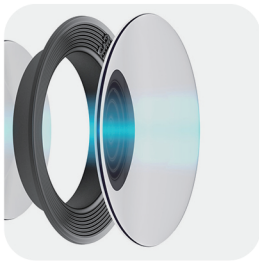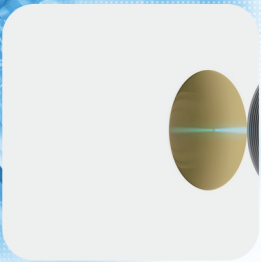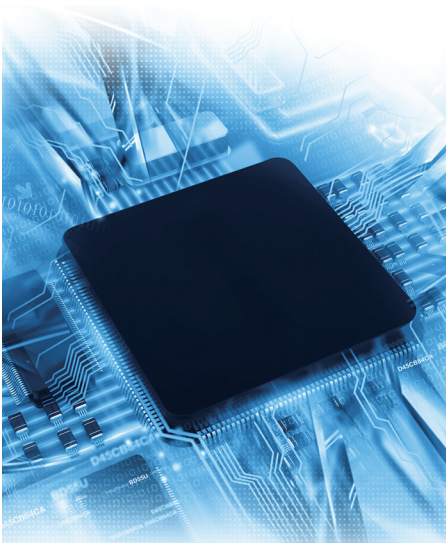# OPTOLOGICS ™

Optical System Total Solution Provider

Dentistry | Medical | Soldier / Police | Inspection Machine
Visually Handicapped | Drone | In Radiation Camera | Parking

Company profile

Drone

OPTOLOGICS

Optologics developed its own auto focus algorithm and vision system optimized for individual applications based on high definition zoom lens. The company continues its R&D efforts and grows in diverse sectors such as medical devices including supplementary engineering vision system for people with low vision and the visually challenged, 3D camera for precision surgical operations, dental AF Intra Oral camera system, and optical system for endoscope; radiation resistant camera used inside nuclear power plants, industrial cameras and other camera and vision systems for special areas such as military and police.

Engineering Design house,

- Optical Engineers
- Optical Electrical Engineers
- Vision Algorithm Engineers

- Embedded software Engineers
- Hardware Engineers
- Mechanical Engineers

CAMERA LENS

Opto
Le
AF C
Mo

Φ52

2012
Inaugurated
Fixed LENS (M12, Blackbox Type)

2013
Company research institution, venture company registration
AF Zoom Lens 3X, 5X

2014
AF Zoom Lens 12X
Digital Magnifier 3X Camera Module
IR Zooming(6X) illuminator

2015
Digital Magnifier 5X Camera Module
AF Intra oral Camera
Wearable Camera Lens(M8 Type)12X Camera Module

2016
3D Stereo Camera, Medical
Wide Angle Lens (Parking System)

2017
Drone Camera (3X,5X,12X AF Camera)
2.4Ghz (TX, RX Controller)
5.8Ghz (Image TX, RX)

Applied Device & Application & Customer

Intra oral Camera

Medical Camera

Wearable Camera

Laser IR Zooming Illuminator

Full HD   IP Network

Radiation

ITS

Video Magnifier

Inspection Camera

tologics
ens &
Camera
lodule

18-55 mm/3·2-5·6

TM

OPTICAL

Zoom Lens

3X Zoom Lens

7.9
30
18
Unit : mm
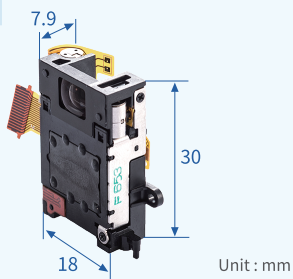
- F-number :
  2.8 (Wide) ~ 5.6 (Tele)
- Effective Focal Length :
  f = 4.4 ~ 13.2 (Zoom ratio 3)
- Back Focal Length :
  2.33 (Object distance= infinity ,in air)
- Focusing Range :
  Wide 10cm ~ ∞ ,
  Tele 10cm ~ ∞ (from 1st Lens R1)

- Field of View :
  Diagonal ,
  Wide : 66.84 ~ Tele : 24.48
- Zoom Driving :
  Stepping Motor
   (Moving 2nd Group & 3rd Group)
- Focus Driving :
  Stepping Motor (Moving 3rd Group)
- Iris mechanism : Fixed Iris

