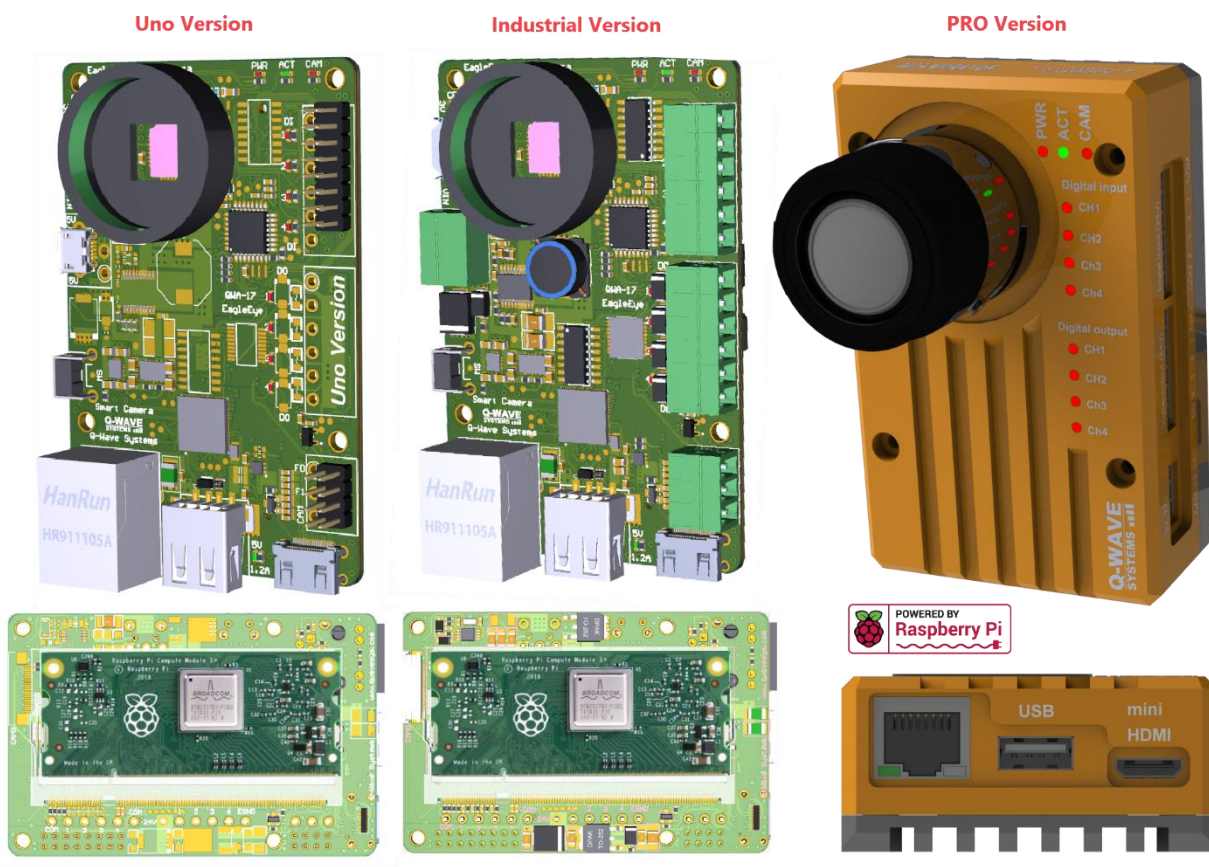# EagleEYE Smart Camera

Product Datasheet

Developer Manual

Getting Start Guide

Revision History

Revision	Date	Comment	Editor
A0.1	9/11/2019	Initial version	Amornthep Phunsin

Order Part Number

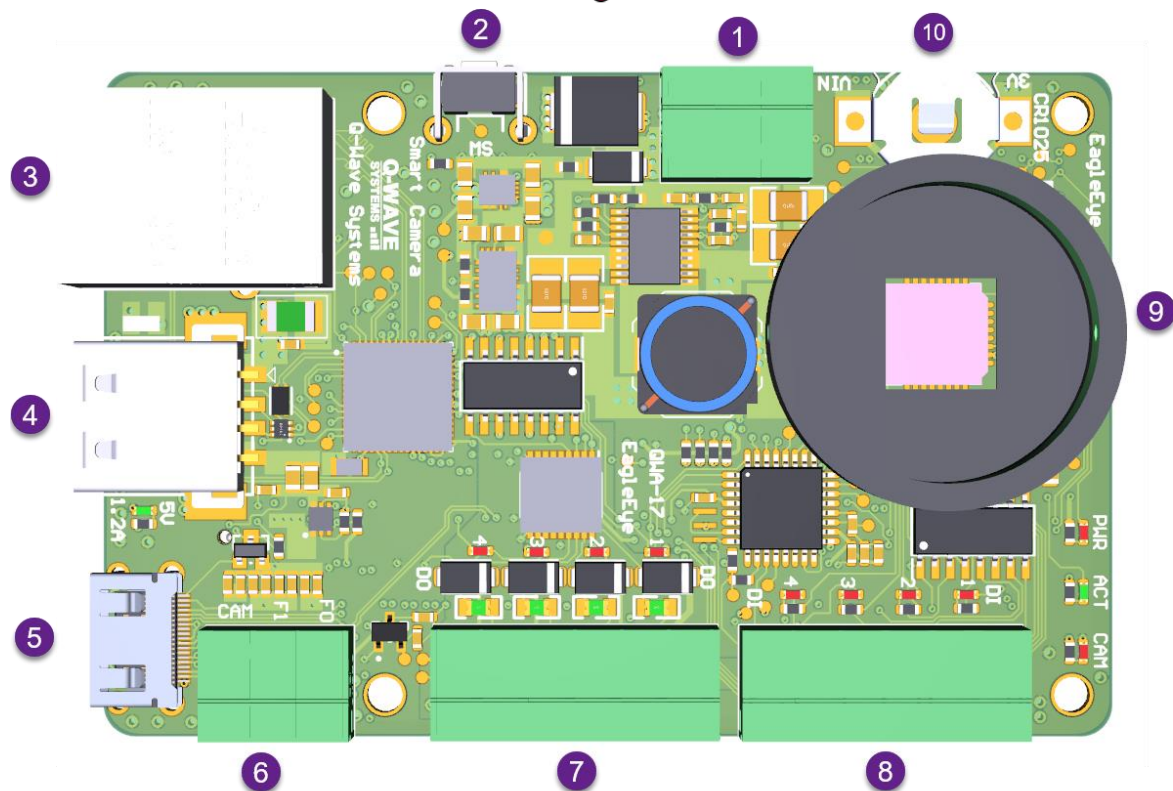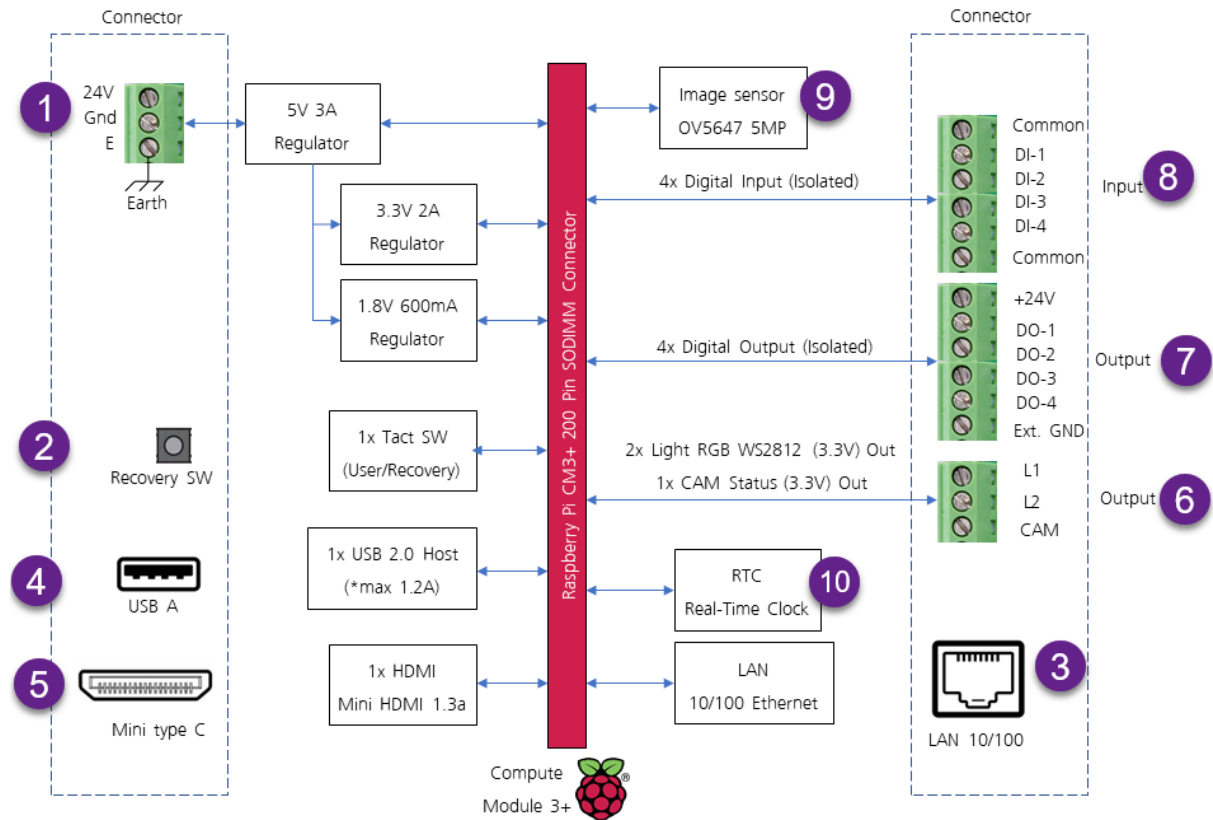| Product	P/N	Price USD/THB
EagleEYE Uno Board	EY-UNO	
EagleEYE Industrial Board	EY-IND	
Full Size Heat-sink	EY-HSK	
EagleEYE Uno+ Heat sink+"CM3+ 32GB"	EY-UNO-32	
EagleEYE Industrial+ Heat sink+"CM3+ 32GB"	EY-IND-32	
EagleEYE Pro "CM3+ 32GB"	EY-PRO-32	
EagleEYE Pro Developer Kit - Raspberry Pi CM3+ 32GB - EagleEYE Flasher CM3+ board - x1 Power supply 24V 2A - x5 Lens CS mount 4/6/8/12/5-50mm - x1 RGB 40 LEDS (WS2812) - x1 mini HDMI to HDMI cable 1m - x1 LAN 100Mbps cable 1m - x1 USB 2.0 hub 3 port Slim version - x1 USB 2.0 WiFi 2.4GHz 802.11b/g/n (150Mbit/s) - x1 Din rail clipper	EY-PRO-KIT	
EagleEYE Uno Developer Kit - Raspberry Pi CM3+ 32GB - EagleEYE Flasher CM3+ board - x1 Power supply 5V 2.5A (micro USB) - x5 Lens CS mount 4/6/8/12/5-50mm - x1 RGB 40 LEDS (WS2812) - x1 mini HDMI to HDMI cable 1m - x1 LAN 100Mbps cable 1m - x1 USB 2.0 hub 3 port Slim version - x1 USB 2.0 WiFi 2.4GHz 802.11b/g/n (150Mbit/s)	EY-UNO-KIT	

Target Application

- Embedded vision

- industrial machine vision application

- Prototype computer vision algorithm

- Image processing analysis

- AI vision machine learning

- Drones navigation systems

- Robots vision, AGV (Automated Guided Vehicles)

- ADAS (Advanced Driver Assistance System)

