Optobox power connectors

Connector board

Optoboards

Powerbox with power board
Optobox panel

- Large panel with 4x7 optoboxes
- Small panel with 3x2 optoboxes
- One box 136mm long
- <5cm space at end of optoboxes
Optobox space – front view

Powerbox wall ~1mm
Optobox wall ~2mm

Only 2 out of 4 boxes shown
All units in mm
Some more space above boxes available

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Cables

• CAN (8 pins / 4 pins for single CAN interface):
  - 4 pairs of AWG 26
  - twice Vcan and twice CAN
  - > 2 CAN bus per cable

• Power & Interlock (10+14 = 24 pins)
  - 10 x AWG 18 for 12V and GND (bPOL12V supply)
  - 10 x AWG 26 for 12V sens lines
  - 4 x AWG 26 for interlock
Connector proposal: Harwin Gecko G125

- **CAN:**
  - G125-M S1 10 05 M1
  - 10 pins
  - A=17.7mm

- **Power&Interlock:**
  - G125-M S1 26 05 M1
  - 26 pins
  - A=27.7mm

**Calculation**

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>A</td>
<td>B + 12.7</td>
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<tr>
<td>B</td>
<td>0.625 x (Total No. of contacts - 2)</td>
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<td>C</td>
<td>B + 7.8</td>
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<td>D</td>
<td>B + 1.8</td>
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Cable connector

- Backshell for EMI shielding
  - Open how to connect to powerbox
- Connector for cables
  - AWG26 only
CAN bus cabling scheme

Type 2/3 cable

T-connection to each connector

Single 10 Pole connector on powerboard (connecting 8 wires)
Probably not enough space for two connectors on power board

Alternative, connect cable so that the two CAN buses are swapped after 4 connectors
Check if tail works for CAN bus
Current layout of power board

Use Harwin Gecko G125 connector 26 pin for power and 10 pin for CAN
Could be used with shielded connector directly on board, or with patch panel option

All elements just provisionally placed
Option P – Opto Patch Panel

- Patch panel at end of Optoboxes (~red box)
- Closes shield of entire panel
- Shielded connectors on outside for type 2 cables
- Small connectors inside with no shield
- Twinax shield connects to panel on opposite side (blue box)
- Walls and cover (not drawn) to complete cage
- Cooling plate, powerboxes and patch panel could be assembled and cabled for installation as one piece
Opto Patch Panel connector space

Possible connector arrangement
Drawings to ~scale
CAN connector can be smaller
*D-SUB connectors with AWG 18 do not fit!*

See Glenair Micro-D 9
and Glenair Micro-D 25
Questions

• Can the power cable with AWG18 bit connected to a AWG24 connector?
  – e.g. with a small (<1m) tail of AWG24 wire

• How are the twinax bundles shielded?
  – Connection to optoboard shield through patch panel or at termination board

• Can the CAN cable be fabricated with this T-connector scheme?
Next steps

- Design of powerboard with Harwin Gecko connector
- Verification of grounding and shielding scheme
  - Design of Faraday cage extension
- Preciser space estimate for fibers, cables, connectors
  - In cable guides between optobboxes
  - At patch panel area
- Decision on continuation
Backup: Alternative connectors

- CAN: Lemo EYG.0B.304.CLN
- CAN: Glenair Alphalink SL 4
- CAN: Glenair Micro-D 9 MWDM-CB 5
- CAN: Glenair Micro-D 9 + Cable inside power box
- Power&Interlock: Glenair Alphalink SL 24
- Power&Interlock: Glenair Micro-D 25
- Power&Interlock: Glenair Micro-D/High Denisty D-Sub + Cable inside box
CAN Connector: LEMO
EGY.0B.304.CLN

+Right angled cable connector
+Shield connection to box possible

-large footprint
-through hole mount
-single CAN connection → requires octopus cable (Scheme C)

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<th>Dimensions (mm)</th>
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<td>EYG</td>
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CAN Connector: Glenair Alphalink SL 4/8

171-134-01 Solder Cup Termination

Solder cup terminations may be factory modified for crimp termination

Accommodates #24 AWG wire

Recessed flange

Gold-plated Copper Alloy spring-loaded contacts

8.9mm

13.4mm

15.9mm

+"Small" footprint
+maybe possible to fit 2

-screw form bottom, difficult to mount
-shield & box connection
-AWG24 wires

Scheme B or C possible
CAN Connector: Glenair Micro-D 9 MWDM-CB 5

+shielded box connection possible
+T-backshell available for Scheme B

- through-hole mount
- large shell (space for cables?)

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CAN Connector: Cable inside box

- **Micro-D 9 Pol**

  Glenair Micro-D connector with solder cup termination
  Cable soldered inside and connected with Harting harflex connector
  (or soldered directly to PCB)
  Backshells (see #Slide 9)

  e.g. for ribbon cable

  + Proper shielding contact with box (evtl connector with filter)
  + Small footprint on PCB
  + Surface mount possible
  + Use T-Backshell for scheme B, configure CAN bus selection with cable
  - Additional connector & cable
  - Space with backshell
Power & Interlock Connector

• Glenair Alphalink SL 24

- "Small" footprint
- Shielded (box connection?)
- Screw form bottom, difficult to mount
- Only AWG24 wire solder cup
Power Connector: Glenair Micro-D 25

EMI conform backshells (quite large h=28mm)

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+shielded box connection possible

- through-hole mount
- large shell
- AWG24 cable max

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Micro D backshells

**Style S - Side Entry**

- EMI Gasket Option (559-005)
- See Note 4

**Style E - 45° Entry**

- Code H
  - Extended Jackscrew

**Style D - 45° Dual Entry**

- Code S
  - Qwik-Ty

### Table: Dimensions

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### Notes:
- **9 Pol (CAN)**
- **25 Pol (Power)**
- 21.10.19
Micro D backshell

- Smaller casing but no T-version available
- For Power&Interlock
Power Connector: cable inside box

- High Density D-Sub 26 p
  
  Connector with solder cup termination  
  Cable soldered inside and connected with connector to PCB  
  (or soldered directly to PCB)  
  AWG 20 contact  

  +Proper shielding contact with box  
  +small footprint on PCB  

  -additional connector & cable  
  -large connector  
  -huge backshell (?)

  e.g. for ribbon cable
Power Connector: cable inside box

- D-Sub 25 p

Connector with solder cup termination
Cable soldered inside and connected with connector to PCB
(or soldered directly to PCB)
AWG 18 contact

+ Proper shielding contact with box
+ Small footprint on PCB

- Additional connector & cable
- Very large connector (go above components)
- Huge backshell (?)

e.g. for ribbon cable
# Cable backshells D-Sub

## Table

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<th>Typ</th>
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**HD 26 Pol**

**25 Pol**

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