5X Zoom Lens

43
26.5
18.4
Unit : mm
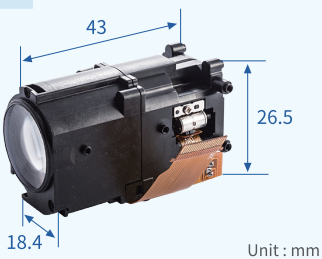
- F-number :
  3.5 (Wide) ~ 3.7(Tele)
- Effective Focal Length :
  f = 5.0 ~ 25.0
  (38~190 at 35mm format)
- Back Focal Length :
  4.46mm (Wide)~ 7.34mm (Tele) in air
- Focusing Range :
  Wide 10cm ~ ∞ , Tele 0.8m ~ ∞
  (from 1st Lens R1)

- Field of View :
  Diagonal , Wide :
  60.26 ~ Tele : 13.08
- Zoom Driving :
  Stepping Motor
  (Moving 2nd Group & 4th Group)
- Focus Driving :
  Stepping Motor (Moving 3rd Group)
- Iris mechanism : Fixed Iris

12X Zoom Lens

74
41.6
36
Unit : mm
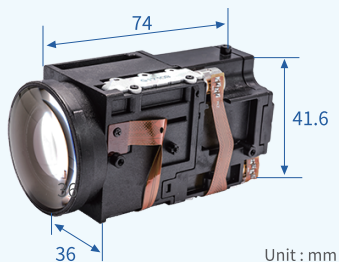
- F-number :
  2.2 (Wide) ~ 2.3 (Tele)
- Effective Focal Length :
  f = 4.8 ~ 57.6mm (Zoom ratio 12x)
- Back Focal Length :
  9.45mm (Wide,in air),10.3mm(Tele, in air)
  Image Plane Position
   * OV2715 : -0.31mm
      (OLPF t=0.7mm + Cover Glass t=0.445mm)
   * IMX036 : -0.90mm
      (OLPF t=0.7mm + Cover Glass t=0.70mm)
- Focusing Range :
  Wide 10cm ~ ∞ , Tele 100cm ~ ∞
  (from 1st Lens R1)

- Field of View :
  Diagonal , Wide : 71.7 ~ Tele : 6.7
- Zoom Driving :
  Stepping Motor (Moving 2nd Group & 4th Group)
- Focus Driving :
  Stepping Motor (Moving 4th Group)
- Iris System :
  Auto Iris (Driven by Servo motor)
  Including ND filter @small iris
- IR Cut Filter :
  Stepping Motor (On/Off type)

Fixed Lens

M8 Lens

Ø 11
Unit : mm

- F-number :
  2.25
- Effective Focal Length :
  2.22mm
- Back Focal Length :
  2.734mm
- F.B.L : 2.24mm
- Field of View :
  Diagonal , 118(1/4") ~ 159(1/3")
  M8 *P0.35
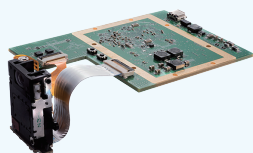
Ultra Wide Lens

Ø 48
Unit : mm

- F-number :
  1.38
- Effective Focal Length :
  4.2mm
- Field of View :
  Diagonal , 139
- Optical TTL :
 79.5
- Sensor Type :
  IMX226, 12MP

OPTO ELECTRONIC 1

Zoom Camera Module

3X Zoom Camera

| MODEL	EEM001-HDMI
Sensor Device	Aptina 1/3.2" progressive scan CMOS, 2Megapixel
Total Pixels	1945(H) x 1109(V) 2.16 Megapixel
Effective Pixels	1945(H) x 1097(V) 2.13 Megapixel
Horizontal	800TVL
Shutter Speed	1/30s Default,(Long Exposure Mode, ~1Sec)
Video Output	1280 x 720 60F, 1920 x 1080 30F, 1920 x 1080 60P (Mode Select)
Digital Output	HDMI
Serial Port	RS232
Lens Control	Motorized Lens Control by stepping Motor. (Simplified Adjustment)

5X Zoom Camera
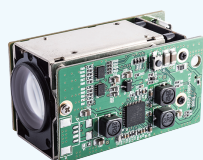
MODEL	EEM003
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Total Pixels	1952(H) x 1116(V) 2.18 Megapixel
Effective Pixels	1944(H) x 1104(V) 2.14 Megapixel
Horizontal	800TVL
Shutter Speed	1/60s Default, (Long Exposure Mode, ~1Sec)
Video Output	1920 x 1080 60P
Video Output Format	MHL 3.0 packed pixcel type
Day & Night	IR CUT Filter built in System
Serial Port	RS232
Lens Control	Motorized Lens Control by stepping Motor. (Simplified Adjustment)
ISP output Format	YUV 4:2:2 16bit (BT1120 ,16bit)