Product Specification

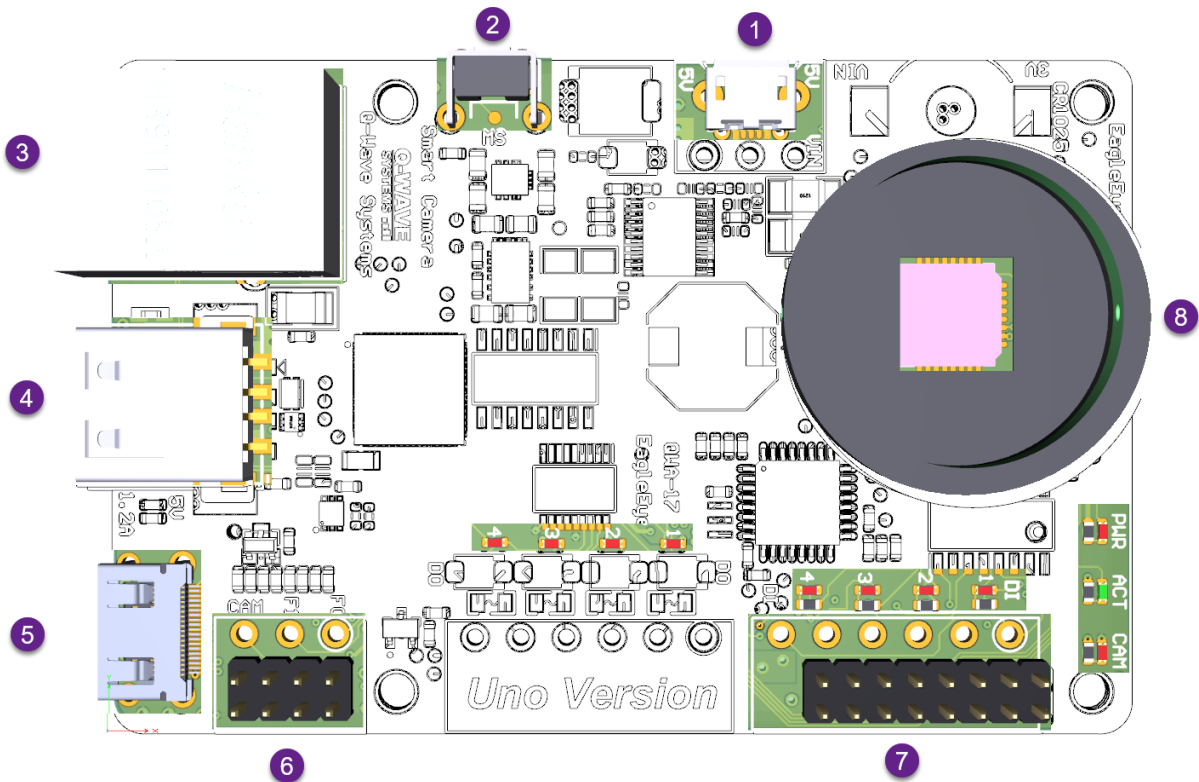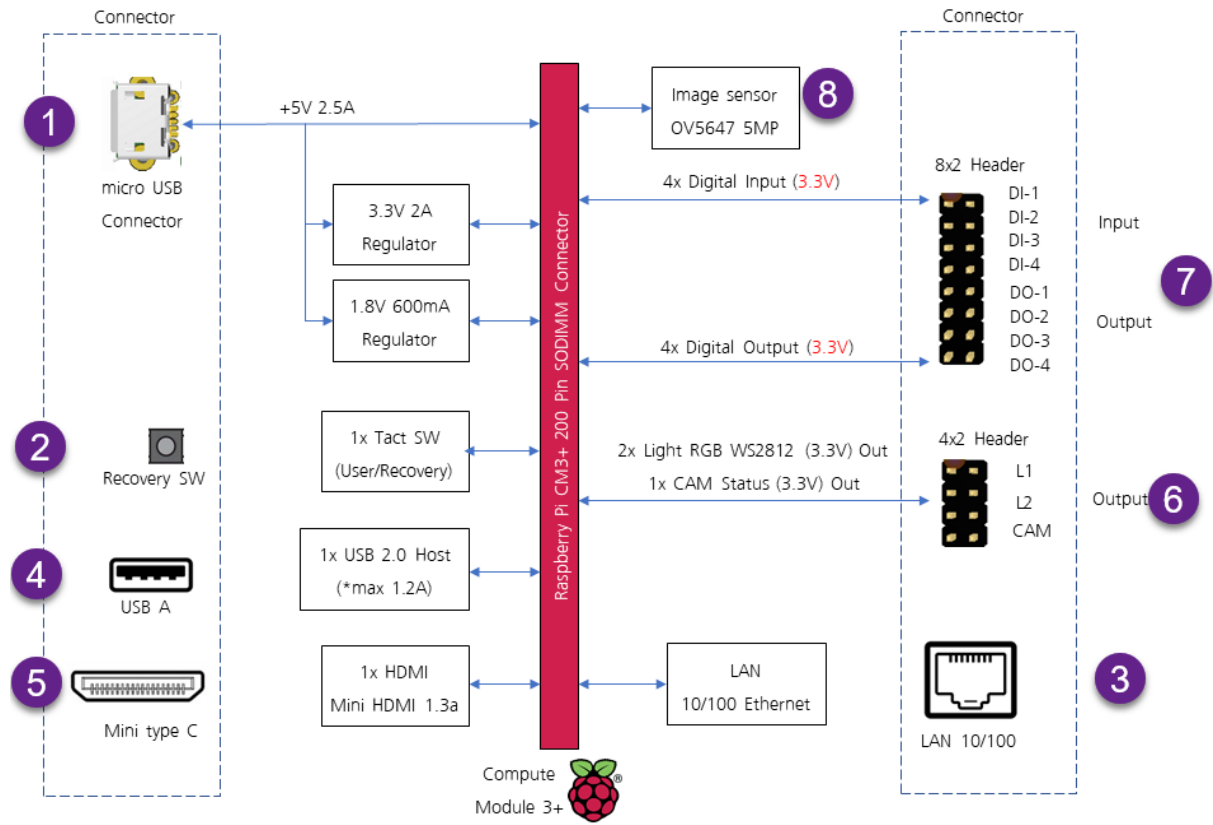| Specification	Industrial/Pro Version	Uno Version
CPU	Raspberry Pi Compute Module 3+ (CM3+) via SODIMM connector, CPU Broadcom BCM2837B0 1.2GHz quad core cortex-A53 processor, 1GB LPDDR2 RAM, eMMC 8GB/16GB/32GB flash	
Camera Sensor	5MP OV5647 1/4inchs CMOS RAW image sensor (CSI-2)	
Camera Resolution	QSXGA 2592x1944 (max), Video QVGA 320x240 @120fps (max)	
Lens Configuration	CS mount lens	
Video Output	1x Mini HDMI Port (HDMI V1.3a)	
Networking	1x 10/100M Ethernet	
USB Host	1x USB 2.0 host port up to 1.2A	
Camera Status	1x 3.3V Output (CAM)	
Light RGB Output	2x 3.3V Output (L1,L2) *Required external +5V 3A (RGB WS2812)	
Thermal Solution	Full size heat-sink (98x61mm)	
RTC	Real-Time clock onboard	-
HW Watchdog	Yes (onboard MCU)	-
Voltage Input	12V-24V Input (*min 25W)	5V 3A Input via uUSB
Circuit Protection	Polarity protection, Short circuit, Over voltage/current, Thermal shutdown	-
Temperature Range	-20 C − +85 C	0 C − +45 C
Digital Input	4x Isolated 4 Channel 24V input	4x 3.3V via GPIO header
Digital Output	4x Isolated 4 Channel 24V Output (Required external +24V supply)	4x 3.3V via GPIO header (*50mA total)
Dimension (W/L/H)	Board size 85x56x19.5mm	Board size 85x56x19.5mm
Weight	-	-
Dimension(heatsink)	with heat-sink 98x61x31mm	with heat-sink 98x61x28mm
Power Consumption	25W (max)	15W (max)
Software	Standard Raspbian OS, OpenCV, C++ and Python	

