Suggestion for S-mount solution

with S-C mount conversion adaptor ring SCAR

Toshiba Teli Corporation

May 28th 2020
Contents

01 Introduction
02 Overview of SCAR
03 Solution 1 : 360° fish eye camera
04 Solution 2 : Camera for positioning
05 Solution 3 : Camera for AI-IoT
06 Applicable lens
Introduction

Explanation about S-mount & S-mount lens
Introduction

About S-mount & S-mount lens

1. What’s S-mount?
   - Small size lens mount mainly for board camera etc.
   - Mounting screw: M12 x 0.5
   - Flange back is not specified as no flange aspect
   - Standardize as JIIA LE-005
   - Lens with narrow thread pitch is applied among several lenses for board camera

2. Advantage of S-mount lens
   - Smaller than C-mount lens generally
   - Wider variation of focal length. Substantial of fish eye and single focus one
   - Comparatively reasonable cost

3. Disadvantage of S-mount lens
   - Most of lenses for board camera have focus and aperture fixed
   - Most have dark open F number (about F2~F2.8)
   - Disadvantages in optical performance comparing with C-mount
   - No flange surface
     - Lens has a risk to contact the sensor as no mechanical stopper
     - Need to consider how to fix the lens after focus setting. (screw or adhesive)

© 2020 Toshiba Teli Corporation
02

Overview of SCAR

Explanation about S-C conversion adaptor of SCAR
Application & structure of SCAR

SCAR expands application of C-mount camera

For FA・MV

• As S-mount lens is smaller, it can build smaller system than that with C-mount lens.

Closer WD

Smaller installation place

Special effect by super wide angle & fish eye lens

For Surveillance・security

• Application of FA-MV camera to surveillance-security (Integrated solution of FA & surveillance)

Application of fish eye lens to FA360° system
**Application & structure of SCAR**

**Structure of SCAR**

**S-C mount conversion adaptor (SCAR)**
Lens can be fixed without side screw or adhesive.

**S-mount lens**
(example : E1222KRY)

* Japanese design registration No. 1642948
Solution 1: 360° Fish eye camera

Explanation about a solution with S-mount lens
Small and low cost camera module can be built with S-mount lens.

360° Fish eye camera

- Fish eye lens with over 180° view angle performs shooting all around optical axis.
- Image processing technology of IMMERVISION is well known as a software to view developed all around image.
- S-mount lens supporting IMMERVISION is available.

Fish eye lens for 35 mm SLR and C-mount is available in the market. However, they are in various styles and relatively costly.

CBC is selling S-mount lenses supporting IMMERVISION technology.

Small & IMMERVISION supported S-mount lens is better.

CBC’s lens (refer pp. 17-18)
- L1028KRW (1/2.5 type)
- E1222KRY / E122KF3RY (1/1.7 type)
04

Solution 2: Camera for positioning

Explanation about a solution with S-mount lens
Camera for positioning

Positioning camera does not require high resolution lens

Small & low cost camera module can be built with S-mount lens

Alignment mark for positioning

Simple & clear shape for easier image processing

- High resolution lens is large and costly as it consists of more lens components
- Shape of alignment mark does not require high lens resolution (detectable even in low frequency)

Small & low cost S-mount lens is good enough
05

Solution 3 : Camera for AI-IoT

Explanation about a solution with S-mount lens
Camera for AI does not require high-definition image quality

Small & low cost camera can be built with S-mount lens

Use of image AI analysis (example)

- Inspection in food factory
- Inspection of industrial products
- Medical pattern analysis
- Bill reading for accounting system
- Image classification
- Surveillance system for security
- Face recognition
- Sentiment analysis
- Optical character reading, OCR
- Eye tracking

- With mainly fixed aperture and low cost specifications, S-mount lens is not good for high definition image quality.
- As decision is made with weighted feature point in case of AI, specific high image quality is not required.

