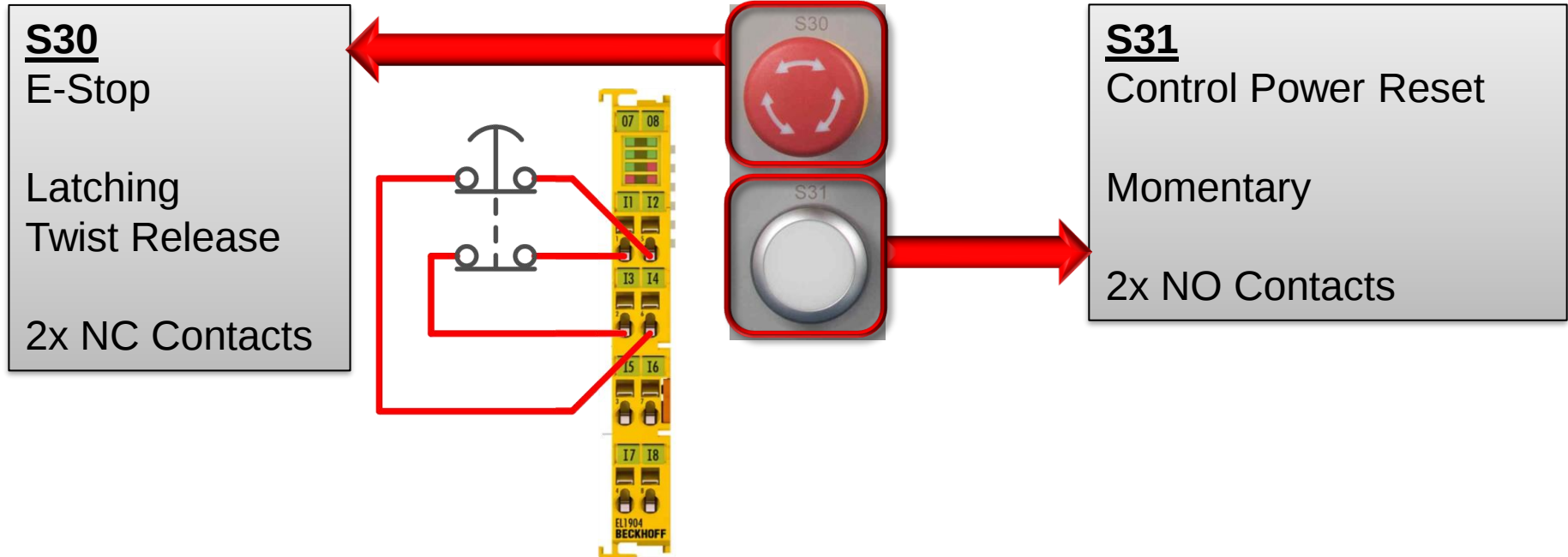


Control Element	Input (Digital)	Terminal Position	Signal Type
S18 Handwheel	EL5151 – Input A / B - Pin 1 / 5	-A1 (CX5140) -> -PM1 (EL5151)	UINT
S18 Push Button	EL5151 - Latch - Pin 8	-A1 (CX5140) -> -PM1 (EL5151)	BOOL

Switch S30 - S31

TwinSAFE Switches

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Control Element	Input (Digital)	Terminal Position	Signal Type
S30 N/C contact	EL1904 - Input 1 – Pin 1 / 2	-A1 (CX5140) -> -SI1 (EL1904)	BOOL
S30 N/C contact	EL1904 - Input 2 – Pin 5 / 6	-A1 (CX5140) -> -SI1 (EL1904)	BOOL
S31 N/O contact	EL1904 - Input 3 – Pin 3 / 4	-A1 (CX5140) -> -SI1 (EL1904)	BOOL
S31 N/O contact	EL1859 - Input 1 – Pin 1	-A1 (CX5140) -> -DC2 (EL1859)	BOOL

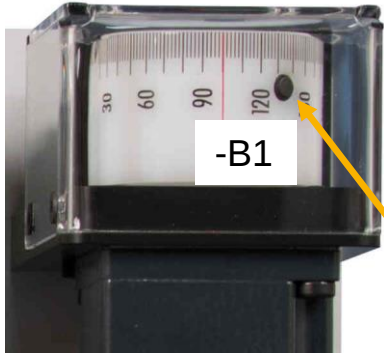


Leds H31

Control Element	Output (Digital)	Terminal Position	Signal Type
H31	EL1859 - Output 1 - Pin 9	-A1 (CX5140) -> -DC2 (EL1859)	BOOL

Reference Point

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Reference Point

Control Element	Input (Digital)	Terminal Position	Signal Type
-B1 N/O contact Reference Point	EL7201-9014 - Input 1 - Pin 2	-A1 (CX5140) -> -U1 (EL7201-9014)	BOOL

Signal Bridge	Output to Input (Digital)	Terminal Position	Signal Type
From	EL2904 - TS Output 1 - Pin 1	-A1 (CX5140) -> -SO1 (EL2904)	BOOL
To	EL7201-9014 - STO - Pin 13	-A1 (CX5140) -> -U1 (EL7201-9014)	BOOL

