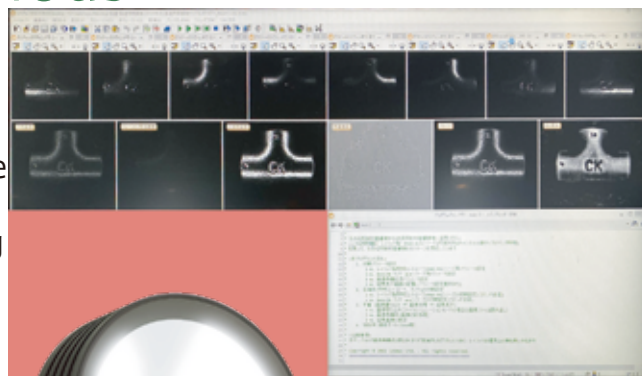


**NEW**

# High-Speed Synchronous Imaging Starter Kit

With synchronized illumination direction switching, you can easily evaluate image composition algorithms such as "multiple imaging + illumination difference stereo" that are representative of image processing techniques

All-In-One solution is provided, offering hardware, software, and algorithms such as [Segmented Illumination], [Controllers], [I/O Cables], and [Sample Programs], etc.



## Applications

- Metal/Plastic Injection Molding Industry
  - Character inspection and recognition for glossy materials
  - Marking and indentation inspection for castings and surfaces with patterns
  - Detection of fine scratches

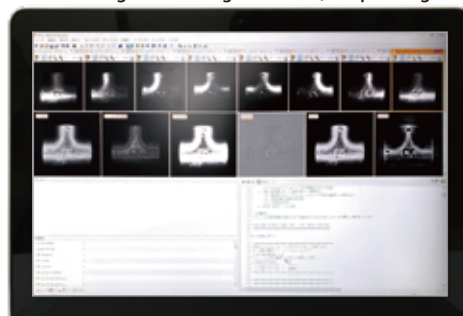


## Basic System Configuration

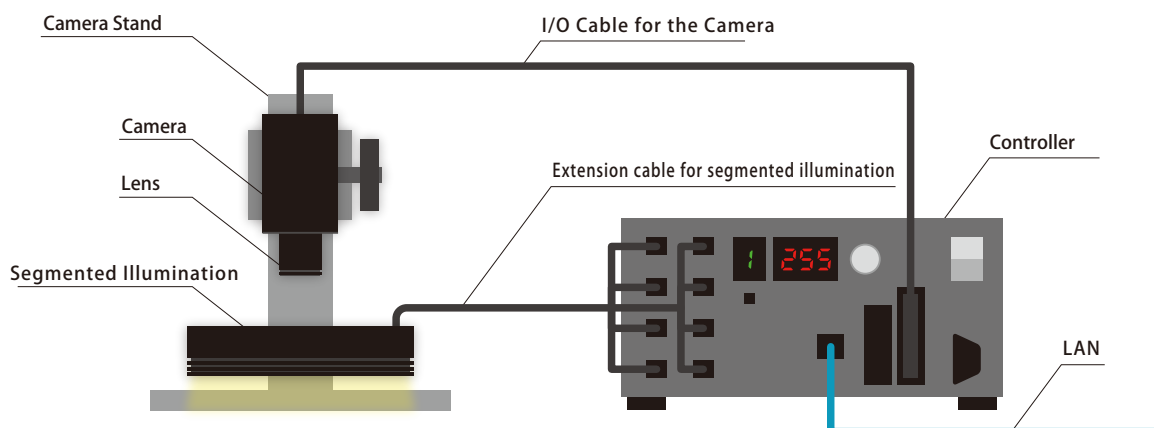
The basic configuration for high-speed synchronous imaging consists of devices and programs such as:

- Camera    ○ Segmented Illumination    ○ Controller
  - I/O cable for the camera    ○ Extension cable for segmented illumination
  - Image processing software    ○ Sample program for image synthesis
- These components are used to construct the system.