MODEL	EEM003-USB2.0
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Shutter Speed	1/60s Default,(Long Exposure Mode, ~1Sec)
Video Output	1920 x 1080 30P
Video Output Format	Compressed MJPEG
Serial Port	RS232
ISP output Format	YUV 4:2:2 16bit (BT1120 ,16bit)
USB Chip	EM27386D, Not supported UVC, How to control form Windos OS, directdraw
Operating PC spec	Current is over the 700mA, OS : Win7SP1 up, CPU :Core i3 up, RAM: 4GB up, With stand alone VGA card well be better.
Image Delay Time	About 250ms ~ 300ms (Difference depending HOST PC performance)

12X Zoom Camera
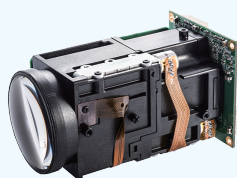
M.F.M Camera
is a module that controls the zoom and focus motor manually ADC Interface for external control of zoom motor and focus motor

is a module that controls the zoom and focus motor automatically

- Control using RS232
- ADC Interface for external control of zoom motor and focus motor
- The I2C interface is used to accept and process the Auto Focus data

MODEL	EEM012-BT1120
Sensor Device	Sony IMX291 1/2.8" progressive scan CMOS, 2Megapixel
Video Output	1280 x 720 60F, 1920 x 1080 30F, 1920 x 1080 60P (Mode Select)
AV Output	1V p-p Composite. 75 Ohms
Output Format	BT1120 16bit (YUV422)
Day & Night	IR CUT Filter Conversion System
Serial Port	RS232
2D/3DNR	Off / On (User selectable by OSD)
Power Source	DC 12V
OSD	Video Mode / D&N / AWB / AE / Flickerless / DIS Brightness / Sharpness / Mirror & Flip / DSS/DNR, etc.

| MODEL	EEM012-USB2.0
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Video Output	1920 x 1080 30F
Video Output Format	Compressed MJPEG
AV Output	1V p-p Composite. 75 Ohms
ISP output Format	YUV 4:2:2 16bit (BT1120 ,16bit)
USB Chip	EM27386D, Not supported UVC, How to control form Windos OS, directdraw
Operating PC spec	Current is over the 700mA, OS : Win7SP1 up, CPU :Core i3 up, RAM: 4GB up, With stand alone VGA card well be better.
Day & Night	IR CUT Filter Conversion System
Serial Port	RS232
Lens Control	Motorized Lens Control by stepping Motor. (Simplified Adjustment)
2D/3DNR	Off / On (User selectable by OSD)
Power Source	DC 12V
OSD	Video Mode / D&N / AWB / AE / Flickerless /DIS Brightness / Sharpness / Mirror & Flip / DSS/DNR, etc.

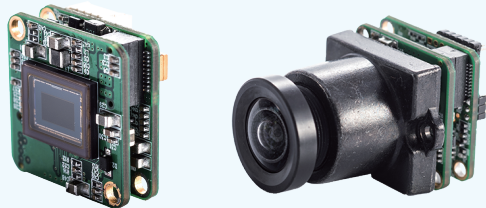| MODEL	EEM012-HDSDI
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Total Pixels	1945(H) x 1109(V) 2.16 Megapixel
Horizontal	800TVL
Shutter Speed	1/30s Default,(Long Exposure Mode, ~1Sec)
Video Output	1280 x 720 60F, 1920 x 1080 30F, 1920 x 1080 60P (Mode Select)
Video Output Format	1.485G/s, HD-SDI Output (SMPTE 292M) ,or EX-SDI
AV Output	1V p-p Composite. 75 Ohms
Digital Output	SDI Output
Day & Night	IR CUT Filter Conversion System
Serial Port	RS232
Lens Control	Motorized Lens Control by stepping Motor. (Simplified Adjustment)
2D/3DNR	Off / On (User selectable by OSD)
OSD	Video Mode / D&N / AWB / AE / Flickerless /DIS Brightness / Sharpness / Mirror & Flip / DSS/DNR, etc.

