Octopus v1

8-channel general purpose absorptive RF commutator

Features

- Bidirectional (Rx / Tx)
- Frequency range: 50 MHz - 8 GHz
- SMA Female connectors, 50 Ohm
- Power handling of 25 dBm CW
- Absorptive 50 Ω terminations for unconnected nodes
- TTL logic levels control
- Terminated all-off mode
- Robust milled aluminum housing
- -20 °C to +60 °C operating temperature support

Applications

- Antenna switching
- Filter bank switching
- RF signal routing
- Standalone or complete with RigExpert® Fobos Pro and Fobos One devices

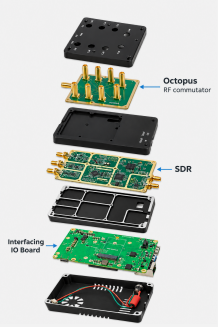
Octopus



Octopus + Fobos PRO



Octopus + Fobos One



Assembly illustrations

Product description

RigExpert® Octopus is an 8-channel radio-frequency commutator. It has an absorptive configuration with internal matched terminations on all ports. In its original housing and connector configuration, the commutator works directly with RigExpert® Fobos PRO and Fobos One Software Defined Radio receivers. This expands the channel capacity and allows switched multi-channel receivers to be built. Different antennas, band-pass filters, amplifiers, attenuators and polarizers can be connected through the RigExpert® Octopus antenna commutator, adding flexibility and functionality to the receiver. Channels can be switched using the standard interface functions of the **libfobos-sdr-agile** library https://github.com/rigexpert/libfobos-sdr-agile/releases/.

RigExpert® Octopus can also be used as a standalone radio-frequency commutator in other devices and systems. Simple TTL logic-level control allows integration with a wide range of microcontrollers and other embedded devices. The commutator is bidirectional and can operate as a 1-to-8 or 8-to-1 input/output device. It can be used for both receiving and transmitting, handling continuous signal power of up to 25 dBm. A custom housing can be manufactured upon request.

The simple and reliable SMA female connector provides a stable connection and compatibility with most radio-frequency devices and cables.

The RigExpert® Octopus radio-frequency commutator is based on the Peregrine Semiconductors PE426482 chip, which uses UltraCMOS® and HaRP technologies.

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Supply voltage	-0.3	5.5	V
Digital input voltage	-0.3	3.6	V
RF input power (connected port) CW		25	dBm
RF input power (terminated port) CW		17	dBm
ESD voltage		1000	V

Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
Supply voltage	2.3	3.3	5.5	V
Supply current		120	200	µA
Digital input high	1.17		3.6	V
Digital input low	-0.3		0.6	V
Digital input current			10	µA
Operating temperature range	-20	+25	+60	°C

Electrical specifications

Parameter	Min	Typ	Max	Unit
Operating frequency	50		8000	MHz
Insertion loss		0.9 1.0 1.8 3.2 8.1	1.4 1.6 2.5 4.5 9.9	dB@100MHz dB@1GHz dB@2GHz dB@4GHz dB@8GHz
Isolation	61 45 38 28 25	65 47 41 32 30		dB@100MHz dB@1GHz dB@2GHz dB@4GHz dB@8GHz
All-off isolation	68 50 45 38 35	79 61 56 52 48		dB@100MHz dB@1GHz dB@2GHz dB@4GHz dB@8GHz
RFC port return loss	15 21 18 15 12	22 27 23 19 23		dB@100MHz dB@1GHz dB@2GHz dB@4GHz dB@8GHz
Port-to-Port isolation (Neighbor ports)	58 43 36 33 34	73 66 58 56 48		dB@100MHz dB@1GHz dB@2GHz dB@4GHz dB@8GHz

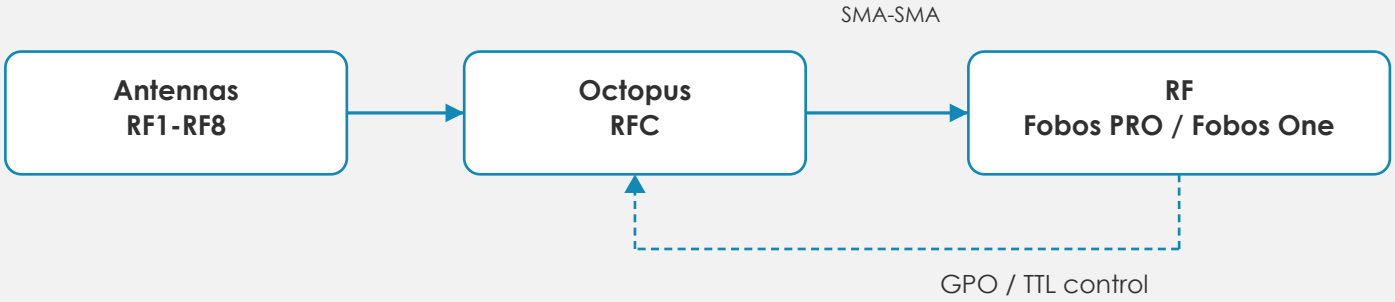
Physical parameters

Parameter	Value	Unit
Dimensions	82 × 60 × 23.5	mm
Weight, no more than	60	g

Control logic

GPO					RFC to
B0	B1	B2	B3	Value	
0	0	0	0	0	RF1
1	0	0	0	1	RF2
0	1	0	0	2	RF3
1	1	0	0	3	RF4
0	0	1	0	4	RF5
1	0	1	0	5	RF6
0	1	1	0	6	RF7
1	1	1	0	7	RF8
x	x	x	1	8	All off

Using Octopus with Fobos PRO and Fobos One



Connect antennas or other RF devices to RF1-RF8. Connect the common RFC port of Octopus to the Fobos PRO or Fobos One RF input using an SMA-SMA cable. Octopus routes one selected antenna channel to the receiver.

Channels are selected through Fobos PRO or Fobos One GPO using the standard API functions of the **libfobos** libraries https://github.com/rigexpert/libfobos-sdr-agile/releases/