

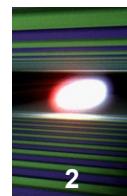
LOGM status and path to mass-production

Mateusz Żukociński, ISE/WUT

12-13 May 2014, DESY Hamburg



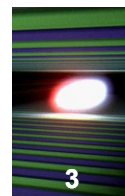
Specification LOGM13 for XFEL



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- Input signal:
 - » 1x REF 1300 MHz +21 dBm
- Output signals:
 - » 3x REF 1300 MHz >10 dBm (uVM, HOM, KLM)
 - » 2x REF 1300 MHz 0... +3 dBm (uDWC)
 - » 9x LO 1354 MHz >10 dBm
 - » 9x CLK 81 MHz >10 dBm
- Synchronization RESET functionality for 81MHz CLK signal ← X2TIMER (**differential, RJ45 conn.**)
- **LO power adjustment (fixed and remote via TMCB → firmware required !!)**
- **EMC/EMI screening → metal enclosures for PCBs**
- 1HE, 360mm depth crate
- Phase-noise performance:
 - » RMS additive jitter <10 fsec (10Hz - 1MHz)
 - » Phase noise floor <-160 dB
 - » Lowest possible harmonics
- Diagnostics:
 - » Monitor outputs
 - » Power level detectors, Temperature (TMCB)
 - » **Power supply management (FRED)**
- Power supply:
 - » DC: +7V, -7V, +15V, +/-15 (for TMCB) → **23-pin Burndy**
- Additional modules
 - » **TMCBv.2**
 - » **FRED**
 - » **RESET board**