Block Diagram

EagleEYE Industrial version

Pro Version (Industrial Version + Enclosure+ Heat-sink)

EagleEYE Uno version

Connector

+5V 2.5A

1 micro USB Connector

Image sensor OV5647 5MP **8**

3.3V 2A Regulator

1.8V 600mA Regulator

4x Digital Input (3.3V)

Connector

8x2 Header
DI-1
DI-2
DI-3
DI-4
DO-1
DO-2
DO-3
DO-4

Input

Output

7

4x Digital Output (3.3V)

2 Recovery SW

1x Tact SW (User/Recovery)

2x Light RGB WS2812 (3.3V) Out
1x CAM Status (3.3V) Out

4x2 Header
L1
L2
CAM

Output **6**

4 USB A

1x USB 2.0 Host (*max 1.2A)

5 Mini type C

1x HDMI
Mini HDMI 1.3a

LAN
10/100 Ethernet

LAN 10/100 **3**

Raspberry Pi CM3+ 200 Pin SODIMM Connector

Compute Module 3+

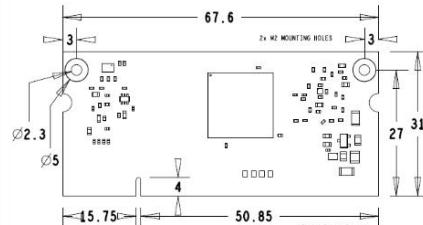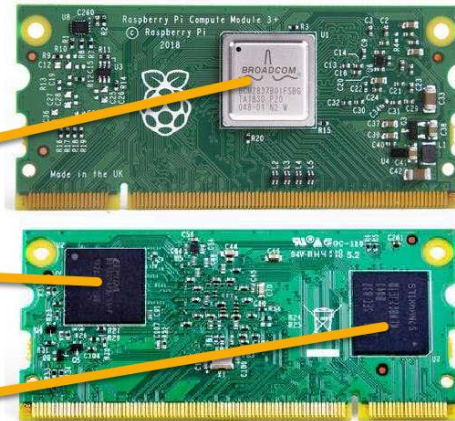## Raspberry Pi Compute Module 3+ (CM3+) Specification
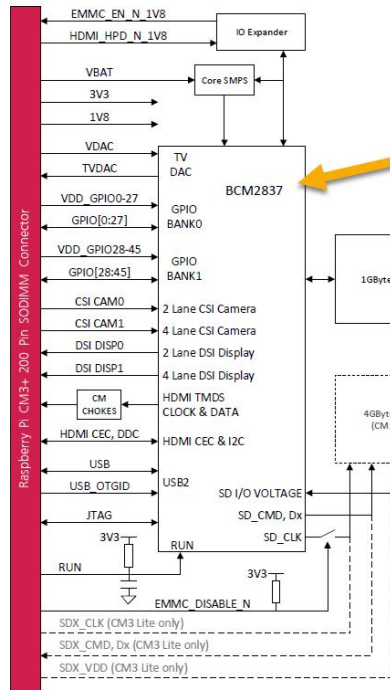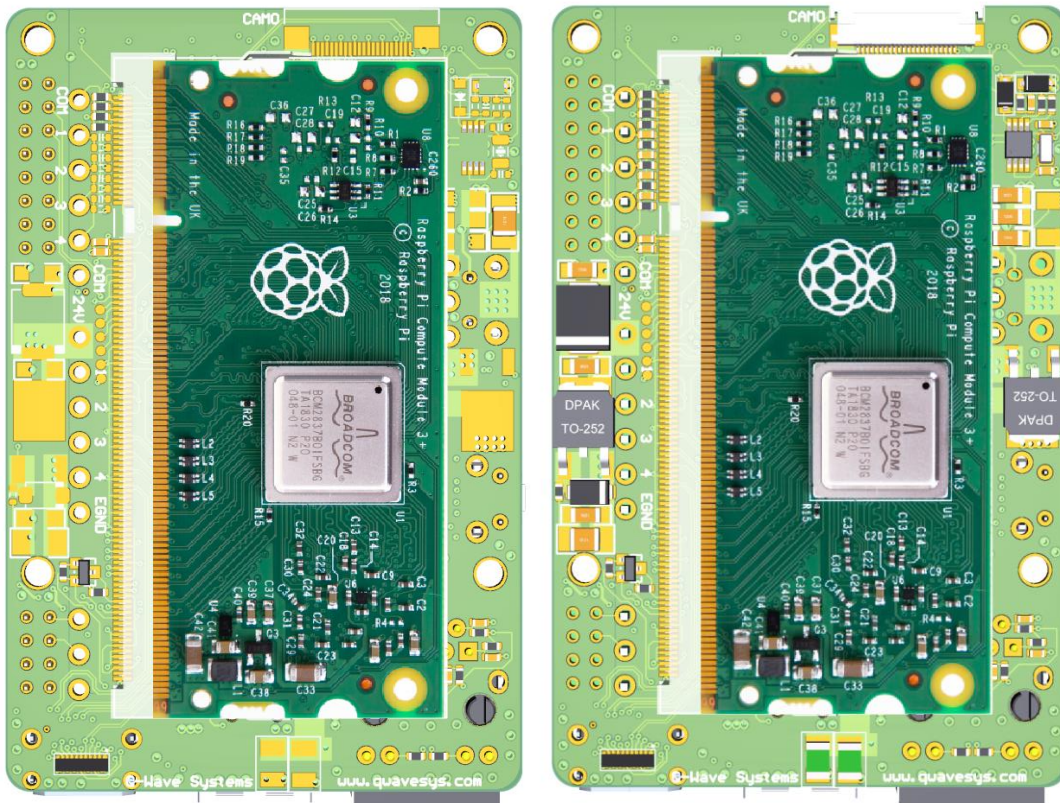

