



Intelligent Image Sensor

iIS-010 series

TK6234A5 : iIS-010

TK6238A7 : iIS-011

TK6240A5 : iIS-012

Product Specification

| | |
|------------------------------------|----|
| 1. Product Description | 2 |
| 2. Features | 2 |
| 3. Configuration..... | 4 |
| 4. Name and Function of Parts..... | 6 |
| 5. Specification | 9 |
| 6. External View | 22 |
| • Restriction For Use | 26 |
| • Precautions | 27 |
| • Exemption Clauses | 27 |

TOSHIBA TELI CORPORATION

The contents of this product specification may be revised without notice to reflect future product modifications. Please confirm the functions and the specifications on the latest specification sheet.

1. Product Description

"intelligent image sensor" iIS-010 series is an integrated image processing system consists of CCD camera head, control unit, and application software. iIS-010 series is a pre-packaged solution designed to simplify the deployment of machine vision in industrial applications.

2. Features

(1) High measurement accuracy

High measurement precision finds small defects in manufactured parts.

(2) Double speed VGA sensor

Remote head VGA sensor connected through a single cable with all camera electronics contained within the iIS assembly. The camera electronics support a 60Hz progressive scan frame rate.

(3) Interface for industrial applications

Industrial and intelligent I/O interfaces for part type (job code), part inspection, part decision and light control.

(4) Standard interfaces

Standard serial and Ethernet 10/100baseT communication interfaces for configuration and data reporting.

(5) Graphical user interface

Intuitive step-by-step configuration and monitoring GUI, accessible through a standard Microsoft browser page and available in two languages (English and Japanese).

(6) Local Scaling / Global Scaling

Simple calibration procedure which factors out both perspective and non-linear lens distortions, provides high measurement accuracy. And measurement in metric, English or pixel, supports unique system requirements.

(7) History reports

Customer-defined history reports including parts images records information on recent passed, failed and reworked parts; key measures; specifics on which part failed to enable diagnosis. Provides a history of recent good and bad label images enables you to monitor and spot error trends on a line.

(8) Gauge Application

Comprehensive set of gauging tools gives you the ability to precisely and accurately measure lines, angles between lines, ellipses and circles (center, circularity or out-of-round, nicks, major and minor axes), arcs (centers and lengths), Annuli, thread spacing (“wave tool”), multiple measures of length and spacing of parts such as pins on an electrical connector (“rake tools”), and other part measures.

(9) Label Application

User-defined features including label rotation, movement, rejection thresholds enables you to define your label quality criteria. All settings are quickly defined and changed using a sliding bar from “lower” to “higher”. Automatic learning of good labels, using a proprietary neural net learns labels and variations.

3. Configuration

Hardware

| | | |
|---------|---|---|
| iIS-010 | Camera Head: 20mm square type | 1 |
| | Camera cable: Direct Fixing (2m) | 1 |
| | *Cable fixing direction: (viewed from rear) Right | |
| | Control Unit (iIS-010 series compatible) | 1 |
| iIS-011 | Camera Head: ϕ 17mm type | 1 |
| | Camera cable: Separated type (2m) | 1 |
| | *Cable fixing direction: (viewed from rear) Rear | |
| | Control Unit (iIS-010 series compatible) | 1 |
| iIS-012 | Camera Head: C mount head type | 1 |
| | Camera cable: Direct Fixing (2m) | 1 |
| | *Cable fixing direction: (viewed from rear) Right | |
| | Control Unit (iIS-010 series compatible) | 1 |

Accessories

| | | |
|-----------------------------|---|---|
| Ethernet crossover cable | KB-10T5-03CK (Sanwa-supply, 3m) | 1 |
| DIN rail mounting kit | CKD-80 (Takachi Denki) | 2 |
| Screws for the mounting kit | PB3X10BS-NI | 4 |
| Plug for power cable | 39860-1002 (MOLEX, 2 terminal type) | 1 |
| Plug for parallel I/O cable | 1-1546208-5 (AMP/Buchanan, 15 pin type) | 1 |
| Floppy Disk | Including switching application file | 1 |
| Operation Manuals | Basics (Japanese) | 1 |
| | Basics (English) | 1 |
| | Applications (Japanese) | 1 |
| | Applications (English) | 1 |
| Calibration sheet | A4 size | 1 |

*Ethernet® is a trademark of Xerox Corporation U.S.

Software

| | |
|-----------------|---|
| iIS Web pages | for viewing on Internet Explorer® (Installed) |
| iWorks(Gauge) | Application for Gauge (Auto download from the control unit) |
| iWorks(Label) | Application for Label (Auto download from the control unit) |
| iAssistant | Application for Upgrade (Auto download from the control unit) |
| iServer | Application for monitoring connection status (Installed) |
| HTML Help | Microsoft® online help for Gauge / Label application |
| Switch To Gauge | Binary File for switching to Gauge (including in the floppy disk) |
| Switch to Label | Binary File for switching to Label (including in the floppy disk) |
| Others | ActiveX® control libraries (Auto download from the control unit) |

*Microsoft®, Windows®, Microsoft® Internet Explorer, and ActiveX® are registered trademarks of Microsoft Corporation, U.S., in the U.S. and other countries.

Optional Accessories

Camera Lens

| | |
|-------------|--------------------------------------|
| For iIS-010 | Dedicated lenses (M10.5 P0.5 female) |
| For iIS-011 | Dedicated lenses (M15.5 P0.5 male) |
| For iIS-012 | C mount lenses |

Camera mounting kit

| | |
|-------------|---------------------|
| For iIS-010 | CPT4310A / CPT4310B |
| For iIS-011 | CPT5130 |
| For iIS-012 | CPT5110 |

*Please contact your dealer / distributor for details of option units.

Peripheral Devices (compatibility verified)

| | |
|-----------------|---|
| DC Power supply | PS5R-D24 (Idec) |
| PC | DynaBook 2590X (Windows® 2000 Japanese / English) |
| Local Display | RDF17S (Mitsubishi) |

*Please contact your dealer / distributor for the other peripheral devices.

