

Sensor platform for a large-format camera

HARTING Mitronics



Pushing Performance

People | Power | Partnership

Intended use and function

The MID component is used as a platform for a charge-coupled device image sensor (CCD). A PCB helps handle the sensor power supply and the image data transfer to the multi-scale camera control module (MCCM) at up to 2 Gb/s. The sensor platform is built into large-format cameras (including AWARE 2 camera) that have to deliver the highest resolution images and that are used, for example, for counting birds or person recognition. The innovative camera system allows a broader field of view (FOV), a larger visual range, greater resolution and multiband imaging capability for clearer target identification in any weather and under day and night conditions.

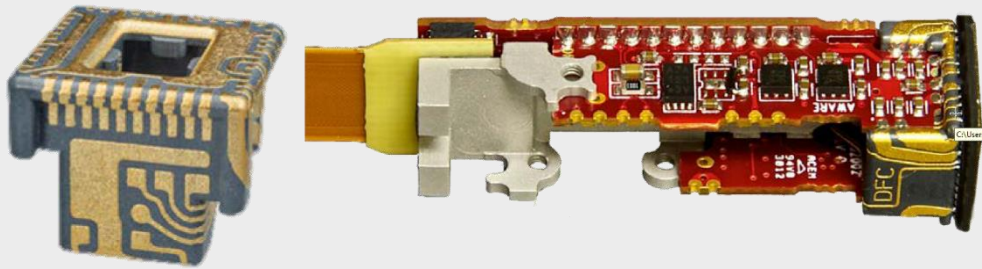


Figure1: 3D-MID component as platform for the CDD sensor (left) and integrated into the system with CCD sensor and PCB (right).

Advantages of the MID solution

- Component miniaturization, which results in images with more pixels per constructed space.
- The MID component reduces the weight.
- MID integration simplifies the assembly.
- The MID allows rectangular mounting of the CCD sensor.

Application areas	Industry, sensor systems
User	Distant Focus Corporation
Product	Sensor module for a camera system
Main function	Sensor platform

Sensor platform for a large-format camera

HARTING Mitronics



Pushing Performance

People | Power | Partnership

Project implementation

The project to implement a sensor module in MID technology commenced in March 2012. The first prototypes were delivered in September 2012, and the first samples from series production were delivered in April 2013. Specific requirements were placed on the electronic and mechanical design due to the fact that unlike in conventional camera systems, the lens is moved in this case, and not the image sensor. The geometry of the camera housing also allows restricted space for the integration.

Functions of the MID component

- The MID functions as the platform for the CCD sensor.
- The MID component provides the electrical connection between the CCD sensor and the module board (PCB).
- Heat generated in the CCD sensor is dissipated by a metallized surface and coupling to an aluminum block.

Manufacturing aspects

- Positioners had to be added to the systems engineering for the lasering and component packaging:
 - Six sides of the component are laser structured.
 - High positioning accuracy is required when assembling the sensor
- LPKF-LDS technology is used to structure the injection molded component from the material LCP. Metalization is done without external current and consists of Cu-Ni-Au, which is a typical layer composition for MIDs.
- The assembly and interconnection concept is implemented at the customer. The CCD sensor is mounted on the MID by means of lead-free soldering without solder resist. The MID is soldered on to the PCB in the same work step.
- The MID is provided in a blister tray, similar to that for an SMD component, and is packaged on to the PCB in a fully automatic Pick&Place process.

Substrate material	LCP (Vectra E 840i LDS)
Structuring	LDS
Metallization	Chemical Cu-Ni-Au
Connection technology	Soldering (vapor phase)
Number of components	1
Start of production	2013
Production run	10,000 p.a.
Development period	9 months