

Industrial Raspberry Pi Catalog

VOL.1



Make a world first with the Industrial Raspberry Pi.
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Industrial Raspberry Pi PL-R4 Series

• Industrial PC with CM4 compatible with general Raspberry Pi

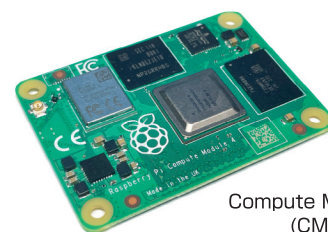
PL-R4 is an industrial Raspberry Pi with a built-in genuine Compute Module 4 (CM4) for embedded use, equivalent to the general Raspberry Pi 4B. The core components, such as the CPU and memory, are the same as in a the general Raspberry Pi 4B. PL-R4 can be used with the Raspberry Pi OS, programs and libraries, cameras, sensors and other devices released for Raspberry Pi. This makes it easy to introduce the system from development to the field.

• Robustness for industrial applications

PL-R4 is designed for installation in factories and production sites with harsh environments. Industrial components are also used for the core peripherals, with a 24 VDC power supply, vibration/shock resistance to enable installation on moving vehicles, high noise immunity and hardware watchdog... etc.

For general Raspberry Pi use in business, storing images on a SD card tends to be a bottleneck in terms of durability and reliability. PL-R4 writes images to the CM4's onboard eMMC and does not use an SD card for boot, eliminating such problems.

PL-R4 also solves the heat problem that often causes Raspberry Pi to malfunction with its excellent heat dissipating aluminium chassis. The entire case acts as a heat sink, enabling stable long-term continuous operation. Operates over a wide temperature range of -20 to 60° C.



Compute Module 4 (CM4)

Metal housing

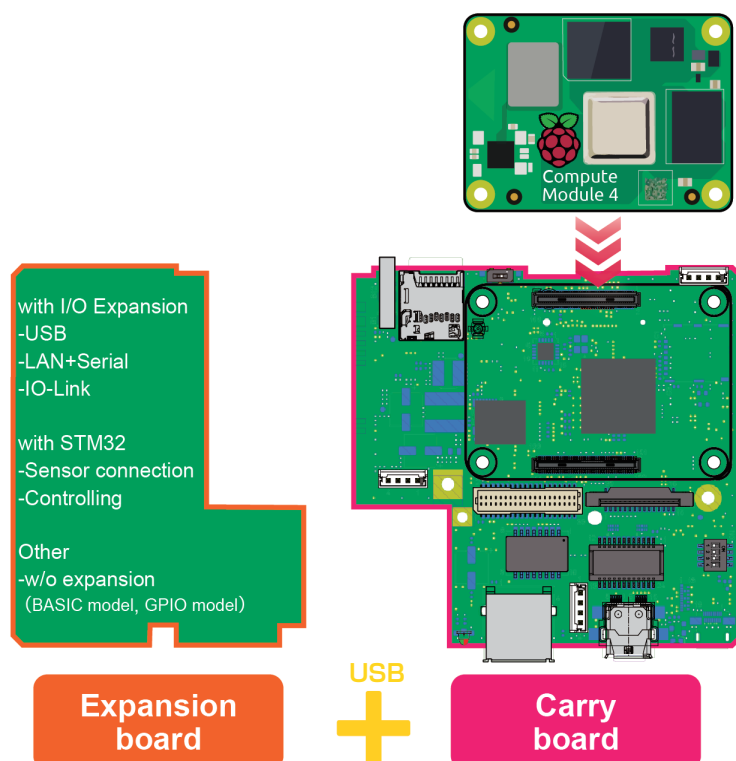


More scalability for the Industrial Raspberry Pi

• Custom Expansion Board

PL-R4 has a unique structure in which two boards are connected inside the housing: a carry board [right] that houses the CM4, and a custom board [left] for expansion. The custom board can be used to add the interfaces required for the connected equipment, devices and communications, as well as the microcontroller required for AD conversion and high-speed sampling of sensor values. The custom board is powered by either 5.0 VDC or 24 VDC from the carrier board.

There are currently five types of custom boards in the range, with three interface types - USB, IO-Link and LAN+Serial - and two STM32 microcontroller types for controlling accelerometers, AGVs, etc. We can also develop new custom expansion boards to meet your unique specifications at a low initial cost.