OPTO ELECTRONIC 2

## Intra oral AF System ●

Telecentric / Liquid AF Type
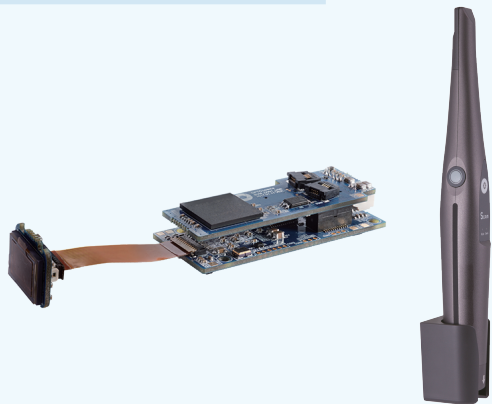
MODEL	BVM_O001 USB 2.0
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Total Pixels	1945(H) x 1109(V) 2.16 Megapixel
Shutter Speed	1/30s Default,(Long Exposure Mode, ~1Sec)
Video Output	1920 x 1080P 30F
Video Output Format	USB2.0 compressed MJPEG
AV Output	1V p-p Composite. 75 Ohms
Digital Output	BT1120 16bit
Serial Port	RS232
Lens Control	Motorized Lens Control by stepping Motor. (Simplified Adjustment)
OSD	Video Mode / D&N / AWB / AE / Flickerless /DIS Brightness / Sharpness / Mirror & Flip / DSS/DNR, etc.
USB Chip	EM27386D, Not supported UVC, How to control form Windos OS, directdraw
Operating PC spec	Current is over the 700mA, OS : Win7SP1 up, CPU :Core i3 up, RAM: 4GB up, With stand alone VGA card well be better.

Fixed Camera ●

MODEL	BVM-M001-HDSDI
Sensor Device	Sony 1/2.8" progressive scan CMOS, 2Megapixel
Total Pixels	1945(H) x 1109(V) 2.16 Megapixel
Shutter Speed	1/30s Default,(Long Exposure Mode, ~1Sec)
Video Output	1280 x 720 60F, 1920 x 1080 30F, 1920 x 1080 60P (Mode Select)
Video Output Format	1.485G/s, HD-SDI Output (SMPTE 292M) ,or EX-SDI
AV Output	1V p-p Composite. 75 Ohms
Digital Output	SDI Output
Day & Night	IR CUT Filter Built in System
Serial Port	RS232
2D/3DNR	Off / On (User selectable by OSD)
Power Source	DC 12V
OSD	Video Mode / D&N / AWB / AE / Flickerless /DIS Brightness / Sharpness / Mirror & Flip / DSS/DNR, etc.

IR Zooming Illuminator ●

62
42
37
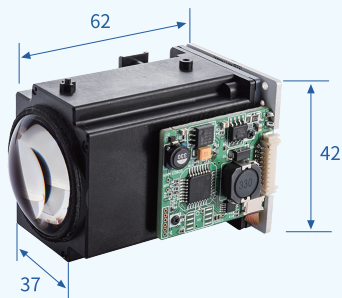
Unit : mm

MODEL	X BEAM 002 _LED Type	X BEAM 003_ Laser Diode Type
Angle of View	- 6 ˚ ~ 70 ˚	3.7 ˚ ~ 25.4 ˚
Driving Condition	1A 3.4V	2.4A
Zooming	Stepping motor	Stepping motor
Heatsink	Not use	Use
Centroid wavelength	850nm	850nm
Power	3W	2.75W

Tele   Middle   Wide
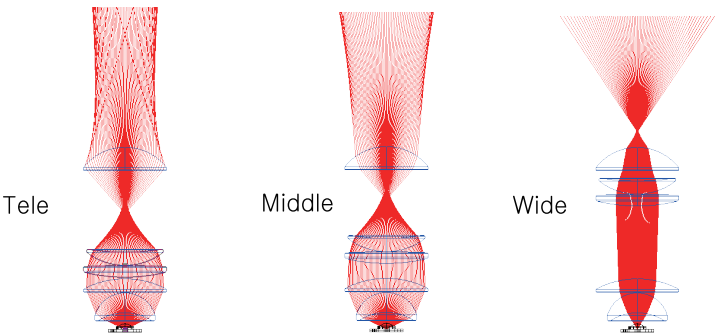
Image & ISP Solution

