



High-speed optical switching device for selective marking with CO₂ lasers Device includes driver and a beam dump

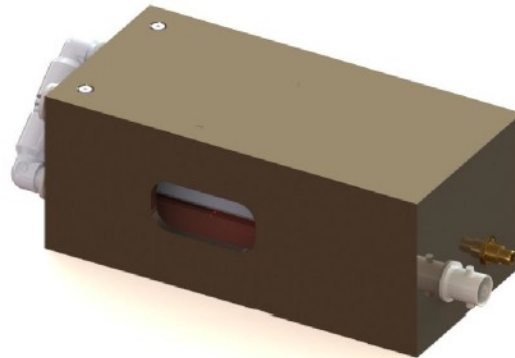
High-speed optical switching device
ideal for
extra-cavity modulation or power
control of high power CO₂ lasers.

Combining optimum grade mono-crystalline germanium, high quality optical finishing, robust anti-reflection coating and high reliability transducer bonding, with novel acoustic management and opto-mechanical design techniques, we have successfully achieved exceptional thermal management whilst maintaining high RF power handling, transmission and diffraction efficiency.

In addition to the specifications indicated, we also offer alternative wavelengths, RF frequencies, active apertures & a wide range of custom housing configurations.

This product conforms to the requirements of the European Union Directive 2011/65/EU of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

Our scientists and engineers are available to assist in selecting the most appropriate Acousto-Optic device and RF driver for your application.



Key Features

- High optical power handling
- Low insertion loss
- Excellent pointing stability
- Superior beam quality
- High diffraction efficiency

Applications

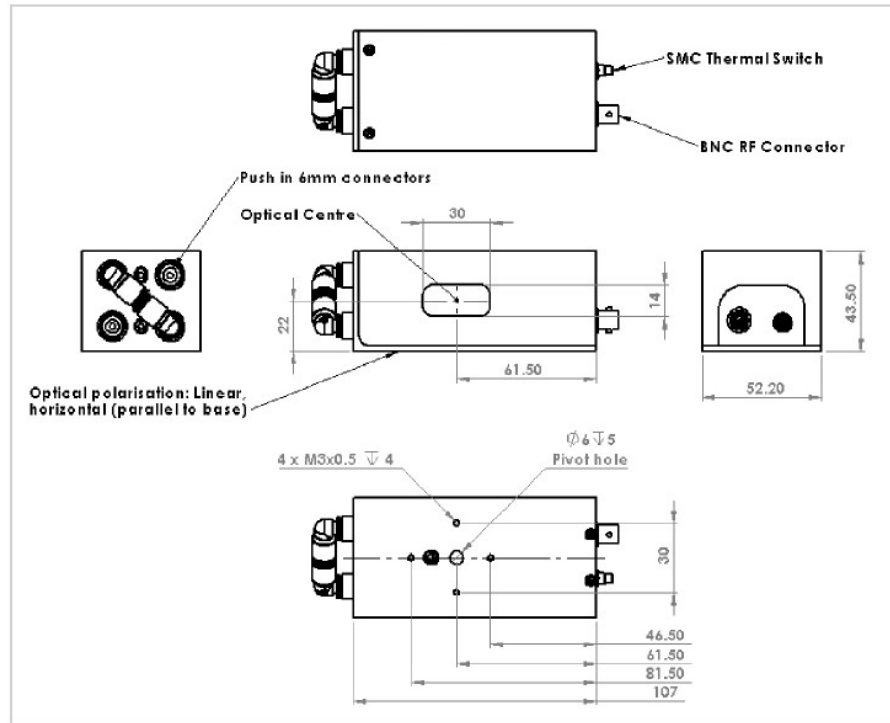
- Industrial (material processing)
 - PCB via drilling
 - Marking and engraving
 - Light guide panel processing
 - Micro-perforation
- Q-Switching



General Specifications

Device:	High-speed optical switching device
Interaction material:	Germanium
Wavelength:	9.4 μm or 10.6 μm
Maximum optical power density:	$>15 \text{ W/mm}^2$
AR coating reflectivity:	$<0.2 \%$ per surface
Transmission:	$>96.5 \%$
Frequency:	40.68 MHz
Optical polarisation:	Linear, Horizontal (parallel to base)
Active aperture:	Up to 9.6 mm
Acoustic mode:	Compressional
Rise-time (10-90%):	120 ns/mm
Diffraction efficiency:	$\geq 90 \%$
RF Power:	Max 120 W
Housing:	Refer to drawing
Recommended RF Driver:	included

Device schematic





Ordering code

I - M 0 4 1 - x x C 1 1 x x x - P 5 - G H 7 7

Code	Active aperture	Code	AR coating	Code	Water connector
7	7 mm	V41	9,4 μm	P	6 mm OD straight push fit
10	9,6 mm	Q	10,6 μm		

Driver

drivers provide up to 125 Watt output power at 40.68 MHz signal frequency

The driver can be operated with modulation frequencies (2 x analogue and digital) up to 1 MHz to create complex output waveforms as illustrated in connection examples below.