• M.2 slot expansion [SSD / LTE / AI accelerator]

The M.2 slot on the back of the Carry Board allows additional NVMe storage [high capacity SSD], WWAN [LTE] or AI accelerators to be added.

Back side



*M.2 slot B-key x1

Front side of the carry board

The PL-R4 carry board, which carries the Raspberry Pi CM4, is also designed with industrial-grade components around the core. The interfaces and DIP switches common to each model are implemented on it.

SD Memory

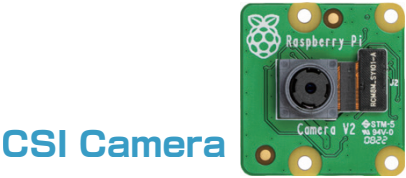
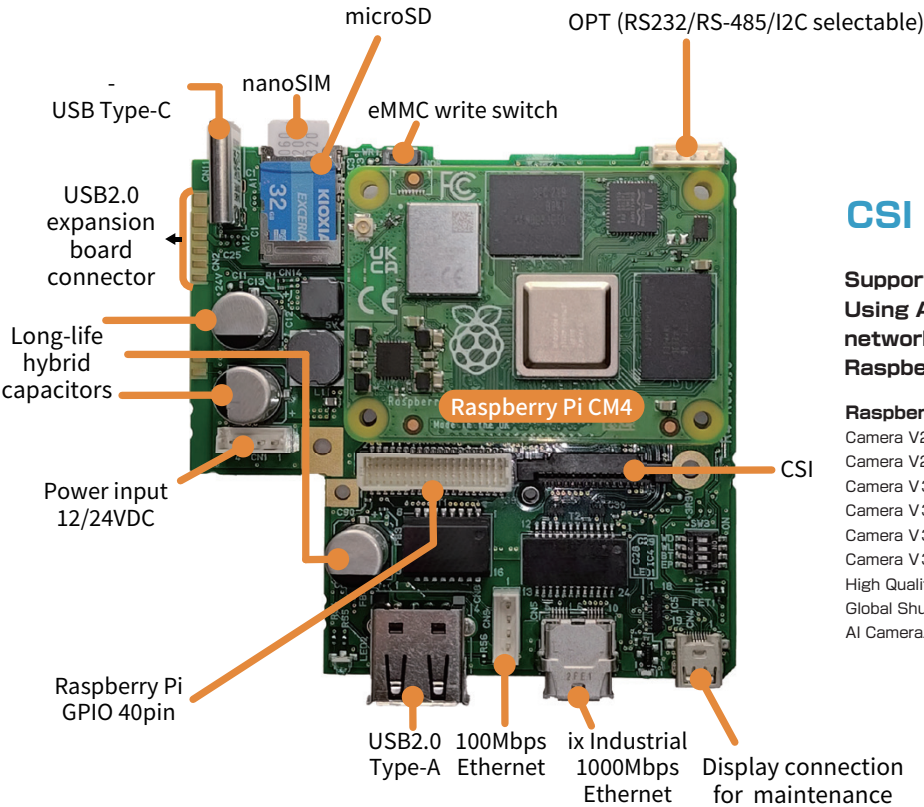
Micro SD slot for data storage.

By placing the system on an internal eMMC or SSD, MicroSD can be used as the user's data area.

Serial Communication

Can be connected to various peripherals such as RS232C, RS485 and I2C!

Modbus RTU with EIA signal level and various I2C sensors with 3.3 V level can be connected.



CSI Camera

Supports a wide range of camera modules! Using AI cameras can support different neural network models without burdening the Raspberry Pi itself.

Raspberry camera module / Raspberry Pi Foundation

- Camera V2/SC0023/ IMX219, 8MP/-20~60°C
- Camera V2 NOIR/SC0024/ IMX219, 8MP/-20~60°C
- Camera V3/SC0872/ IMX708, 11.9MP/0~50°C
- Camera V3 NOIR/SC0873/ IMX708, 11.9MP/0~50°C
- Camera V3 Wide/SC0874/ IMX708, 11.9MP/0~50°C
- Camera V3 Wide NoIR/SC0875/ IMX708, 11.9MP/0~50°C
- High Quality Camera/SC0261/ IMX477, 12.3MP/0~50°C
- Global Shutter Camera/SC0715/IMX296, 1.58MP/0~50°C
- AI Camera/SC1174/IMX500, 12.3MP/0~50°C

Raspberry Pi GPIO

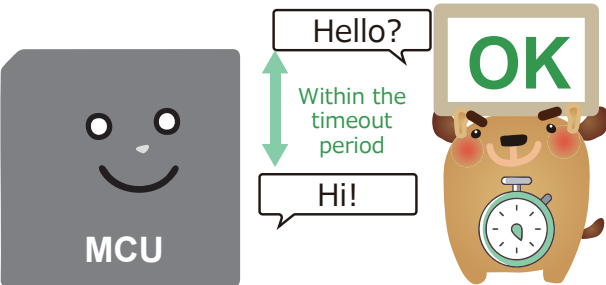
Pin compatible with standard Raspberry Pi Equipped with 40 pin connector. Various SPI/I2C extensions available!

