



Mount the terminal block on spare DIN rail space.
Use the terminal block to distribute the 24V supply.

This EtherCAT chassis uses copper only.
Mount the modular adapters to the front panel.
Using CAT5 patch cables:

- Connect the front panel input to the first coupler (left rail).
- Connect the output of the first coupler to the input of the second one.
- Connect the output of the second coupler to the input of the third one.
- Connect the front panel output to the output of the last coupler (right rail).

Ports

| | IN | OUT | A/B | C/D |
|--|---------------------------------|---|--|---|
| PN2 EtherCAT chassis LIGO D0902552-v3 | PN6 Ethernet patch cable, 1' | PN9 Ethernet patch cable, 1' | PN12 DB15/male | PN15 DB9/female |
| PN3 Front Panel LIGO D2100054-v1 | PN7 Ethernet patch cable, 1' | PN10 Ethernet patch cable, 1' Newark 21M5658 | PN13 DB15/male Digi-Key A32503-ND | PN16 DB9/female Digi-Key A32510-ND |
| PN4 Rear Panel LIGO D2100055-v1 | CAT5 Squeezer | CAT5 Squeezer | Shutter Logic | Beam Diverter |

TBLOCK

| | |
|-------------------------|-------------------------|
| PN24 Terminal Block | PN30 Terminal Block |
| PN25 Terminal Block | PN31 Terminal Block |
| PN26 Terminal Block | PN32 Terminal Block |
| PN27 Terminal Block | PN33 Terminal Block |
| PN28 Terminal Block | PN34 Terminal Block |
| Digi-Key 277-1483-ND | PN35 Jumper, 10pos |
| PN29 End Plate | PN36 Jumper, 10pos |
| Digi-Key 277-1495-ND | Digi-Key 277-1494-ND |

Alternative terminal block:
- Phoenix 2315272
- Phoenix 2315269

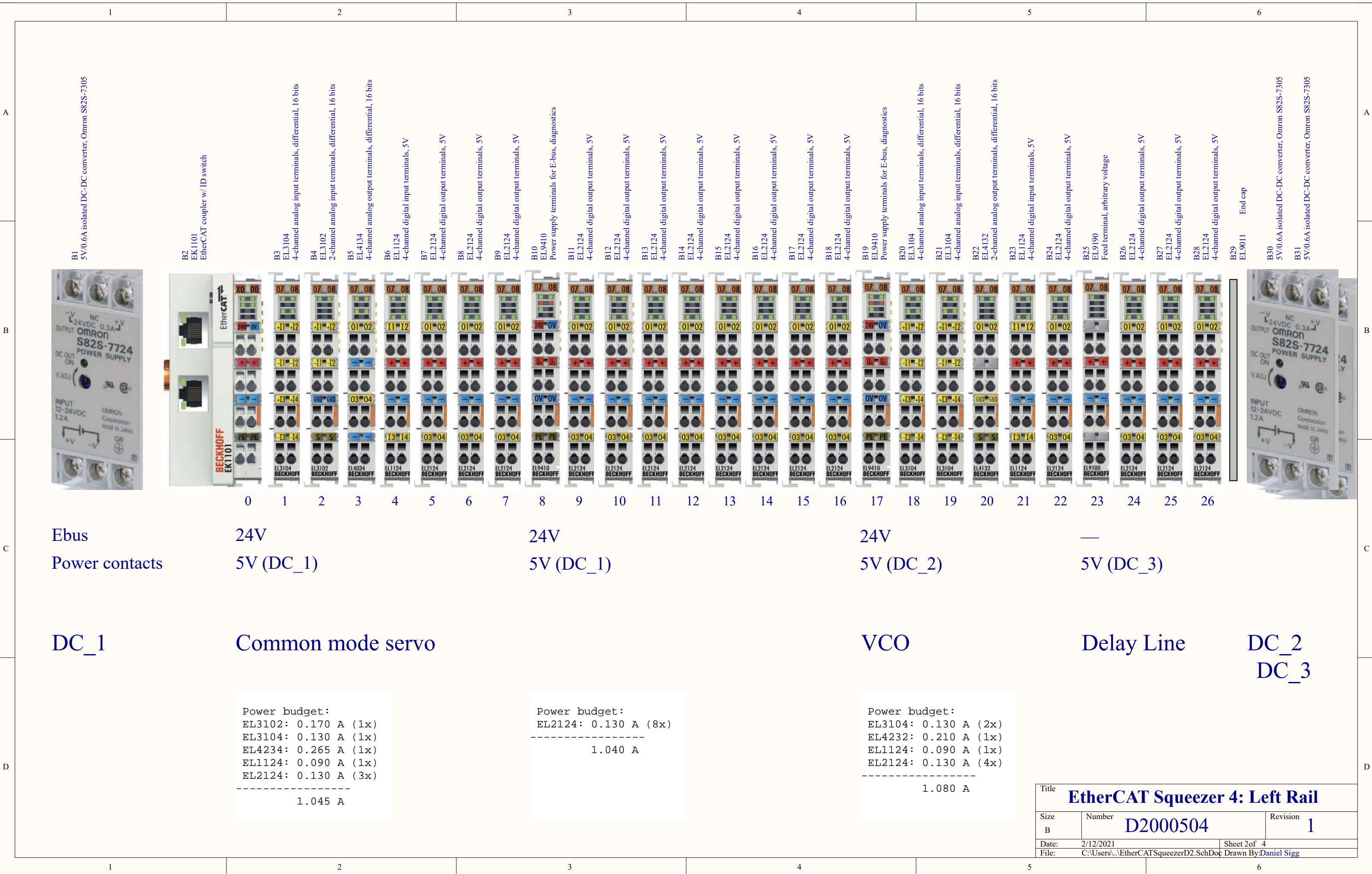
Alternative DC-DC supply:
- Mean Well DDR-15G-5

