LASERBANK MultiLine

Set up guide

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Laser safety

The Cairn LaserBank system incorporates dual independent interlocks to ensure complete laser safety provided that the correct procedures and precautions are taken by the installer and operator. Any number of interlock switches can be connected to the LaserBank controller in series and if tripped, all lasers are modulated to emit no photons both in the analog and digital domain and an additional fail-close mechanical safety shutter is activated. In order to reset the lasers and open the safety shutter, a key switch must be turned off and then back on again, requiring deliberate action by the operator. All output ports of the TriLine and MultiLine laser combiners are automatically interlocked internally to prevent lasers from being switched on when fibre-optic cables are disconnected.

A typical configuration of the LaserBank for epifluorescence microscopy would involve interlock cables being connected to some combination of:

i. Fibre-optic ports of the LaserBank
ii. A laser-safe microscope frame
iii. Eyepiece shutter
iv. The door of a laser-safe enclosure
v. A physical cover positioned over the sample chamber (to prevent rays escaping during TIRF or oblique illumination).

In the case of (v) the sample cover has a long-pass filtered lid to block all installed laser wavelengths, whilst allowing near infra-red transmitted light to pass through for DIC, phase contrast or other brightfield technique.

In order to make the system more convenient for automated software control, a “safe” state can be activated in advance to prevent the interlock from tripping under non-fault conditions. This state can only be engaged in advance, and would typically be set to allow use of the eyepieces for non-laser inspection without causing a fault conditions. The work-flow would be as follows:

i. Digitally set a safe state switching off all lasers via the software
ii. Divert the light-path from camera port to eyepieces
iii. Carry out non-laser observation
iv. Re-divert light train to camera port
v. Deactivate laser safe state to give control back to the standard software illumination drivers

The specific laser powers and a bespoke configuration diagram will be supplied with your system.
Please take particular care with lasers lines <405nm which are high energy and less visible (or in some case invisible) to the human eye.

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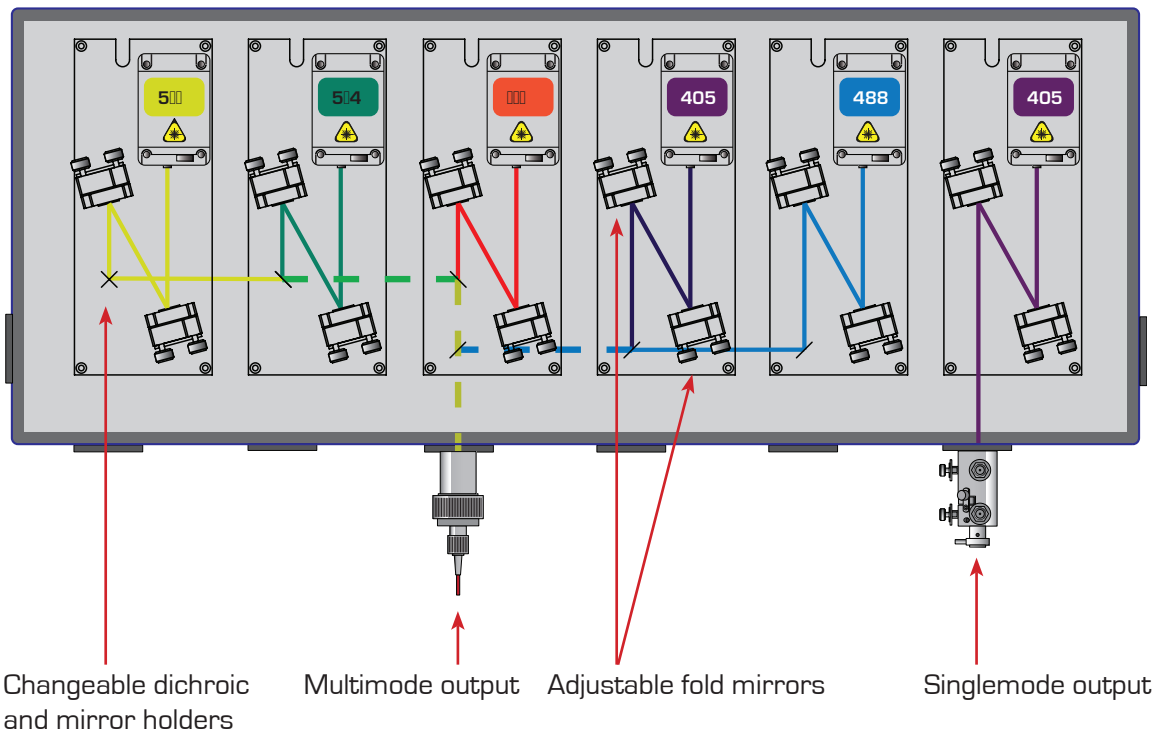
The MultiLine LaserBank is a flexible, compact, and affordable multi-channel laser combiner designed to work with laser heads from Coherent, Omicron, Vortran, Integrated Optics and other manufacturers. Each LaserBank is supplied with a configuration document showing the arrangement of lines, combining beamsplitters and single-mode and multi-mode output ports. The philosophy is that it the Bank can be re-configured and serviced on site as applications change, or new lasers become available. The design is amenable to modification for special requirements and will work with our LaserBank rack controller or with third party power supplies and USB control. The TriLine can be fitted with up to three output ports which can be single mode FC/PC with Kineflex mount or our proprietary SMA adapter for multimode fibres. The multmode adapter can be supplied with fibres from 50 micron to 1500 micron core size.

