



RIKOLA Ltd

State-of-the-art

Opto- & Microelectronic Modules



Vision:

*To be world class module partner
for leading instrument manufacturers*

Rikola Ltd.

Privately owned company
Established 1993

With:

40 years of cumulative
experience in optoelectronics

Location:

Finland
Oulu
Technology park



Business

Development and production

- Custom optoelectronic modules according to customer specifications

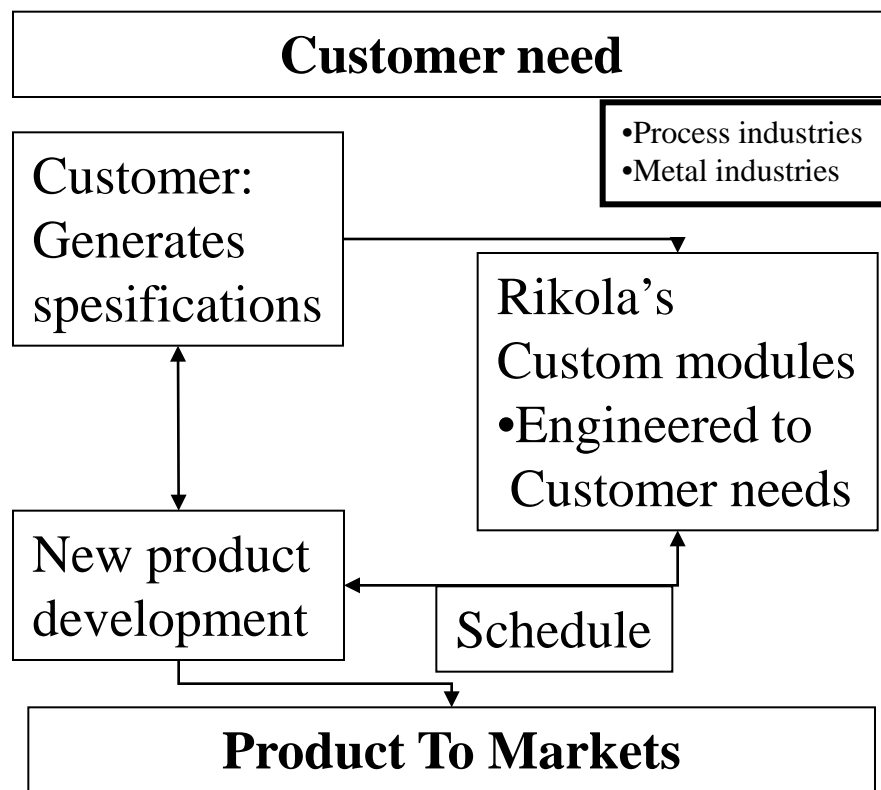
Customers

- Instrument manufacturers
- Chip vendors

Your Partner from New Product Development phase
To
Decline of the Product



New possibilities



Custom modules Benefits

- Flexible
- High integration
- Excellent performance
- Cost effective irrespective of quantity
- Difficult to re-engineering

•Performance:

- Agreed on customer specifications

•Environment:

- Temperature
- Temperature cycling
- Humidity
- Vibration
- Shock

•Interfaces:

- Mechanical
- Electronic
- Thermal

Typical Instrument development time scale

Development	Time frame From start
proto	1-3 months
Zero series	3-6 months
Production	6-12 months



- Custom Modules:
Platform for different products**
- **Spectro leds**
 - **Multicolour detectors**
 - **Array detectors**
 - **Multiplexed detectors**
 - **Etc.**

Services

- Module development and design
- Manufacturing of prototypes
- Small series production
- Material purchasing and logistic

Capabilities

- Conformal coating
- Passive alignment
- Semi-automatic epoxy and solder die bonding
- Semi-automatic wedge and ball wire bonding
- Hermetic sealing of metal packages
- Module testing

- Facilities
- Clean room ISO6-7
- Semiautomatic die and wire bonders
- Welders for hermetic packages
- Equipment for module testing