Slots

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--|--|--|--|---|--|--|--|---|--|--|--|--|
| PN1 DB25M adapter LIGO D0902567-v1 | PN5 DB25M adapter LIGO D0902567-v1 | PN8 DB25M adapter LIGO D0902567-v1 | PN11 DB25M adapter LIGO D0902567-v1 | PN14 TEC Driver LIGO D1201359-v1 | PN17 TEC Driver LIGO D1201359-v1 | PN18 TEC Driver LIGO D1201359-v1 | PN19 TEC Driver LIGO D1201359-v1 | PN20 M12 socket PN21 M12 socket PN22 M12 socket PN23 M12 socket Newark 08R3678 | PN37 DB37M adapter LIGO D0902569-v1 | PN44 DB25M adapter LIGO D0902569-v1 | PN52 DB25M adapter LIGO D0902567-v1 | PN53 DB25F adapter LIGO D0902568-v1 |
| E1 #6-32 1/4" flat E2 #6-32 1/4" flat McMaster-Carr 91099A205 | E3 #6-32 1/4" flat E4 #6-32 1/4" flat McMaster-Carr 91099A205 | E5 #6-32 1/4" flat E6 #6-32 1/4" flat McMaster-Carr 91099A205 | E7 #6-32 1/4" flat E8 #6-32 1/4" flat McMaster-Carr 91099A205 | E9 #6-32 1/4" flat E10 #6-32 1/4" flat McMaster-Carr 91099A205 | E11 #6-32 1/4" flat E12 #6-32 1/4" flat McMaster-Carr 91099A205 | E13 #6-32 1/4" flat E14 #6-32 1/4" flat McMaster-Carr 91099A205 | E15 #6-32 1/4" flat E16 #6-32 1/4" flat McMaster-Carr 91099A205 | | E17 #6-32 1/4" flat E18 #6-32 1/4" flat McMaster-Carr 91099A205 | E19 #6-32 1/4" flat E20 #6-32 1/4" flat McMaster-Carr 91099A205 | E21 #6-32 1/4" flat E22 #6-32 1/4" flat McMaster-Carr 91099A205 | E23 #6-32 1/4" flat E24 #6-32 1/4" flat McMaster-Carr 91099A205 |
| PLL Integration | FC QPDs | VCXO RLF | VCXO ADF | SF1 Oven | SF2 Oven | OFI Oven | Spare Oven | Temp. Sensors | CM A/1 Filter Cavity | CM A/2 | VCO | Delay |

| | | |
|-----|-------|-------|
| M12 | Color | PT100 |
| 1 | brown | RL+ |
| 2 | white | R+ |
| 3 | blue | RL- |
| 4 | black | R- |

| | | |
|---|---------------------------|----------------------|
| Title EtherCAT Squeezer 4 | | |
| Size B | Number D2000504 | Revision 1 |
| Date: 2/12/2021 | Sheet 1 of 4 | |
| File: C:\Users\...\EtherCATSqueezerD1.SchDot | Drawn By: Daniel Sigg | |