LOGM - concept

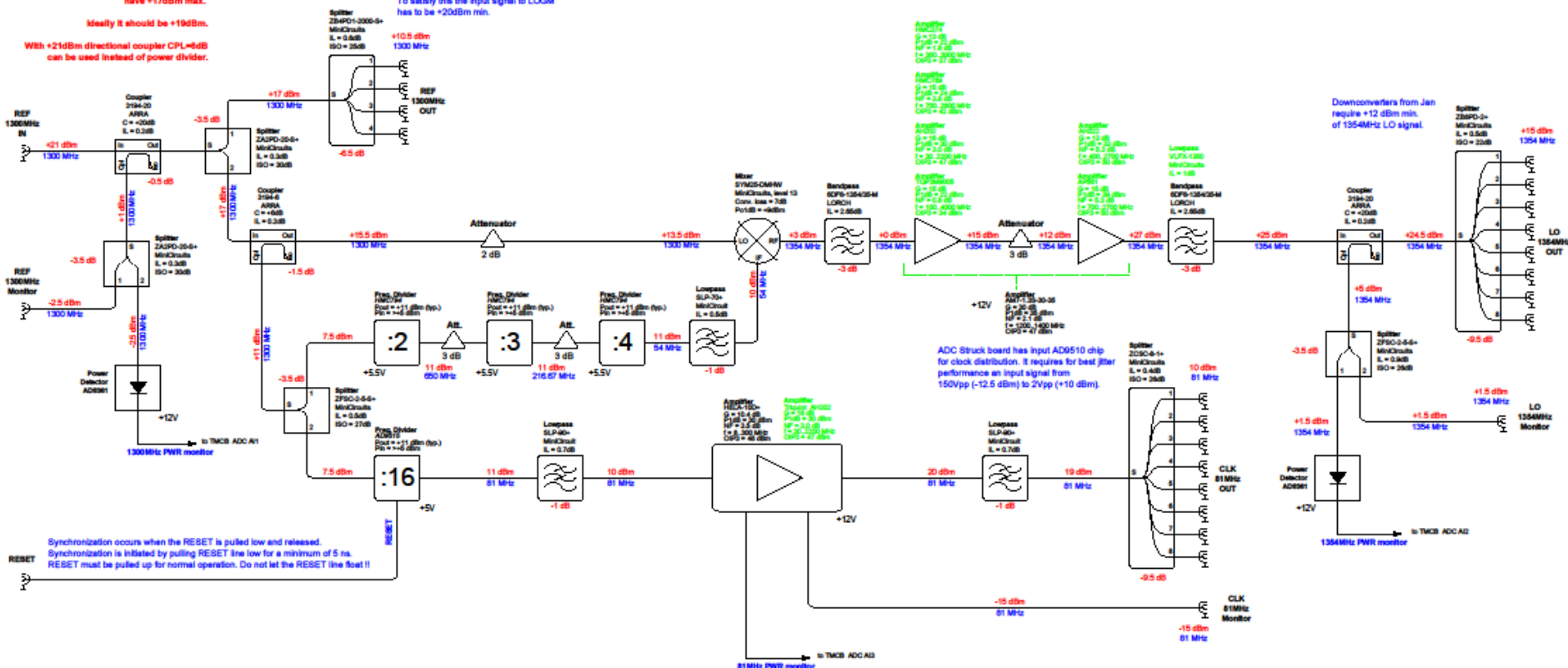


The measured 1300 MHz reference MO power coming into the rack is +20dBm. It means that after power splitter ADCM and LOGM can have +17dBm max.

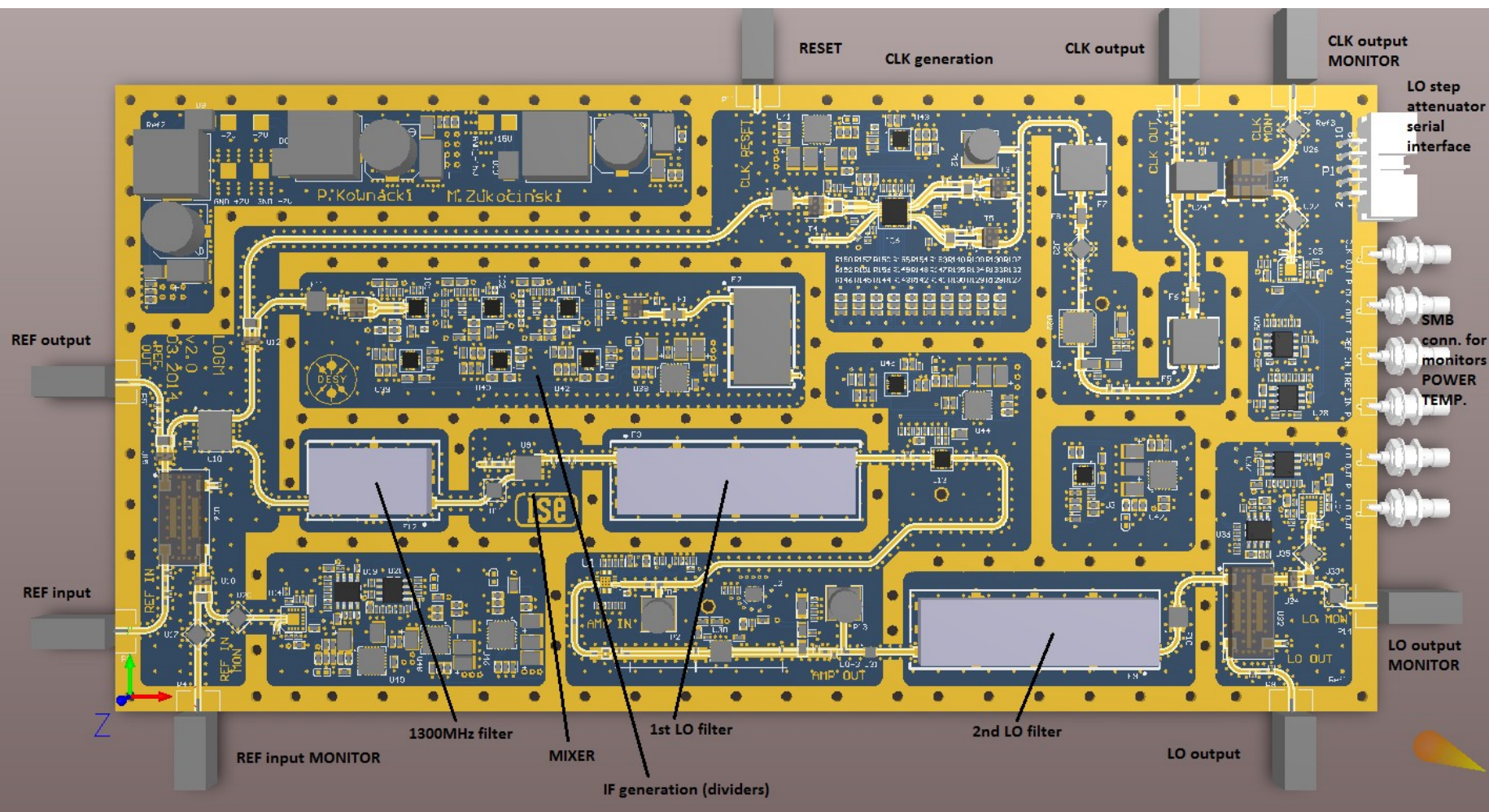
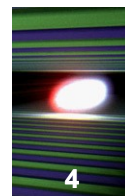
Ideally it should be +10dBm.

