OMRON

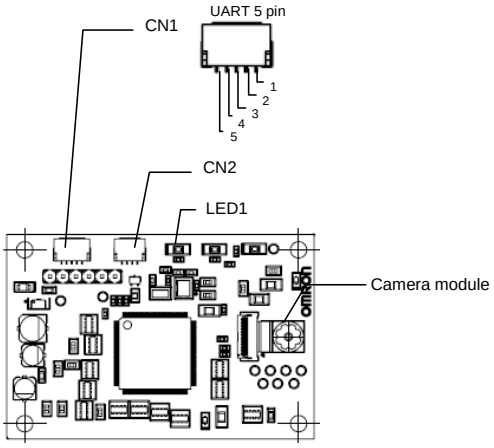
Image Sensing Component

HVC-P-S
B5T-001001-S (Sample) Model

HVC-P Sample Specification Manual

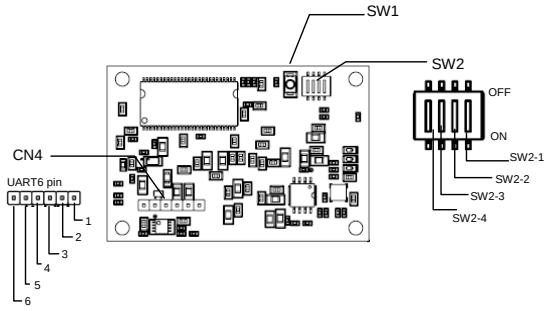
■ Parts Name and Functions

● Front



Signal	Name	Function
CN1	Connector 1	UART signal, power switch, reset input (cannot be used simultaneously with CN4)
CN2	Connector 2	Not usable
LED1	LED1	Lit when power is ON

● Back

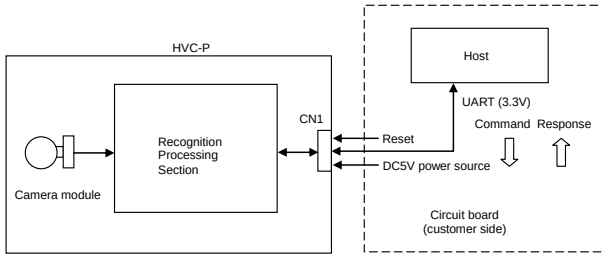


Signal	Name	Description
CN4	Connector 4	Reserved for OMRON HVC-CONV-S conversion board. (cannot be used simultaneously with CN1)
SW1	Tact switch	Reset input for HVC-P module board
SW2	DIP switch	Transmission rate setting of the UART signal (*1)

(*1): DIP Switch SW2 setting. The function of each bit is as follows:
SW2-1: Fixed to ON (Please do not set it to OFF).
SW2-2 to 2-4: Used to set the transmission rate setting of the UART signal.

Transmission rate (bps)	SW2-2	SW2-3	SW2-4
9,600	OFF	OFF	OFF
38,400	ON	OFF	OFF
115,200	OFF	ON	OFF
230,400	ON	ON	OFF
460,800	OFF	OFF	ON
921,600 (factory setting)	ON	OFF	ON

■ Block Diagram



■ Specifications and Functions

● Input Image Specifications

Item	Specifications
Resolution	640 × 480 pixels
Horizontal detection range (angle of view)	49 degrees
Vertical detection range (angle of view)	37 degrees