Terminal	Address	Terminal Position
EL1904	10	-A1 (CX5140) -> -SI1 (EL1904)
EL2904	30	-A1 (CX5140) -> -SO1 (EL2904)
EL6910	201...	-A1 (CX5140) -> -SL1 (EL6910)
EL3214-0090	100	-A1 (CX5140) -> -AI2 (EL3214-0090)

The following pertains to the Demo Sample code

Example variables declaration

Global variables I/O CX5140

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```
(* GVL00_IO *)
{attribute 'TcContextName' := 'PlcTask'}
VAR_GLOBAL

(* EK1100 *)

(* EL1859 digital inputs / outputs *)
bSwitchS10      AT%I*      :BOOL;      (* Switch S10 - Run/Stop group 1 *)
bSwitchS11      AT%I*      :BOOL;      (* Switch S10 - ErrAck group 1 *)
bSwitchS12      AT%I*      :BOOL;      (* Switch S12 - start axis absolute *)
bSwitchS13      AT%I*      :BOOL;      (* Switch S13 - Uncouple axis / set target position to zero *)
bSwitchS14      AT%I*      :BOOL;      (* Switch S14 - Enable axis *)
bSwitchS15      AT%I*      :BOOL;      (* Switch S15 - Reset axis *)
bSwitchS16      AT%I*      :BOOL;      (* Switch S16 - Start sequence axis *)
bSwitchS17      AT%I*      :BOOL;      (* Switch S17 - Axis release STO *)

bLedH10         AT%Q*      :BOOL;      (* Led H10 - Run group 1 aktiv *)
bLedH11         AT%Q*      :BOOL;      (* Led H11 - Error on group 1 *)
bLedH12         AT%Q*      :BOOL;      (* Led H12 - Move absolute done *)
bLedH13         AT%Q*      :BOOL;      (* Led H13 - Axis coupled (flashes) *)
bLedH14         AT%Q*      :BOOL;      (* Led H14 - Axis ready for operation *)
bLedH15         AT%Q*      :BOOL;      (* Led H15 - Axis has an error (flashes) *)
bLedH16         AT%Q*      :BOOL;      (* Led H16 - Sequence axis busy (flashes) *)
bLedH17         AT%Q*      :BOOL;      (* Led H17 - Axis release STO done *)

(* EL1859 digital inputs / outputs *)
bSwitchS31      AT%I*      :BOOL;      (* Switch S31 - Reset emergency stop *)
bLedH31         AT%Q*      :BOOL;      (* Led H31 - TwinSAFE switch S31 (Reset emergency stop) *)

(* EL3255 0..10V potentiometer measurement / analog inputs *)
nAnalogInR10    AT%I*      :INT;       (* Analog R10 / voltage measurement 0-10V / 0-32767 *)
bAnalogInR10Err AT%I*      :BOOL;      (* Analog R10 -> Error aktiv *)

(* EL3214-0090 / analog inputs / resistance measurement 1k ohm *)
nAnalogInR11    AT%I*      :UINT;      (* Analog R11 - resistance measurement 1k ohm - 0-65535*)
bAnalogInR11Err AT%I*      :BOOL;      (* Analog R11 -> Error aktiv *)
```

Example variables declaration

Global variables I/O CX5140

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```
(* EL5151 incremental encoder 24 increments/rotation * 4-fold evaluation -> 96 increments/rotation*)
nHandwheelCounter      AT%I*      :UINT;      (* handwheel counter (Axis_3_Encoder) *)
bHandwheelSwitchS18    AT%I*      :BOOL;      (* axis 1 - 2 couple to the handwheel *)

(* EL1904 *)
(* EL2904 *)
(* EL6910 *)

(* EL9110 potential supply with diagnosis *)
bPotentialAxis24VOk     AT%I*      :BOOL;      (* Power axis ok *)

(* EL7201-9014 *)
bAxis1ReferenceCam      AT%I*      :BOOL;      (* Reference switch axis 1
                                           (Inputs 1A07 FB Touch probe status -> TP1 Input)*)
nAxis1ActTorque          AT%I*      :INT;      (* axis 1 current +/- 1000
                                           (Inputs 1A03 DRV Torque actual value)*)
nAxis1Infodata1          AT%I*      :UINT;      (* axis 1 Info Data
                                           (Inputs 1A04 DRV Info data 1 / 8010:39 -> 10 Input level)
                                           BIT0 - Input 1
                                           BIT1 - Input 2
                                           BIT8 - STO      *)

(* PLC -> TwinSAFE *)
bSwitchS11Out            AT%Q*      :BOOL;      (* Switch S11 -> TwinSAFE - ErrAck group 1 *)
bSwitchS13Out            AT%Q*      :BOOL;      (* Switch S13 -> TwinSAFE - ErrAck group 2 *)
bSwitchS17Out            AT%Q*      :BOOL;      (* Switch S17 -> TwinSAFE - Release contactor K1 *)
bAxis1StoEdm             AT%Q*      :BOOL;      (* Axis1 STO -> TwinSAFE - Axis1 STO EDM *)
nAnalogInR10Out          AT%Q*      :UINT;      (* Analog R10 -> scale ( *2 ) -> TwinSAFE *)
```

END_VAR
(* End *)

Beckhoff Automation GmbH & Co. KG

Head office
Hülshorstweg 20
33415 Verl
Germany

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