With +21dBm directional coupler CPL=6dB can be used instead of power divider.

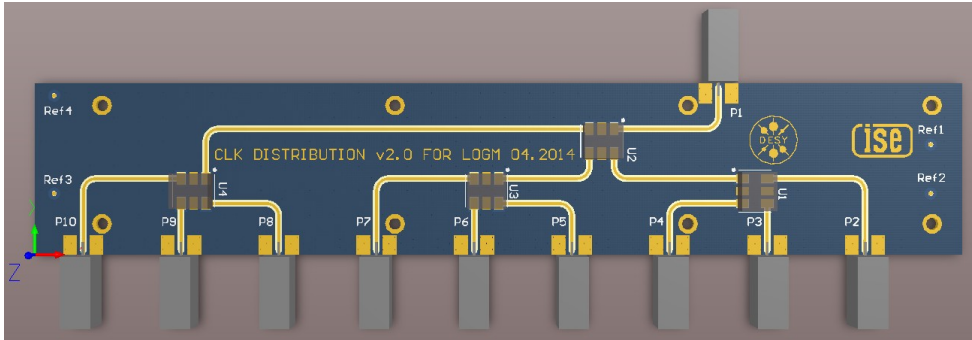
Vector Modulator from Igor requires +10dBm of 1300MHz reference MO signal. To satisfy this the input signal to LOGM has to be +20dBm min.



LOGM13 for XFEL - Main PCB v2.0

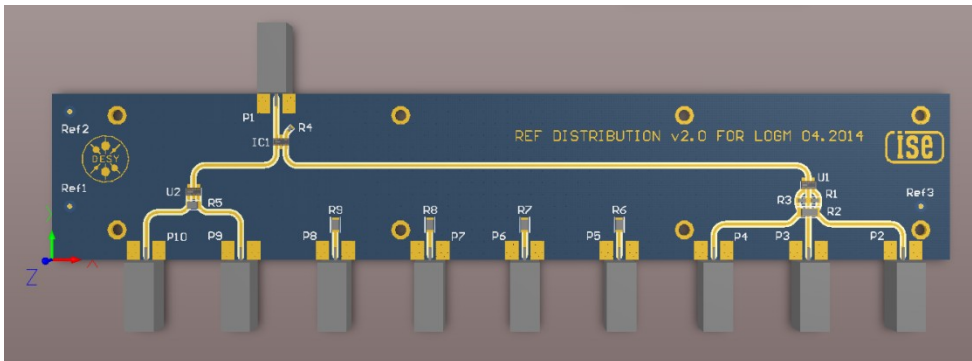
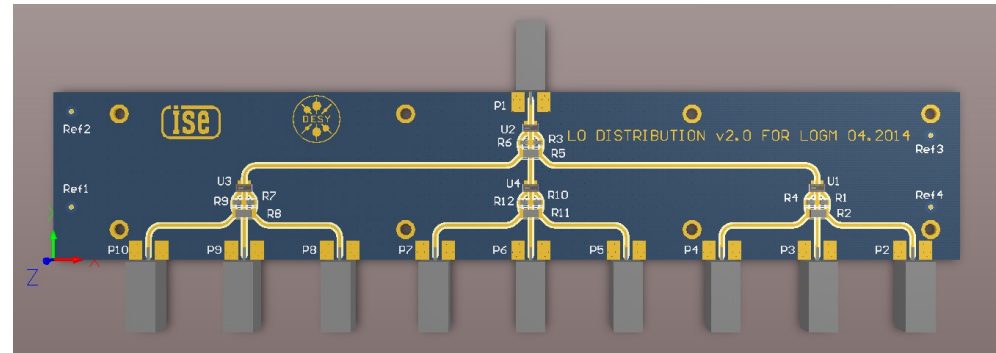