B1
5V/0.6A isolated DC-DC converter, Omron S82S-7305

B2
EK1101
EtherCAT coupler w/ ID switch

B3
EL3104
4-channel analog input terminals, differential, 16 bits

B4
EL3102
2-channel analog input terminals, differential, 16 bits

B5
EL4134
4-channel analog output terminals, differential, 16 bits

B6
EL1124
4-channel digital input terminals, 5V

B7
EL2124
4-channel digital output terminals, 5V

B8
EL2124
4-channel digital output terminals, 5V

B9
EL2124
4-channel digital output terminals, 5V

B10
EL9410
Power supply terminals for E-bus, diagnostics

B11
EL2124
4-channel digital output terminals, 5V

B12
EL2124
4-channel digital output terminals, 5V

B13
EL2124
4-channel digital output terminals, 5V

B14
EL2124
4-channel digital output terminals, 5V

B15
EL2124
4-channel digital output terminals, 5V

B16
EL2124
4-channel digital output terminals, 5V

B17
EL2124
4-channel digital output terminals, 5V

B18
EL2124
4-channel digital output terminals, 5V

B19
EL9410
Power supply terminals for E-bus, diagnostics

B20
EL3104
4-channel analog input terminals, differential, 16 bits

B21
EL3104
4-channel analog input terminals, differential, 16 bits

B22
EL4132
2-channel analog output terminals, differential, 16 bits

B23
EL1124
4-channel digital input terminals, 5V

B24
EL2124
4-channel digital output terminals, 5V

B25
EL9190
Feed terminal, arbitrary voltage

B26
EL2124
4-channel digital output terminals, 5V

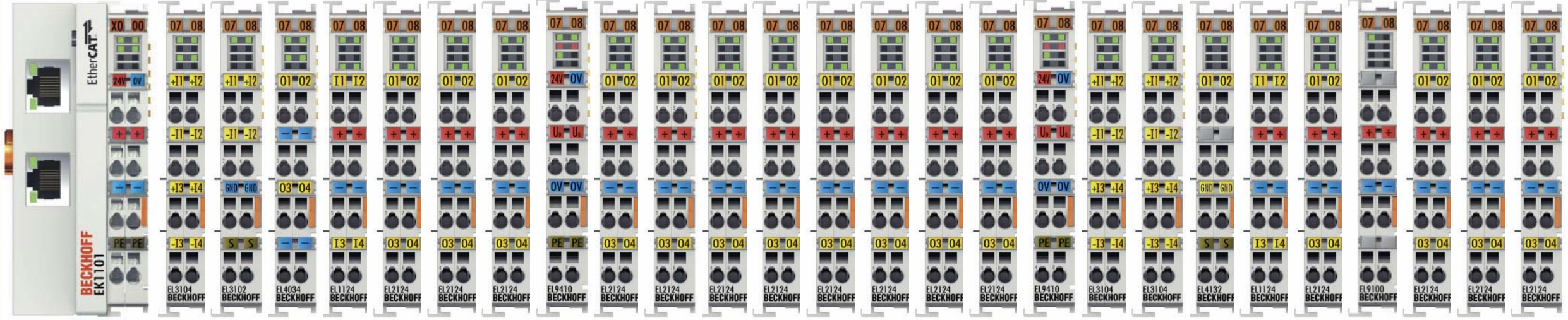
B27
EL2124
4-channel digital output terminals, 5V

B28
EL2124
4-channel digital output terminals, 5V

B29
EL9011
End cap

B30
5V/0.6A isolated DC-DC converter, Omron S82S-7305

B31
5V/0.6A isolated DC-DC converter, Omron S82S-7305



Ebus
Power contacts

24V
5V (DC_1)

24V
5V (DC_1)

24V
5V (DC_2)

—
5V (DC_3)

DC_1

Common mode servo

VCO

Delay Line

DC_2
DC_3

Power budget:
 EL3102: 0.170 A (1x)
 EL3104: 0.130 A (1x)
 EL4234: 0.265 A (1x)
 EL1124: 0.090 A (1x)
 EL2124: 0.130 A (3x)

 1.045 A

Power budget:
 EL2124: 0.130 A (8x)

 1.040 A

Power budget:
 EL3104: 0.130 A (2x)
 EL4232: 0.210 A (1x)
 EL1124: 0.090 A (1x)
 EL2124: 0.130 A (4x)

 1.080 A

| | | |
|---|---------------------------|----------------------|
| Title EtherCAT Squeezer 4: Left Rail | | |
| Size B | Number D2000504 | Revision 1 |
| Date: 2/12/2021 | Sheet 2 of 4 | |
| File: C:\Users\...\EtherCATSqueezerD2.SchDoc | Drawn By: Daniel Sigg | |

