



Stabilisation unit for free-space optical receiver

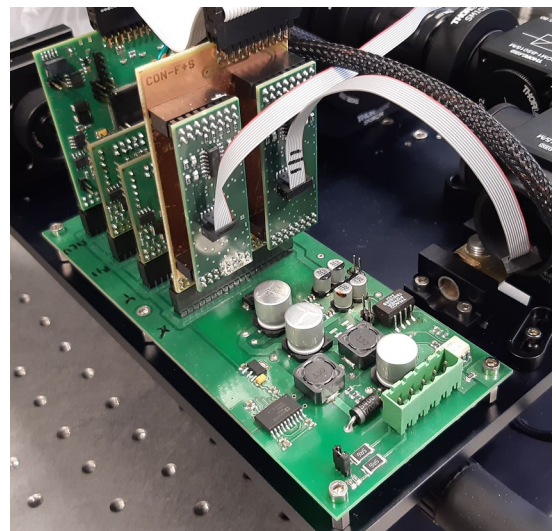
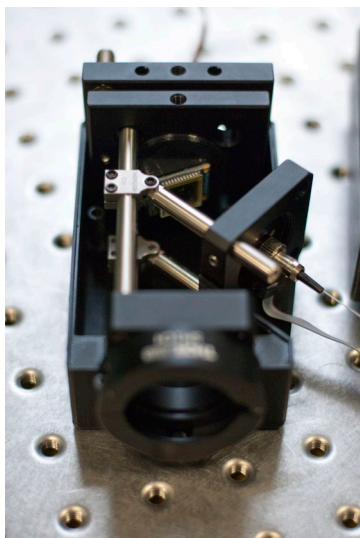
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Abstract – The subject of the functional sample is a new solution of the stabilisation unit for the FSO (Free-Space Optics) connection receiver assembly, i.e. receivers for optical connection through free space. The motivation of the research team was to simplify the solution of the receiver's optical assembly and eliminate the need for a robust mechanical construction with subsequent precise adjustment. The result is intended for a receiving unit with automatic pointing for FSO, emphasising its applicability for ground connections with a range of up to 1 km. The proposed assembly uses a direct connection to the optical fiber for reception; thus, the electro-optical conversion in the external FSO terminal is eliminated. The subject of the new solution is the assembly of fiber and a four-quadrant photodiode for detecting the position of the optical beam. The feedback loop stabilises the optical beam position on the optical fiber aperture using a mirror with a MEMS-type actuator. This ensures compensation for fluctuations in the angle of incidence of the optical wave and mechanical movements of the lens itself.



Obr. 1: Stabilization unit (left) and control electronics (right).