LOGM13 for XFEL - distribution PCBs v2.0



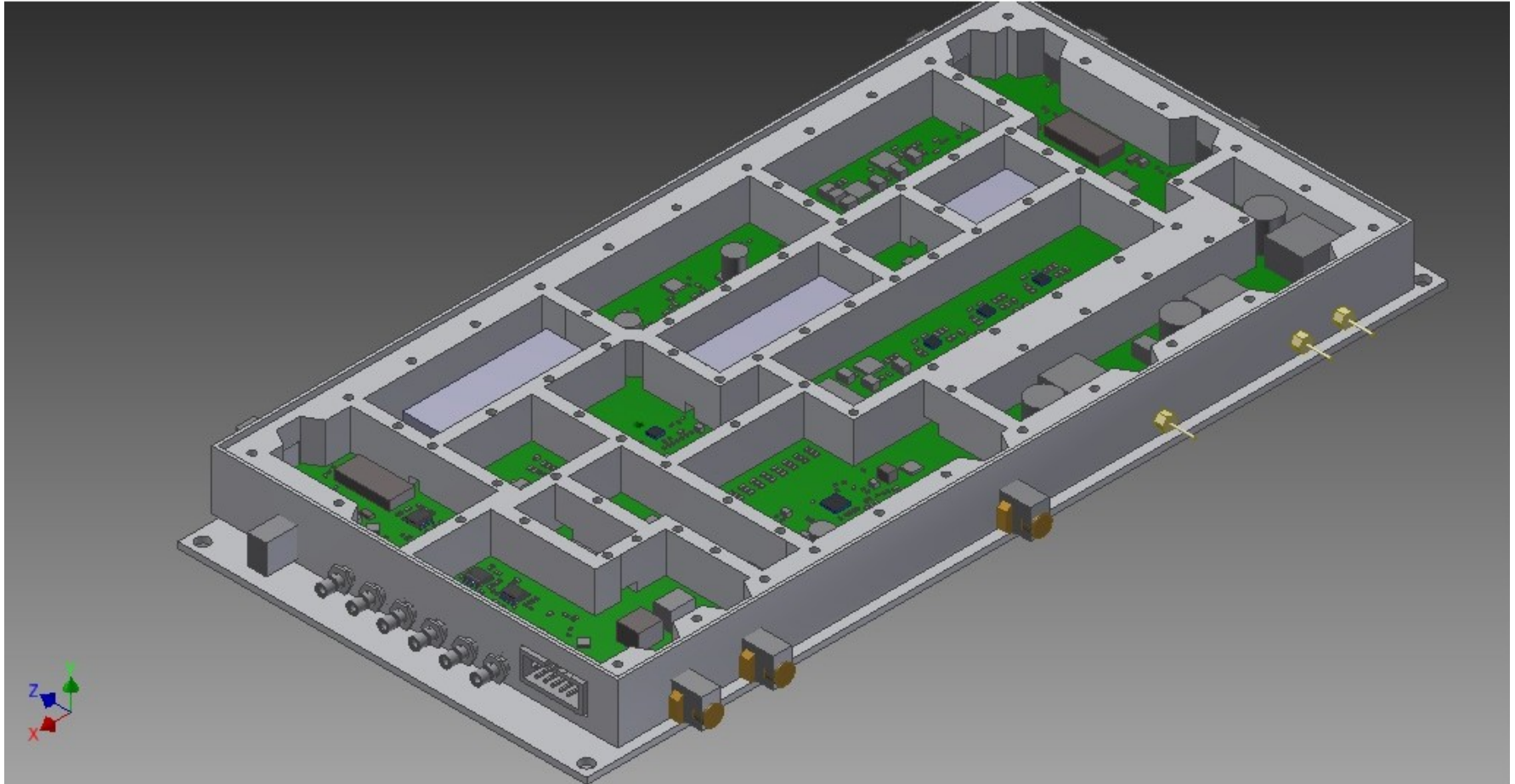
■ CLK Distribution PCB

■ LO Distribution PCB