4. Name and Function of Parts

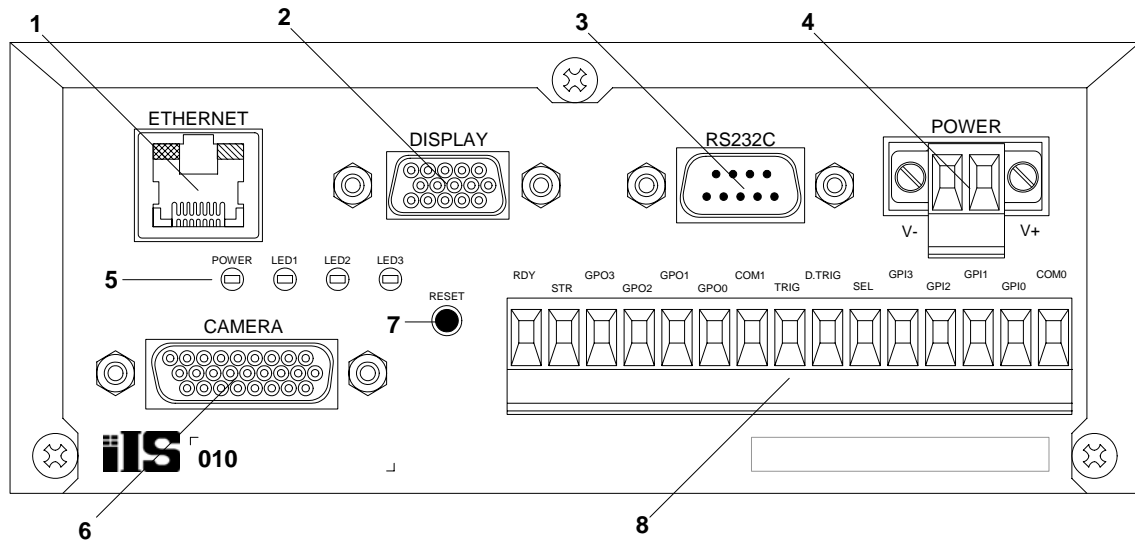


Figure 1. Control unit (Front-panel side)

1. RJ45 connector for Ethernet

Connect with PC or PLC by using Ethernet cable.

2. Local Display connector

A XGA Monitor can be connected directly to the control unit, for local display of the camera image.

3. RS-232C connector

Connect with PC or PLC by using the crossover RS-232C cable.

4. Power connector

Connect the DC Power Supply (+24V DC ±10%) to the control unit power connector.

5. LED indicator

| | | |
|--------|--|-----------------------|
| POWER: | power-on indicator | - steady green |
| LED1: | server “heartbeat” | - slow flashing green |
| LED2: | acquisition (frame) done (or processing start) | rapid flashing green |
| LED3: | reserved for future use | steady off |

6. Camera connector

Connect the control unit and camera head with the camera cable provided with iIS-010 series kits.

7. Reset button

Reset the control unit or reset to the factory default.

8. Parallel I/O

8 inputs and 7 outputs parallel I/O.

Table 1. Parallel I/O terminal functions

| NAME | I/O | Function | Name | I/O | Function |
|--------|-----|--|------|-----|-------------------------|
| COM0 | I | Common for inputs | COM1 | O | Common for outputs |
| GPI0 | I | Select solution input (4bit, ID00~15) | GPO0 | O | Result (Pass) output |
| GPI1 | I | | GPO1 | O | RESERVE |
| GPI2 | I | | GPO2 | O | Result (Recycle) output |
| GPI3 | I | | GPO3 | O | Result (Reject) output |
| SEL | I | Change solution input | STR | O | Strobe pulse output |
| D.TRIG | I | Decision trigger input | RDY | O | Ready signal output |
| TRIG | I | Inspection trigger input | | | |

COM0: Common input for all other inputs.

GPI0 ~ 3: 4 inputs for solution selection. This is a BCD code representing 16 different solutions that can be loaded.

SEL: 1 input for job change - This input will generate an interrupt to the CPU informing it that a line changeover is taking place. The system will then load one of 16 predefined solutions according to the BCD code present on the job selection inputs. During this process, the ready signal will go OFF indicating a busy state.

D.TRIG: 1 decision trigger input representing detection of a valid part to make a decision on. Decisions are queued following every inspection.

TRIG 1 inspection trigger input representing detection of a valid part to inspect.

COM1: Common output for all other outputs.

GPO0 ~ 3: 4 outputs for pass, fail, rework and reserve

STR: 1 strobe light control with offset and pulse width programmable.

RDY: 1 ready indicator. This OUTPUT will be active when the iIS system is available to process parts. It is a level sensitive signal where a ON indicates the system is available and a OFF indicates that it is busy, not configured or unable to continue due to a catastrophic event.

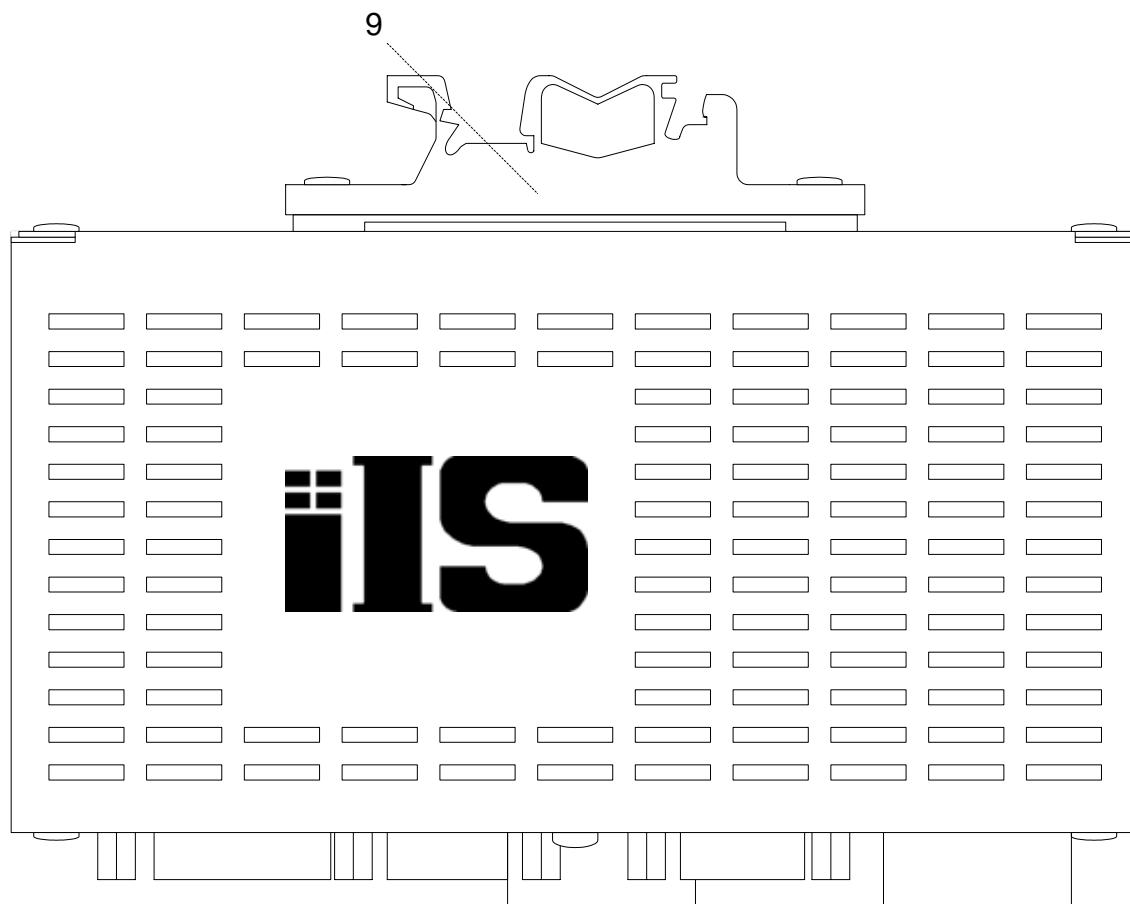


Figure 2. Control unit (top view)

9. Mounting kits for DIN rail

You can mount with 32mm / 35mm width type DIN rail.