RasPi GPIO40pin
(Same pin assignment as Raspi 40-pin. BM40B-SRDS-G-TF)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
3.3V	5V	GPIO2	GPIO3	5V	GPIO4	GPIO5	GPIO6	GPIO7	GPIO8	GPIO9	GPIO10	GPIO11	GPIO12	GPIO13	GPIO14	GPIO15	GPIO16	GPIO17	GPIO18	GPIO19	GPIO20	GPIO21	GPIO22	GPIO23	GPIO24	GPIO25	GPIO26	GPIO27	GPIO28	GPIO29	GPIO30	GPIO31	GPIO32	GPIO33	GPIO34	GPIO35	GPIO36	GPIO37	GPIO38	GPIO39	GPIO40

Watchdog IC

General Raspberry Pi uses internal WD, while PL-R4 is equipped with external WD to ensure safe operation!



Back side of the carry board

There is an M.2 expansion slot [B-key] on the back of the Carry Board for additional modules such as 4G/LTE communication, NVMe storage [SSD] and AI accelerators.

4G/LTE module

Industrial grade IoT module

EM7431 / Sierra Wireless

- 4G LTE
 - 3G
 - Speed
 - Cellular carriers
 - Location based service
 - Interface
 - Size
 - Operation temperature
- Category : Cat-7
 Band : B1/3/5/8/18/19/39/B41/B42/B43
 HSPA+ : B1/5/6/19
 Peak download speed : 300Mbps
 Peak upload speed : 150Mbps
 NTT Docomo, KDDI, Softbank
 Satellite systems : Galileo, Glonass, GPS, BeiDou
 M.2 B-key USB 3.0, USB 2.0 High Speed
 42x30x2.3mm
 -40 ~ 85°C



Security Chip

Supports encryption and secure boot

cryptographic coprocessor ATECC608B / Microchip



OPT port power output selector (solder jumper)

- 5V
- 3.3V

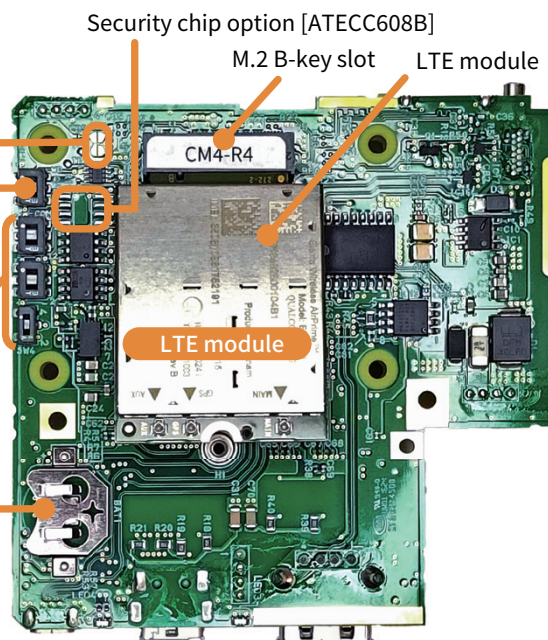
Hardware watch dog / CSI selection switch

SW1:GPIO44,45 select
 ON*:Watchdog *Default setting
 OFF:CSI(i2c)

OPT port communication selection switch

SW6:i2c/COM select 1 ON
 ON:COM
 OFF:i2c
 SW5:RS select 1 ON
 ON:RS-485
 OFF:RS-232
 SW4:COM select 1 ON
 ON:RS-485
 OFF:RS-232

Battery
 BR1225 or CR1225



Battery Backup RTC

Clock data is backed up by the battery when the power is OFF.

AI accelerator

An AI-powered chip with up to 26 TOPS.

fully integrated with Raspberry Pi's camera software stack
 Accelerates deep models



M.2 Key B+M 2280 ET
 HM218B1C2ZAE/Hailo

SSD Storage

NVMe can be used.

