FRAMOS Sensor Module
GMSL Ser-/Deserializer Kit

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 Add-On Kit comes with a serializer- and deserializer Board as well as cable and power supply, to upgrade an existing FSM Devkit with MIPI CSI-2 (D-PHY) Output and bridge up to 14 m of distance using a single GMSL3 line.

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

12Gb/s
4K / 90 FPS
Up to 14 m
GMSL

Run all FSMs up to 14 m – at full speed!

Automotive Cabling - Robust, Simple and Affordable

≤1.6W
Power
Overhead

Low Power, Optimized for Embedded Applications

Processor Board independent with PixelMate™

Transparent Link, Standard Software Package

ADD-ON FOR FSM DEVKITS

GMSL – THE NEXT GEN!
With generation three of the "Gigabit Multimedia Serial Link", Maxim pushes the limits of power sensitive SerDes solutions to the next level and addresses most demanding 4K video applications. While the FSM Ecosystem can support you out-of-the-box with i.e. super-smooth 8 MP / 4K / 90 FPS at 10 bit, also multi-sensor and stereoscopic 3D applications with fluid 30 fps are possible – at 4K, over a single Coax-Link, and including Power over Coax. Its automotive roots guarantee simple handling, a maximum of robustness and efficiency - all at an unbeaten cost-performance ratio.

FULL FSM ECOSYSTEM COMPATIBILITY
Our *FRAMOS Functional Adapters for GMSL* (FFA-GMSL3) create a seamless integration into the existing FRAMOS Sensor Module Ecosystem. On the basis of our Devkits with MIPI CSI-2 (D-PHY) output, the serializer / deserializer combo is just added to the regular Flex-Cable connection between FSA and FPA – with up to 14 m in-between allowing you to bridge mid range distances as they appear in embedded environments.
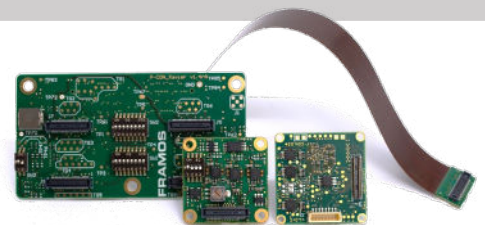
SERIALIZER AND DESERIALIZER BOARDS
While the serializer FFA packages up to 4-Lanes MIPI CSI-2 (D-PHY) at 2.5Gb/s into a GMSL compliant data stream, the deserializer FFA recovers the original data and provides at power to the imaging front-end over the same coax wire. The whole link is transparent, the output on receiver side appears to be an untouched MIPI CSI-2 stream as if it comes directly from the imager – including I2C communication, sync signals and further bi-directional sensor GPIOs.

COAX CABLING WITH FAKRA CONNECTORS
Using automotive standard cabling between serializer and deserializer creates a simple and affordable solution. The combination of Fakra type connectors with a single coax wire makes it furthermore easy to route and robust to plug.

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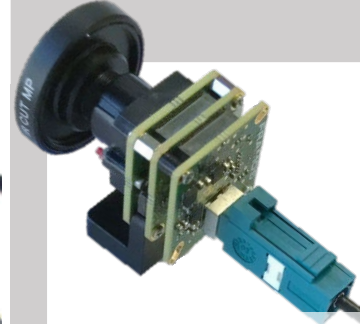
SOFTWARE & DRIVER

The software package contains a reference implementation of the MIPI CSI-2 (D-PHY) driver and GMSL Serializer/Deserializer configuration, 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 5.1 / L4T 35.2.1
  (NVIDIA Jetpack 4.6 / L4T 32.6.1 on select sensors)
- V4L2 based subdevice drivers (low-level C API)
- Streamlined V4L2 library (LibSV) providing C/C++ API
- Displaying and Processing Examples:
  - OpenCV (Software)
  - LibArgus (Hardware)
- Sensor and kit lens optimized ISP configuration

Supported FSM Devkits:

- All **FSM-xxxxxxx/yyy-Devkit-zzz** with **MIPI CSI-2 (D-PHY)** output are physically supported (not included in kit)
- Further drivers are provided on per project basis.

Implemented Functions:

- Sensor configuration as supported by standard driver:
  - Image Resolution & Bitdepth
  - Lane configuration & data rate
  - Exposure Time & Gain Control
  - Sensor Operation Mode
  - Frame Rate, Blacklevel
- Streaming at full sensor speed
- I2C sensor communication (SDA, SCL)
- Transmission of sensor specific signals:
  - Synchronization (XVS, XHS, XTRIG)
  - Master Clock (MCLK)
 - Generic Signals (RST, PW_EN)

Full documentation can be found in the "User Manual" of the FSM Ecosystem.

Further details are provided on request: support@framos.com.

ORDERING INFORMATION

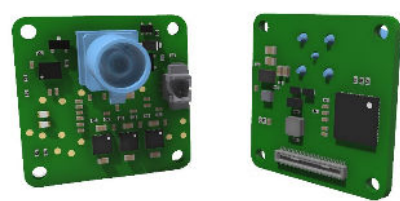Part Number: **FFA-GMSL3/SerDes-Kit-5m-V2A**

Kit Components:	Description	Qty
1. FFA-GMSL3/Ser-V1A	GMSL2/3 **Serializer** Board, 26.5/28 mm	1 pc
2. FFA-GMSL3/Des-V2A	GMSL2/3 **Deserializer** Board, 26.5 mm	1 pc
3. FMA-CBL-FAK.LD302-5M-V1A	10m Fakra / Coax cable for GMSL3 SerDes (Leoni Dacar 302 cable, Ø3.2mm, male/female, housed)	1 pc
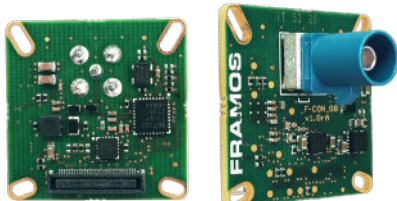
FFA-GMSL3-**Ser**-V1A

FMA-CBL-FAK.LD302

FFA-GMSL3-**Des**-V2A