Figure 2: CM3/CM3L Block Diagram

Figure 4: CM3 and CM3L Mechanical Dimensions

EagleEYE and Raspberry Pi CM3+ Interface Board view

Left (Uno), Right (Industrial)

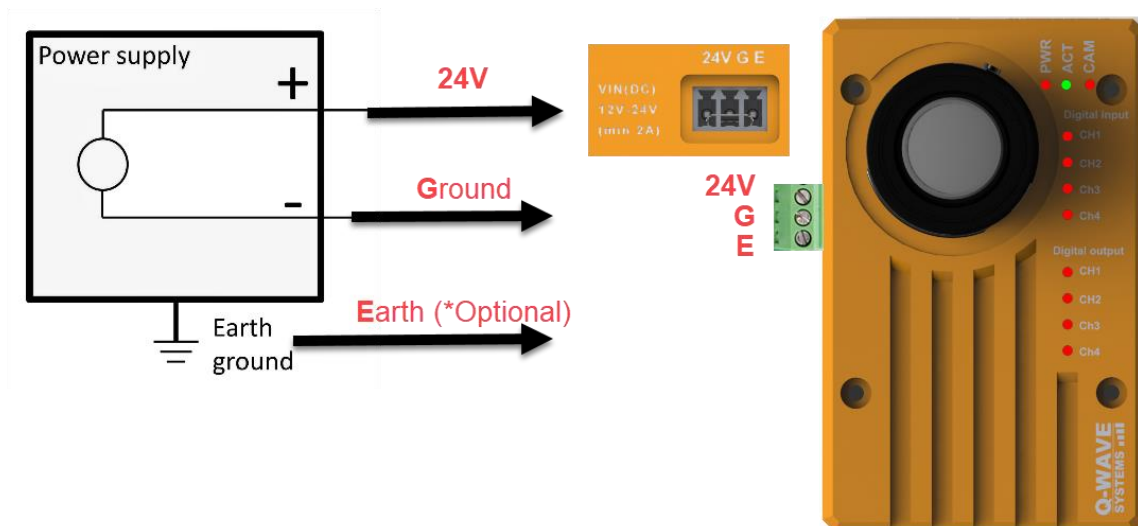Dimension

Update OS via EagleEYE Flasher CM3+ board

Power Supply Connection Diagram

Industrial/Pro version:

Power Requirement: 25W Power supply

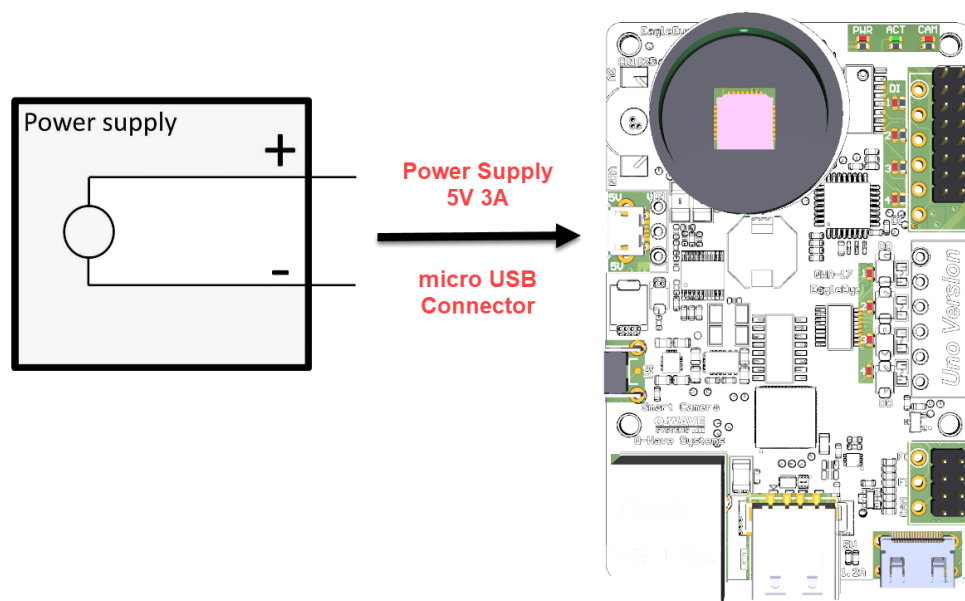Vin support range: 5.5V-35V

Typical: 12V or 24V (2A)

