Warning

Do not use the Product for the safety of life or crime prevention purposes.
Do not use the Product for the safety of the automobile or other vehicles, including bikes as it may result in accidents.

The following will result in fire, electric shock, injury or damage if ignored.

- Do not touch the Product or any connected cable while taking a lightning strike.
- Do not use the Product if it is wet or damaged.
- Do not insert foreign objects in the connector or on the batteries on the vertical line during operation.
- Do not use the Product in bathrooms or any other place where it may get in contact with water.
- Do not install the Product or any connected cable with wet hands.
- Do not install the Device in a location subject to smoke or human body fluids.
- Do not disassemble, repair, or modify the Device.
- Turn the power off and stop using the Product if you notice any abnormality, including foul odor, distortion or disconnection to the Device due to using the cables that are not strong enough, and making sure they are not cracked or damaged.
- The following will result in accident or injury if ignored.

Install the Device and the cables out of reach of infants.
Store the Device out of reach of infants when not using it.
Contact emergency services if any small parts are ingested.
Do not touch sharp parts or the exposed interior of the Device that was damaged.

The contents and specifications, etc., may change without notice.

- **Term Definitions**
  - The "Product" indicates the BST-007001-010 and BST-007001-020 models. It consists of the "Device" and the "SDK". In this instruction sheet, the whole "Product" refers to the whole or a part of them.
  - The "Device" indicates the hardware component that consists of the main board, the camera board and the flexible flat cable (FFC).
  - The "SDK" consists of the demonstration software, the command specifications and other documentations concerning the "Device" or the "SDK".

**Safety Precautions**

Make sure to read these precautions for a safe use of the Product.
- The contents included is to ensure proper use of the Product and prevent harm and/or property damage to the user or other people.
- **Warnings and cautions are defined as follows.**
  - **Warning**
    - Denotes a potentially hazardous situation which, if not avoided, may result in minor, moderate or serious injury, or death. It may also result in serious damage.
  - **Caution**
    - Denotes a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or damage.
  - **Danger**
    - Indicates property damage to a building, production line, household goods, other products, livestock, pets, etc.
    - Indicates forbidden actions.
    - Indicates required actions.

**Precautions for Correct Use**

Observe the following precautions to prevent failure to operate and malfunctions. To prevent adversely affecting the performance and function of the Product.

- **Store the Device at a temperature between -30 and +70°C and a humidity level below 90%RH**.
- Do not touch the board mounted parts with bare hands. Discharge any static electricity from your body before use.
- Take proper measures against static electricity by using an antistatic wrist strap, etc., before handling the Product.
- Make sure to properly ground the connector’s earth terminal in order to prevent malfunction due to noise.
- Do not use the Product in a location where it would be subjected to direct sunlight.
- Do not use the Product in a location subject to excessive inductive or power supply noise, such as in strong magnetic or electric fields.
- Do not use the Product in a location where it would be subjected to strong UV light.
- Do not use the Product in a location where it would be subjected to radiation.
- Sufficiently evaluate the electrical characteristics of any connection to the Device.
- Make sure to properly align the connectors when connecting them.
- Avoid desorption of power supplied connectors as it will result in accidents.
- Refer to the BST-007001 Command Specifications document separately provided by OKMOMO for details on the interface specifications.
- Never use benzene, paint thinner, or any other volatile cleaning solution, detergent, beach or chemical washcloth for cleaning the Device. Take in consideration heat dissipation during the installation in order to improve its long term reliability.
- Install the Device at least 10cm away from any other surrounding charged parts.
- Install the Device making sure not to obstruct the detection range. Use transparent materials to cover and protect the front of the lens so that it should be in contact with hands or objects.
- Remove the “Device” including screws or the like if the lens should be in contact with hands or objects.
- Do not touch the camera module.
- The Product performs detection in images. As such, note that it may sometimes detect objects other than living beings, such as photographs or posters, etc.
- Note that since the Product uses a camera for detection, successful detection is not possible if the lighting brightness is too high or too low, or the camera is obstructed by hands, fingers, etc.
- Make sure to reset the Product before using it again after a power interruption or failure.
- Restart or reset the Device if data is received improperly.
- Cutting or losing power to the Device while saving the album on the flash ROM may destroy the Album data saved on it. As such, make sure to take a backup of the Album data on the Host device. Refer to the BST-007001 Command Specifications document for details.
- Do not use the USB and UART connection method simultaneously.
- Do not use the PCC connection between the main board and the camera board, and do not alter the configuration of the combination.
- Do not connect the USB connector and the fixing holes on the Device when fixing it. Make sure not to bend or break the board when fastening the screws. Apply torque appropriately for the screws.
- Do not apply stress on the Device, e.g., twists, deformations or impacts, as it may result in causing defects or degradation.
- Do not apply stress on the connector or display implementation parts when installing the Device, as it may result in causing defects or degradation.
- Do not touch sharp parts or the exposed interior of the Device that was damaged.