Contents

Please refer to your order confirmation or delivery note for details, but the package should contain all or some of the following:

- MultiLine housing
- Multiway control and power cable
- Interlock output protector
- Single-mode fibre(s)
- Multi-mode fibre(s)
- Despeckler
- Configuration schematic
- Power output document

Internal schematic of the MultiLine Laser bank



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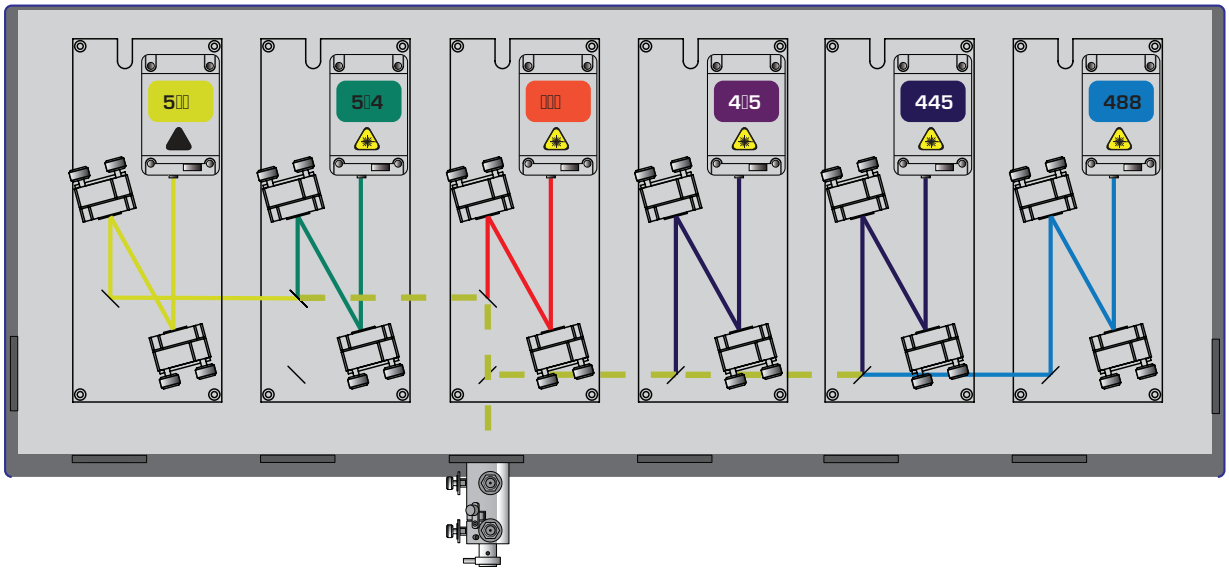
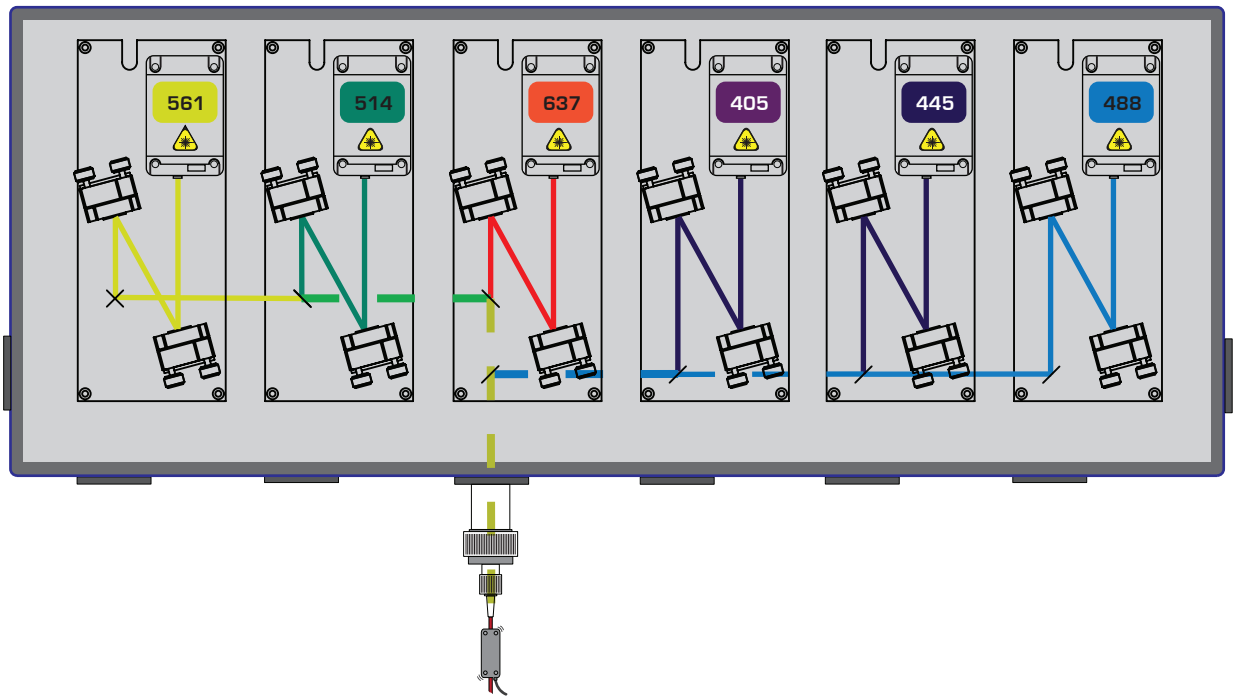
Example Layout Formats

