techshot

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Dynamic Microscope Stage

Biotechnology Experiment Module

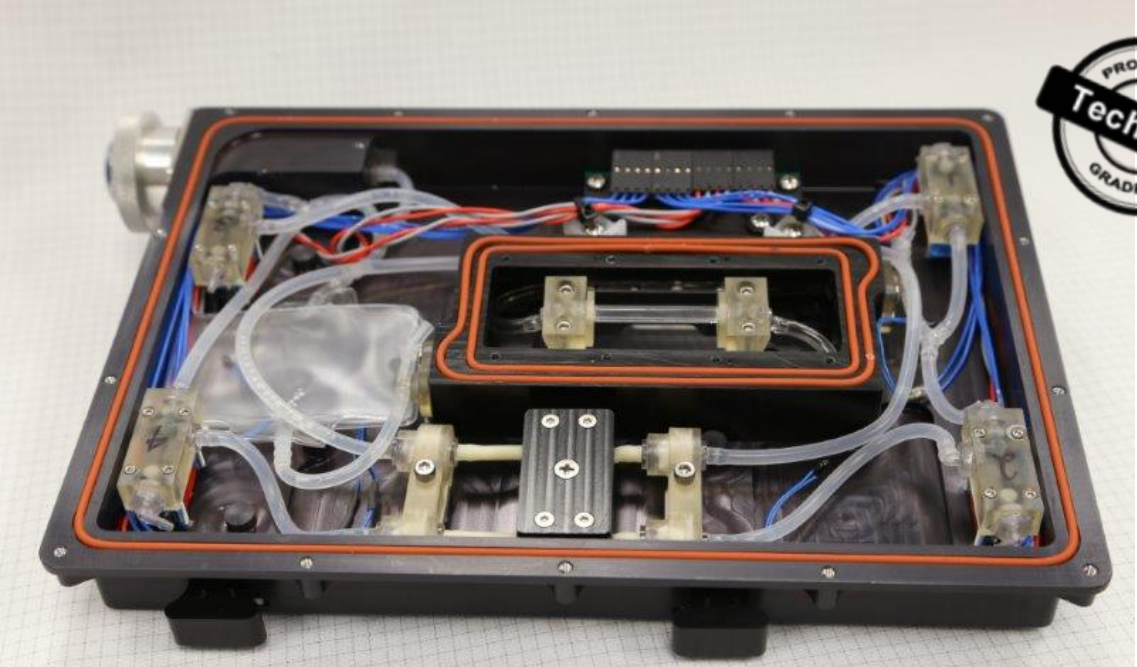

Figure 1. – DMS-Biotechnology Experiment Module with Cover Removed

The Techshot Dynamic Microscope Stage-Biotechnology Experiment Module (DMS-B) is designed to enable real time dynamic experimentation with visualization using the Light Microscopy Module (LMM) located aboard the ISS. The DMS-B mounts to a cold plate located beneath the within the LMM and thereby enables sample monitoring through all phases of an experiment.

Experiments that are to be used with the LMM, travel and are transferred from an Experiment Transfer Module (ETM) to the LMM Auxiliary Fluids Container (AFC). Located within the AFC is an interfacing cold plate where the microscope stage and sub-stage condenser would normally be located. This is where the DMS-B will mount and reside throughout the duration of the experiment.

During the experiment, sample flows into a central hollow slide (4.0 x 0.4 mm cross section) where it is in focus under the LMM objective turret. Samples are collected by flushing the hollow slide using solution stored in a 2.5-ml reservoir. In addition to monitoring, samples can be added or removed from the DMS-B Experiment Module through a needleless septum using a syringe.

An example of an Experiment Module with its cover removed can be seen below in Figure 1. The module shown in the example has been configured to support biological research; however, the hardware can be reconfigured to support many other types of experiments and research.

Control of the experiment is possible as power and data are transferred between the Experiment Module and Electronics Module through a connector located on their interfacing surface. In addition to power and operational commands, the Electronics Module is equipped with an LED based sub-stage condenser for experiment illumination and evaluation. This interfacing connector and an Experiment Module/ Electronics Module interface can be seen below in Figure 2.

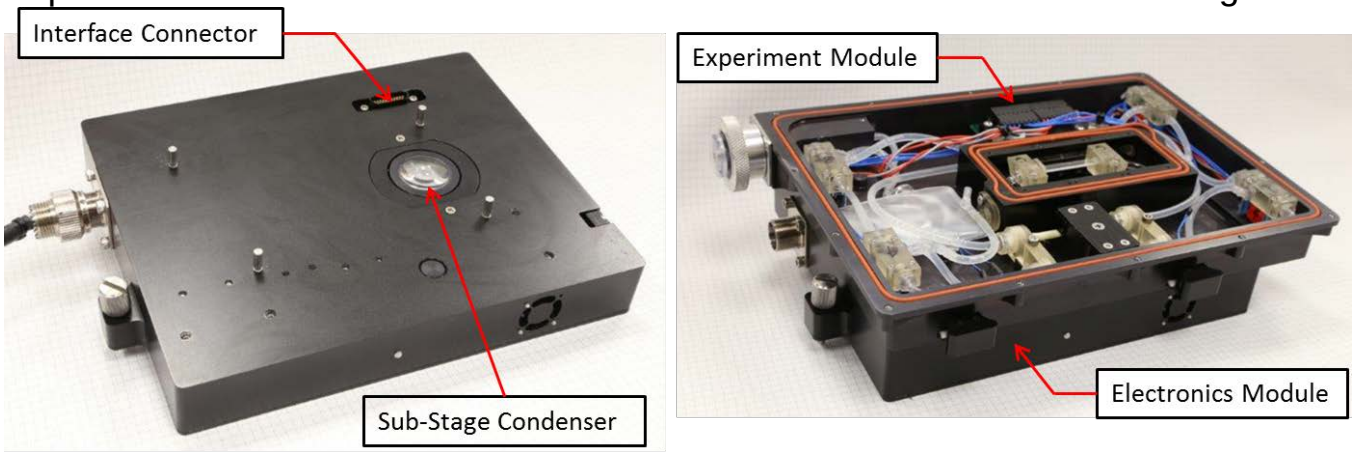

Figure 2 – DMS-B Electronics Module *(Left)* and Electronics Module Interface with an Experiment Module

When fully implemented, control of the experiment will be conducted through interfaces on the LMM. On the ground it is controlled using a laptop computer. With software resident on the laptop simple commands are issued to open and close valves, pump fluid from the reservoir to waste bag and select from five modes of Sub-stage condenser illumination. The available modes of illumination include bright field, darkfield, Phase1 and Phase 2 contrast and fluorescence.

Besides the biotech module, the Electronics Module also is designed for use with a suite of other Experiment Modules available for colloid research on the LMM.