**Precautions for Safe Use**

Check the Product for physical damage upon opening its package. It is recommended to wear gloves when opening the package.
Follow the guidelines listed below for a safe use of the Product.

1. **Installation Environment**
   - There is potential internal deterioration and damage of internal parts of the Device.
   - Do not use the Product in conditions exceeding the ratings for temperature and humidity.
   - Do not use the Product in an environment where condensation occurs.
   - Do not use the Product in an environment subjected to water, oil or chemicals spills.
   - Do not use the Product in an environment subjected to corrosive, combustible or explosive gas.
   - Do not use the Product in an environment where dust, salt or iron powder are present.

2. **Power Supply and Wiring**
   - Make sure there is no faulty wiring of I/O terminals, etc. as this may result in fire.
   - Do not connect the DC power supply terminal to AC power.
   - Do not connect the Product to DC voltage above the rated capacity.
   - Do not connect the Product to other products.
   - Make sure to turn the Device off before removing cables.
   - Do not connect the UART connector (COM) to asynchronous method non-compliant devices.
   - Make sure to check the Device and the connect pin for distortion or physical damage before connecting or removing cables.
   - Connect a commercially available MicroUSB cable (TypeB) to the USB connector (CN9). Make sure the cable is not damaged and do not modify it.
   - Other:
     - Do not disassemble, repair or otherwise remodel the Device.
     - Treat the Product as industrial waste when disposing of it.
     - Use the M3 screws on the fixing holes on the Device when fixing it. Make sure not to bend or break the board when fastening the screws.
     - Appropriate torque should be applied for the screws.
     - Do not apply stress on the Device, e.g., twists, deformations or impacts, as it may result in causing defects or degradation.
     - Do not apply stress on the connector or display implementation parts when installing the Device, as it may result in causing defects or degradation.

**Specifications & Functions**

*Image input specifications*

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Vision 1000 / 1200 / 2400 (Type1)</td>
<td></td>
</tr>
<tr>
<td>Image format</td>
<td>CMOS</td>
<td>HDMI / AV / USB (TypeA)</td>
</tr>
<tr>
<td>System</td>
<td>Resolution (Horizontal x Vertical)</td>
<td></td>
</tr>
<tr>
<td>Separation</td>
<td>- 1080P</td>
<td>HDMI / AV / USB (TypeA)</td>
</tr>
<tr>
<td>Pixel output</td>
<td>- 720P</td>
<td>HDMI / AV / USB (TypeA)</td>
</tr>
<tr>
<td>Max. bitrate</td>
<td>- 480P</td>
<td>HDMI / AV / USB (TypeA)</td>
</tr>
</tbody>
</table>

**Host communication specifications**

<table>
<thead>
<tr>
<th>UART Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature</td>
</tr>
<tr>
<td>System</td>
</tr>
<tr>
<td>Proprietary Communication</td>
</tr>
</tbody>
</table>

**USB Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data format</td>
<td>Start: 1 bit, Data: 8 bit, Stop: 1 bit, no parity</td>
<td></td>
</tr>
<tr>
<td>Transmission code</td>
<td>- NIBB</td>
<td>(TypeB)</td>
</tr>
<tr>
<td>Transmission rate</td>
<td>1200 baud</td>
<td></td>
</tr>
</tbody>
</table>

**Angle range**

<table>
<thead>
<tr>
<th>Function</th>
<th>Angle range (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human body detection</td>
<td>+/−10°</td>
</tr>
<tr>
<td>Face detection</td>
<td>+/−10°</td>
</tr>
<tr>
<td>Face direction</td>
<td>+/−10°</td>
</tr>
<tr>
<td>Age estimation</td>
<td>+/−10°</td>
</tr>
<tr>
<td>Gender estimation</td>
<td>+/−10°</td>
</tr>
</tbody>
</table>

**Models**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Angle range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Vision Components (HVC-P2) BST-007001-010</td>
<td>Model 1</td>
<td>45° to 135°</td>
</tr>
<tr>
<td>Human Vision Components (HVC-P2) BST-007001-020</td>
<td>Model 2</td>
<td>45° to 135°</td>
</tr>
</tbody>
</table>
### External Dimensions
(Units: mm / unspecified dimension tolerance: tolerance class IT16)

