

# PROTEUS-C

## Mode selective Spatial Multiplexer for optical telecommunications

### Features

- Up to **15 mode** multiplexer
- **Large bandwidth** of operation
- **Low insertion loss** and **high mode selectivity**

### Applications

- Space division multiplexing over **novel optical fibers**
- **Pump and signal multiplexing** for few-mode EDFA
- **Mode adaptation** between few-mode components

### Description

CAILabs' Proteus-C, tailored to the latest SDM research.

The **Proteus-C** line provides the best interface between single-mode fibers and few-mode passive or active fibers, and between few-mode components.

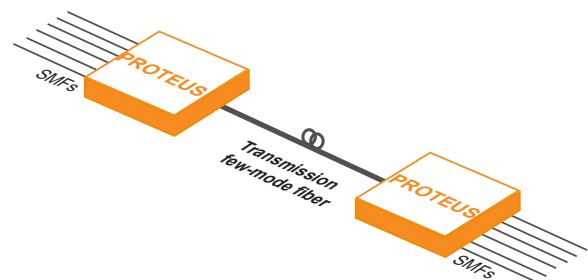
Based on the highly flexible technology of **Multi-Plane Light Conversion**, Proteus-C can be customized to **any set of input or output spatial modes**; it provides efficient multiplexing **up to 15 modes** into any multi-mode or few-mode fiber. The Proteus-C can also be designed for **two wavelength bands**, enabling mode shaping and multiplexing for active few-mode fibers and components.

CAILabs' PROTEUS-C series is the ideal solution for **all mode division multiplexing research & development**.

### Use cases

High selectivity of the PROTEUS-C multiplexers allows to reduce the complexity in digital signal processing for mode division multiplexing transmission. It enables:

- weakly-coupled transmission (Genevaux et al., OFC 2015, W1A.5)
- mode dispersion compensation (Wakayama et al., OFC 2016, M3E.6)
- uncoupled transmission and amplification (Trinel et al., ECOC 2015, We.2.4.3)

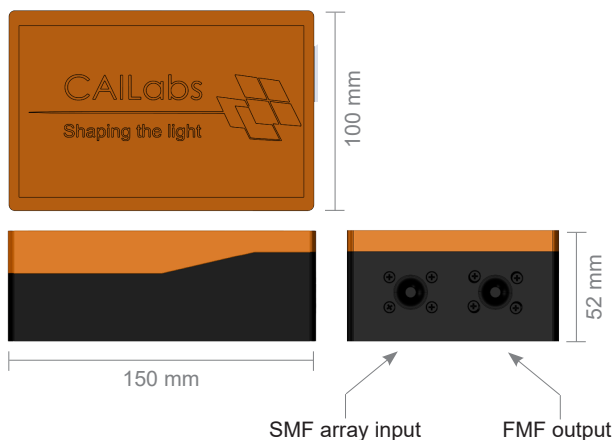


All specifications are correct at the time of production of this specification sheet. Any design or specification can be changed without prior notice.  
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## General specifications

Parameter	PROTEUS-C-6		PROTEUS-C-10		PROTEUS-C-15		Comments
	Value (at 20°C)	Typical	Value (at 20°C)	Typical	Value (at 20°C)	Typical	
Number of modes	6		10		15		
Wavelength of operation	C-band, L-band or O-band						Other wavelength ranges available
Back-to-back insertion loss	< 7 dB	5 dB	< 10 dB	8 dB	< 14 dB	9 dB	Value for MUX+DEMUX, at 1550 nm, for standard fiber
Back-to-back cross-talk	< -15 dB	-20 dB	< -12 dB	-18 dB	< -12 dB	-18 dB	Value for MUX+DEMUX, at 1550 nm, for standard fiber
Signal input fiber type	SMF-28e+ array or MMF or FMF						SMF-28e+ and standard MMF or FMF provided by CAILabs; Custom fiber provided by customer
Pump option	Up to 2 additional inputs at 980 nm can be shaped and combined in the multiplexer						
Signal output fiber type	MMF or FMF						Standard MMF or FMF provided by CAILabs; Custom fiber provided by customer
Package size (mm)	150 x 100 x 52						

## Package layout



## Output fiber information

### Example of output fibers

- 4 LP mode step-index fiber by Prysmian
- 6 LP mode graded-index fiber by Prysmian
- 9 LP mode graded-index fiber by Prysmian
- 2 LP mode graded-index fiber by OFS
- 4 LP mode graded-index fiber by OFS
- 2 LP mode step-index fiber by OFS
- 4 LP mode step-index fiber by OFS
- OM1 : 62.5 um conventional multi-mode fiber
- OM2/3/4 : 50 um conventional multi-mode fiber
- OAM modes in free-space

### Other type of fiber

Please contact us with detailed requirements