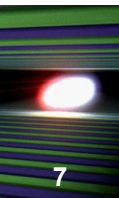


■ REF Distribution PCB

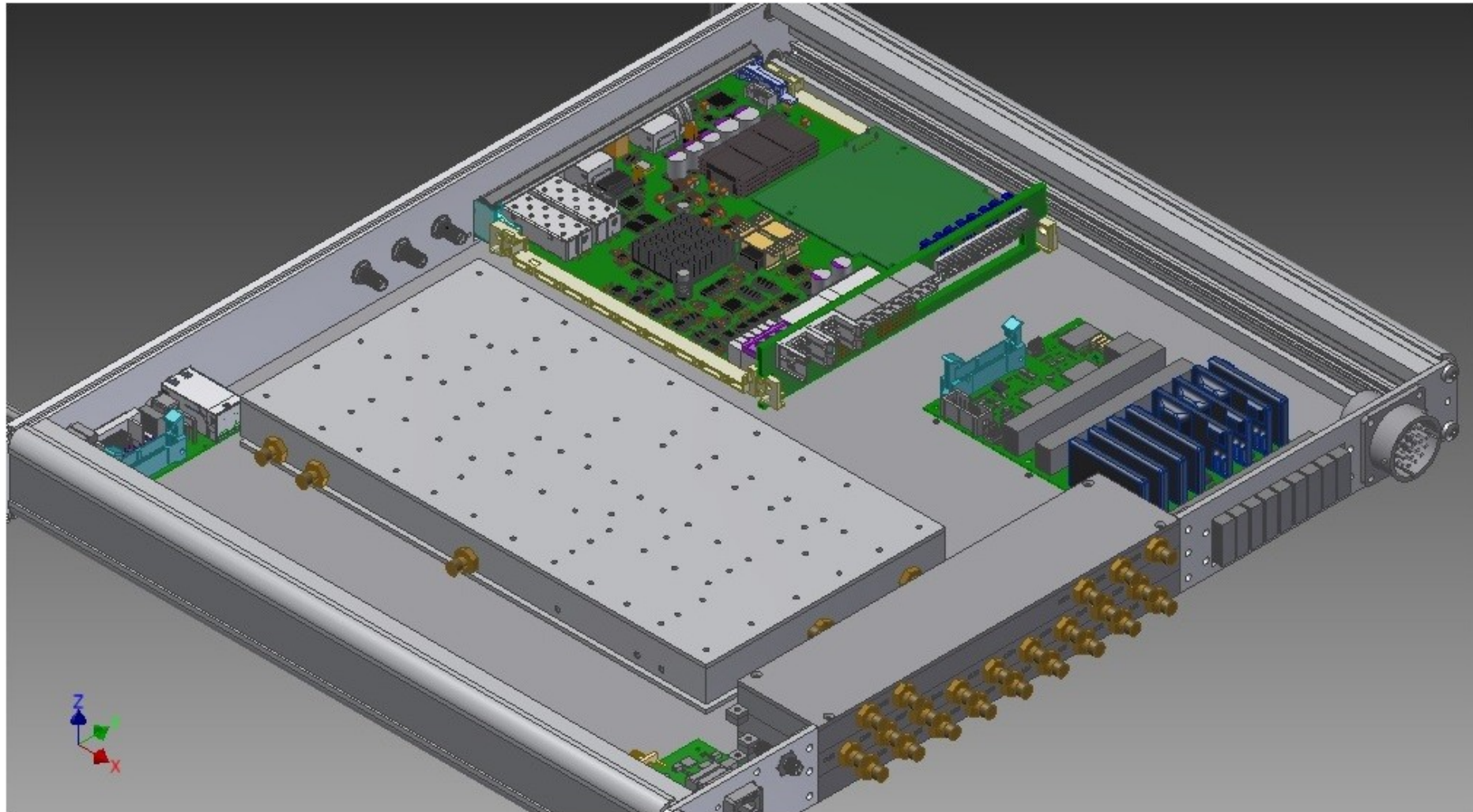
LOGM13 for XFEL - metal enclosures