Significantly faster than SATA!



PCIe 2242 M.2 SSD

MTE452T2 model / Transcend

TS512GMTE452T2... 512GB
 TS256GMTE452T2... 256GB
 TS128GMTE452T2... 128GB

MTE460T model / Transcend

TS1TMTE460T... 1TB
 TS512GMTE460T... 512GB
 TS256GMTE460T... 256GB
 TS128GMTE460T... 128GB

PL-R4 BASIC IP20



Picture



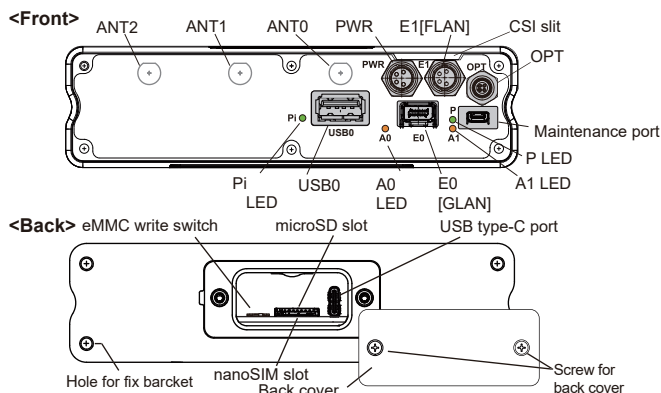
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR : Power input, 2-line
	2x LAN : FLAN 1ch, GLAN 1ch
	1x OPT*1 : i2c/RS-232/485 selectable
Back	1x USB : USB2.0 Host Type-A
	1x Maintenance :Maintenance port(reserved)
	[Option]1x WLAN IEEE 802.11 b/g/n/ac, Bluetooth 5.0, BLE
	[Option]1x LTE(M.2 slot/EM7431)
Internal	1x USB-C : USB Type-C(eMMC writing only)
	1x SW : eMMC write switch
	1x microSD : microSD slot
	1x M.2 slot B-key*2, 1x nanoSIM slot
LED, Button	P: Power status, A0,1: LAN status
	Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	BASIC:DC10.7V...28.8V/ 12W(incl.USB 500mA x1)
Temperature	Operating Temp.: -20...60°C, Storage:-25...85°C
Humidity	Operating Humi.:0...95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	BASIC:Approx.540g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2 Radio frequency electromagnetic fields EN 61000-4-3 Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Option)

*1: Speed is variable, but data bit 8, parity N, and stop bit 1 are fixed.

*2: This is not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

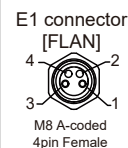
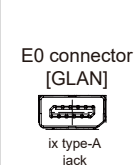
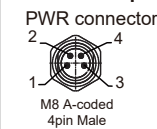


Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- Internal M.2 slot for SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

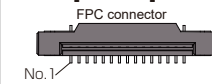
<Connector pin layout>



<LED>

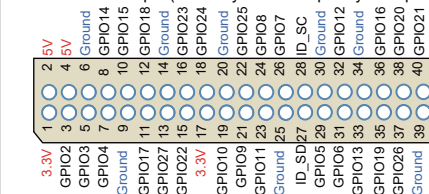
LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	BK	E0 active
A1(OR)	BK	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<CSI>[Internal]

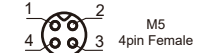


<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)



OPT connector



Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.

<ANT SMA port> [Option]

LED	Sts.	Comments	Type	ANT2	ANT1	ANT0
P(GR)	Off	No power supply	Wired LAN	---	---	---
	On	Power OK	Wired LAN+LTE	Main	GNSS	Aux
A0(OR)	BK	E0 active	Wired LAN+Wireless LAN	WL/BT	---	---
A1(OR)	BK	E1 active	Wired LAN+Wireless LAN+LTE	Main	GNSS	WL/BT
Pi(RD)	Off	WD Normal				
	On	WD Error				
Pi(GR)	Off	User OFF				
	On	User ON				

Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPIO45]
6	CAM1_D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

! The GPIOs of CM4 are 3.3V level.