Uno version:

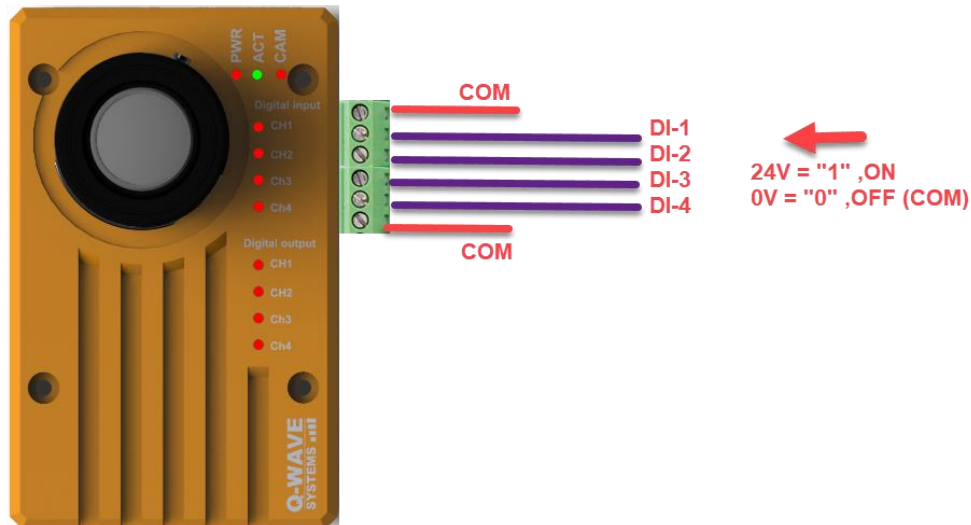Power Requirement: 15W Power supply

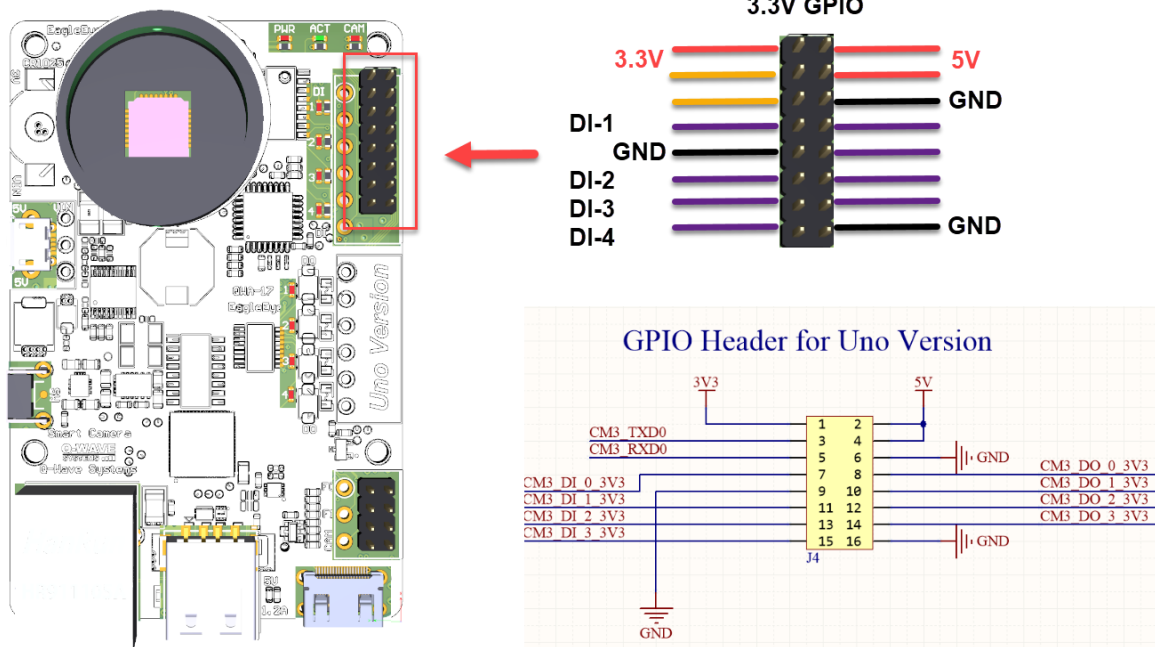Vin support range: 4.75V-5.25V

Typical: 5V 3A

Digital Input Connection Diagram
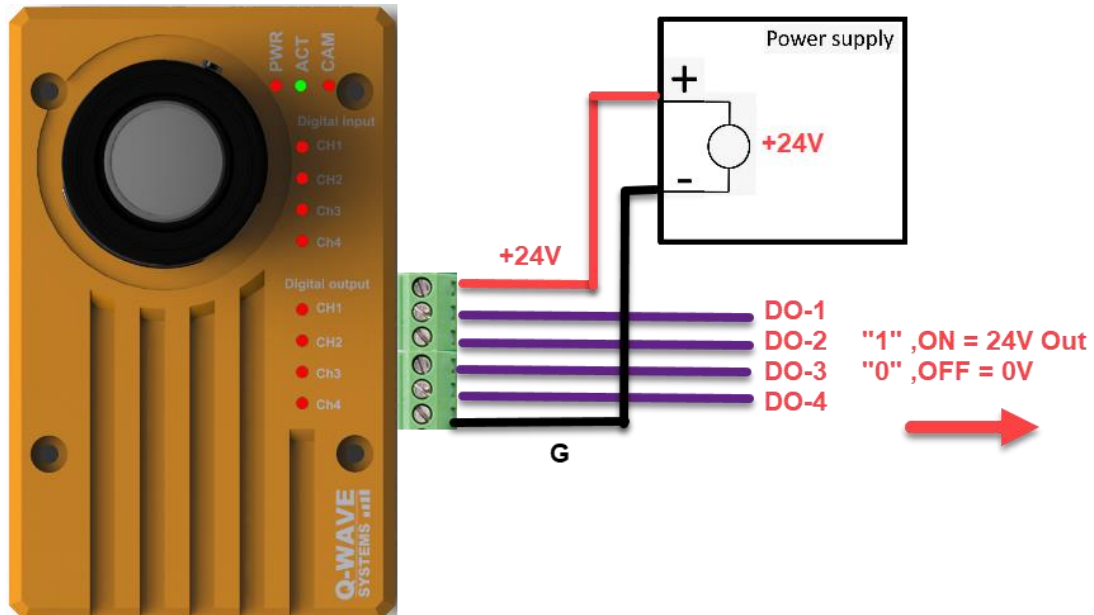
Industrial/Pro version: Digital Input 4 CH Isolate