<table>
<thead>
<tr>
<th>PIN number</th>
<th>Signal</th>
<th>IO</th>
<th>Board</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>I/O</td>
<td>0</td>
<td>I/O</td>
<td>I/O</td>
</tr>
<tr>
<td>3</td>
<td>Input</td>
<td>0</td>
<td>I/O</td>
<td>Input</td>
</tr>
<tr>
<td>4</td>
<td>Output</td>
<td>0</td>
<td>I/O</td>
<td>Output</td>
</tr>
<tr>
<td>5</td>
<td>Input</td>
<td>0</td>
<td>I/O</td>
<td>Input</td>
</tr>
<tr>
<td>6</td>
<td>Output</td>
<td>0</td>
<td>I/O</td>
<td>Output</td>
</tr>
<tr>
<td>7</td>
<td>Input</td>
<td>0</td>
<td>I/O</td>
<td>Input</td>
</tr>
<tr>
<td>8</td>
<td>Output</td>
<td>0</td>
<td>I/O</td>
<td>Output</td>
</tr>
<tr>
<td>9</td>
<td>Input</td>
<td>0</td>
<td>I/O</td>
<td>Input</td>
</tr>
<tr>
<td>10</td>
<td>Output</td>
<td>0</td>
<td>I/O</td>
<td>Output</td>
</tr>
</tbody>
</table>

**Pin 2**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 3**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 4**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 5**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 6**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 7**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 8**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 9**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Pin 10**  
- Input: Used as an input for Host
- Output: Used as an output from the Device to HOST

**Connector Pin Assignment**
- CN3 provides power and the UART communication interface.
- Board-side connector: SM068-SRSS-G-TB (made by JST Connectors, recommended for use)
- Housing: SRH-OSV5-5 or SRH-OSV5-6 (made by JST Connectors)
- Contact: SHH-03SGA-P0.2 (made by JST Connectors)

**Mounting Method**

- The mounting method is the same for both BST-007001-010 and BST-007001-020 models.

**Terms of Use and Disclaimer**

Omnor will see any use of the Product as an indication that you agree and will comply with the contents of these Terms of Use.

1. **Definitions**
   - In addition to the definition in "Term Definitions" section above, the terms in this section have the following meaning.
   - Software: (i) Omron's ORAP™ software, as embedded in the Device, and (ii) software included in the SDK.
   - Customer: The person or entity acquiring the Product.

2. **Customer Application**
   - Any kind from application, integration or use of the Product as a whole, to be used in a Customer Application. It is strictly forbidden to extract, copy, amend or reproduce the Software and/or to otherwise infringe Omron's intellectual property rights on the Product and/or the Software, and doing or attempting to do so may be punished by law.

3. **PRODUCT SHALL NOT BE USED IN THE FOLLOWING APPLICATIONS:**
   - Applications with stringent safety requirements, including but not limited to nuclear power control equipment, combustion equipment, aerospace equipment, railway equipment, elevator/lift equipment, amusement park equipment, medical equipment, safety devices, or any other applications that could cause danger/harm to people's body and life.

4. **Customer Application**
   - Applications which require high reliability, including but not limited to supply systems for gas, water and electricity, etc., 24 hour continuous operating systems, financial settlement systems and other applications that handle rights and property.

5. **Applications for use under severe conditions or in severe environments, including but not limited to outdoor equipment, equipment exposed to chemical contamination, equipment exposed to electromagnetic interference and equipment exposed to vibration and shocks.

6. **Applications under any conditions or environments not specifically defined in the specification.

7. **Automotive applications (including automotive applications relating to two-wheeled vehicles).

8. **Applications which aim to cause danger/harm to people's body, life, property or property, including but not limited to weapons and criminal activities.**

9. **IF THE CUSTOMER INTRODUCES, USES, OR INTEGRATES THE PRODUCT IN THE APPLICATIONS DESCRIBED IN SECTION (4)(a) to (4)(i), OMRON WILL NOT PROVIDE ANY WARRANTY FOR THE PRODUCT.**

10. **LIMITED WARRANTY AND LIMITATION OF LIABILITY**
    - ANY WARRANTY ON THE PRODUCT SHALL NOT APPLY IF THE PRODUCT IS NOT INTRODUCED, USED OR INTEGRATED IN ACCORDANCE WITH THE PRECAUTION AND DISCLAIMER STATEMENTS INCLUDED IN THIS DOCUMENT. OMRON DISCLAIMS ALL LIABILITY, TO THE EXTENT POSSIBLE BY LAW, FOR ANY AND ALL COSTS OR DAMAGES WHICH MAY ARISE IN RELATION TO THE PRODUCT OR CUSTOMER APPLICATION WHERE THE PRODUCT OR CUSTOMER APPLICATION IS INTRODUCED, INTEGRATED OR USED IN A MANNER THAT IS NON-COMPLIANT WITH THE PRECAUTION AND DISCLAIMER STATEMENTS INCLUDED IN THIS DOCUMENT.

11. **EXPORT CONTROLS**
    - The Customer shall comply with all applicable laws and regulations of relevant countries with regard to security export control, when exporting Products or providing Products to a non-resident. Omnorn may not provide customers with Products should they fail to comply with such laws and regulations.

OMRON SHALL NOT BE LIABLE FOR LOSS OF USE OR ANY OTHER SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT COSTS, EXPENSES OR DAMAGES.