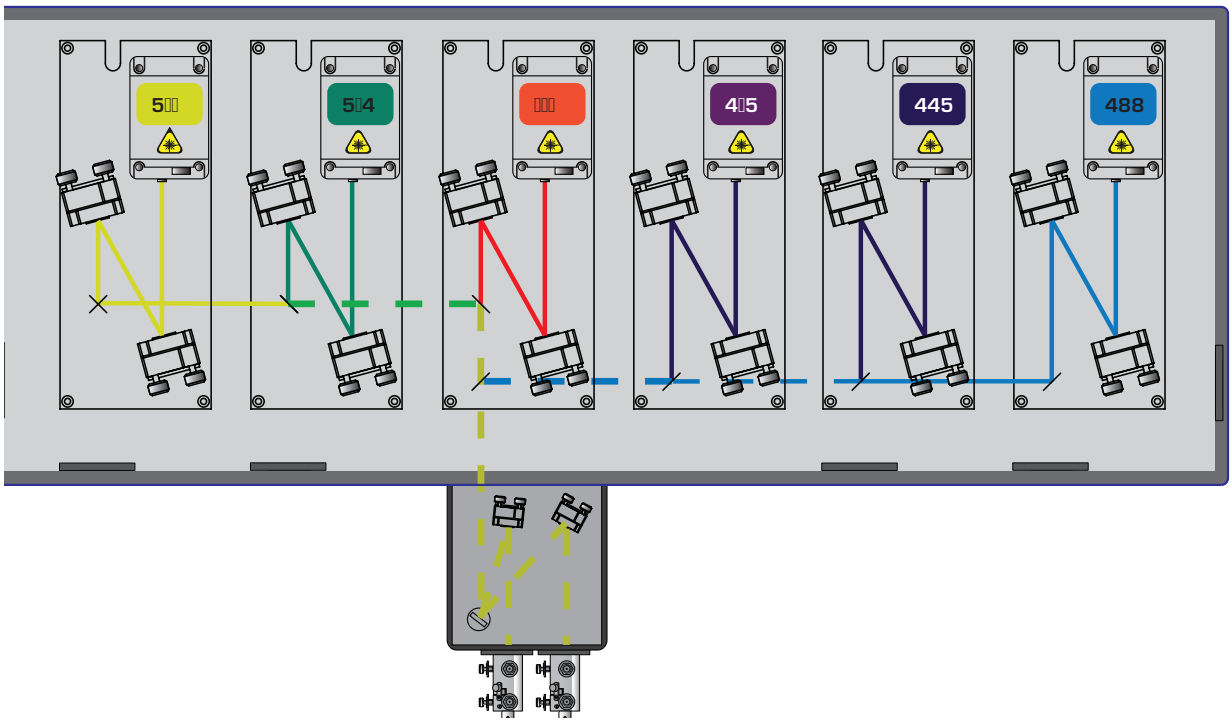
Single Mode output



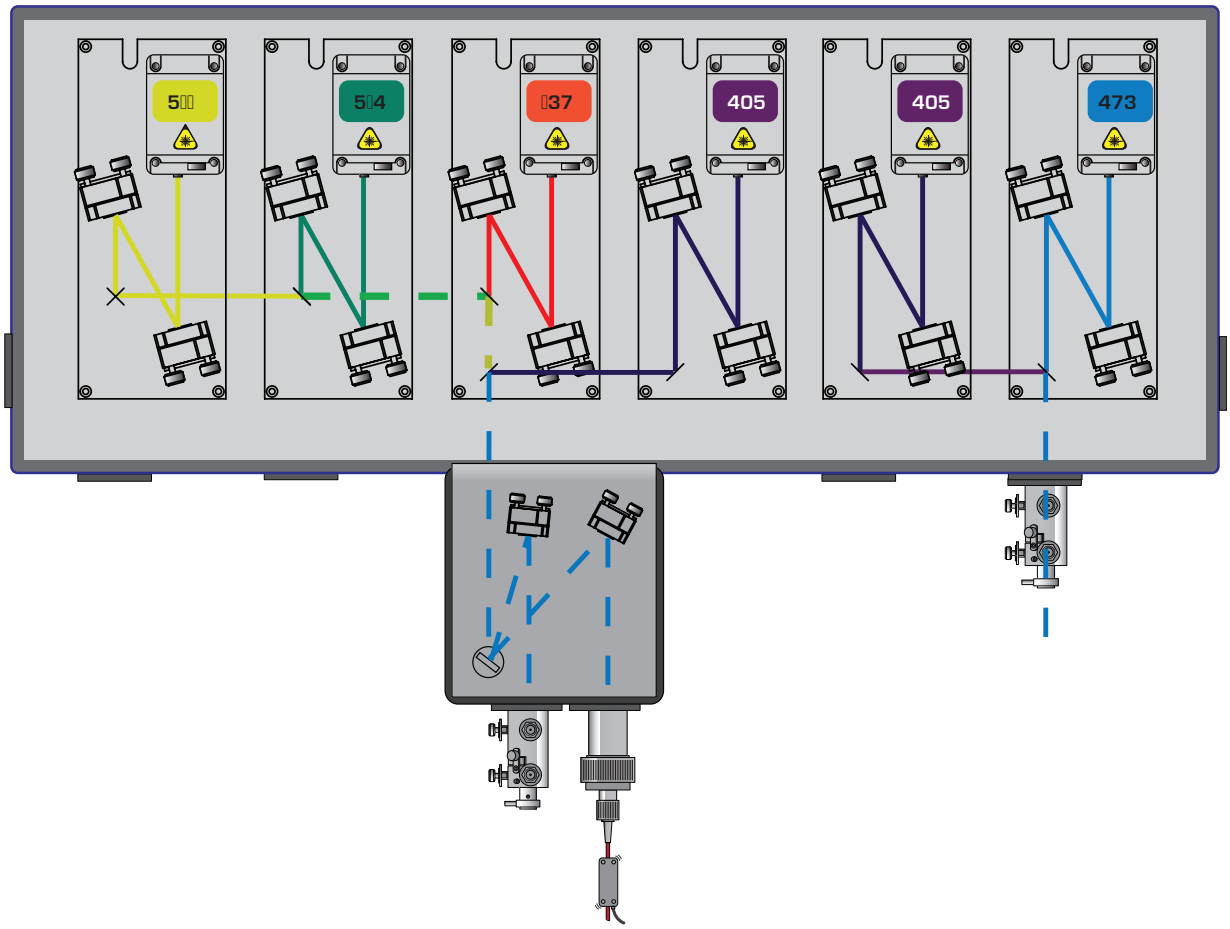
Multi Mode output with Despeckler



2 Single Mode Outputs with Galvo



Single Mode and Multi Mode Outputs with Galvo



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