B52
5V/0.6A isolated DC-DC converter, Omron S82S-7305

B33
EK1100
Beckhoff EtherCAT coupler

B34
EL3104
4-channel analog input terminals, differential, 16 bits

B35
EL3104
4-channel analog input terminals, differential, 16 bits

B36
EL4132
2-channel analog output terminals, differential, 16 bits

B37
EL1124
4-channel digital input terminals, 5V

B38
EL2124
4-channel digital output terminals, 5V

B39
EL9410
Power supply terminals for E-bus, diagnostics

B40
EL3104
4-channel analog input terminals, differential, 16 bits

B41
EL3104
4-channel analog input terminals, differential, 16 bits

B42
EL4132
2-channel analog output terminals, differential, 16 bits

B43
EL1124
4-channel digital input terminals, 5V

B44
EL2124
4-channel digital output terminals, 5V

B45
EL9410
Power supply terminals for E-bus, diagnostics

B46
EL3692
2-channel high precision resistance terminal

B47
EL3692
2-channel high precision resistance terminal

B48
EL3104
4-channel analog input terminals, differential, 16 bits

B49
EL3104
4-channel analog input terminals, differential, 16 bits

B50
EL4134
4-channel analog output terminals, differential, 16 bits

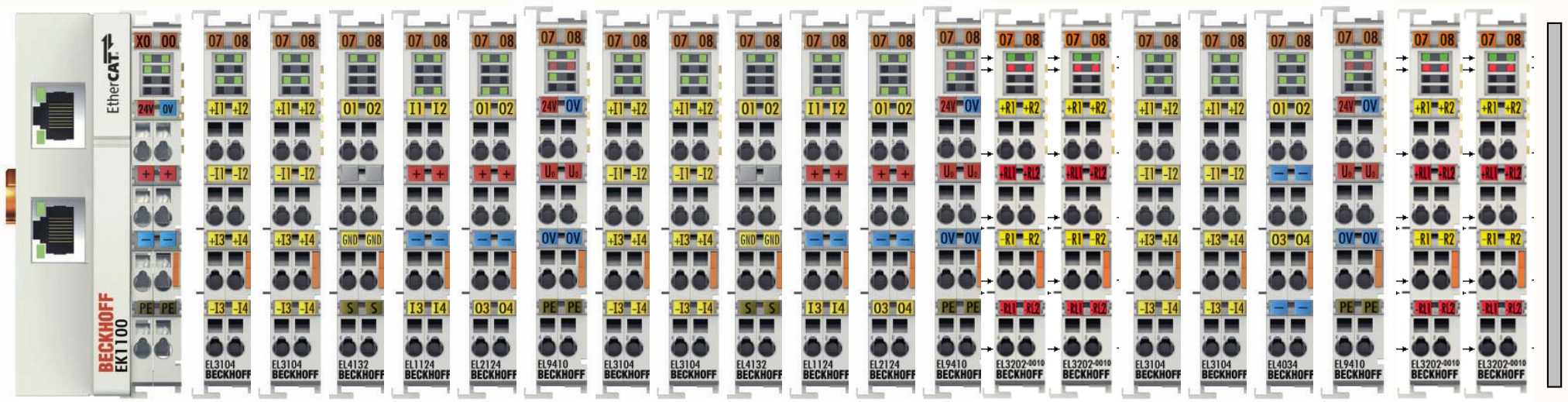
B51
EL9410
Power supply terminals for E-bus, diagnostics

B52
EL3692
2-channel high precision resistance terminal

B53
EL3692
2-channel high precision resistance terminal

B54
EL9011
End cap

B55
5V/0.6A isolated DC-DC converter, Omron S82S-7305



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

Ebus
Power contacts

24V
5V (DC_4)

24V
5V (DC_5)

24V
24V

24V
24V

DC_4

VCXO RLF

VCXO ADF

TEC SF1/2 OFI

Temperature

DC_5

Power budget:
 EL3104: 0.130 A (2x)
 EL4132: 0.210 A (1x)
 EL1124: 0.090 A (1x)
 EL2124: 0.130 A (1x)

 0.690 A

Power budget:
 EL3104: 0.130 A (2x)
 EL4132: 0.210 A (1x)
 EL1124: 0.090 A (1x)
 EL2124: 0.130 A (1x)

 0.690 A

Power budget:
 EL3104: 0.130 A (2x)
 EL3692: 0.220 A (2x)
 EL4134: 0.265 A (1x)

 0.965 A

Power budget:
 EL3692: 0.220 A (2x)

 0.440 A

| | | | | | |
|-------|--|-----------------------|---|--|--|
| Title | | | EtherCAT Squeezer 4: Middle Rail | | |
| Size | Number | Revision | | | |
| B | D2000504 | 1 | | | |
| Date: | 2/12/2021 | Sheet 3 of 4 | | | |
| File: | C:\Users\...\EtherCATSqueezerD3.SchDoc | Drawn By: Daniel Sigg | | | |