5. Specification

[General Specification]

| | | | |
|-----------------------|---|-----------------|--|
| Power Supply | +24V DC \pm 10% (Ripple voltage: 50mV _{P-P} or less) | | |
| Power Consumption | 10W or less (+24V DC) | | |
| Operating Temperature | 0 °C ~ +40 °C | | |
| Operating Humidity | 30 % ~ 85 %RH | (No condensing) | |
| Storage Temperature | -20 °C ~ +60 °C | | |
| Storage Humidity | 10 % ~ 95 %RH | (No condensing) | |

EMC conditions (Electro-Magnetic Compatibility)

| | |
|---------------------------------------|---|
| EMI (Electro-Magnetic Interference) | EN50081-2 (Examination level: EN55011-A) Conformity |
| EMS (Electro-Magnetic Susceptibility) | EN61000-6-2 Conformity |

* Conformity of EMC conditions

About the conformity of the EMC standard of this machine, it has guaranteed in the conditions combined with the peripheral devices of the 3rd clause.

When used combining parts other than specification of our company, I ask you to have final EMC conformity checked of a visitor with a machine and the whole equipment.

[Camera head specification]

| | | | | |
|---------------------|---|---|----------|----|
| Image sensor | All Pixel's Data Read-out Interline CCD | | | |
| Total pixels | 692 (H) | × | 504 (V) | |
| Valid pixels | 648 (H) | × | 494 (V) | |
| Unit cell size | 7.4 (μm) | × | 7.4 (μm) | |
| Sensitivity | 400lx, F5.6 (Exposure time = 1/60s) | | | |
| External Dimensions | | | | |
| iIS-010 | 20 (W) | × | 20 (H) | × |
| | | | 25 (D) | mm |
| iIS-011 | | | φ17 | × |
| | | | 36.2 (D) | mm |
| iIS-012 | | | φ35 | × |
| | | | 40 (D) | mm |
| Lens mount | | | | |
| iIS-010 | Special mount (M10.5 P0.5 female) | | | |
| iIS-011 | Special mount (M15.5 P0.5 male) | | | |
| iIS-012 | C mount | | | |
| Weight | | | | |
| iIS-010 | Approx. 19g (Excluding cable) | | | |
| iIS-011 | Approx. 16g (Excluding cable) | | | |
| iIS-012 | Approx. 55g (Excluding cable) | | | |
| Camera cable length | 2m (iIS-010 series) | | | |

Relative Spectrum Response (*Including lens characteristics, Excluding light source characteristics)

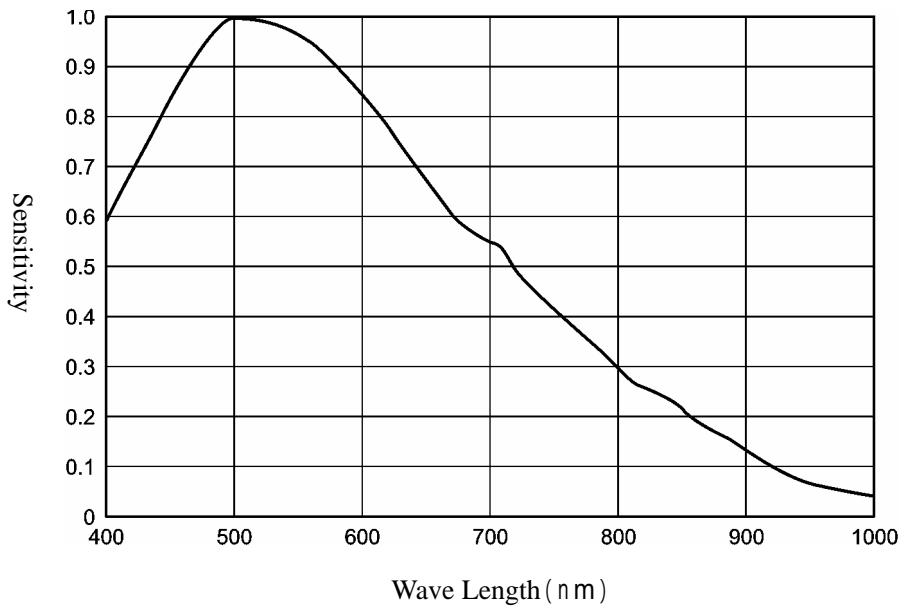


Figure 3. Relative Spectrum Response

[Control Unit]

| | |
|---------------------|--|
| Camera input | 1 |
| Video output pixels | 640 (H) × 480 (V) |
| Quantization | 10bit gray scale |
| Processing | 8bit gray scale |
| Video format | Non-Interlace |
| Sensor Trigger mode | Selectable Internal Timer or External trigger |
| Exposure time | Settable from 1 to 1024 (1 step = Approx. 60μs) |
| Brightness | Approx. 3 ~ 19 LSB (8 bit) |
| Contrast | Approx. ±4dB |
| Processor | 266MHz Intel compatible SOC processor |
| Memory | 64MB image acquisition and processing 32MB program and solution (job) storage |
| Device Name | NS2***** (Default) |
| IP address | 192.168.0.100 (Default) |
| Subnet Mask | 255.255.0.0 (Default) |
| MAC address | 00-01-0D-**-**-** (* Unique ID) |
| DHCP | Disabled (Default) |
| DHCP server | Not Available (Default) |
| Primary WINS server | 000.000.000.000 (Settable on the web page) |

| | |
|-----------------------|-------------------------|
| Secondary WINS server | Not Available (Default) |
| Interfaces | |
| Ethernet | 1ch |
| Connector | RJ-45 |

