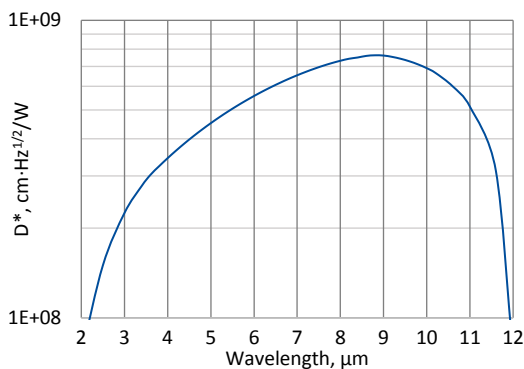


1.9 LabM-I-10.6

1.9.1 2.0 – 12.0 μm and DC – 100 MHz HgCdTe programmable, laboratory IR detection module with optically immersed photovoltaic detector

LabM-I-10.6 is a laboratory IR detection module with optically immersed photovoltaic detector based on HgCdTe heterostructure, integrated with transimpedance, programmable preamplifier. 3° wedged zinc selenide anti-reflection coated window prevents unwanted interference effects. For proper operation programmable „smart“ VIGO thermoelectric cooler controller PTCC-01 (sold separately) and Smart Manager Software (freeware) are required. LabM-I-10.6 module comes complete with PTCC-01 and Smart Manager is the best solution for prototyping and R&D stage in a variety of LWIR applications. This set provides flexible approach to different needs of system designers.

Spectral response ($T_a = 20^\circ\text{C}$)



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification ($T_a = 20^\circ\text{C}$, default module settings)

Parameter	Typical value
Optical parameters	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), μm	≤ 2.0
Peak wavelength λ_{peak} , μm	9.5 ± 0.5
Optimum wavelength λ_{opt} , μm	10.6
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	≥ 12.0
Detectivity $D^*(\lambda_{\text{peak}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 7.2 \times 10^8$
Detectivity $D^*(\lambda_{\text{opt}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 6.0 \times 10^8$
Output noise density v_n (10 MHz), $\text{nV}/\text{Hz}^{1/2}$	≤ 400
Electrical parameters	
Voltage responsivity $R_v(\lambda_{\text{peak}})$, V/W	$\geq 2.4 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$, V/W	$\geq 2.0 \times 10^3$
Low cut-off frequency f_{lo} , Hz	DC
High cut-off frequency f_{hi} , Hz	$\geq 100\text{M}$ (adjustable)
Output impedance R_{out} , Ω	50
Output voltage swing V_{out} , V	± 1 ($R_{\text{Load}} = 50 \Omega$)
Output voltage offset V_{off} , mV	max ± 20
Other information	
Active element material	epitaxial HgCdTe heterostructure
Optical area A_{ov} , mm $\times$ mm	1 $\times$ 1
Window	wZnSeAR
Acceptance angle Φ	$\sim 36^\circ$
Ambient operating temperature T_a , $^\circ\text{C}$	10 to 30
Signal output socket	SMA
Power supply and TEC control socket	LEMO (female) ECG.0B.309.CLN
Mounting hole	M4
Fan	yes

Features

- Very high performance and reliability
- DC offset compensation
- Sensitive to IR radiation polarisation
- Compatible with optical accessories
- Versatility and flexibility
- Quantity discounted price
- Fast delivery

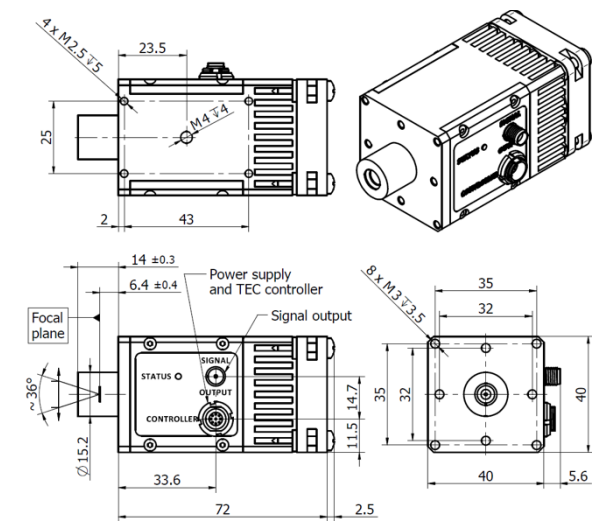
Parameters configurable by the user

- Output voltage offset
- Gain (in 40 dB range)
- Bandwidth (1.5 MHz/15 MHz/100 MHz)
- Coupling AC/DC
- Detector's parameters (temperature, reverse bias etc.)

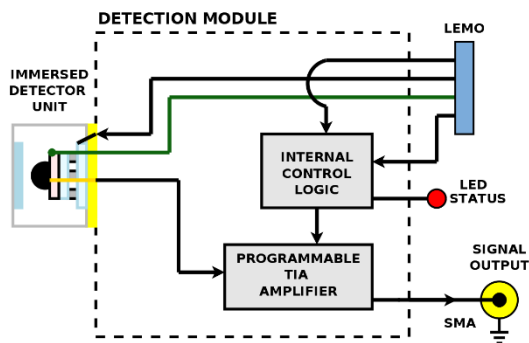
Applications

- Gas detection, monitoring and analysis
- CO₂ laser (10.6 μm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Semiconductor manufacturing
- Glucose monitoring
- Dentistry

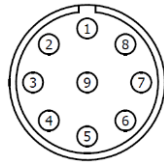
Mechanical layout, mm



Schematic diagram

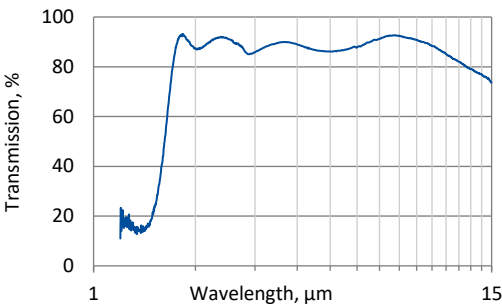


Power supply and TEC control socket LEMO (female)
ECG.0B.309.CLN



Function	Symbol	Pin number
Fan and programmable preamp internal logic auxiliary supply	FAN+	1
Thermistor output (2)	TH2	2
TEC supply input (-)	TEC-	3
Power supply input (-)	-V _{sup}	4
Ground	GND	5
Power supply input (+)	+V _{sup}	6
TEC supply input (+)	TEC+	7
Thermistor output (1)	TH1	8
Biderictional data pin	DATA	9

Spectral transmission of wZnSeAR window (typical example)



Included accessories

- SMA-BNC, LEMO-DB9 cables

Dedicated accessories

- PTCC-01-BAS TEC controller + USB: TypeA-MicroB cable + AC adaptor
- PTCC-01-ADV TEC controller + USB: TypeA-MicroB cable + AC adaptor
- PTCC-01-OEM TEC controller + USB: TypeA-MicroB , KK2- POWER cables
- OTA optical threaded adapter
- DRB-2 base mounting system