Copper water cooling circuits ensure the highest levels of corrosion protection.

Optimum EMC shielding and mechanical protection is achieved by an aluminum casing with conductive surface passivation.

This product conforms to the requirements of the European Union Directive 2011/65/EU of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.



Key Features

- RF output power up to 125 Watt
- Copper water-cooling path
- Constant output power design
- High SWR and overheat safety shutdown
- Compact casing, fully shielded (EMC)

Applications

- Industrial (material processing)
 - PCB via drilling
 - Marking and engraving
 - Multi-layer Polymer film processing
 - Micro-perforation
 - Glass Processing



Technical Data

Supply voltage		+24 VDC
Supply current		typ. 12.5 A @ 125 W RF output power
Maximum RF output power (adjustable) ¹		60 W, 100 W or 125 Watt (depending on model)
Adjustment range		< 1 W... Max value
Output impedance		nom. 50 Ω
RF output frequency		40.68 MHz
Frequency accuracy		< ±30 ppm
Frequency stability		< ±30 ppm
Extinction Ratio		> 50 dB
Harmonics distortion ¹		< -30 [dBc]
Analogue modulation (Pin 12 AM1, Pin 11 AM2)	Impedance Voltage range @ 50 Ω	600 Ω 0 V to +10 V
The voltage range corresponds to 0 to 100% of the potentiometer pre-adjusted maximum RF output power.		
Digital modulation/ Power Level Select (Pin 13)	Impedance Level Logic	4.7 kΩ (pull-up) Standard TTL compatible High = AM2 Select / Low = AM1 Select
Maximum modulation frequency (digital and analogue)		1 [MHz]
RF rise time/fall time (10 ... 90%) ¹ (digital and analogue)		< 80 [ns]

¹ into 50 Ω load

Connectors, Cooling, Dimensions, Weight

RF output connector	BNC female
Control connector	D-Sub 25-pole, female For pin assignment refer to Control Connector section, on page 3
Power supply cords (supplied fitted) red (or yellow) black (or violet)	2 x 750±50 mm H07V-K 1.5 mm ² + Vs (24 VDC) CGND (case ground)
Cooling	Water cooling - Coolant needs to be compatible with copper and stainless steel cooling system parts. NOTE: Do not use de-ionized water. Cooling block material: Copper
Cooling Connections	2 x G 1/4" thread fitted with 6 mm push in connectors
Coolant Flow rate/pressure	> 1 L/min at ≤ 25°C / < 100 psi (6.9 bar)
Dimensions [mm]	200 x 100 x 52.5 (length x width x height)
Weight	1.5 kg



Environmental Conditions

Warm up time	10 minutes for optimum stability
Operating case temperature	< +50°C, safety shutdown at ≈55°C
Storage temperature	-20°C... +65°C, non-condensing

Absolute Maximum Ratings

Supply voltage maximum	+26 VDC
Analogue modulation Voltage range @ 0 ... +10 V	-0.5 V ... +11 V
Digital modulation Level	-0.5 V ... +5.5 V
Maximum operating temperature	+55°C heat sink / base plate temperature

Output Indications

RF status (pin 1)	RF ON = High RF OFF = Low
VSWR Fault (pin 2)	VSWR OK = High VSWR exceeded = Low
Driver temperature (pin 3)	Temperature OK = High Safe temperature exceeded = Low
Interlock monitoring (pin 5 and 8)	Interlock OK = High Interlock fault = Low

Fan cooled beam dump with a 50mm aperture:

Aperture	Ø50mm	Max Energy Density (for <100ns)	0.3J/cm ²
Spectral Range	0.19 - 20µm	Max Energy Density (for 2ms)	10J/cm ²
Power Range	Up to 500W	Backscatter	N.A.
Dimensions	90 L x 90 W x 105 D (mm)	Compliance	CE, China RoHS
Max Average Power Density	7kW/cm ²		