### PC and Image Processing Software (Sample Program)



The High-Speed Synchronous Imaging Starter Kit will be selected and proposed according to your application and environment, based on the products of the category marked with ○ above.

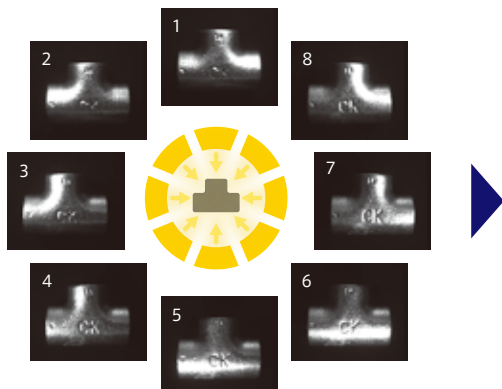


|   |                               |
|---|-------------------------------|
| IDBB-LSRF   | Line illumination products    |
| IDBC-LSR  |                               |
| IDBB-LSRH   |                               |
| IDBB-LSRA   |                               |
| IDBB-LSRS   |                               |
| IDBC-LSRC   |                               |
| IDBB-LSRC   |                               |
| IDBC-RE   |                               |
| IDBB-RE   |                               |
| IDBA-RK   |                               |
| IQDH-RE   |                               |
| IMAR-D_8ch  | Ring illumination products    |
| IDR-LA-8ch  |                               |
| IDRA-T-8ch  |                               |
| IMAR-D  |                               |
| IMAR-CT D   |                               |
| IHR-LE  |                               |
| IHRB • IHRA   |                               |
| IDR-F   |                               |
| IDR-F33/16  |                               |
| IDR   |                               |
| IDR-LA  |                               |
| IDRA-T  |                               |
| IFR • IPR   |                               |
| IDBA-HM   | Bar illumination products     |
| IDBA-HMS  |                               |
| IDBA-HMS-IR   |                               |
| IDBA-FD   |                               |
| IDBA-LEH2   |                               |
| IDBA-LEH  |                               |
| IDBA-LE   |                               |
| IDBA-SE   |                               |
| IDBA-SL   |                               |
| IDBA  |                               |
| IDBA-Q  |                               |
| IFLA • IFLB   | Coaxial illumination products |
| IDHM  |                               |
| IHMA  |                               |
| IHMA-V  |                               |
| IFPA  |                               |
| IFD   |                               |
| IFD-IR  |                               |
| IHMA-40D  |                               |
| IFPA-D  |                               |
| IPQC  |                               |
| IFHA  |                               |
| IDDB-KH • IDDA-KH                                   |                               |
| IDUB  |                               |
| IDD   |                               |
| IDD-CB  |                               |
| IQD • IQDH  |                               |
| IQDA-CB   |                               |
| IFVA • IFVB   |                               |
| IFVA-ST   |                               |
| IFV   |                               |
| IV-14 • IV-30                                       |                               |
| IHV-20 • IHVE-21                                    |                               |
| IHVA-SP • IHSL-SP                                   |                               |
| IBF   |                               |
| IHV-FX  |                               |
| RBOX  |                               |
| IDBB-CH   |                               |
| IDHRA   |                               |
| UV-CAN  |                               |
| Infrared  |                               |
| Infrared  |                               |
| IMAR-RGB  |                               |
| IDDA-KH-RGB   |                               |
| RGB Full-color                                      |                               |
| ISU   |                               |
| ISS   |                               |
| Introduction of Customization                       |                               |
| High-speed synchronous imaging starter kit products |                               |
| ISC-24  |                               |
| Image capture evaluation kit products               |                               |
| IDMU  |                               |
| ILP   |                               |
| ILC   |                               |
| ILV   |                               |
| ILS   |                               |
| IPPA_G • IRPA_G                                     |                               |
| IPSA • IPPA   |                               |
| IDGC  |                               |
| IDPA  |                               |
| IDCA  |                               |
| IMC   |                               |
| IWDV-24   |                               |
| IWDV(S)-48  |                               |
| ISC   |                               |
| JS  |                               |
| JS-30M2-TP/SS                                       |                               |
| ILS-40M2-PI/SS                                      |                               |
| SAG   |                               |
| SLLUB   |                               |
| LLUB  |                               |
| IFIC  |                               |