Table 2. Ethernet connector pin assignment

| Pin # | I/O | Terminal function |
|-------|-----|-----------------------|
| 1 | O | TD+ (Transmit data +) |
| 2 | O | TD- (Transmit data -) |
| 3 | I | RD+ (Receive data +) |
| 4 | - | NC |
| 5 | - | NC |
| 6 | I | RD- (Transmit data -) |
| 7 | - | NC |
| 8 | - | NC |

| | |
|----------------------|--|
| Connection Type | 10/100 BaseT Ethernet IEEE 802.3 compatible 10/100 BaseT Auto Sence |
| Protocol | HTTP, ICMP, DHCP, TCP/IP |
| LED indicator | Orange indicates for working on 100BaseT Green indicates for working on 10BaseT Light on indicates for linking Ethernet Blink indicates for working communication |
| Cables | Twisted Pair (Category 5e or greater) |
| Maximum cable length | 100m (Unshielded Twisted Pair cable) |
| DISPLAY | 1ch |
| Connector | D-SUB 15 pin, Right Angle, female |

Table 3. Local Display connector pin assignment

| Pin # | Terminal Function | Pin # | Terminal Function |
|-------|-------------------|-------|-------------------|
| 1 | Red Data | 9 | NC |
| 2 | Green Data | 10 | GND |
| 3 | Blue Data | 11 | NC |
| 4 | NC | 12 | NC |
| 5 | GND | 13 | HSYNC |
| 6 | GND | 14 | VSYNC |
| 7 | GND | 15 | NC |
| 8 | GND | | |

| | |
|--------------------|--------------------------------------|
| Scanning type | Progressive |
| Video signal level | 0.7V _{P-P} (75Ω terminated) |

for sync on green, 1.0 V_{P-P} (75 Ω terminated)
 (Video signal: 0.7 V_{P-P}, sync signal: 0.3 V_{P-P})

Sync signal Separate sync

Horizontal sync frequency 56.4kHz

Vertical sync frequency 70Hz

Image resolution 1024 × 768 × 16bpp

Sampling resolving power R=5bit, G=6bit, B=5bit

RS-232C 1ch

Connector D-SUB 9pin, Male

Table 4. RS-232C connector pin assignment

| Pin # | I/O | Description | Pin # | I/O | Description |
|-------|-----|--------------------|-------|-----|-------------|
| 1 | - | NC | 6 | - | NC |
| 2 | I | RX (Receive Data) | 7 | - | NC |
| 3 | O | TX (Transmit Data) | 8 | - | NC |
| 4 | - | NC | 9 | - | NC |
| 5 | - | Ground | | | |

Control type RS-232C (Non-procedure)

Bit rate 110 / 300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400 /
 57600 / 115200 bps
 *230400 / 460800 / 921600 bps are not supported.

Data bits 5 / 6 / 7 / 8

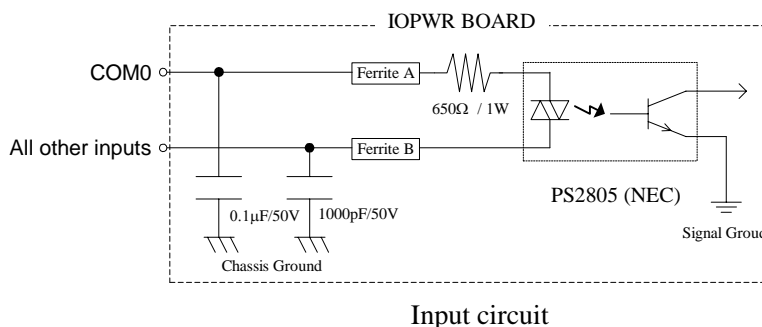
Stop bits 1 / 1.5 / 2

Parity Odd / Even / None / Mark / Space

Flow Control None

Parallel I/O 8 inputs (COM0 / GPIO ~ 3 / SEL / D.TRIG / TRIG)
 7 outputs (COM1 / GPO0 ~ 3 / STR / RDY)

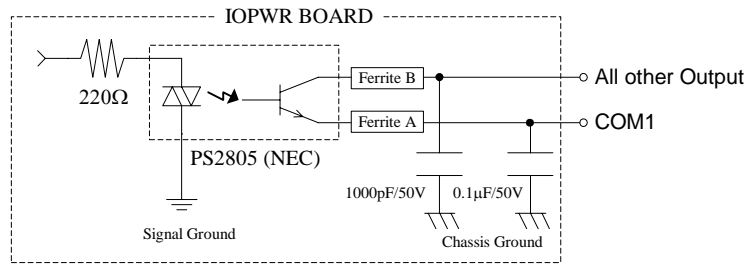
Connector Terminal Block (1-1546208-5 supplied by AMP)



| | |
|------------------------|---------------------------------------|
| Rated input voltage | 25V (1ch) |
| Input voltage range | 0V to 25V |
| Input voltage level | ON: 5V to 25V OFF: 0.8V or less |
| Input current level | ON: 5mA to 20mA OFF: 1.9mA or less |
| Control signal inputs | 3ch |
| TRIG | Inspection Trigger input |
| D.TRIG | Decision Trigger input |
| SEL | Change Solution input |
| Polarity | Positive |
| Minimum pulse width | 200 μ s |
| Select Solution Inputs | 4ch |

Table 5. Select Solution Inputs

| | GPI3 | GPI2 | GPI1 | GPI0 |
|-------|------|------|------|------|
| ID_00 | OFF | OFF | OFF | OFF |
| ID_01 | OFF | OFF | OFF | ON |
| ID_02 | OFF | OFF | ON | OFF |
| ID_03 | OFF | OFF | ON | ON |
| ID_04 | OFF | ON | OFF | OFF |
| ID_05 | OFF | ON | OFF | ON |
| ID_06 | OFF | ON | ON | OFF |
| ID_07 | OFF | ON | ON | ON |
| ID_08 | ON | OFF | OFF | OFF |
| ID_09 | ON | OFF | OFF | ON |
| ID_10 | ON | OFF | ON | OFF |
| ID_11 | ON | OFF | ON | ON |
| ID_12 | ON | ON | OFF | OFF |
| ID_13 | ON | ON | OFF | ON |
| ID_14 | ON | ON | ON | OFF |
| ID_15 | ON | ON | ON | ON |