Small & low cost S-mount lens is good enough
Camera for positioning

Small size is better in camera for IoT

Small & low cost camera module can be built with S-mount lens

IoT camera

- Camera to detect status of things as data
  - brightness
  - human detection
  - object detection
  - contaminants detection
  - color identification
  - location-displacement detection
- To digitize analogue indication
  - measuring instrument
  - location, existence

- Narrow installation space, reasonable cost & simplicity are required
  - Installation in limited space
  - Low cost
  - Easy operation

Small & low cost S-mount lens is good enough.
06

Applicable lens

Introduction of S-mount lens for BU camera

This presentation is supported by CBC Corporation
Applicable lenses to camera w/o optical glass (using BU series)

CBC’s mega pixel fixed focus board lens (1/2” fixed aperture)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Focal Length</th>
<th>F/#</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0320KP</td>
<td>3 mm</td>
<td>2.0</td>
</tr>
<tr>
<td>H0624KP</td>
<td>6 mm</td>
<td>2.4</td>
</tr>
<tr>
<td>H0924KP</td>
<td>9 mm</td>
<td>2.4</td>
</tr>
<tr>
<td>H1620KP</td>
<td>16 mm</td>
<td>2.0</td>
</tr>
<tr>
<td>H2520KP</td>
<td>25 mm</td>
<td>2.0</td>
</tr>
</tbody>
</table>

[Note] Please check availability before using above lenses
### CBC’s mega pixel board lens (360° fish eye lens)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Focal Length</th>
<th>F/#</th>
<th>Img Sz</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1028KRW</td>
<td>1.05 mm</td>
<td>2.8</td>
<td>1/2.5 type</td>
</tr>
<tr>
<td>E1222KRY</td>
<td>1.2 mm</td>
<td>2.2</td>
<td>1/1.7 type</td>
</tr>
<tr>
<td>H1328KP (*)</td>
<td>1.3 mm</td>
<td>2.8</td>
<td>1/2 type</td>
</tr>
<tr>
<td>E1628KRY</td>
<td>1.65 mm</td>
<td>2.8</td>
<td>1/1.7 type</td>
</tr>
</tbody>
</table>

(*) H1328KP is made-to-order product

[Note] Please check availability before using above lenses

Stereoscopic projection of **E1222KRY** is more convenient than Equidistant projection of E1628KRY because the marginal part can be seen larger.
Applicable lenses to camera w/o optical glass (using BU series)

Fish eye lens with IR cut filter (IRCF)

E1222KF3RY as a 360° fish eye lens with IRCF is confirmed to be useful in a camera without optical glass.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Focal Length</th>
<th>F/#</th>
<th>Img Sz</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1222KF3RY</td>
<td>1.2 mm</td>
<td>2.2</td>
<td>1/1.7 type</td>
</tr>
</tbody>
</table>

Only above is the standard model with IRCF among CBC’s fish eye lenses.

[Note] Please check availability before using above lenses.

As mechanical back is only 4 mm, the camera to use has to be checked not to have any mechanical interference.
### Applicable lenses to camera with optical glass (using BU series)

#### CBC’s fixed aperture board lens for mega pixel (1/2” fixed aperture)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Focal Length</th>
<th>F/#</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0320KP</td>
<td>3 mm</td>
<td>2.0</td>
</tr>
<tr>
<td>H0624KP</td>
<td>6 mm</td>
<td>2.4</td>
</tr>
<tr>
<td>H0924KP</td>
<td>9 mm</td>
<td>2.4</td>
</tr>
<tr>
<td>H1620KP</td>
<td>16 mm</td>
<td>2.0</td>
</tr>
<tr>
<td>H2520KP</td>
<td>25 mm</td>
<td>2.0</td>
</tr>
</tbody>
</table>

H0320KP cannot be used as lens barrel contacts optical glass.

[Note] Please check availability before using above lenses.
## Applicable lenses to camera with optical glass (using BU series)

CBC’s mega pixel board lens (360° fish eye lens)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Focal Length</th>
<th>F/#</th>
<th>Img Sz</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1028KRW</td>
<td>1.05 mm</td>
<td>2.8</td>
<td>1/2.5-type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lens barrel contacts optical glass.</td>
</tr>
<tr>
<td>E1222KRY</td>
<td>1.2 mm</td>
<td>2.2</td>
<td>1/1.7-type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lens barrel contacts optical glass.</td>
</tr>
<tr>
<td>H1328KP</td>
<td>1.3 mm</td>
<td>2.8</td>
<td>1/2-type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lens barrel contacts optical glass.</td>
</tr>
<tr>
<td>E1628KRY</td>
<td>1.65 mm</td>
<td>2.8</td>
<td>1/1.7-type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lens barrel contacts optical glass.</td>
</tr>
</tbody>
</table>

No CBC’s 360° fish eye lens cannot be used.

Cannot use because it contacts optical glass as back focus and short mechanical back.
Thank you