## Sample Program Supporting Imaging and Settings with Multi-Segmented Illumination

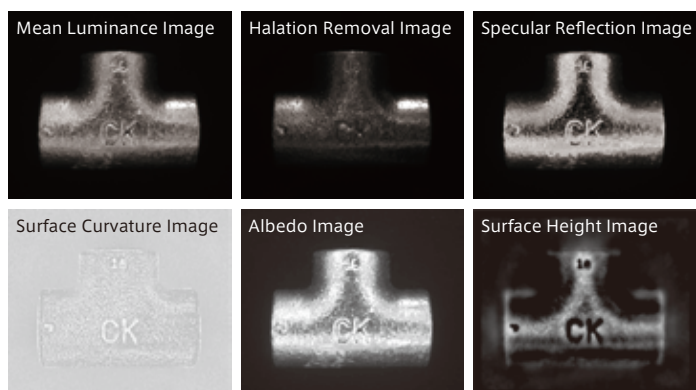
### Imaging with Multi-Segmented Illumination

By illuminating the target work from different directions, the effects of reducing halation and highlighting defects, etc. can be observed



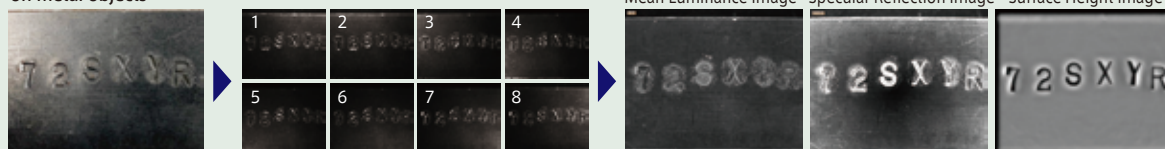
### Image Reconstruction Through Sample Program

Image reconstruction could be tested easily with using the sample program provided by Leimac

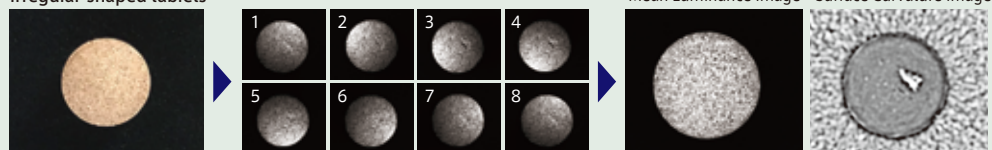


### Image Example

#### Inspection of engravings on metal objects



#### Detection of chipped irregular-shaped tablets



#### Object: Product with package



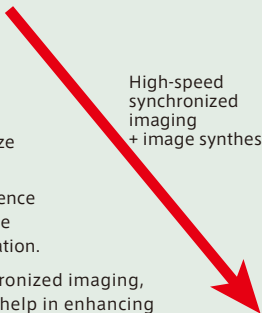
Product appearance (color)

Monochrome imaging



Monochrome image

High-speed synchronized imaging + image synthesis



Surface Curvature Image

The colorful glossy package makes it very difficult to recognize when scratches occur.

In monochrome images, it is possible to distinguish the presence or absence of shade around the scratch, but it may also not be detected as it might get blended in the pattern or due to halation.

By performing image synthesis through high-speed synchronized imaging, it is possible to generate surface curvature images, which help in enhancing the visibility of scratches that are difficult to detect due to changes in surface curvature.