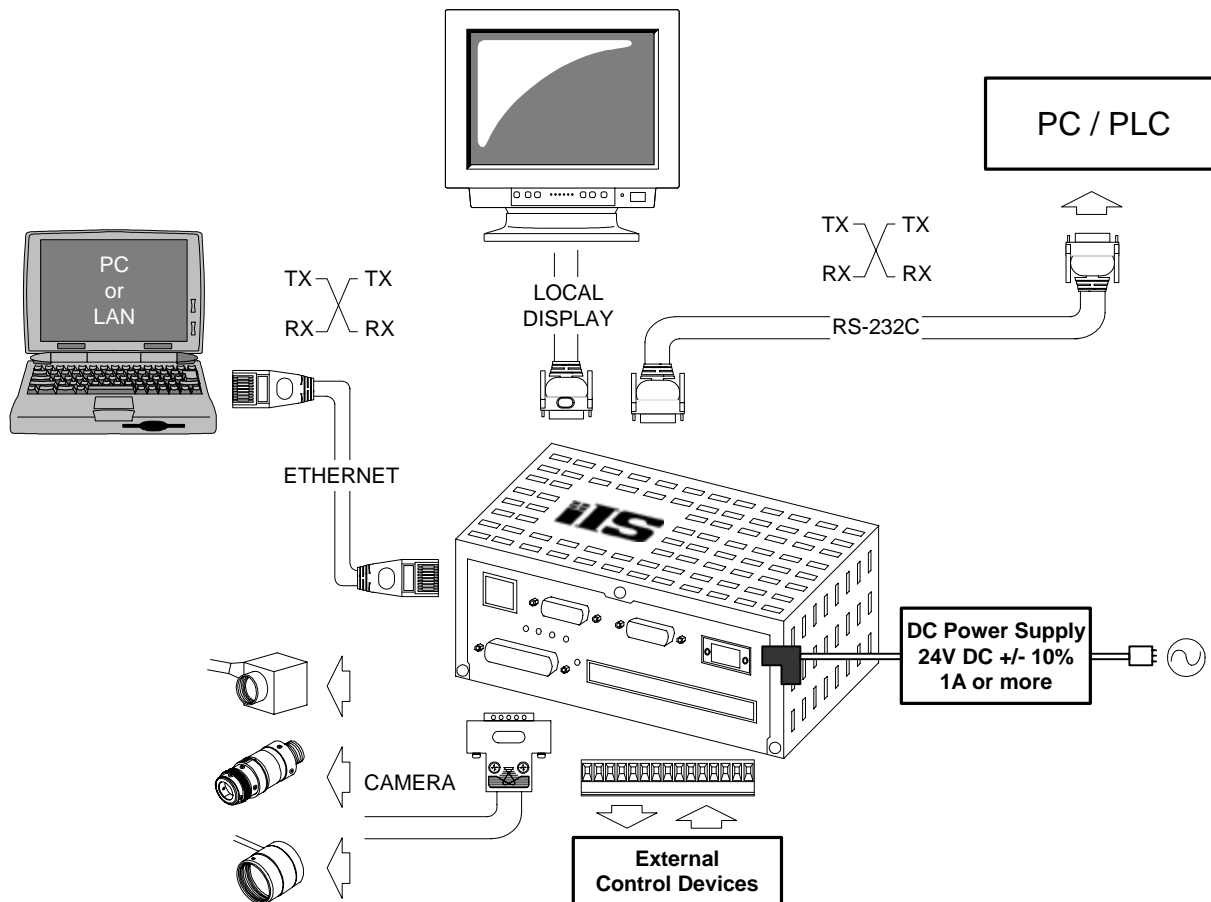
Output circuit

| | |
|----------------------------|---|
| Rated Voltage | 80V (Collector to Emitter) |
| Reverse voltage | -6V (Emitter to Collector) |
| Total Power Dissipation | 120mW |
| Load voltage range | 5V to 24V |
| Rated output current | 50mA |
| Decision outputs | 4ch |
| GPO0 | Pass output |
| GPO1 | RESERVE |
| GPO2 | Recycle output |
| GPO3 | Reject output |
| Light control output (STR) | 1ch |
| READY output (RDY) | 1ch |
| | OFF: Booting the control unit / When changing solution |
| | ON: After boot, start application / After changing solution |

External Dimensions 150 (W) × 60(H) × 80 (D)

Weight Approx. 500g (Excluding DIN rail mounting kits)

[Example Installation]



*The length of the power line between the control unit and DC power supply must be less than 10m, and use twisted-pair wire.

[Client PC system requirements]

| | |
|--------------------|--|
| Operating System | Microsoft® Windows® NT 4.0 SP5 or later, Microsoft® Windows® 2000 SP3 or later, Microsoft® Windows® XP SP1 |
| Web Browser | Microsoft Internet Explorer 6.0 or later (ActiveX control supported) |
| History Log Viewer | Hilgraeve HyperTerminal for Conditional/strings output Microsoft EXCEL for the History log of CSV type |
| PC type | X86 compatible |
| Interface | Ethernet (Static or Dynamic addressing) RJ-45 type connector |

* The PC control program may not work for the effect installed software for application and driver. The workaround for this problem is to be done by users at their own risk.

[Software function specification - on Internet Explorer (Ver.1.2.0.0)]

| | |
|------------------|--|
| Select Language | English / Japanese |
| Devise Setup | |
| Network Alias | Naming a network name your control unit |
| Network Settings | Selectable using DHCP or Static IP Address |
| Monitor | Monitoring inspections from the web |
| Upgrade | Software Upgrades / Backup / Restore |
| | Switch to Gauge or Label |
| Open iWorks | Open Gauge or Label application window |
| HistoryLog | Viewing data output |
| | File logging (CSV type) |

Table 6. CSV file output format (Gauge application)

| | A | B | C | D | E | |
|---|-----------------------|---------------------------|--------|------------------------------------|------------------------------------|------|
| 1 | Inspection Number N | Time Stamp T ₁ | Result | Measured Value V _{N1} | Measured Value V _{N2} | ... |
| 2 | Inspection Number N+1 | Time Stamp T ₂ | Result | Measured Value V _{(N+1)1} | Measured Value V _{(N+1)2} | ... |
| 3 | Inspection Number N+2 | Time Stamp T ₃ | Result | Measured Value V _{(N+2)1} | Measured Value V _{(N+2)2} | ... |
| . | . | . | . | . | . | ... |
| . | . | . | . | . | . | ... |

| | |
|-------------------|---|
| Inspection Number | Parts Inspection Number |
| Time Stamp | Inspection time taken from Client PC (HH:MM:SS) |
| Result | Pass/ Recycle / Fail |
| Measured value | The values for each measurement. |
| | Measurements sort in ascii order |
| | Significant digit: 3 |

Table 7. CSV file output format (Label application)

| | A | B | C | D | E | F |
|---|-----------------------|---------------------------|--------------------------------|---------------------------------|--------|----------------|
| 1 | Inspection Number N | Time Stamp T ₁ | Failed Area F _N | Angle Offset A _N | Result | Barcode String |
| 2 | Inspection Number N+1 | Time Stamp T ₂ | Failed Area F _(N+1) | Angle Offset A _(N+1) | Result | Barcode String |
| 3 | Inspection Number N+2 | Time Stamp T ₃ | Failed Area F _(N+2) | Angle Offset A _(N+2) | Result | Barcode String |
| . | . | . | . | . | . | . |
| . | . | . | . | . | . | . |

| | |
|-------------------|---|
| Inspection Number | Parts Inspection Number |
| Time Stamp | Inspection time taken from Client PC (HH:MM:SS) |
| Failed Area | How much of the Label's area failed (% , significant digit: 3) |
| Angle offset | How much of the Label's angle failed (degree, significant digit: 3) |
| Result | Pass / Recycle/ Fail |
| Barcode String | Barcode string output if you enabled the barcode reader |