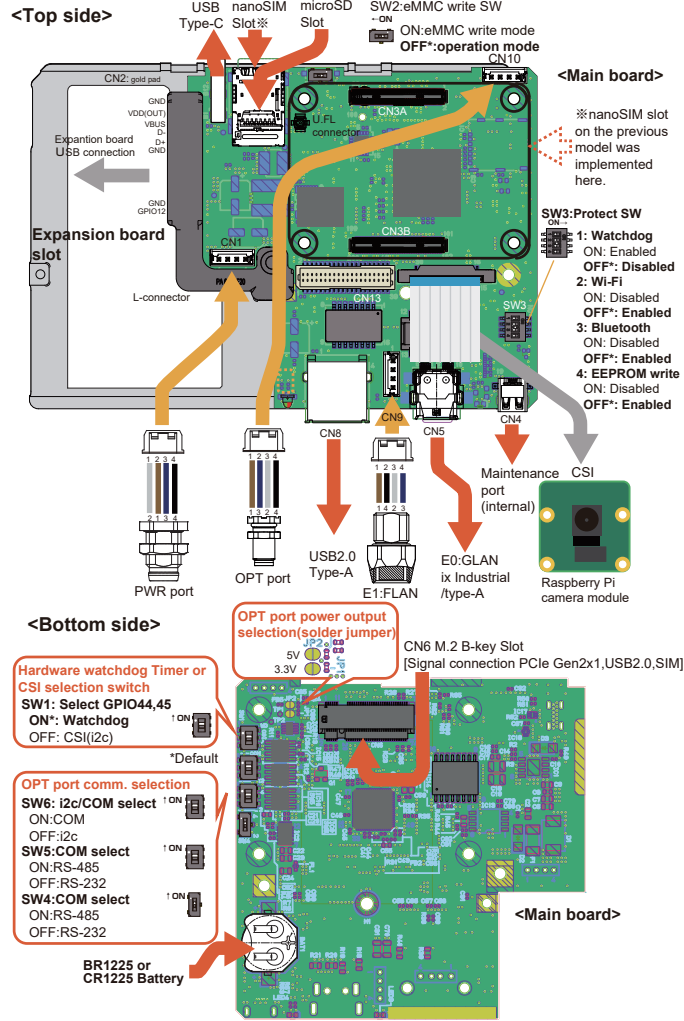
The total GPIO load is up to 50mA. For detailed specifications, please refer to the CM4 datasheet.

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 BASIC IP20

Internal details



Device List

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c0-0/0x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c0-0/-	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI:i2c	CM4/GPI44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

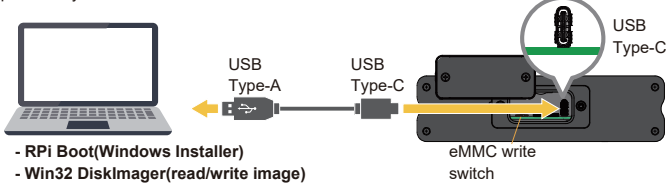
Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

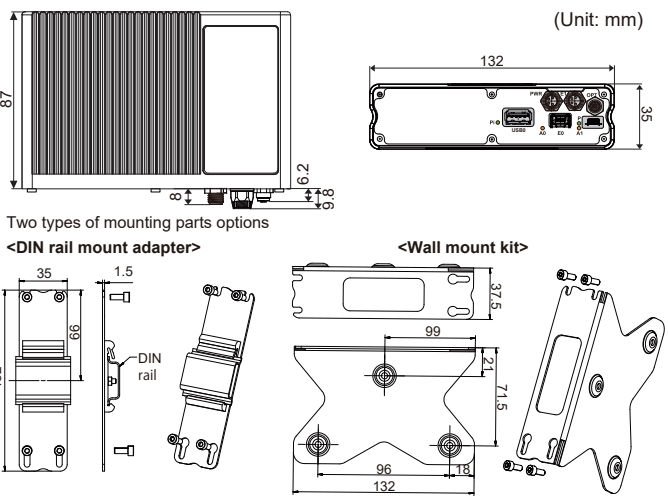
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The boot device of this unit is the onboard eMMC of CM4. Booting from an SSD is also possible. The microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, the USB port is only for eMMC write.