Line illumination products

IDBB-LSRF  
IDBC-LSR  
IDBB-LSRH  
IDBB-LSRA  
IDBB-LSRS  
IDBC-LSRC  
IDBB-LSRC  
IDBC-RE  
IDBB-RE  
IDBA-RK  
IQDH-RE

Ring illumination products

IMAR-D\_8ch  
IDR-LA\_8ch  
IDRA-T\_8ch  
IMAR-D  
IMAR-CT D  
IHR-LE  
IHRB · IHRA  
IDR-F  
IDR-F33/16  
IDR  
IDR-LA  
IDRA-T

Bar illumination products

IFR · IPR  
IDBA-HM  
IDBA-HMS  
IDBA-HMS-IR  
IDBA-FD  
IDBA-LEH2  
IDBA-LEH  
IDBA-LE  
IDBA-SE  
IDBA-SL  
IDBA

Local illumination products

IFLA · IFLB  
IDHM  
IHMA  
IHMA-V  
IFPA  
IFD  
IFD-IR  
IHMA-40D  
IFPA-D  
IPQC  
IFHA

Local illumination products

IDDB-KH · IDDA-KH  
IDUB  
IDD  
IDD-CB  
IQD · IQDH  
IQDA-CB  
IFVA · IFVB  
IFV  
IV-14 · IV-30  
IHV-20 · IHVE-21  
IHVA-SP · IHSL-SP

Special illumination products

IBF  
IHV-FX  
RBOX  
IDBB-CH  
IDHRA  
UV-CAN  
Infrared  
Infrared  
IMAR-RGB  
IDDA-KH-RGB  
RGB Full-color  
ISU  
ISS

Introduction of Customization

High-speed synchronized imaging state kit products  
ISC-24  
Image capture evaluation kit products

Controller products

IDMU  
ILP  
ILC  
ILV  
ILS  
IPPA · G · IRPA · G  
IPSA · IPPA  
IDGC  
IDPA  
IDCA  
IMC  
IWDV-24  
IWDV(S)-48  
ISC  
IJS  
US-30M2-TP/SS  
ILS-40M2-PI/SS

Other illumination products

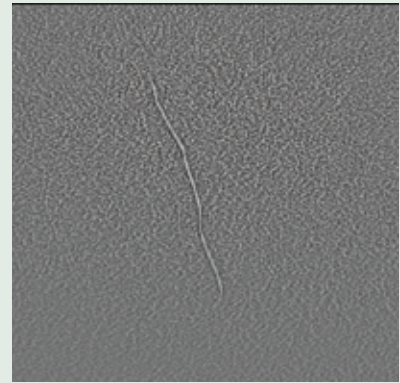
SAG  
SLLUB  
LLUB  
IFIC

## Image Example

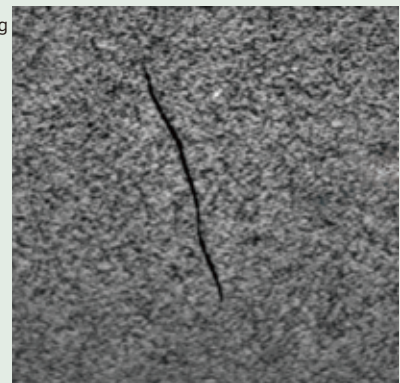
Object: Scratches on wood-grain pattern table



Color image

High-speed synchronized imaging  
+ image synthesis

Surface Curvature Image

High-speed  
synchronized imaging  
+ image synthesis

Surface Height Image

Wood material such as the top plate of the grain wood table or something like a mass of synthetic resin may crack due to drying, convergence, etc.

Detection is easy if a scratch can be clearly seen in a single image, but the difficulty increases if the surface is uneven such as wood grain or a surface that halation can easily occur.

Narrow and deep scratches such as cracks can be recognized with the surface curvature image, but the surface height image can be better clarified.