COM

DI-1
DI-2
DI-3
DI-4

24V = "1" ,ON
0V = "0" ,OFF (COM)

COM

Uno version: 3.3V Input Only

3.3V GPIO

3.3V — 5V

GND
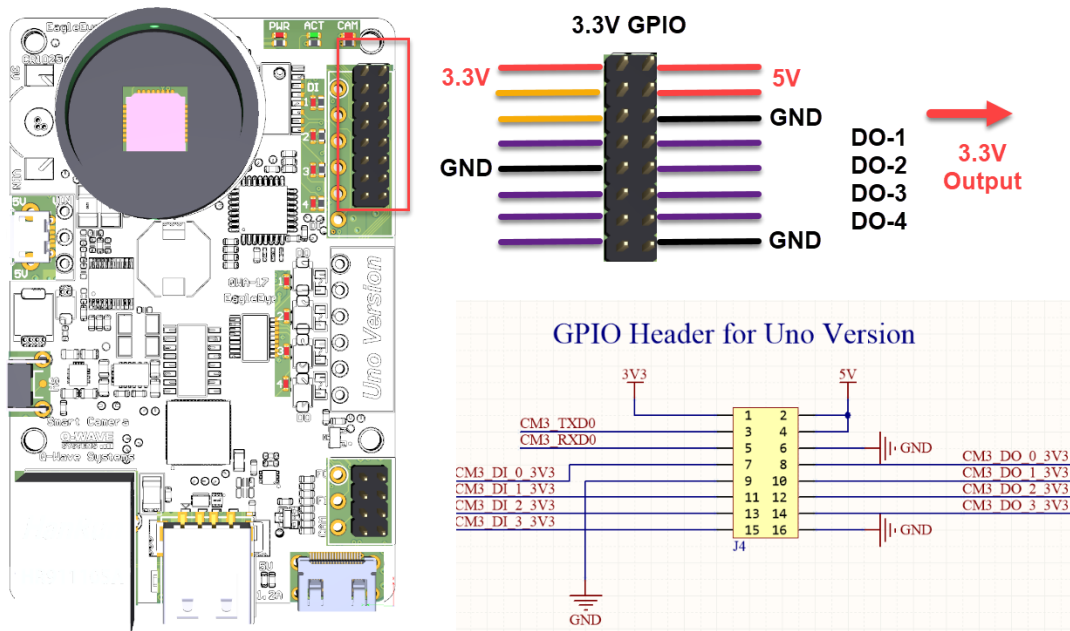
DI-1
GND
DI-2
DI-3
DI-4 — GND

GPIO Header for Uno Version

Digital Output Connection Diagram

Industrial/Pro version: Digital Output 4 CH Isolate

Uno version: 3.3V Output Only (*total 50mA max)

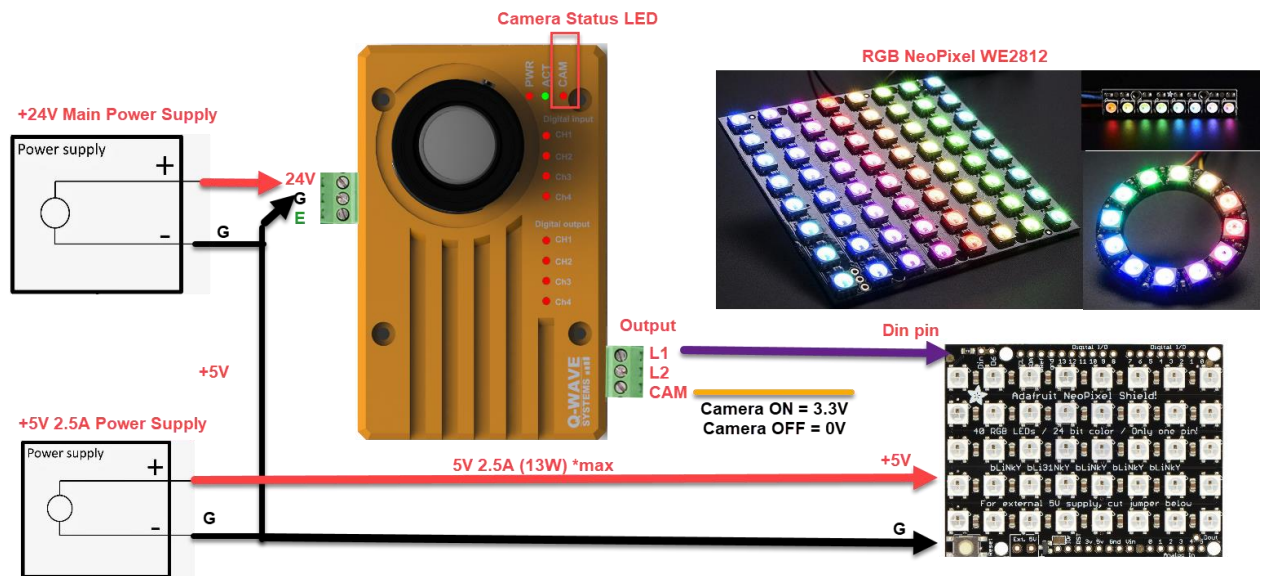CAM status and Light Source Output: RGB (WS2812) Connection Diagram