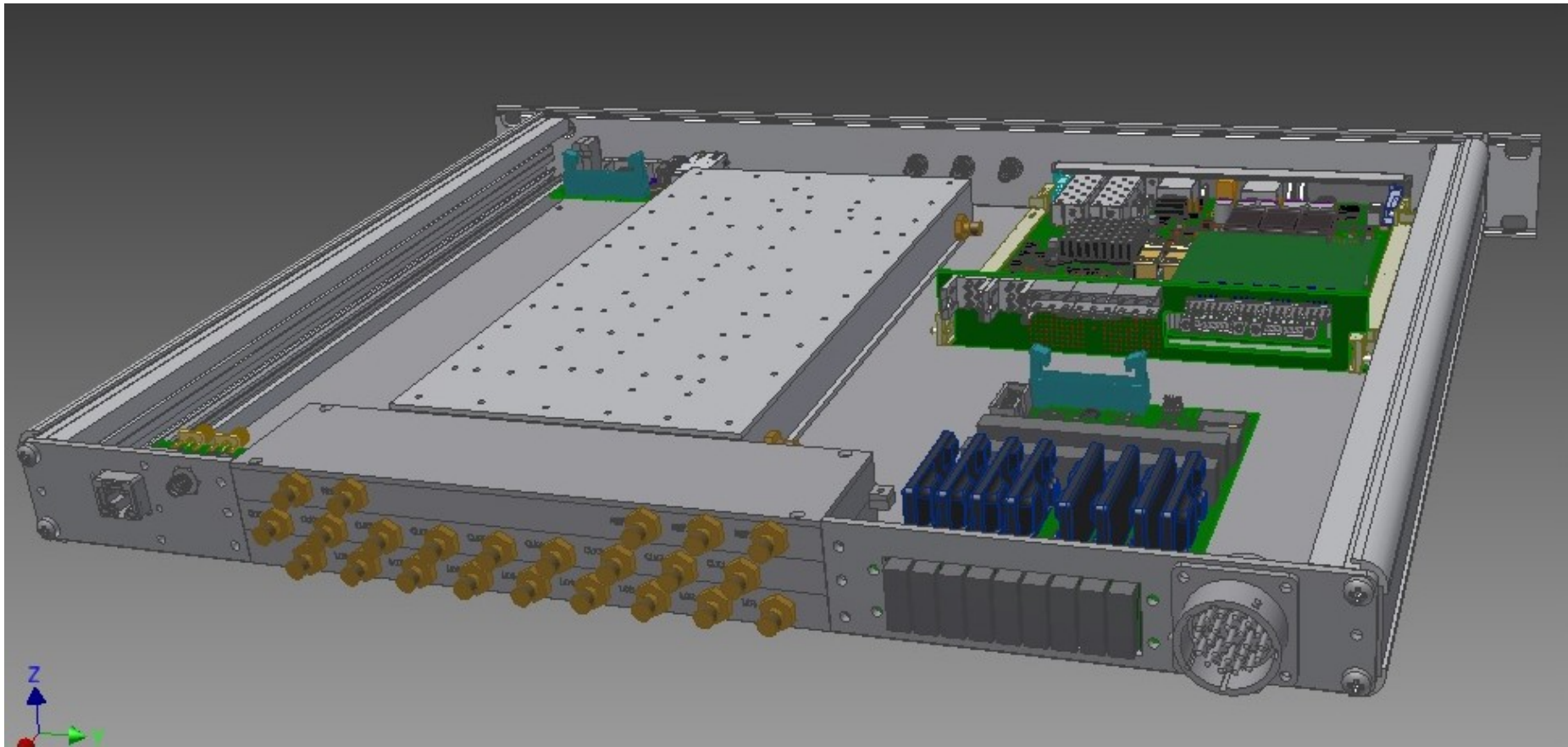
LOGM13 for XFEL - crate integration



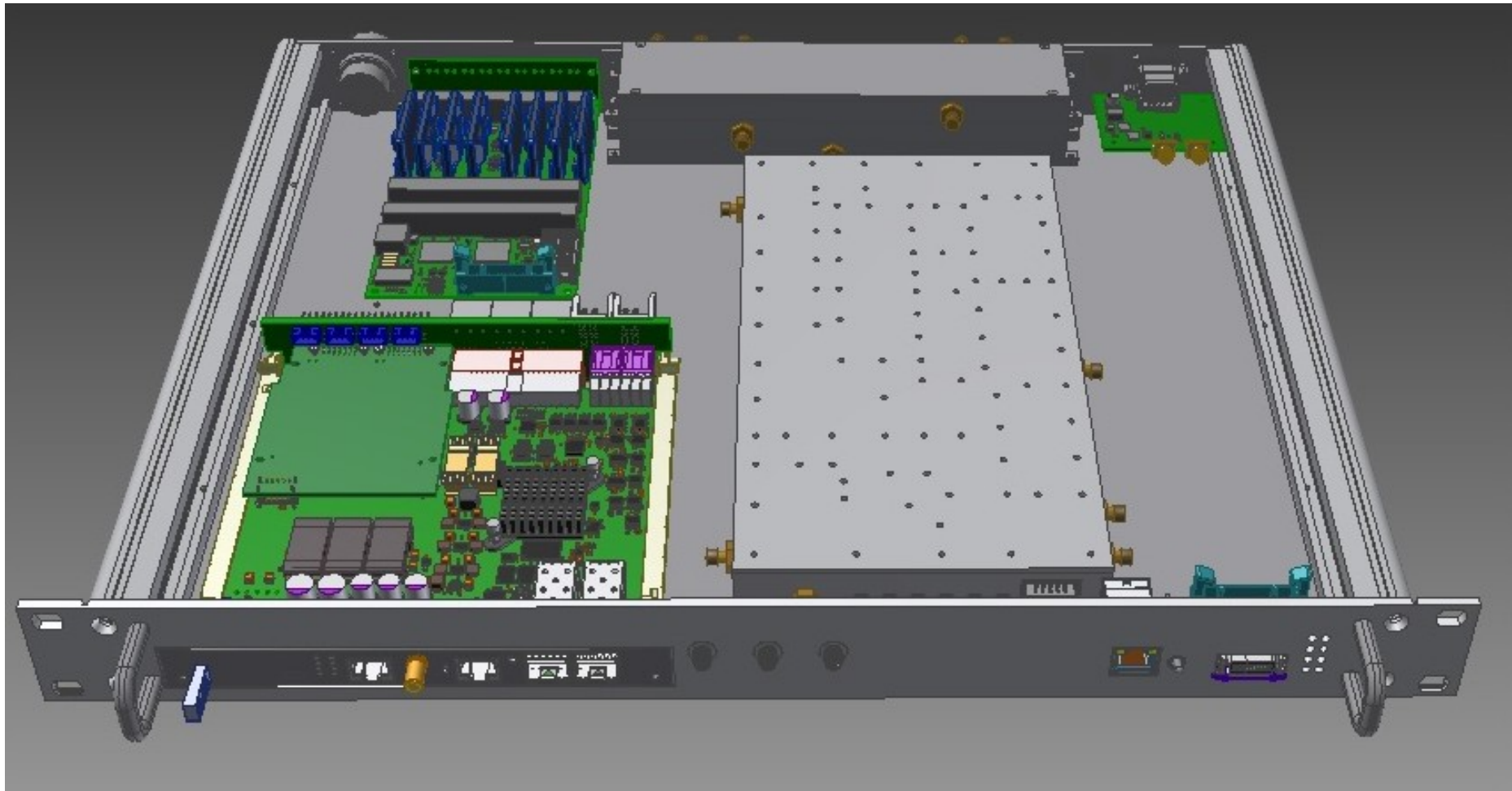
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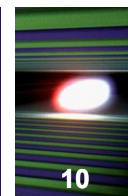
LOGM13 for XFEL - crate integration