Password Protection For preventing others from changing your Solution

[Software Function Specification: Gauge/Label in common specifications (Ver.1.2.0.0)]

| | |
|----------------------------|--|
| Camera image | Displaying on the right panel of the application window |
| Camera Image size | 640 × 480 pixel |
| Zoom in / Zoom out | Zoom in / Zoom out buttons |
| Cursor Location | Displaying X-Y coordinate at mouse cursor location |
| Pixel Intensity | Displaying Pixel intensity at mouse cursor location (0 ~ 255) |
| Solution ID | Displaying Current Solution ID (00 ~ 15) |
| Online Help | Microsoft® HTML Help |
| Setup Status Bar | Displaying current status (Not configured / Stopped / Ready to Run / Running) |
| Select solution panel | Starting new solution Loading last saved solution Importing solution from network client |
| Setup Sensor panel | |
| Sensor Trigger mode | Selectable Internal Trigger or External Trigger |
| Internal Trigger period | Settable from 35ms to 1000ms (1 step = 1ms) |
| Inspection Trigger Delay | Settable from 0ms to 1500ms (1 step = 1ms) |
| Light Control | |
| Duration | Settable from 0ms to 64ms (1 step = 1 ms) |
| Offset | Settable from 0μs to 2000μs (1 step = 1μs) |
| Local display refresh rate | Every 100 / Continuous / None |
| Exposure | Selectable from 1 to 1024 (1 step = 60.0μs) |
| Brightness | 0% ~ 100% |
| Contrast | 0% ~ 100% (with inverting contrast function) |

* Due to the level variation characteristics of the control amplifier, incremental change amount per step is not uniform.

Decision panel

| | |
|--------------------------------|--|
| Action when Images are skipped | Ignore / Stop when count reaches set value / Pass / Recycle / Reject |
| Action when frames are failed | Ignore / Stop when continuous or total count reaches set value |

Setup Outputs panel

| | |
|-----------------|--|
| History Log | Selectable Enable or Disable |
| Decision output | |
| Output timing | Selectable Immediate or Decision sensor |
| Rejection Delay | Settable from 0ms to 1500ms (1 step = 1ms) |
| Duration | Settable from 0.1ms to 1000.0ms (1 step = 0.1ms) |

| | |
|---|--|
| Conditional output | Selectable Disable or Enable |
| if (Condition) | Create / Edit Condition |
| Then (Send) | Add / Edit Output string |
| To (Destination) | Add / Edit Destination |
| Serial (COM3) port settings | |
| Bit rate | Selectable 110 / 300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200bps *230400 / 460800 / 921600bps are not supported. |
| Data Bits | Selectable 5 / 6 / 7 / 8 |
| Parity | Selectable Odd / Even / None / Mark / Space |
| Stop bit | Selectable 1 / 1.5 / 2 |
| Flow control | None |
| TCP/IP | |
| Control unit role | Selectable "as client" or "as server" |
| As client | Define device IP address |
| As server | Alter or reassign Port Number |
| *The reliability of controlling external devices (such as a conveyer, a kicker or etc.) on the product line via Ethernet is NOT guaranteed. | |
| Inspection status | Selectable Ready to Run / Running |
| Monitoring | |
| Statistics Information | Displaying parts inspected number Displaying parts skipped number Displaying Pass / Recycle / Reject parts number |
| Inspection Information | Displaying set upped inspection information |
| Processing Time | Displaying the total time take to find (search) and inspect the part |
| Reset | Product line and Statistics |
| History Recall | Showing history records for inspected parts |
| Saving image | Bitmap image Image Data / Data Only / Nothing |
| Saving Solution | |
| To the Control Unit memory | Up to 16 solutions Settable Solution description (Up to 127 letters) |
| Export | Saving to PC or a network device |
| Deleting saved Solution | All / Current solution / Single Solution |
| [Software function specifications: Gauge Application (Ver.1.2.0.0)] | |
| Calibration | Measurement in real units with the calibration sheet |

| | |
|--------------------------|---|
| Take a picture | Taking a still or frozen picture |
| Location setup | |
| Position / Angle | Settable search area and search pattern |
| Origin Properties | Moving the origin to another location |
| Locator Properties | Confidence / Position / X / Y/ Rotation |
| | Naming each measurements |
| | Setting Tolerance |
| Edge Sensitivity | Settable from 1 to 100 |
| Inspection tools | |
| Perpend Line-Line | measure the perpendicular distance between two edges |
| Line-Line | measure the distance between two edges |
| Point-Point | measure the distance between two points |
| Point-Line | measure the distance between one edge and one point |
| Angle | measure the angle between two edges |
| Corner | define a corner point, or measure the angle between two edges. |
| Circle | define a point, or measure the diameter or circularity of a circle |
| Circle-Circle | measure the distance between 2 circle centers |
| Circle-Line | measure the distance from a circle center to an edge |
| Point-Circle | measure the distance between a circle and one point |
| Concentric Circles | measure the distance from each circle center, to the average center |
| Ruler Properties | Naming measurement |
| | Setting Tolerance (settable units on the measurement) |
| | Settable Accuracy from 2 to 50 |
| | Track locator (Enable / Disable) |
| Angle Properties | Naming measurement |
| | Setting Tolerance |
| | Settable Accuracy from 2 to 50 |
| | Track locator (Enable / Disable) |
| Circle Properties | Diameter / Circularity |
| | Naming measurement |
| | Setting Tolerance (settable units on the measurement) |
| | Settable Accuracy from 8 to 72 |
| | Track locator (Enable / Disable) |
| Concentricity Properties | Naming measurement |
| | Setting Tolerance |
| More inspection tools | |
| ROI (Region of Interest) | Selectable the shape (Line / Rectangle / Circle / Poly) |

| | |
|--------------------------|--|
| Count | count the number of objects in a ROI |
| Count Properties | Count / Area Naming measurement Setting Tolerance (settable units on the measurement) Selectable defecting bright object or dark object Settable Inspection Area / Length / Height Rejecting objects that touch edges (Enable / Disable) Track locator (Enable / Disable) Setting Sensitivity from 0 to 100 |
| Edge count | Counting the edges crossed, along a line or the outline of the ROI. |
| Edge Count Properties | Count / Average Separation / Min / Max Naming measurement Setting Tolerance Selectable transition (Dark-Light / Light-Dark / Both) Track locator (Enable / Disable) Setting Sensitivity from 0 to 100 |
| Intensity | Avg. / Min / Max /Std. Dev. measure pixel intensities in a ROI and calculate statistics |
| Statistics Properties | Naming measurement Setting Tolerance Track locator (Enable / Disable) |
| Eraser | delete a measurement |
| Tip Window | gives hints on drawing measurements |
| Color settings | changing colors of the measurement tools and graphics to suit your preference (HighLight1 / Actual Edge / User Drawn / User Drawn Same Tool / Gauge Point / Construct / Control Point / Landmark / Landmark 2 / Landmark Search / Pass / Warning / Reject) |
| Saving good parts image | Windows® Bitmap Image |
| Decision outputs setting | Define the conditions for part acceptance, recycling or rejections |
| Monitoring | |
| Statistics Information | Displaying parts inspected number Displaying parts skipped number Displaying Pass / Recycle / Reject parts number |
| Inspection Information | Displaying each measured value |
| Processing Time | Displaying the total time take to find (search) and inspect the part |