CAM: 3.3V Output. If camera is ON this pin = 3.3V. If camera is OFF = 0V
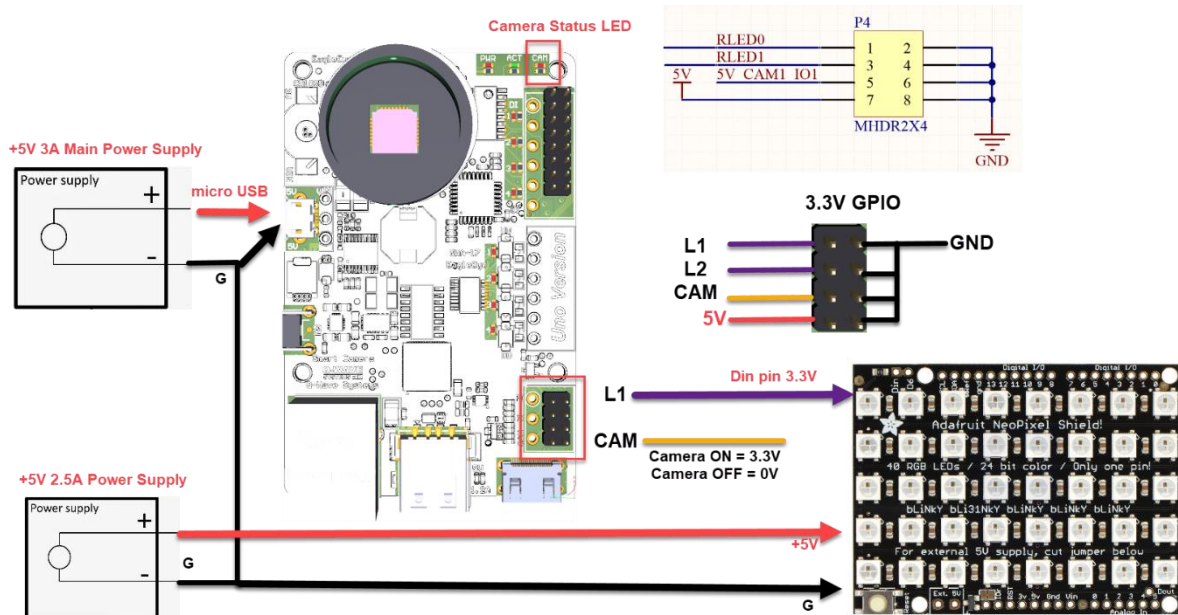
L1: 3.3V Output (RGB WS2812)

L2: 3.3V Output (RGB WS2812)

***L1 and L2 can NOT use both at the same time.

Industrial/Pro version: 3.3V Output

Uno version: 3.3V Output

Getting Start Guide

Once received Smart Camera you can experience with shipped demo program by connect power supply (+24V for Industrial/Pro version or +5V USB power supply for Uno version) then connect HDMI cable to monitor. The boot period will be around 15s-20sec for the first time.

The "ACT" (Green) LED indicated that the board is running normally.
The "PWR" (Red) LED indicated that power supply input status.
The "CAM" (Red) LED indicated that camera status ON/OFF.
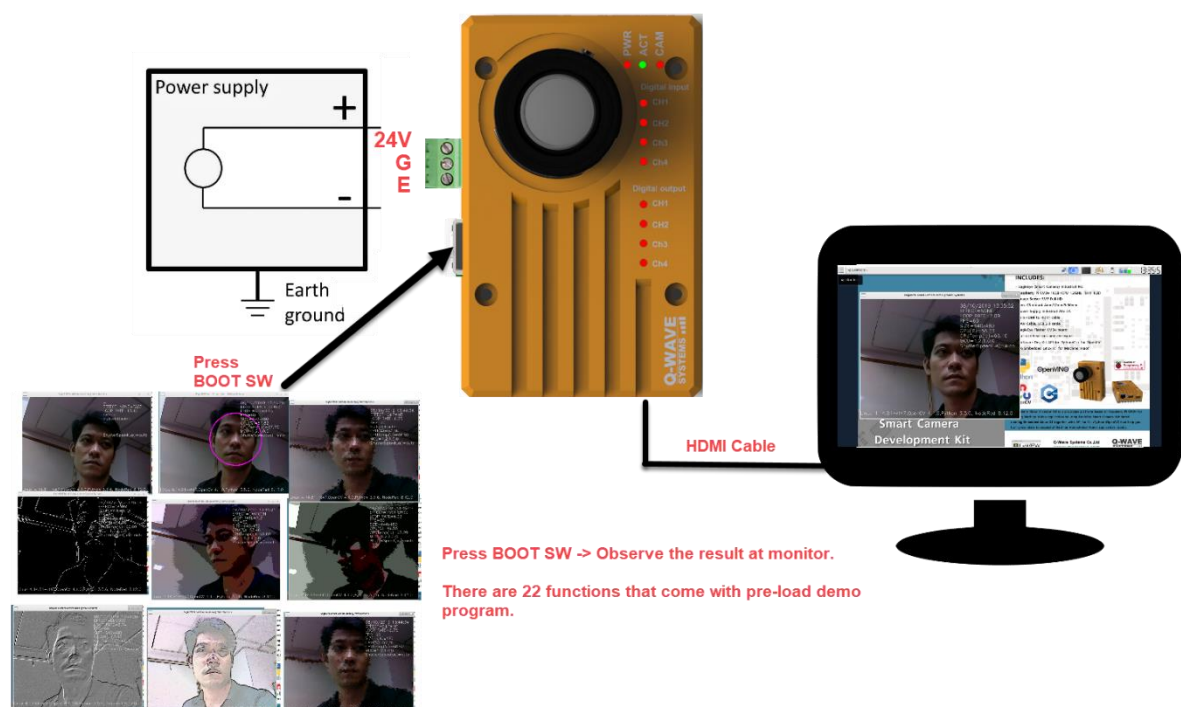
The demo program will be check "BOOT SW" status, Once button has pressed the effect will change accordingly, There will be 22 effect display at monitor screen.

At the screen will also display pre-load software, library version for example.

- Linux Kernel version: 4.14.81
- OpenCV: 4.1.0
- Python: 3.5.6
- NodeRed: 8.12.0

Running demo program without HDMI monitor