Available Solution

I.S.P

- AMBARELLA(A7LS,A12)
- SONY(ITN2 Solution)
- EYENIX(EN77X Solution,EN673)
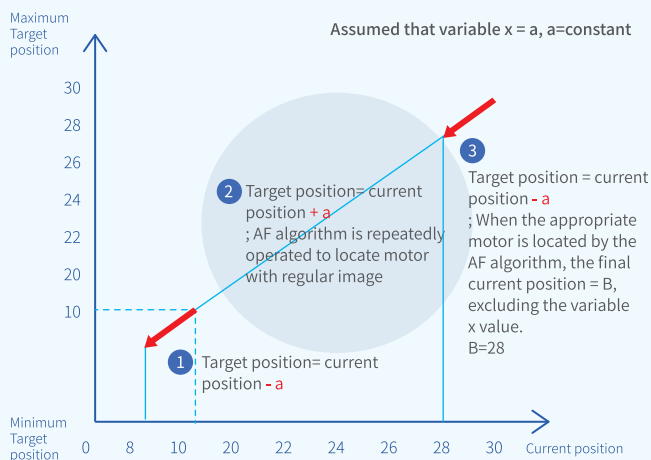- Genesyslogic (GL864A Solution)

R. F

- 2.4 Ghz : Signal TX RX
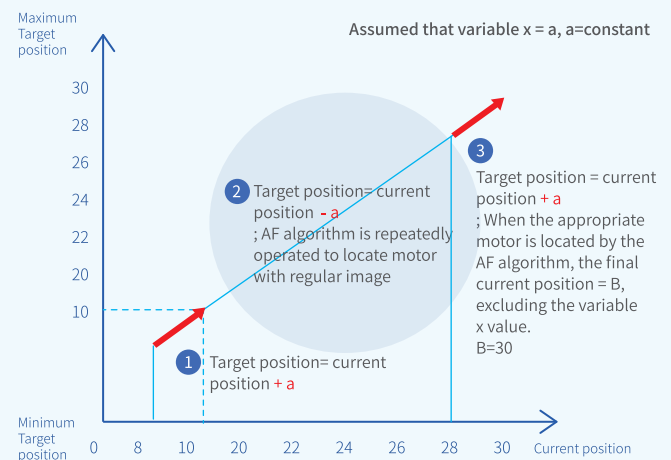- 5.8 Ghz : Image TX RX

Software & Algorithm

Fast Speed High Resolution Autofocus Algorithm

To implement auto focus in full HD (1920x1080), the signal processing method which is under HD (1280x720) can't be implemented focus accuracy and speed stably due to lots of data processing capacity. On the other hand, Optologics's own skill relating zoom and algorithm have a world class of focus speed and accuracy regardless frame rate (30 frame or 60 frame) at fast speed and high resolution (1920x1080).

Low magnification-exclusive algorithm

Maximum Target position

Assumed that variable x = a, a=constant

30
28
26
24
22
20
10

② Target position= current position + a
; AF algorithm is repeatedly operated to locate motor with regular image

③ Target position = current position - a
; When the appropriate motor is located by the AF algorithm, the final current position = B, excluding the variable x value.
B=28

① Target position= current position - a

Minimum Target position

0   8   10   20   22   24   26   28   30   Current position

High magnification-exclusive algorithm

Maximum Target position

Assumed that variable x = a, a=constant

30
28
26
24
22
20
10

② Target position= current position - a
; AF algorithm is repeatedly operated to locate motor with regular image

③ Target position = current position + a
; When the appropriate motor is located by the AF algorithm, the final current position = B, excluding the variable x value.
B=30

① Target position= current position + a
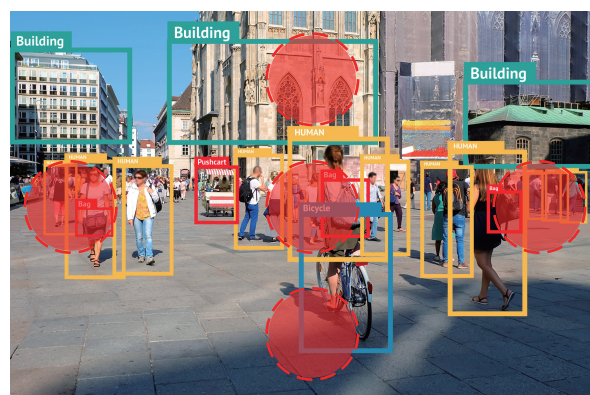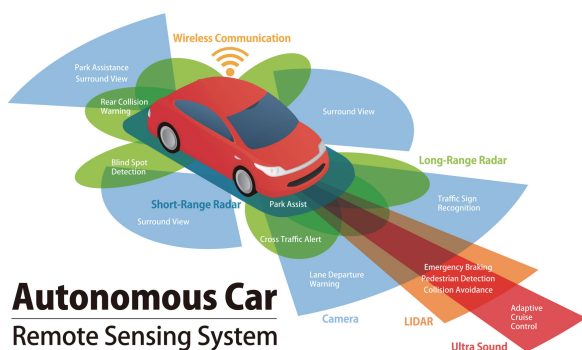
Minimum Target position