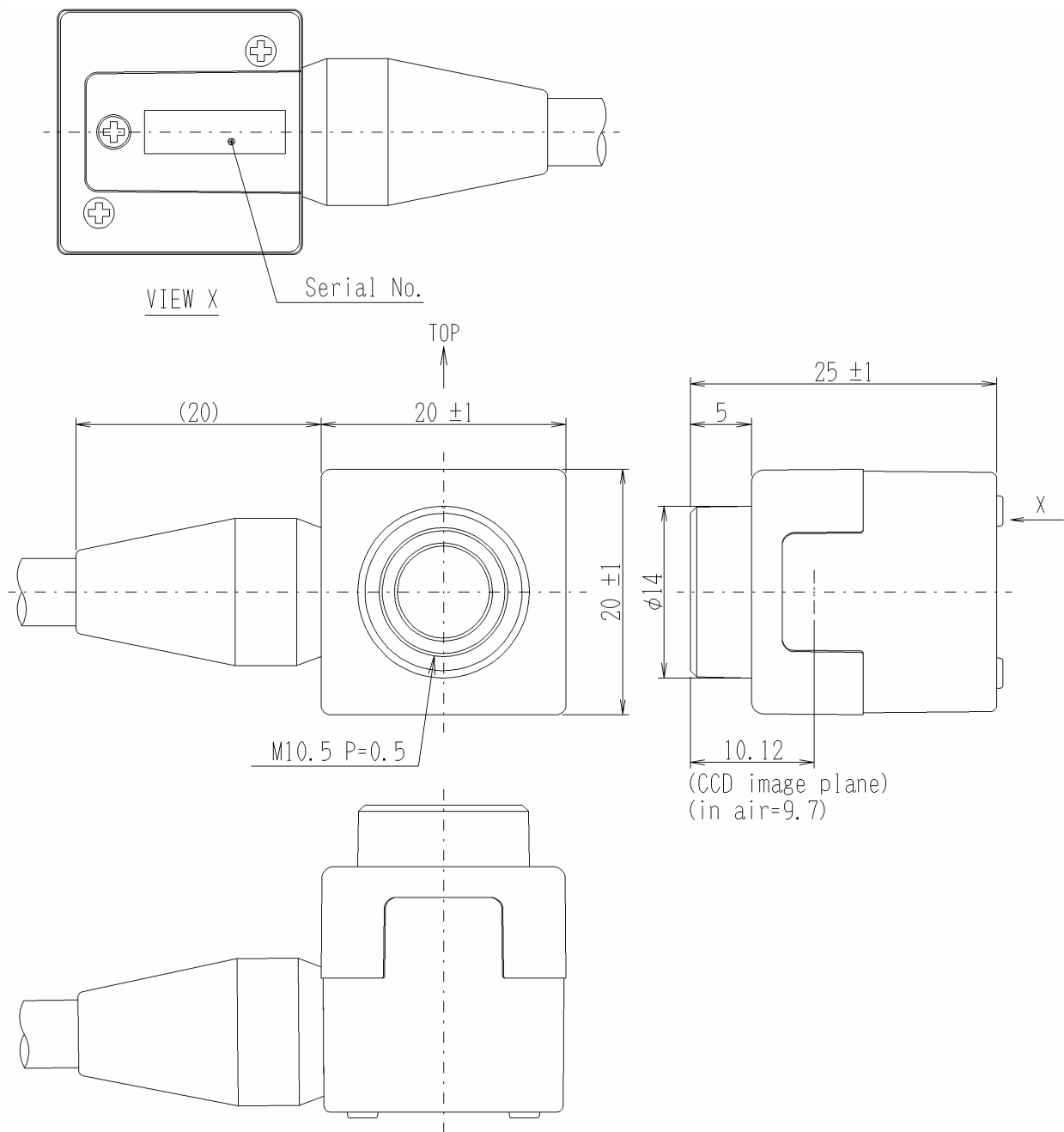
| | |
|----------------------------|---|
| Reset | Product line and Statistics |
| History Log | Recent 8 images and data of Pass / Recycle / Reject |
| Saving current parts image | Windows® Bitmap Image |
| Display | Image and Data / Data only / Nothing |

[Software Function Specifications: iWorks Label (Ver.1.2.0.0)]

| | |
|---------------------------------|--|
| Take a Picture | Taking a still or frozen picture |
| Inspection Area Settings | Setting inspection area |
| | Setting search areas |
| | Define any areas to ignore |
| Barcode Reading (Optional) | Enable / Disable |
| Barcode change | None / Change |
| Inputting Barcode Value | If applicable |
| Inspecting as Part of the Label | Enable / Disable |
| Barcode Inspection Settings | Report Every Read / Report Only If Error |
| Inspection Settings | |
| Label Locator | On / Off |
| Label Rotation Tolerance | Settable $\pm 5^\circ$ (Maximum, 1step=0.25°) |
| Acceptable Tolerance | Contrast / Failed area |
| Learning Good Parts | |
| Acceptable Tolerance | Differences |
| Forgetting Learned Images | |
| Monitoring Inspections | |
| Statistics Information | Displaying parts inspected number |
| | Displaying parts skipped number |
| | Displaying Pass / Recycle / Reject parts number |
| Processing Time | Displaying the total time take to find (search) and inspect the part |
| Inspection Information | Label Quality |
| | Angle Offset |
| | Displaying barcode string (if you enabled the barcode reader) |
| Reset | Product line and Statistics |
| History Log | Recent 8 images and data of Pass / Recycle / Reject / Learn mode |
| Display | Image and Data / Data only / Nothing |
| Saving current image | Windows® Bitmap image format (*.BMP) |

* For detailed information operating procedures, see the operation manuals.