LOGM13 for XFEL - crate integration



LOGM13 for XFEL - crate BOM



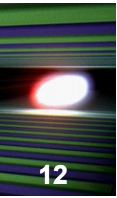
	Qty	Component name	Manufacturer	Model	Price
TMCB	1	TMCB Main Board + panel	I-Tech	TMCB v.2	
	1	TMCB Backplane	I-Tech	TMCB v.2	
	1	TMCB frame/fixture	XXX/ELMA	TMCB v.2	
FRED	1	FRED Main Board	Technosystem	FRED v.2	
	1	FRED Fuse Board	Technosystem	FRED v.2	
	1	FRED Panel Board	Technosystem	FRED v.2	
	1	mechanical fixtures for FRED	XXX	FRED v.2	
LOGM	1	LOGM Main PCB	Technosystem	LOGM13 v.2	
	1	Enclosure for main board	Technosystem	LOGM13 v.2	
	1	LOGM LO distr. PCB	Technosystem	LOGM13 v.2	
	1	LOGM REF distr PCB	Technosystem	LOGM13 v.2	
	1	LOGM LO distr PCB	Technosystem	LOGM13 v.2	
	1	Enclosure for distributoin boards	Technosystem	LOGM13 v.2	
Crate	1	19" crate, 1U, 360mm depth	PBE Elektronik	132-3021	
	1	front panel	XXX		
	1	rear panel	XXX		
Accessories	1	RESET PCB	Technosystem		
	4	SMA bulkhead connectors	Amphenol Connex	132170	7,43
	1	23-pin circular bulkhead connector	Souriau	UTG01823P	6,94
	3	LED indicators, green			
	2	10-way ribbon cable			
	6	SMB-CoaxiPack coaxial RG174 cables			
	8	SMA-SMA semirigid coaxial cables			
	32	DC-power hook-up cables			

TOTAL

LOGM13 for XFEL - status

task	status
Specification	done (?)
Schematics & PCB design	done
Parts ordering	done
PCB production	started (end of May)
Enclosures design	done
Crate integration	done (?) (TMCB frame...)
Mechanics production	not yet (end of May)
Documentation	not yet (June)
Test procedures	not yet (June)
Prototype assembly (x2)	not yet (mid. June)
Industrial partner chosen	not yet (?)
Mass production (x16 ?)	not yet

- This project has to be included in next Annex
- People involved: M. Zukocinski, P. Kownacki (PCB layout), M. Wozniczko (mechanics)



Thank you
for your attention!