Dimensions and installation adapter



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code	1m	21348100489010
	4-pin female to open end	2m	21348100489020
E1[FLAN] cable	M8 A-code4 pin male	1m	M8M4RM4010LI
	to RJ45 Plug	2m	M8M4RM4020LI
	to RJ45 Plug	0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
	to RJ45 Plug	2m	33480653830020
		0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna		LANTIP2001
	IP20/TG.55.8113		
	LTE flat antenna	1m	LANTIP6701
	IP67/GSA.8835.A.101111		
	LTE magnetic mount antenna	2m	LANTIP6501
	IP65/GA.130.201111		
	3in1 antenna[GPS+2x4G]	2m	LANTIP6702
	IP67/MA256.A.LBI.001		

Ordering information

[Part Number] **2RUN1 0 0 0R3 3 1** IP20 BASIC model

2: CM4 IP20 type
R : Wired
W: Wireless
revision number

RAM size [GB]	
1	1
2	2
3	4[standard]
4	8

eMMC size [GB]	
1	8
2	16
3	32[standard]
4	32/SSD128GB
5	32/SSD256GB
6	32/SSD512GB

4,5,6: NVMe fast SSD (Temperature 0-55°C)

Option (OPT) interface	
1	RS-232C[standard]
2	I2C
3	RS-485

Expansion interface	
0	None

Add-on software	
0	None

Accessory	
0	None[standard]
1	Reserved
L	LTE

PL-R4 BASIC IP65



Picture

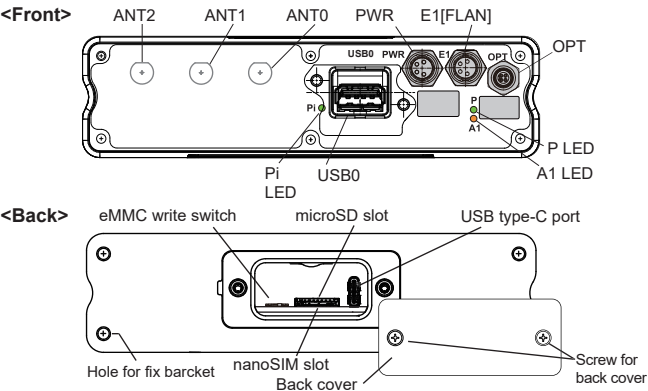


Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR : Power input, 2-line
	1x LAN : FLAN 1ch
	1x OPT*1 : i2c/RS-232/485 selectable
	Back
	1x USB : PushPull USB2.0 Host Type-A
	[Option]1x WLAN IEEE 802.11 b/g/n/ac, Bluetooth 5.0, BLE
	[Option]1x LTE(M.2 slot/EM7431)
	Internal
	1x USB-C : USB Type-C(eMMC writing only)
	1x SW : eMMC write switch
	1x microSD : microSD slot
	Internal
	1x M.2 slot B-key*2, 1x nanoSIM slot
	1x CSI, 1xGPIO 40p
LED, Button	P: Power status, A1: LAN status Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	BASIC: DC10.7V...28.8V/ 12W(incl.USB 500mAx1)
Temperature	Operating Temp.: -20...60°C, Storage: -25...85°C
Humidity	Operating Humi.: 0~95%(non-condensing)
IP grade	IP65
housing material	Aluminum powder coating
Dimensions	W132 x D89x H35 mm (excluding protrusions)
Weight	BAISC: Approx.540g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2
	Radio frequency electromagnetic fields EN 61000-4-3
	Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Option)

*1: Speed is variable, but data bit 8, parity N, and stop bit 1 are fixed.
*2: This is not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part



Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5 connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- Internal M.2 slot for SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

<Connector pin layout>

PWR connector

Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

E1 connector [FLAN]

Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

OPT connector

Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		A
2	WH	SCL	TXD	
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.

<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Bik	E0 active
A1(OR)	Bik	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	Main	GNSS	Aux
Wired LAN+Wireless LAN	WL/BT	---	---
Wired LAN+Wireless LAN+LTE	Main	GNSS	WL/BT

<CSI>[Internal]

FPC connector

No. 1

<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPIO45]
6	CAM1_D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