● Image Sensing Functions

Function	Output	Details
Human Body Detection, **Face Detection**, **Hand Detection**	・Number of detected objects ・Position (center coordinates) ・Size ・Degree of confidence	・Maximum of 35 per object type ・Coordinates on the screen from the top-left corner of the screen (in pixels) ・Pixel size on the input image ・Confidence in the detection result (0 to 1000), a higher value indicates a higher confidence
Face Direction Estimation	・Yaw angle ・Pitch angle ・Roll angle ・Degree of confidence	・Positive to the right (in degrees) ・Positive upwards (in degrees) ・Positive clockwise (in degrees) ・Confidence in the estimation result (0 to 1000), a higher value indicates a higher confidence
Gaze Estimation	・Yaw angle ・Pitch angle	・Positive to the right (in degrees) ・Positive upwards (in degrees)
Blink Estimation	・Blink degree	・Output for both eyes (1 to 1000) A higher value indicates the eye is closer to being fully shut
Age Estimation	・Age ・Degree of confidence	・0 to 75 (75 includes higher ages) ・Confidence in the estimation result (0 to 1000), a higher value indicates a higher confidence
Gender Estimation	・Gender ・Degree of confidence	・Male or female ・Confidence in the estimation result (0 to 1000), a higher value indicates a higher confidence
Expression Estimation	・Estimated expression ・Score ・Expression degree (positive or negative)	・The expression with the single highest score will be output (possible expressions are “neutral”, “happiness”, “surprise”, “anger” and “sadness”). The score indicates the likeliness of a face displaying the estimated expression, where a higher score indicates a higher likeliness of being that expression. ・The single highest score will be output from 0 to 100 ・+100 to -100 A degree closer to +100 indicates a high degree of “happiness” while a degree closer to -100 indicates a high degree of “surprise”, “anger” or “sadness”.
Face Recognition	・Individual identification result ・Score	・Displays the registered User ID, or “non-registered” for non-registered individuals Maximum number of users: 500 Maximum number of images per user: 10 ・Matching degree (the User ID of the user with the highest matching degree is output)

● Basic Performance

Function	Maximum distance (for reference)
Human Body Detection	2.8 meters
Hand Detection	1.5 meters
Face Detection, **Face Direction Estimation**, **Gaze Estimation**, **Blink Estimation**, **Age Estimation**, **Gender Estimation**, **Expression Estimation**, **Face Recognition**	1.3 meters

Caution: Please note that the detection and estimation performance will gradually fall when exceeding the maximum distance indicated for reference.

● Specifications for Signal with Host

Item	Specifications
Outline	Receives the command controlling the module from the host and sends back the detection result info
Transmission system	Full-duplex bidirectional system
Transmission protocol	Non-procedure
Synchronization system	Asynchronous method
Data format	Start: 1 bit, Data: 8 bit, Stop: 1 bit, no parity
Transmission code	NRZ, Logic Low: 0V Logic High: 3.3V
Transmission speed	Please refer to the description of the DIP Switch SW2.

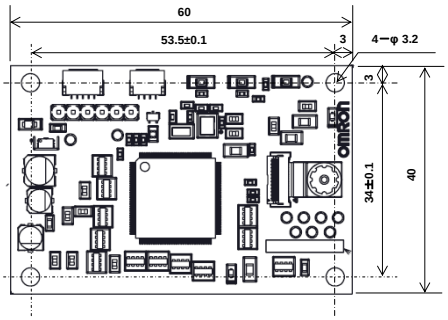
● Operating and Storage Environment

Item	Fixed value
Power supply voltage	5V ±10%
Power consumption	0.45 A
Operating temperature	0 to +50°C (no condensation or freezing)
Operating humidity	Below 90% RH (no condensation or freezing)
Storage temperature	-30 to +70°C (no condensation or freezing)
Storage humidity	Below 90% RH (no condensation or freezing)
Size	W: 60mm × H: 40mm × D: 14.2mm

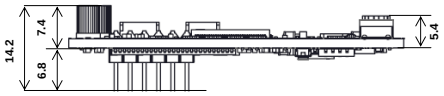
Please note that the specifications may change as the sample is still under development