|  |                               |
|--|-------------------------------|
| IDBB-LSRF                                    | Line illumination products    |
| IDBC-LSR                                     |                               |
| IDBB-LSRH                                    |                               |
| IDBB-LSRA                                    |                               |
| IDBB-LSRS                                    |                               |
| IDBC-LSRC                                    |                               |
| IDBB-LSRC                                    |                               |
| IDBC-RE                                      |                               |
| IDBB-RE                                      |                               |
| IDBA-RK                                      |                               |
| IQDH-RE                                      |                               |
| IMAR-D_8ch                                   | Ring illumination products    |
| IDR-LA-8ch                                   |                               |
| IDRA-T-8ch                                   |                               |
| IMAR-D                                       |                               |
| IMAR-CT D                                    |                               |
| IHR-LE                                       |                               |
| IHRB • IHRA                                  |                               |
| IDR-F  |                               |
| IDR-F33/16                                   |                               |
| IDR  |                               |
| IDR-LA                                       |                               |
| IDRA-T                                       |                               |
| IFR • IPR                                    | Bar illumination products     |
| IDBA-HM                                      |                               |
| IDBA-HMS                                     |                               |
| IDBA-HMS-IR                                  |                               |
| IDBA-FD                                      |                               |
| IDBA-LEH2                                    |                               |
| IDBA-LEH                                     |                               |
| IDBA-LE                                      |                               |
| IDBA-SE                                      |                               |
| IDBA-SL                                      |                               |
| IDBA   |                               |
| IDBA-Q                                       |                               |
| IFLA • IFLB                                  | Coaxial illumination products |
| IDHM   |                               |
| IHMA   |                               |
| IHMA-V                                       |                               |
| IFPA   |                               |
| IFD  |                               |
| IFD-IR                                       |                               |
| IHMA-40D                                     |                               |
| IFPA-D                                       |                               |
| IPQC   |                               |
| IFHA   |                               |
| IDDB-KH • IDDA-KH                            |                               |
| IDUB   |                               |
| IDD  |                               |
| IDD-CB                                       |                               |
| IQD • IQDH                                   |                               |
| IQDA-CB                                      |                               |
| IFVA • IFVB                                  |                               |
| IFVA-ST                                      |                               |
| IFV  |                               |
| IV-14 • IV-30                                |                               |
| IHV-20 • IHVE-21                             |                               |
| IHVA-SP • IHSL-SP                            |                               |
| IBF  |                               |
| IHV-FX                                       |                               |
| RBOX   |                               |
| IDBB-CH                                      |                               |
| IDHRA  |                               |
| UV-CAN                                       |                               |
| Infrared                                     |                               |
| Infrared                                     |                               |
| IMAR-RGB                                     |                               |
| IDDA-KH-RGB                                  |                               |
| RGB Full-color                               |                               |
| ISU  |                               |
| ISS  |                               |
| Introduction of Customization                |                               |
| High-speed synchronized imaging kit products |                               |
| ISC-24                                       |                               |
| Image capture evaluation kit products        |                               |
| IDMU   |                               |
| ILP  |                               |
| ILC  |                               |
| ILV  |                               |
| ILS  |                               |
| IPPA_G • IRPA_G                              |                               |
| IPSA • IPPA                                  |                               |
| IDGC   |                               |
| IDPA   |                               |
| IDCA   |                               |
| IMC  |                               |
| IWDV-24                                      |                               |
| IWDV(S)-48                                   |                               |
| ISC  |                               |
| JS   |                               |
| JS-30M2-TP/SS                                |                               |
| ILS-40M2-PI/SS                               |                               |
| SAG  |                               |
| SLLUB  |                               |
| LLUB   |                               |
| IFIC   |                               |

## Multi-Segmented Illumination Lineup (Partial)

| Illumination Type  | Series            | Channels | Color |
|--|-------------------|----------|-------|
| Multi-Channel Diffuse Irradiate Ring Illumination            | IMAR-8ch series   | 8CH      |       |
| Multi-Channel Low Angle Direct Irradiate Ring Illumination   | IDR-LA-8ch series | 8CH      |       |
| Multi-Channel Horizontal Opposed Irradiate Ring Illumination | IDRA-T-8ch series | 8CH      |       |
| Oblique Highly Directional BAR Illumination                  | IDBA-Q series     | 4CH      |       |
| 16-Division Individual Control Dome Illumination             | IDD-CB series     | 16CH     |       |

An example of illumination that can be divided into 4ch, 8ch, and 16ch.