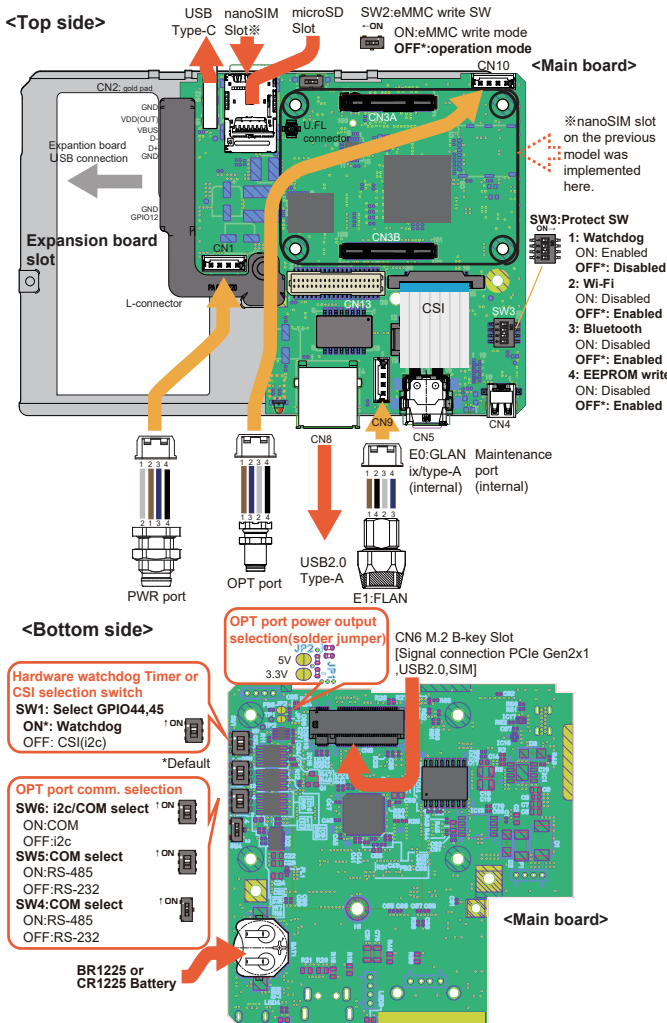
GPIO Pinout Diagram:

Warning: The GPIOs of CM4 are 3.3V level. The total GPIO load is up to 50mA. For detailed specifications, please refer to the CM4 datasheet.



PL-R4 BASIC IP65

Internal details



Device List

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/-	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI:i2c	CM4/GPIO44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

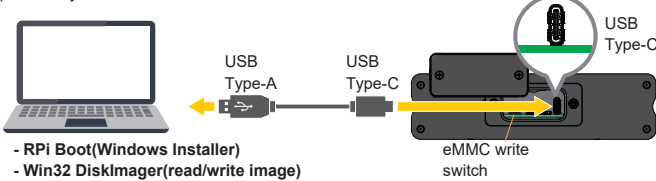
(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

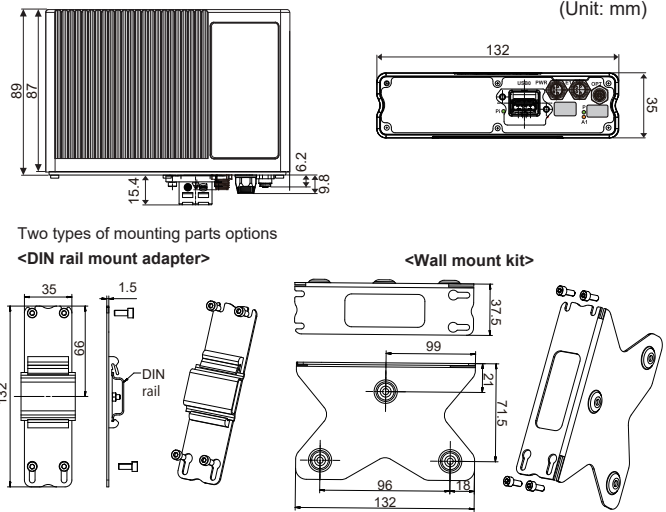
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The boot device of this unit is the onboard eMMC of CM4. Booting from an SSD is also possible. The microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, the USB port is only for eMMC write.



Dimensions and installation adapter



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
E1[FLAN] cable	M8 A-code 4 pin male to RJ45 Plug	2m	21348100489020
	M8 A-code 4 pin male to RJ45 Jack	1m	M8M4RM4010LI
		0.2m	M8M4RM4020LI
OPT cable	M5 4-pin male to open end	1m	T17001449
		2m	M5M4010G0
PushPull cable	PushPull USB to standard USB 2.0 Type-A	1m	M5M4020G0
		2m	09454451911
		5m	09454451913
PushPull cover	PushPull protection cap	Short	09454451915
	PushPull easy cover	Long	09458450009
		NBR	09458450015
Dust cap	for M8 Male(PWR)/IP67		PPCAP01
	for M8 Femal (E1)/IP67		CAPM8M6701
	for M5 Female(OPT, IO-Link)/IP67		CAPM8F6701
Mount kit	DIN rail mount adapter		CAPM5F6701
	wall mount kit		20952000004
Antenna	LTE monopole antenna		20953000007
LTE	IP20/TG.55.8113		LANTIP2001
	LTE flat antenna	1m	LANTIP6701
	IP67/GSA.8835.A.101111		
	LTE magnetic mount antenna	2m	LANTIP6501
	IP65/GA.130.201111		
	3in1 antenna[GPS+2x4G]	2m	LANTIP6702
	IP67/MA256.A.LBI.001		

