LIGO

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MEMORANDUM

DATE: July 21, 2021
TO: Slow controls team
FROM: Daniel Sigg
SUBJECT: Modifications to the Beckhoff chassis
Refer to: LIGO-E2000499-v2

Due to the elimination of the end station computers the remote access chassis in the end stations can be simplified. A set of terminals is removed including the bridge terminal that was used to communicate between computers.

Change 1: Remote Access End

Drawing: D1100619-v3
Wiring diagram: E1100455-v3
Work: Combined the terminals into a single rail and
remove terminals that are no longer needed
Needed: 2x D1100095-v2 per end station (4 total/site)

Change 2: Remote Access Corner

Drawing: D1100618-v2
Work: Verify the position of the EL9400 terminal

The rotation stages are put on a separate rail that can be independently power cycled. As part of the A+ upgrade a picomotor controller for the PSL is added.

Change 3: PSL/IO/TCS Controls Chassis

Drawing: D1101114-v6
Wiring diagram: E1100530-v8
Work: Separate rotation stage onto separate rails, add relay for power on/off
Add picomotor interface terminals for A+
Needed by rotation stage upgrade:
1x EK1122
1x EK1101
1x EL1094
1x EL2612

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Needed by A+ upgrade:
      1x D2000017-v1 (superseded by version 2)
      2x D1100419-v3
      1x EL9410
      1x EL3102
      1x EL1014
      1x EL1872
      1x EL2872

Controls and readbacks for the T-SAMS and the P-SAMS are needed for A+.

Change 4: PSL/IO/TCS Controls Chassis

Drawing: D1101114-v7
Wiring diagram: E1100530-v9
Work: Add terminals for a new middle rail for the P-SAMS
      Add terminals to the end of the right rail for the T-SAMS
Needed for the new middle rail:
      1x D2000017-v2
      2x D0902567-v1
      1x EK1100
      4x EL3104
      1x EL9190
      1x EL9011
Needed for the right rail upgrade:
      2x D0902568-v1
      1x EL9410
      2x EL3104
      2x EL3692
      1x EL4132

Additional picomotor controller interfaces are added to the corner chassis 2 for A+.

Change 5: EtherCAT Corner 2

       Drawing: D1100680-v3
       Wiring diagram: E1101126-v3
       Work: Add 3 picomotor controller interfaces
       Needed by A+ upgrade:
              1x D1102268-v2
              1x EL9410
              3x EL3102
              3x EL1014
              3x EL1872
              3x EL2872
              1x D1100419-v3

The EtherCAT chassis near HAM8 may require picomotor controllers as well.

       Needed by A+ upgrade:
              2x D1100419-v3

Two sets of controls for the AM modulated AOM amplifiers are added to the EtherCAT chassis squeezer 3 for A+. Also, added are interfaces for the DC PD concentrator 9 and an additional auxiliary concentrator 1.

Change 6: EtherCAT Squeezer 3

       Drawing: D1600509-v4
       Wiring diagram: E1600386-v4
       Work: Add controls for an AM modulated AOM amplifiers to the middle rail
            Add a new right rail for another AM modulated AOM amplifiers, and the
            two new concentrators.
       Needed by A+ upgrade for the middle rail:
              1x D1700036-v2
              1x D0902569-v1
              1x Omron S82S-7305
              1x EL9410
              1x EL3104
              1x EL4134
              1x EL1124
              4x EL2124

Needed by A+ upgrade for the right rail:
    3x D0902569-v1
    3x Omron S82S-7305
    1x EK1100
    2x EL9410
    4x EL3104
    1x EL3102
    2x EL4134
    2x EL1124
    8x EL2124

A new EtherCAT chassis squeezer 4 is needed for the additional controls of the filter cavity.

Change 7: EtherCAT Squeezer 4

Drawing: D2000504-v1
Wiring diagram: E2100047-v1
Work: Install new chassis
    Maye require additional +24V power supply.