A wide range of options are also available for divided illumination, and customization is also possible to meet specific needs.

Please feel free to contact our sales team for more information. We will be happy to assist you in selecting the optimal illumination solution for your needs.

## Applicable Controllers

| Output Control Method | Series          | Channels(Max.) |
|-----------------------|-----------------|----------------|
| PWM                   | IDGC-100M8HS-TP | 8CH            |
| PWM                   | IDMU Series     | 8CH            |
| OverDrive             | IJS Series      | 8CH            |

These are a controller that supports high-speed synchronized imaging.

## I/O Cables for Camera

| Series        | Compatible Camera Series | Compatible Controller |
|---------------|--------------------------|-----------------------|
| IC-MIL-BA-26  | BASLER ace Series        | IDGC-100M8HS-TP       |
| IC-MIL-BA-20  | BASLER ace Series        | IJS Series            |
| IC-MIL-BA2-26 | BASLER ace2 Series       | IDGC-100M8HS-TP       |
| IC-MIL-BA2-20 | BASLER ace2 Series       | IJS Series            |

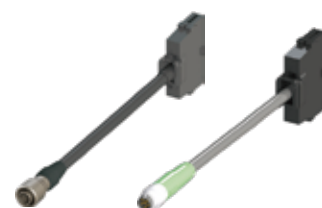
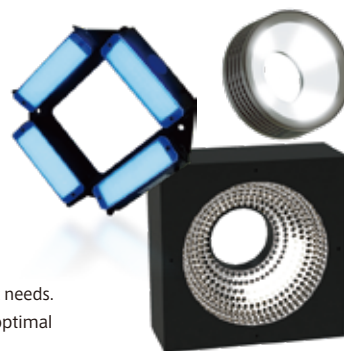
These are I/O cables for cameras with trigger output functionality used for high-speed synchronized imaging.

## 4-Branch Extension Cable for Multi-Segmented Illumination

| Series                 | Channels | Remarks                                      |
|------------------------|----------|--|
| I-CB-F Series          | 4ch      | Extension cables for 12V Illuminations       |
| I-CB-F_-24 Series      | 4ch      | Extension cables for 24V Illuminations       |
| I-CB-F_R-C02 Series    | 4ch      | Extension robot cables for 12V Illuminations |
| I-CB-F_R-24-C02 Series | 4ch      | Extension robot cables for 24V Illuminations |

These are extension cables for multi-segmented illumination

Robot cables excel in flexibility and torsional resistance, making them suitable for use in mechanisms with moving parts.



Line illumination products

Ring illumination products

Bar illumination products

Dome illumination products

Special illumination products

Kit products

Controller products

Other illumination products

IDBB-LSRF  
 IDBC-LSR  
 IDBB-LSRH  
 IDBB-LSRA  
 IDBB-LSRS  
 IDBC-LSRC  
 IDBB-LSRC  
 IDBC-RE  
 IDBB-RE  
 IDBA-RK  
 IQDH-RE  
 IMAR-D\_-8ch  
 IDR-LA-8ch  
 IDRA-T-8ch  
 IMAR-D  
 IMAR-CT D  
 IHR-LE  
 IHRB • IHRA  
 IDR-F  
 IDR-F33/16  
 IDR  
 IDR-LA  
 IDRA-T  
 IFR • IPR  
 IDBA-HM  
 IDBA-HMS  
 IDBA-HMS-IR  
 IDBA-FD  
 IDBA-LEH2  
 IDBA-LEH  
 IDBA-LE  
 IDBA-SE  
 IDBA-SL  
 IDBA  
 IDBA-Q  
 IFLA • IFLB  
 IDHM  
 IHMA  
 IHMA-V  
 IFPA  
 IFD  
 IFD-IR  
 IHMA-40D  
 IFPA-D  
 IPQC  
 IFHA  
 IDDB-KH • IDDA-KH  
 IDUB  
 IDD  
 IDD-CB  
 IQD • IQDH  
 IQDA-CB  
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 IFVA-ST  
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 IHV-20 • IHVE-21  
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