

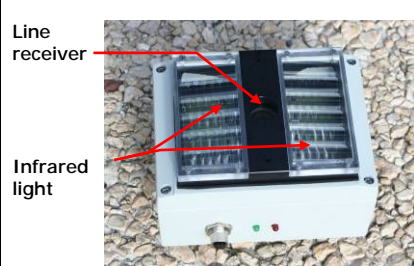
APPLICATION

SPICA is an optical sensor which detects container prior to handling with a container crane.

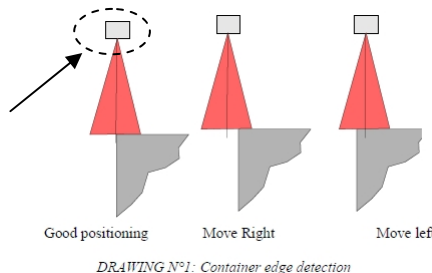
Applications of SPICA are numerous especially for container terminal automation :

- Container position detection prior to hoisting
- Container position detection prior to stacking
- Gap between containers detection
- Container size detection.

SPICA sensor is associated to a central calculator designed to be connected to 6 sensors and directly linked to the spreader's PLC through an RS422 serial line.



Optical sensor



Calculator

MEASUREMENT PRINCIPLE

1D DETECTOR : One optical head integrates an infrared light which lights in a fan way around its vertical axis.

The emission standard angle is $\pm 8^\circ$.

In the other direction the beam is very narrow.

A receiver analyzes the received light and checks the reflection shape.

The internal processor analyzes the light and gives the **angular position** of the container's edge regarding the sensor optical axis: **detection of square objects.**

In an other functioning way the processor searches main line : **detection of a cylindrical object.**

Multiple detectors : A central computer can receive up to 6 sensors and combine these measurements to do a multiple degrees measuring system.

Environment : SPICA detectors are designed to work in a **very harsh environment** : shocks, vibration, humidity, temperature.

Sensors and central calculator are perfectly protected in a special steel housing to avoid any damages. Steel protection with rubber silent blocks against vibrations and shocks were tested in CNES Laboratory in Toulouse – France dedicated to Space Industry.



Optical sensor on metallic support

Optical sensor on metallic support and enclosed in protective housing



TECHNICAL SPECIFICATIONS

PERFORMANCES

The standard performances are the following:

- Working range from 0,5 m to 4 m
- Angle : +/-8° i.e. +/- 250 mm at a 1600 mm-working distance
- Resolution 1D : 0,125°
- Frequency of measurement : 5Hz
- Interface : RS422
- Functioning temperature : - 20°C to + 60°C
- Storage temperature : - 30°C to + 70°C
- Protection : IP67
- Shocks : 25g 10msec
- Vibration : 10 to 50Hz 5G in three directions

CHARACTERISTICS

Dimensions of the optical sensor :

- Length 180 mm
- Width 140 mm
- Height 115 mm

Dimensions of the calculator :

L 220 mm, w 185 mm, H 100 mm

Electrical Characteristics :

230VAC 50 Hz - consumption: 50W / 250mA

Interfaces :

RS422

Principal options :

- Number of detectors variable from 1 to 6
- Graphical software to install and supervise from a PC

SALES REFERENCES

SOS38-ST Detector with a working range of 3 m

Included software :

GA : gap between containers detection

SOS48-ST Detector with a working range of 4 m

Included softwares :

CC : container detection prior to handling in 1D or 2D, container size detection

CS : container detection prior to stacking

SPC60-ST Central calculator in waterproof box for 6 detectors

Included softwares :

CC : container detection prior to handling in 1D or 2D, container size detection

CS : container detection prior to stacking

SCA-05 Cable between calculator and crane's PLC – 5 meters long

SCA-10 Cable between sensor and calculator – 10 meters long

BEME158 Metallic support for SPICA sensor

BEME159 Protective housing for SPICA sensor