B56
5V/0.6A isolated DC-DC converter, Omron S82S-7305

B57
EK1100
Beckhoff EtherCAT coupler

B58
EL7332
2-channel DC motor output stage 24 V DC, 1 A

B59
EL1094
4-channel digital input terminals, 24V, n-type

B60
EL1094
4-channel digital input terminals, 24V, n-type

B61
EL2008
8-channel digital output terminals, 24V

B62
EL3104
4-channel analog input terminals, differential, 16 bits

B63
EL4134
4-channel analog output terminals, differential, 16 bits

B64
EL9410
Power supply terminals for E-bus, diagnostics

B65
EL3104
4-channel analog input terminals, differential, 16 bits

B66
EL1124
4-channel digital input terminals, 5V

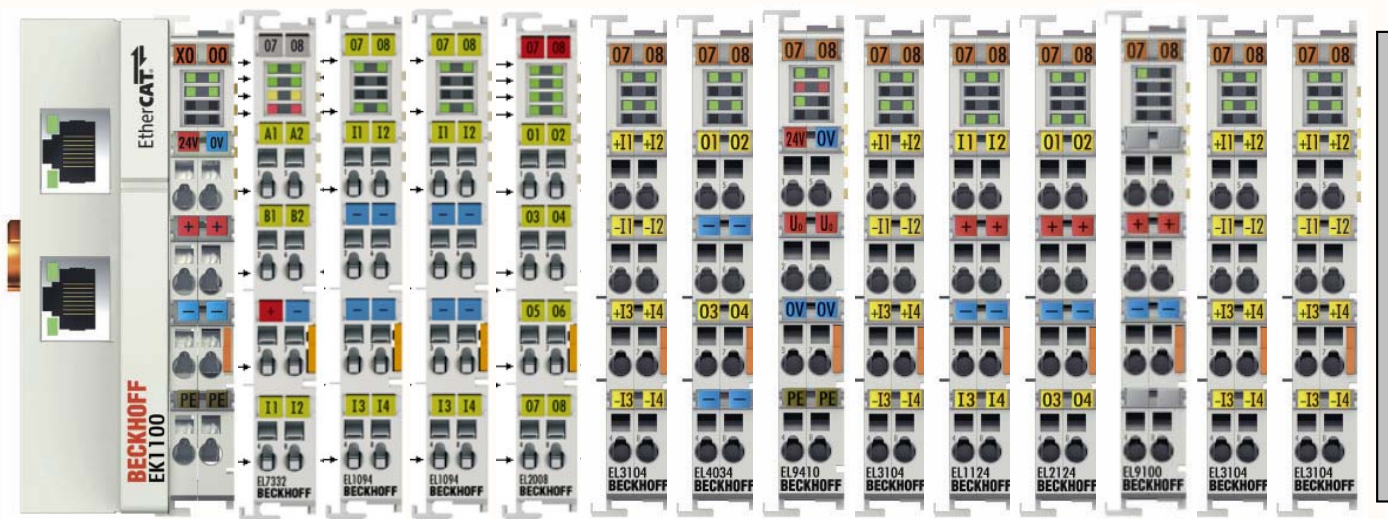
B67
EL2124
4-channel digital output terminals, 5V

B68
EL9190
Feed terminal, arbitrary voltage

B69
EL3104
4-channel analog input terminals, differential, 16 bits

B70
EL3104
4-channel analog input terminals, differential, 16 bits

B71
EL9011
End cap



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Ebus 24V 24V —
Power contacts 24V 5V (DC_6) 24V

DC_6 Shutter Beam Diverter PLL Integration FC QPDs

Power budget:
EL7332: 0.140 A (1x)
EL1094: 0.090 A (2x)
EL2008: 0.110 A (1x)
EL3104: 0.130 A (1x)
EL4134: 0.265 A (1x)

0.825 A

Power budget:
EL3104: 0.130 A (3x)
EL4134: 0.265 A (0x)
EL1124: 0.090 A (1x)
EL2124: 0.130 A (1x)

0.610 A

| | | | |
|-------|--|-----------------------|--|
| Title | | | EtherCAT Squeezer 4: Right Rail |
| Size | Number | Revision | |
| B | D2000504 | 1 | |
| Date: | 2/12/2021 | Sheet 4 of 4 | |
| File: | C:\Users\...\EtherCATSqueezerD4.SchDoc | Drawn By: Daniel Sigg | |