0   8   10   20   22   24   26   28   30   Current position

Fast Auto detection Rear Camera based on Autofocus Algorithm

- SONY Image sensor & ISP Integral Type
- Auto Detection : Object & Motion

Autonomous Car
Remote Sensing System

AF Area

Advanced Technology

12X Zoom AF-based image and control exchange integrated system integrating
RF(2.4Ghz, 5.8Ghz) system-based 3Axis Stabilizer

Commercial Drone

Built-in camera, RF2.4Ghz receiver, camera control

5X &12X AF Camera
- Recording ON / OFF
- Zooming

X Beam
- power ON / OFF
- Zooming

RF 2.4Ghz
Zoom Camera & IR Zooming Illuminator 조정

Image Format

RF 5.8Ghz
Image exchange

Commercial : 5.8Ghz Remote
high speed image transmitter

Commercial : 5.8Ghz & 2.4Ghz
Remote high speed image
receiver & Display
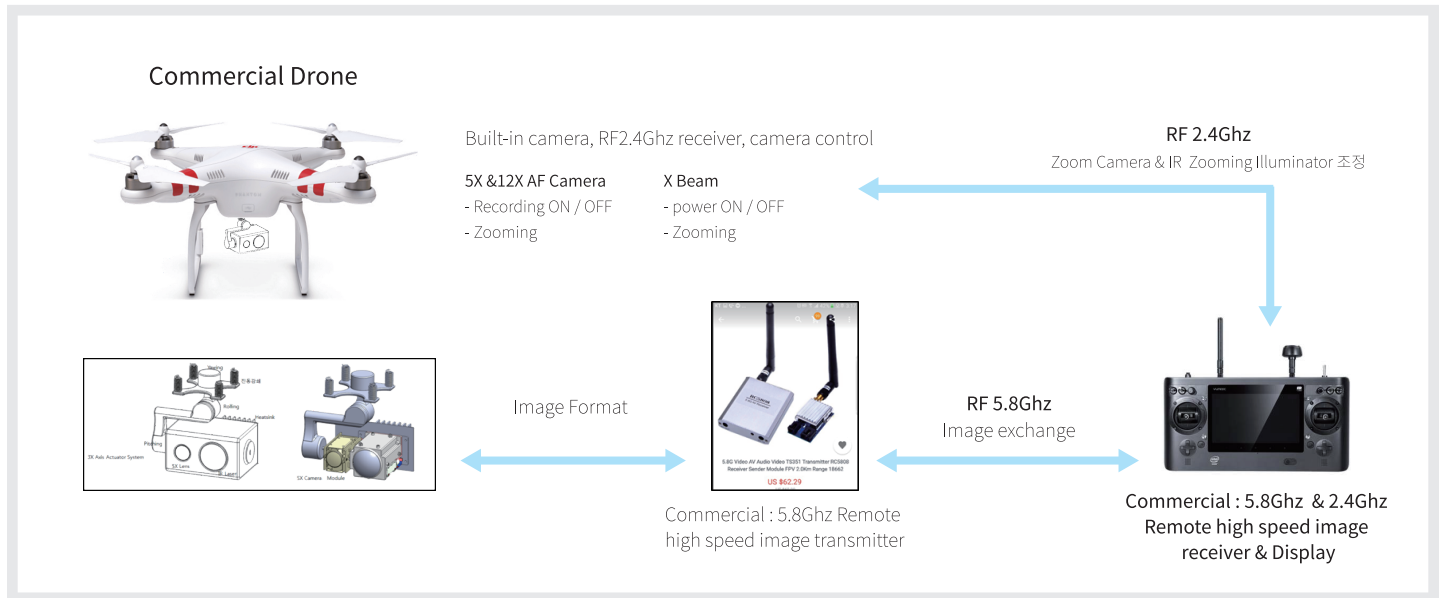
Smart cube that can be linked with social network that maintains operability
of general cube based on analog sensibility

USER 1

Reaset

Start

Bluetooth

Start

Bluetooth

Reset

Ranking record

Application server

Social Network

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Optical design and manufacturing expertise

OPTOLOGICS ™