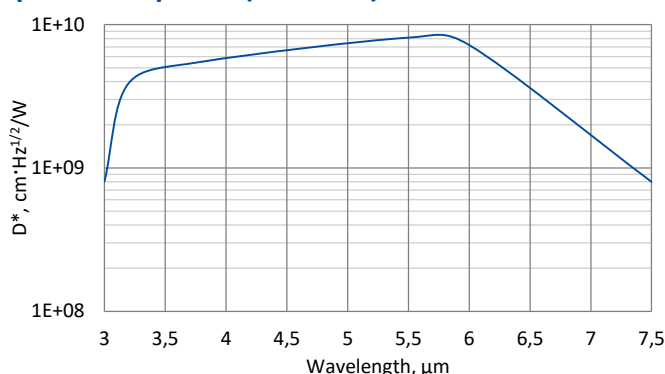


LabM-I-6

3.0 – 7.5 μm and over 200 MHz HgCdTe programmable, laboratory IR detection module with optically immersed photovoltaic detector

LabM-I-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-6 module comes complete with PTCC-01 and Smart Manager is the best solution for prototyping and R&D stage in a variety of MWIR 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	3.0 ± 1.0
Peak wavelength λ_{peak} , μm	5.5 ± 0.5
Optimum wavelength λ_{opt} , μm	6.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	7.5 ± 0.5
Detectivity $D^*(\lambda_{\text{peak}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 8.1 \times 10^9$
Detectivity $D^*(\lambda_{\text{opt}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 7.2 \times 10^9$
Output noise density v_n (10 MHz), $\text{nV}/\text{Hz}^{1/2}$	≤ 350
Electrical parameters	
Voltage responsivity $R_v(\lambda_{\text{peak}})$, V/W	$\geq 2.3 \times 10^4$
Voltage responsivity $R_v(\lambda_{\text{opt}})$, V/W	$\geq 2.0 \times 10^4$
Low cut-off frequency f_{lo} , Hz	10
High cut-off frequency f_{hi} , Hz	$\geq 200\text{M}$ (adjustable)
Output impedance R_{out} , Ω	50
Output voltage swing V_{out} , V	± 1 ($R_L = 1 \text{ M}\Omega^*)$)
Output voltage offset V_{off} , mV	max ± 20
Other information	
Active element material	epitaxial HgCdTe heterostructure
Optical area A_o , mm $\times$ mm	1 $\times$ 1
Window	wedged zinc selenide AR coated (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

^{*)} R_L – load resistance

Features

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

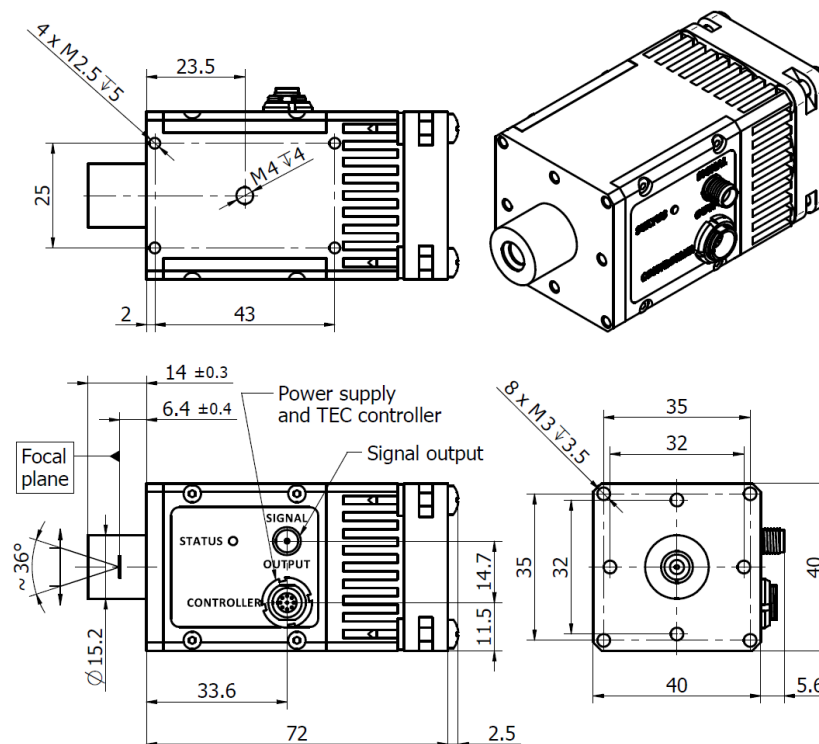
Parameters configurable by the user

- Output voltage offset
- Gain (in 40 dB range)
- Bandwidth (1.5 MHz/15 MHz/200 MHz)
- Coupling AC/DC
- Detector's parameters (temperature, reverse bias etc.)

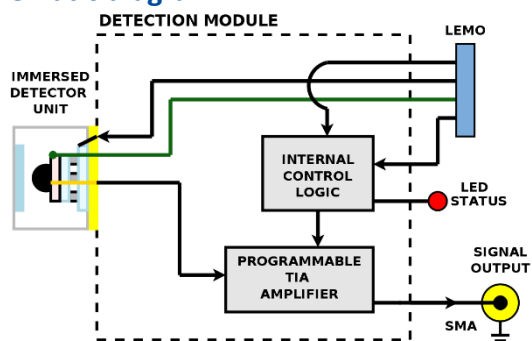
Applications

- MWIR gas detection, monitoring and analysis
- Flue gas denitrification
- Fuel combustion monitoring at power plants and other industrial facilities
- Breath analysis
- Explosion prevention
- Emission control (exhaust fumes, greenhouse gases)
- Contactless temperature measurements

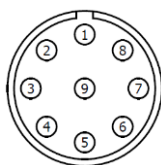
Mechanical layout, mm



Schematic diagram

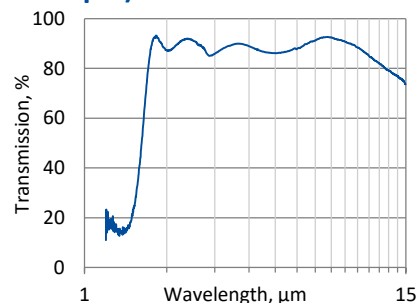


Power supply and TEC control socket LEMO (female) ECG.0B.309.CLN



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
Bidirectional 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