■ Board Dimensions

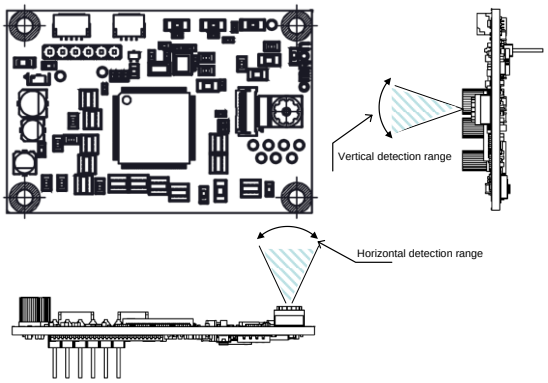
● Front



● Side

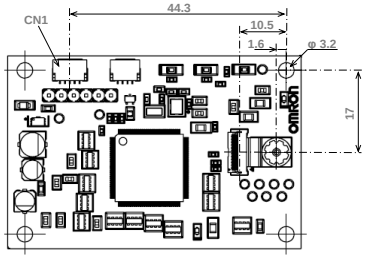


■ Image Input Detection Range

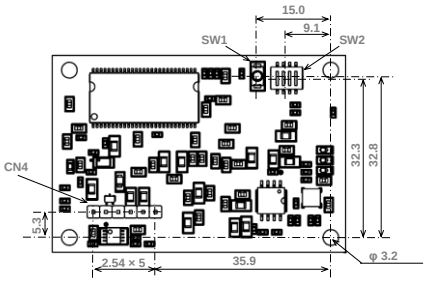


■ Component Layout Dimensions

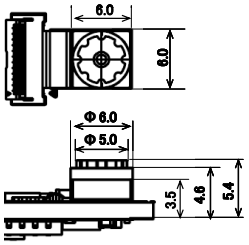
● Front

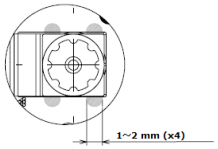


● Back



● Camera Device





Please apply the glue to fix the camera as displayed above.

■ Connector Pin Configuration

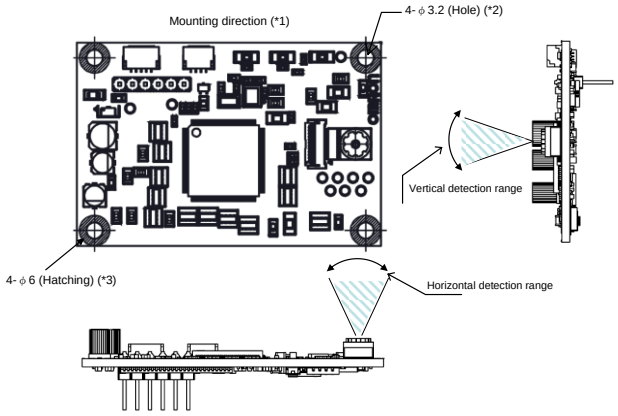
Please keep CN2 free of any connection.
CN4 is reserved for the OMRON HVC-CONV-S conversion board.
CN4 cannot be used simultaneously with CN1.

CN1 is used to connect to the power supply and the UART signal interface.
Connector: SM05B-SRSS-TB (made by J.S.T. Mfg. Co. Ltd.)

Recommended CN on the other end:
Housing: SHR-05V-S (made by J.S.T. Mfg. Co. Ltd.)
Contact: SSH-003T-P0.2 (made by J.S.T. Mfg. Co. Ltd.)

Pin number	Signal	I/O	Description
1	Vcc	Input	Power supply: 5.0V±10%
2	UART RX	Input	UART signal (from host to HVC-P) Logic 0: 0V Logic 1: 3.3V
3	UART TX	Output	UART signal (from HVC-P to host) Logic 0: 0V Logic 1: 3.3V
4	GND	-	Ground
5	RESET	Input	Reset signal (from host to HVC-P) Logic 0: 0V Logic 1: 3.3V Reset is active on logic 1

■ Mounting



(*1) This figure is for a frontal mounting direction (0°) of the module.
The software settings can be changed to reflect a 90°, 180° or 270° clockwise mounting direction from the front (0°).

(*2) Please use the M3 screws to fix the board in the four corners.
Please make sure to not bend or break the board when fixing the screws.
Please make sure to also use the tightening torques provided.
Please make sure to fix the board so that it is not warped, bent or any under unreasonable stress.
Please make sure that the board is sufficiently distanced from any electrically-conductive part.

(*3) The ϕ 6 (x4) hatching sections indicate the acceptable area for metallic components.

■ Inquiries

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