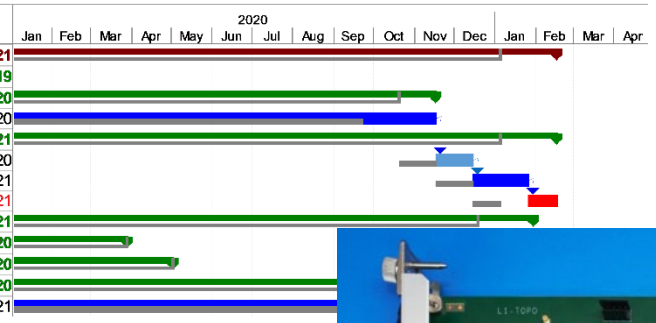
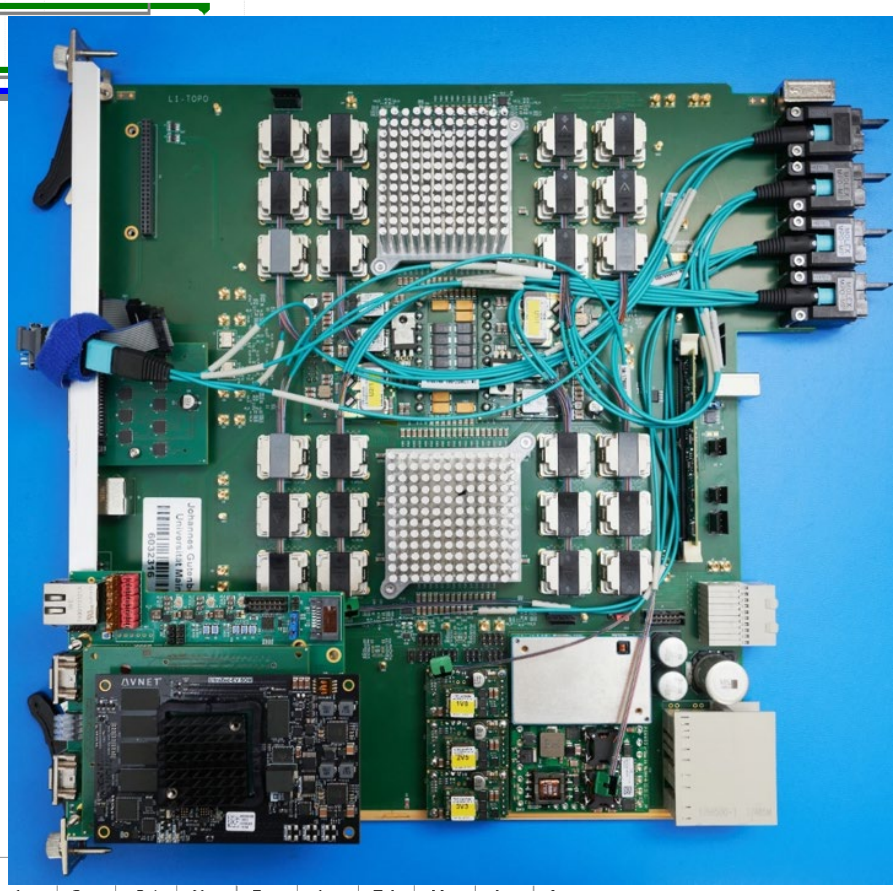
ID	Task Name	Start	Duration	Finish
100	**Phase-I L1Topo**	**Mon 09/01/17**	**1031 days**	**Mon 15/02/21**
101	**Prototype**	**Mon 09/01/17**	**513 days**	**Wed 23/01/19**
108	**Pre-Production**	**Thu 24/01/19**	**463 days**	**Mon 16/11/20**
111	Standalone Tests	Tue 30/04/19	79 wks	Mon 16/11/20
112	**Production**	**Mon 05/08/19**	**381 days**	**Mon 15/02/21**
114	Assembly of Series Modules	Tue 17/11/20	4 wks	Mon 14/12/20
115	Acceptance Tests	Tue 15/12/20	4 wks	Mon 25/01/21
116	Contingency	Tue 26/01/21	3 wks	Mon 15/02/21
117	**Firmware**	**Mon 21/08/17**	**860 days**	**Fri 29/01/21**
118	**Algorithm**	**Mon 21/08/17**	**650 days**	**Fri 27/03/20**
123	**Control**	**Mon 21/08/17**	**675 days**	**Fri 01/05/20**
135	**Readout**	**Mon 21/08/17**	**825 days**	**Fri 27/11/20**
140	Refinement, Revision	Mon 02/09/19	70 wks	Fri 29/01/21

