



## STIFF-FLOP soft manipulator

Modular soft manipulator with high dexterity and intrinsic safety. The manipulator is based on a modular approach and each module is 60 mm long and 14 mm in diameter. It is able to implement omnidirectional bending and elongation when pressurized (pressure range: 0 – 1.5 bar). The basic version of the manipulator is composed of two modules, completely based on elastomers (silicones) and some ABS parts for connection. On the tip, the system can lodge a micro camera, a gripper or an ablator (all tested)

### Key Features

- Safe interaction with body parts or delicate objects
- Modular
- Contraction, elongation, omnidirectional bending
- Multipurpose platform

### Possible Applications

- Endoscopic/Surgical robotics
- Controllable overtube structure for inserting and guiding flexible tools
- Soft robotic platform for testing control algorithms



---

## Access information

<b>Corresponding infrastructure</b>	School of Advanced Studies Sant'Anna The BioRobotics Institute
<b>Location</b>	Viale Rinaldo Piaggio, 34 56025 Pontedera PI, Italy
<b>Unit of access</b>	Working day

---



## Technical specifications

**Modules can be quickly connected/disconnected for a one/two modules manipulator.**

<b>DoF</b>	Infinite passive – 6 active (actuators)
<b>Time response (pneumatic valves)</b>	0.03 sec
<b>Interface</b>	USB
<b>Power supply</b>	220 V@ 50 Hz
<b>Weight</b>	9 g (per single module)
<b>Operating pressure</b>	0 – 1.5 bar (per single fluidic chamber)
<b>Bending</b>	Omnidirectional – max 90 deg
<b>Elongation</b>	50%

## Additional information

<https://www.dropbox.com/s/c43uxr16xornzwo/Miniaturised%20STIFF-FLOP%20manipulator.wmv?dl=0>