

Optical interconnect for high-speed, high-bandwidth 10GigE and 40GigE cameras



The quest for fast and reliable data links

40GigE camera integrator are now offering cameras that integrate optical module capable of >40 Gbps electro-optical conversion. For that purpose, up to now, camera designers were considering QSFP+ devices.

Reflex Photonics is offering an innovative solution that integrates the capabilities of QSFP+, but in a format, that occupies 7 times less space, offers multiple board mounting option, and consumes less power. The *LightVISION*[®] VM is now giving camera designers the ability to envision more compact and more reliable product that can be deployed in harsh environments.

The *LightVISION* VM is a screw-in, robust, industrial, and RoHS optical module with MPO interface. This combination allows a standard MPO cable to be plugged into the optical module.

This approach combines a standard MPO cable connection with a robust, board mounted optical engine providing small size (footprint), face-plate or line-card mounting, and convenient optical cabling. In addition, the MPO connector is covered with an outside cover boot addressing the issue of water and dust contamination.

The *LightVISION* VM acts like a QSFP+ but offers reduced dimensions and power consumption, industrial temperature range, multiple board mounting options, and board-mount and edge-mount capability. This optical module offers advantages over the QSFP+ form-factor and it is backed by Reflex Photonics proven reliability and rugged design. This new device is perfectly suited for 40GigE high-speed camera and demanding machine vision applications.

Description of the application

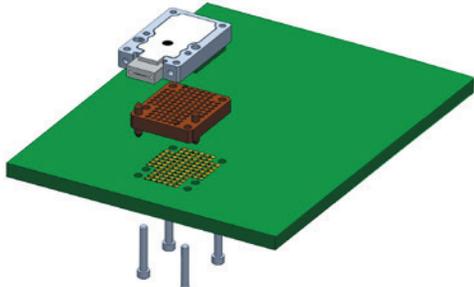
40GigE camera can generate of to 40 Gbps of data that needs to be transferred from the sensor to servers or computers across a fast and reliable link.

It is well known in the high-bandwidth connectivity world that signal integrity tends to degrade at baud rate higher than 10 Gbps over traditional copper links. At these rates, an optical link is the only viable solution to transfer the information generated by these high-bandwidth devices.

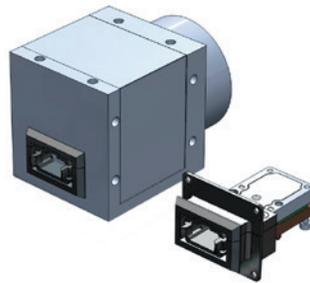
LightVISION with MPO interface features

- Multimode 850 nm wavelength laser
- Over 100 m reach on OM3 ribbon fiber
- Standard MPO parallel fiber connector
- Equalizer, pre-emphasis, adjustable output
- Monitoring: LOS, RSSI, temperature, etc.
- Integrated microcontroller
- Available in extended commercial grade temperature range (0°C to 85°C)

The LightVISION™ VM module is offered with bandwidth from 20G (2 TX or 2 RX lane) to 120G (12 TX or 12 RX lane). All modules operate at up to 10.3125 Gbps per lane with a BER as low as 10⁻¹² and a -9 dBm sensitivity.



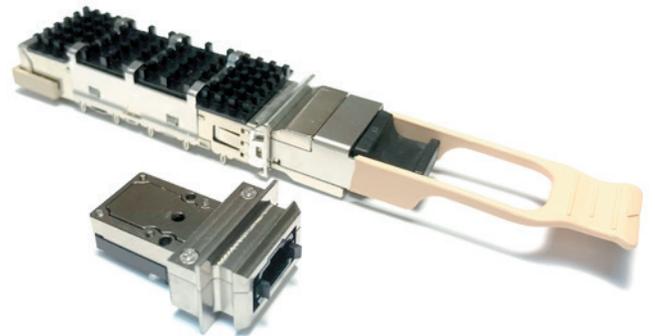
LightVISION LGA interposer and board attachment.



Example of integration of LightVISION in a high-resolution camera.

LightVISION and QSFP+ feature comparison

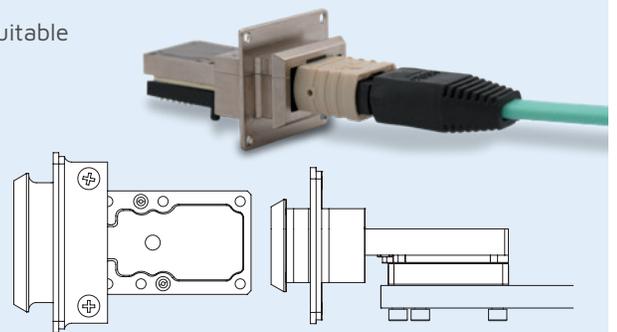
	QSFP+	LightVISION
Dimensions (L x W x H) in mm	72 x 18 x 9	23 x 14 x 5
Temperature (°C)	0 to 70	0 to 85
Mounting options	Few	Multiple
Direct board mounting	No	Yes
Power	<1.25 W	<1 W
MTP/MPO interface	Yes	Yes
RoHS compliance	Yes	Yes
Price	Low	Low
100GBASE-SR4 compatibility	Yes	Yes
Hot pluggable	Yes	No
I2C interface	Yes	Yes
850 nm emission	Yes	Yes
OM3 fiber	Yes	Yes



Size comparison between a QSFP+ (top) and a LightVISION module (bottom). LightVision occupies 7 times less volume than a QSFP+.

Benefits of using the industrial LightVISION VM

- Robust screw-in board-mounted optical module with reduced footprint suitable for harsh environment
- Bandwidth from 20G (2 TX or 2 RX lane) to 120G (12 TX or 12 RX lane)
- Performance of up to 10.3125 Gbps/channel
- Lightweight and easy to integrate optical cable
- Standard MPO parallel fiber connector
- Multimode 850 nm wavelength laser
- Flexible height adjustable with LGA interposer
- Rugged RoHS electrical interface
- Low power consumption: <100 mW per channel



Real size for LightVISION VM with MPO interface.