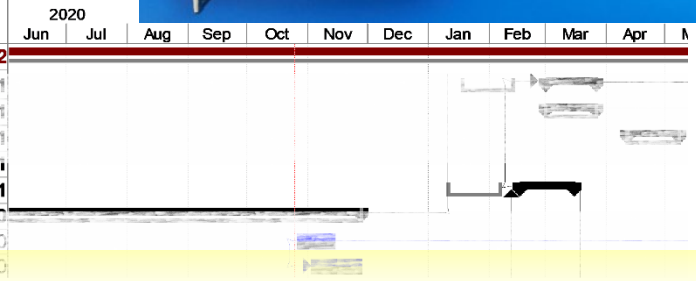


L1Topo Installation Commissioning



Uli / Mainz

ID	Task Name	Start	Duration	Finish
506	**Installation & Commissioning**	**Thu 25/04/19**	**713 days**	**Mon 28/02/22**
566	jFEX	Mon 01/03/21	20 days	Fri 26/03/21
570	eFEX Shelf 1 (Initial)	Mon 01/03/21	20 days	Fri 26/03/21
574	eFEX Shelf 1 (Completion)	Mon 12/04/21	20 days	Fri 07/05/21
578	**eFEX Shelf 2**	**Mon 07/06/21**	**20 days**	**Fri 02/07/21**
582	**L1Topo**	**Tue 16/02/21**	**20 days**	**Mon 15/03/21**
586	FOX	Thu 25/04/19	407 days	Fri 27/11/20
588	Fibre Laying: LAr–FOX	Mon 26/10/20	3 wks	Fri 13/11/20
589	FOX Installation (inc. FOX–FEX fibres)	Mon 02/11/20	4 wks	Fri 27/11/20



Installation

- Effort available: Ren-Jie and Julio
- Need to cover jFEX, L1Topo, legacy L1Topo
- …will keep them quite busy…
- Requires careful planning
- Intend to send more people once COVID travel restrictions lifted
- Quite some infrastructure at P1 required before we can go down with the first module >> see slides from last joint meeting
  - Shelf
  - Fibering
  - Source/sink systems
  - DCS/hub/clocking/computing/control/JTAG
- Two modules currently available:
  - 1 production, PRRed 2019.08
  - 1 prototype (functionally near identical)
- Equipped with new mezzanine v 3.1
- Well tested at hardware level
  (though firmware development and tests ongoing)
- Total quantity of production modules required
  - 3 modules at point 1
  - 2 spares
  - All being well tested in home lab (except full link count concurrent test) and STF
- Assume no spares of infrastructure (cables, …)

Module production and installation…

- Expect to move one module to point 1 as early as possible to get tests going there
- Assembly and basic tests of further modules assumed to go fast and smoothly (PCBs and components available, established test procedure)
- However, further system level tests required at STF to deal with PRR recommendations before starting production
  - MUCTPI
  - CTP
  - Power/temperature test under full firmware load
  - …
- Still some work to be done on readout
  → a bit of uncertainty on the production schedule
- We are currently assuming to have modules available for firmware development and system tests with L1Calo at STF and P1 concurrently
- Both STF and P1 testing assumed to be mainly remote controlled
  - Need to arrive at fully remote operation at P1 anyway
  - COVID is an excellent reason to prioritize that goal

Commissioning of modules at P1

- Module health monitoring via DCS
  (plus automatic-over temperature shutdown of processors)
- Link error monitoring in firmware
- Fibre mapping tests with automated / scripted IBERT (Emanuel, jFEX)
- Fibre mapping tests with playback from source systems (plus meta frames, eg. from jFEX)
- Timing checks in firmware (BCIDs in trailer)
- Expect to receive TOBs from calorimeters/FEXes early on
  - FEX playback
  - Hot towers (noise / lowered thresholds)
  - Cosmics / splashes…
- Comparison with bitwise simulation
- Monitoring plots ??? Inspired from legacy Topo
- As soon as useful data coming from the detectors, compare to legacy system
- Running parasitically without triggering
- -->where to sample trigger bits for disabled triggers ?
- In terms of triggers, any (physics like) should do, obviously legacy topo triggers most useful

Commissioning of algorithms

L1Topo is special in a sense that individual new algorithms need to be commissioned for inclusion in the menu in irregular intervals anyway

- Simulation in HDL
- Comparison to software model (bitwise)
- Include in firmware build
- Test rig playback/spy standalone validation vs. software
- Validation at P1 outside physics run in ATLAS partition
- Validation of freshly included algorithms in physics runs with triggers disabled (parasitic)

While timing calibration / validation used to be crucial and difficult in run 2, we'd assume that this step is eased significantly with BCID information in trailer of TOBs