

Range Imaging Kit SynViewRIK 1-N-300 Product Description

1. Introduction to the SynView Range Imaging Kit

The Range Imaging Kit SynViewRIK provides the base components for a Terahertz / Millimeter Wave range imaging system: the receiver array SynViewRAY¹ and a broad-band radiation source. Combining the RIK with suitable mechanics and optics leads to a customized imaging system, e.g. for security applications. One example of such a system using the imaging kit RIK is the SynViewROT² system, a range imaging system which achieves 10 images per second.

The key advantages of the range imaging kit RIK 1-N-300 are:

- the SynViewRAY 8-pixel linear detector array can be used for various optical setups
- the measurement of the range information, leading to a much better object recognition (see appendix for details)
- a very high dynamic range of up to 70 dB, allowing high-quality images
- a very fast operation: sweep times (full range data) as low 100 μ s
- a center frequency around 300 GHz leads to a potential spatial resolution of 1 mm
- a large frequency bandwidth of 90 GHz leads to an: excellent range resolution of about 2 mm
- it is scalable: to image larger objects, simply use a higher number of RAY detector arrays

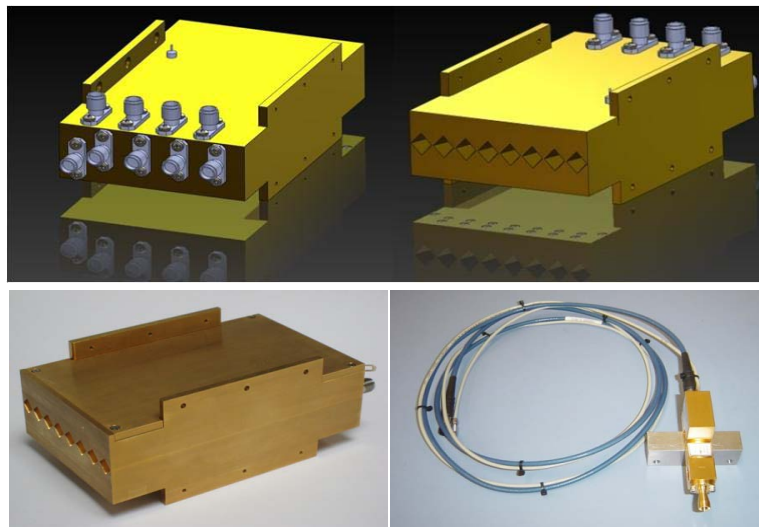


Figure 1: Top: Technical drawing of the receiver array RAY R8-300. Bottom left: photograph of RAY 8-300. Bottom right: photograph of broadband Millimeter wave source.

¹ see the SynViewRAY product information for more details

² see the SynViewROT product description for more details

2. Scope of Delivery

The THz / Millimeter wave Range Imaging Kit RIK contains:

- a broad-band radiation source
- a receiver array with 8 pixel (optional: upgrade to 16 or more pixel)
- a data acquisition and control unit with PC
- all necessary data acquisition software

The kit allows building a 3D/range imaging and tomography systems in reflection or transmission mode. The customer has to supply all necessary imaging optics and scanner mechanics. The included data acquisition units with PC including software will provide raw range data per pixel and scanner optic position in the frequency or in the time domain. Further data processing and image formation is required to gain a 3D range image and is not included, i.e. the required software needs to be developed by the customer.

3. Specifications

SynViewRIK KEY SPECIFICATIONS:

Frequency Range	0.23 - 0.32 THz	
No. of Pixel	8	(16 or 24 on request)
Operation mode	coherent FMCW	
Source output power	60 μ W typ.	
Sweep Times	100 μ s - 1 sec	
Dynamic Range *)	50 db	(sweep time 100 μ s)
Dynamic Range *)	70 db	(sweep time 10 ms)
Pixel spacing:	8 mm	
Array antenna:	diagonal horn	
Beam width array: (Full Width Half Maximum)	14 deg.	
Maximum continuous data acquisition time	> 1.2 seconds (100 000 range traces @ 100 μ s/trace)	
Trigger capabilities	hardware (TTL) or software	
Software interface	LabView driver, DLL or RS232	
*) Dynamic Range is defined with respect to a full illumination of the source power into one pixel		

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