Example products

Array
Detector

LED
Spectrometer

Multichannel
Optodetector

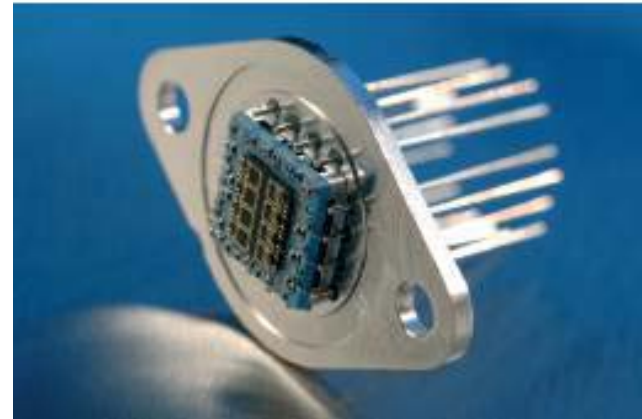
Multiplexed
Array Detector

Spectro
LEDs

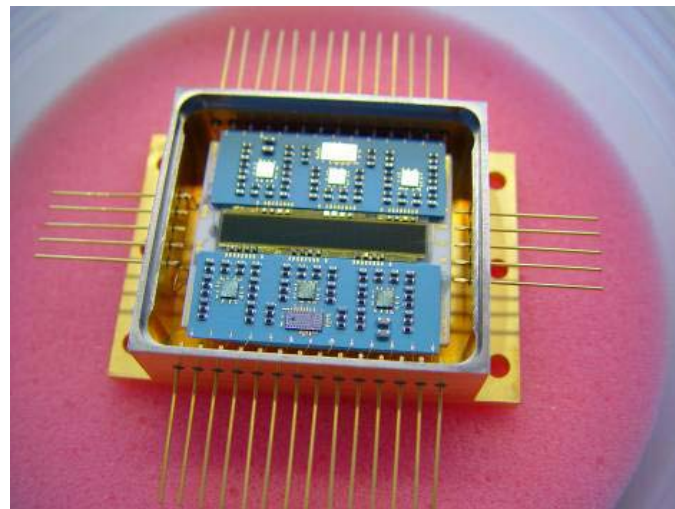
LED spectrometer

- Accurate wavelength scale, pre-calibrated for sub-nanometer tolerances
- High photometric accuracy; SNR up to 104, with sample absorbances from 4A to 3A
- Fast electronic scanning; down to 0,1 ms per spectrum
- Low power consumption; less than 6 W, according to specification
- Other wavelength regions available, depending on application requirements (400 - 2500 nm)

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- **Spectro LEDs**
 - Stability of output with active Peltier stabilisation up to 0,01%
 - Center wavelength reproducibility better than 2%
 - I_{max}: 100mA DC ; 3A with 200ns pulses at 5kHz repeating rate
 - Max. reverse voltage 1V
 - Reverse leakage current 50 μ Amax. at 0,8V
 - Operating temperature up to 320K; storage 260-340K
- **Multichannel optodetector**
 - Light leakage level is typically below 0.1% of peak intensity
 - Temperature tracking between channel signals is typically 0.01 %/°C.
 - Environmental specification according IEC-6800 standards and customer requirements



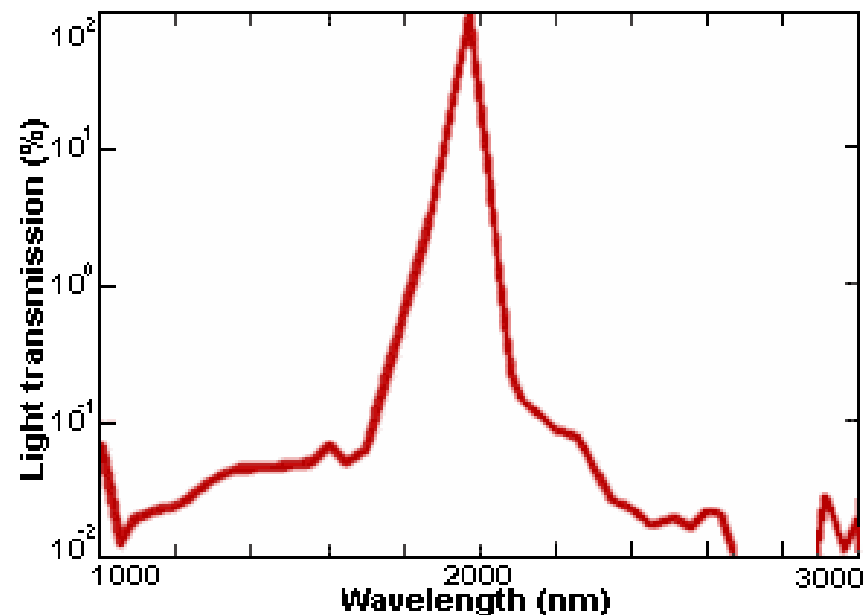
- **Array Detector**

- Detector temperature changes max. 0,01°C per 1°C change of environment temperature
- Temperature difference between detector and heat sink min. 50 °C
- Temperature difference between elements max. 0,015 °C
- Hermetic, welded metal housing; window and feed-through connections with glass-metal seals
- Leakage fulfils the MIL standard 883C requirement

- **Multiplexed Array detector**

- Optimised for high performance lead salt (PbS, PbSe) photoconductor detector elements
- Small, rugged, lightweight construction
- Option for peltier and thermistor for temperature stabilisation
- Low cost, high performance
- Single or multipoint measurement

- **Technology provides:**
- Small, rugged optoelectronic detectors and microelectronic modules
- **for applications:**
- In harsh environments
- **Utilizations ranging from:**
- Paper and pulp process control to space measurement



Reference

- Custom modules can be customized to preferred wavelengths as long there is a pre-existing bulk component for specified wavelength
- Shielding gas as standard; vacuum technique available
- Maximum environment temperatures range from -50C to 150C
- Maximum humidity from 0 to 100
- Shielding from acids and alkalis are usually integrated to solution

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Thank you!