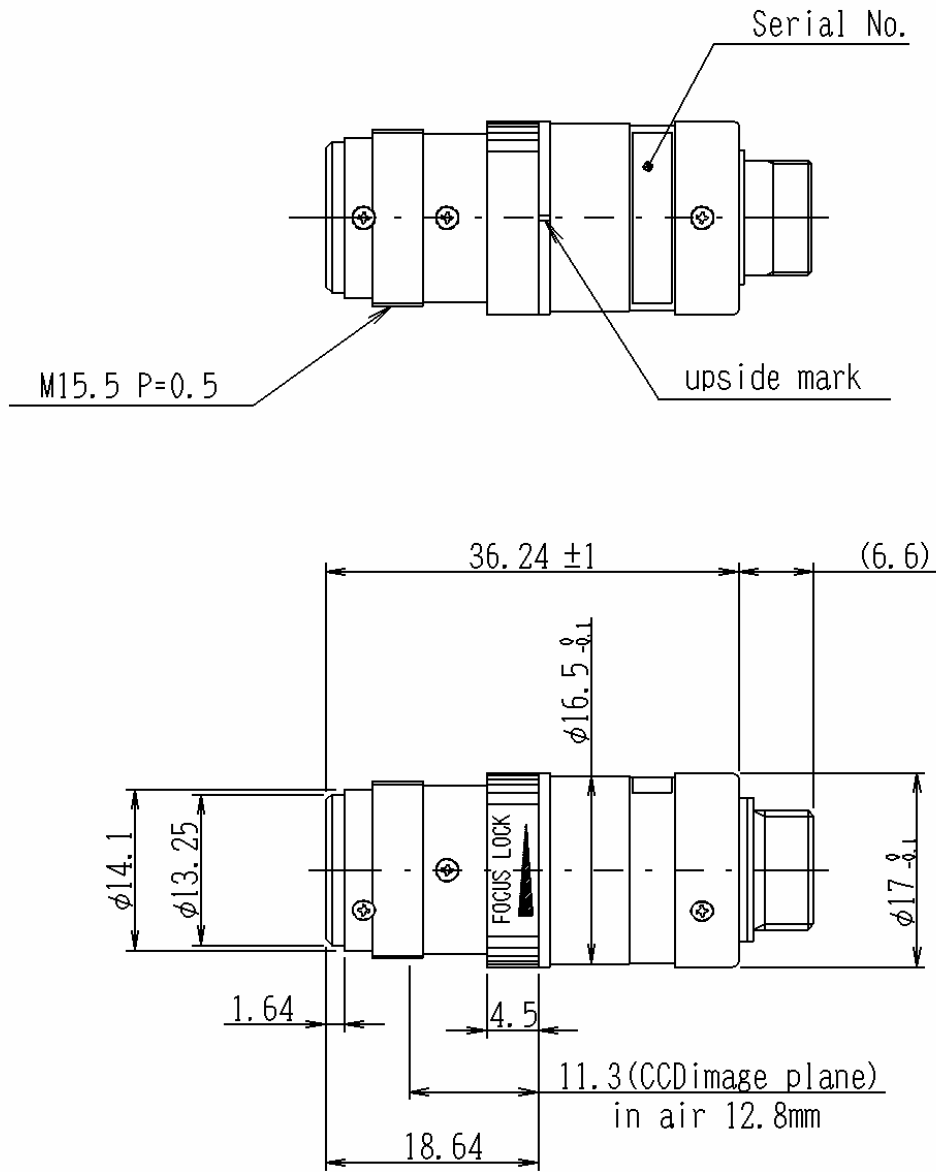
* The design and specification may change without prior notice.



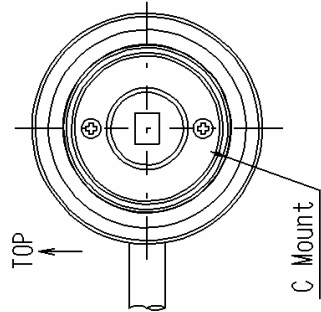
iIS-010

20mm square camera head - external view

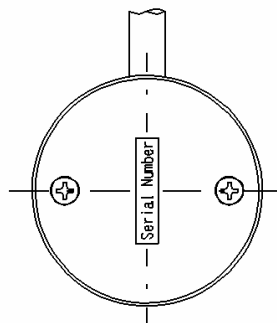
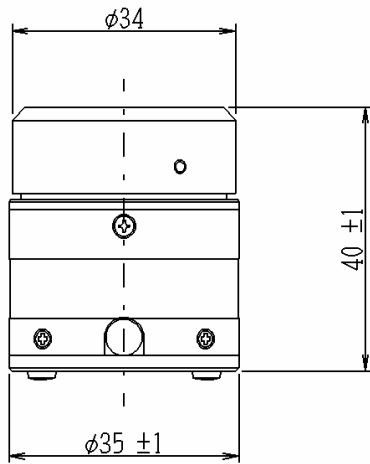
Main Material ; Anti-corrosive Aluminum
 Finish ; Black anodic oxide coating



iIS-011
 $\phi 17$ mm camera head- external view



Specification
Main Material Anti-corrosive Aluminum Alloy
Finish Black anodized aluminum (equivalent to munsell N1.5)



iIS-012

C mount camera head - external view

• Restriction For Use

- Should the equipment be used in the following conditions or environments, give consideration to safety measures and inform us of such usage:
 1. Use of the equipment in the conditions or environment contrary to those specified, or use outdoors.
 2. Use of the equipment in applications expected to cause potential hazard to people or property, which require special safety measures to be adopted.
- This product can be used under diverse operating conditions. Determination of applicability of equipment or devices concerned shall be determined after analysis or testing as necessary by the designer of such equipment or devices, or personal related to the specifications. Such designer or personal shall assure the performance and safety of the equipment or devices.
- Do NOT place your device near any noises generating source. Correct result outputs may be not obtained causes the inputted data are disturbed. Take extra precautions against electromagnetic-wave-interference if the camera is used with a servomotor, inverter, or other electromagnetic-wave-generating equipment.
- This product is not designed or manufactured to be used for control of equipment directly concerned with human life(*1) or equipment relating to maintenance of public services/functions involving factors of safety(*2). Therefore, the product shall not be used for such applications.

(*1): Equipment directly concerned with human life refer to:

Medical equipment such as life-support systems, equipment for operating theaters.

Exhaust control equipment for exhaust gases such as toxic fumes or smoke.

Equipment mandatory to be installed by various laws and regulations such as the Fire Act or Building Standard Law.

Equipment related to the above.

(*2): Equipment relating to maintenance of public service/functions involving factors of safety refer to:

Traffic control systems for air transportation, railways, roads, or marine transportation.

Equipment for nuclear power generation.

Equipment related to the above.

Although sufficient check is performed about translation of these specifications, we will apply a Japanese sentence, if a doubt should occur.

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