



# FRAMOS Sensor Module SWIR Development Kit

## FACT SHEET

FSM-IMX990  
Shortwave-Infrared (SWIR)

The FRAMOS Sensor Module Development Kits provide a ready-to-use, feature-rich development platform for embedded vision projects, supporting all phases from proof-of-concept helping shape the mass production design. The kit comes with a sensor module, paired with adapters, optical mount and accessories fitting to the NVIDIA Jetson AGX Xavier and TX2 Developer kits.

All for a quick startup, in one kit -  
Off-the-shelf rapid prototyping -  
Reference for full customized designs.



### ALL IN ONE KIT

#### FRAMOS SENSOR MODULE

The FSM-IMX990 is the new Sony SWIR image sensor on PCB, allowing an easy connection to standard connectors, lens mounts and mechanical attachment points for seamless interchangeability. It integrates the Sony IMX990AABA-C with thermo-electrical cooler (TEC) integrated right into the sensor package. For best heat-dissipation, the heat-sink on the backside of the FSM is connected directly to the sensor package through a cut-out in the PCB. While the whole design is made for rapid prototyping, it serves as the reference for us to learn your needs and build your unique, full custom and mass production optimized optical sensor module.

#### LENS MOUNT & OPTICS

Our Devkits for FSM-IMX990 are equipped with a C-Mount, allowing us to offer you a wide selection of SWIR and apochromatically optimized lenses, specifically for your application.

#### FRAMOS SENSOR MODULE ADAPTER

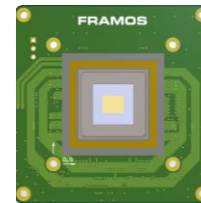
The "FSAs" are the connection between image sensors and our versatile PixelMate™ interface. In this specific case, their functionality is split into two functionally independent boards: The supply FSA generates the six sensor specific power rails and bootup sequencing, while the converter FSA performs SLVS to MIPI CSI-2 conversion and provides slave mode timing for the synchronization of multiple sensor modules by a simple frame trigger.

#### FRAMOS PROCESSOR BOARD ADAPTER

Our "FPA" for NVIDIA Jetson AGX Xavier and TX2 Developer Kits connects one FSM with the appropriate FSAs and MIPI CSI-2 output to the official NVIDIA Developer Kits.

#### FLEX CABLE

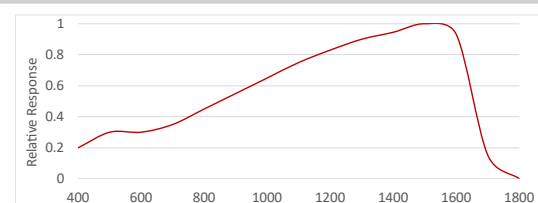
Each kit comes with a 150 mm flex cable, that combines a reliable and precise connector, fully shielding and impedance controlled, for maximum signal integrity.



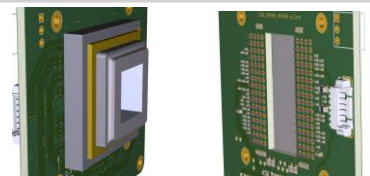
1.5 MP  
1/2" - 5µm

**SenSWIR**

FSM-IMX990 with latest Sony SenSWIR sensor



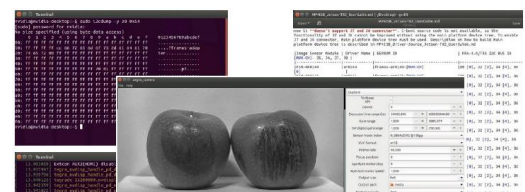
Sensitive from 400 to 1800 nm



Thermo-Electrical Cooled (TEC) package supporting heat-sinking from rear



PixelMate™ interface into the FSM Ecosystem



Software Package with Sensor Drivers

Version 0.9 (Preliminary) from 2022-02-25



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## FRAMOS Sensor Module(s) - Available as Development Kit

Module / Sensor	Technology	Resolution [MP (HxV)]	[FPS] @10bit	Format (Pixel Size)	Chromaticity	Lens Mount	Lens* (HFOV)
FSM-IMX990	SenSWIR (GS)	1.46 MP (1392x1052)	125	1/2" (5 µm)	Mono	C-Mount	---

## SOFTWARE & DRIVER



The software package contains a reference implementation of the MIPI CSI-2 driver, demonstrating how to utilize the platform specific data interface, implement communication and initialize the image sensor with easy access to the sensor's main features. The software package enables embedded software engineers to access the streaming system and provide at the same time all tools that are needed to adapt it to the individual needs of the application.

### Driver Package Content:

- Platform and device drivers with Linux for Tegra Support
- NVIDIA Jetpack 4.6 / L4T 32.6.1
- V4L2 based subdevice drivers (low-level C API)
- Streamlined V4L2 library (LibSV) providing C/C++ API
- Displaying examples

### Supported Devkits:

- NVIDIA Jetson AGX Xavier Developer Kit
- NVIDIA Jetson TX2 Developer Kit

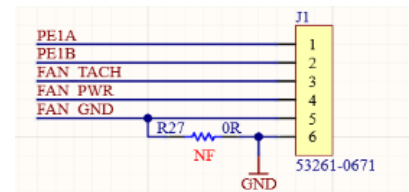
\*Further sensor features, lane configurations and data rates are supported on per project basis.

### Implemented Functions\*

- Master / Slave Operating Mode
- Image Resolution(s) (10/12 Bit):
  - (1) 1296 x 1032 @ 125 FPS (Full Resolution)
  - (2) 640 x 480 @ 260 FPS (ROI)
- Sensor Feature Access:
  - Exposure Time Control (max. 3s in Master mode)
  - Analog Gain Control
- Sensor Operation Mode (Master, Slave)
- Frame Rate, Blacklevel
- Sensor Temperature (polled via dmesg)

### Thermo-Electrical Cooling:

- The TEC package of the IMX990 can be accessed and driven using the connector J1 on the sensor module (FSM):



Further documentation on the mechanical and electrical interfaces, technical drawings as well as 3D models are provided on request: [support@framos.com](mailto:support@framos.com).

## ORDERING INFORMATION

Part Number: FSM-IMX990SxTXA\_Devkit-Single

Sensor: Sony IMX990AABA-C

S: with socket for sensor

x - chromaticity:

M: Monochrome

X: No sensor in socket

Components included in Kit	Description	Qty
1. FSM-IMX990Sx + C/CS-Mount	Sensor Module	1 pc
2. CAB-TEC_300	TEC power cable (300 mm, flying leads)	1 pc
3. FSA-FT25/BC	Sensor Adapter (Power, 6 rails)	1 pc
4. FSA-FT25/A-00G	Sensor Adapter (Data conversion, MIPI CSI-2)	1 pc
5. FMA-FC-150/60	Flex Cable, CSI-2, 150 mm	1 pc
6. FPA-4.A/AGX	Processor Adapter (NVIDIA TX2, AGX) Devkits	1 pc
7. FMA-MNT-TRP1/4-CS	¼" Tripod Adapter	1 pc
8. FMA-CBL-FL-150/8	Programming cable (flying leads) for converter	1pc
9. Software Download	Reference Drivers for NVIDIA Jetpack 4.6	-

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