Ordering information

[Part Number] 1R1UN1 0 0 0R 3 3 1 IP65 BASIC model

1: CM4 IP65 type
R: Wired
W: Wireless
revision number

Option (OPT) interface	Expansion interface	RAM size [GB]	eMMC size [GB]	Add-on software	Accessory
0 None	0 None	1 1	1 8	0 None	0 None[standard]
1 RS-232C[standard]		2 2	2 16		1 Reserved
2 i2C		3 4[standard]	3 32[standard]		L LTE
3 RS-485		4 8	4 32/SSD128GB		
			5 32/SSD256GB		
			6 32/SSD512GB		
			4,5,6: NVMe fast SSD (Temperature 0-55°C)		

All data given are in line with the actual state of art and therefore not binding. PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 BASIC RJ Plus IP20



Picture



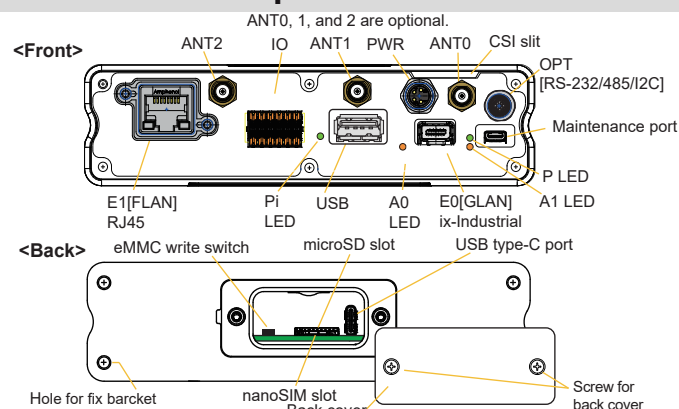
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front 1x PWR : Power input, 2-line 2x LAN : FLAN[100Mbps]x1, GLAN[1000Mbps]x1 1x OPT*1 : i2c/RS-232/485 selectable 1x USB : USB2.0 Host Type-A 1x IO : Di x2 (photocoupler input, DC 5V-24V) Dox2 (photorelay output, DC 48V, Max. 400mA: 25°C/Maximum 250mA: 60°C) Aix4 (non.iso., res.12bit, max. 3.3kSPS) Select 0-5V/0-10V (100V) 1x Maintenance: Display connection [Option] 1x WLAN IEEE 802.11 b/g/n/ac Bluetooth 5.0, BLE [Option] 1x LTE(M.2 slot/EM7431) Back 1x USB-C : USB Type-C(eMMC writing only) 1x SW : eMMC write switch 1x microSD : microSD slot 1x M.2 slot B-key*2, 1x nanoSIM slot 1x CSI, 1xGPIO 40pin Internal
LED, Button	P: Power status, A0,1: LAN status Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	DC10.7V~28.8V/10W (incl.USB 500mA x1)
Temperature	Operating Temp.: -20~60 °C, Storage:-25~85 °C
Humidity	Operating Humi.:0~95%(non-condensing)
Waterproof grade	IP20
housing material	Aluminum powder coating
Dimensions/Weight	W132xD87xH35mm (excluding protrusions)/Approx.570g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2
	Radio frequency electromagnetic fields EN 61000-4-3
	Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Optional)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

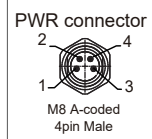


Features

- Industrial Raspberry Pi 4(CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5 connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

<Connector pin layout>



Pin	Col	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

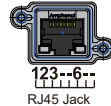
V1: Main power supply
V2: IO power supply

E0 connector [GLAN]



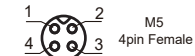
Pin	Signal
1	TX+
2	TX-
3	N.C.
4	N.C.
5	N.C.
6	RX+
7	RX-
8	N.C.
9	N.C.
10	N.C.

E1 connector [FLAN]



Pin	Col	Signal
1	BR	TX+
3	WH	RX+
6	BL	RX-
2	BK	TX-

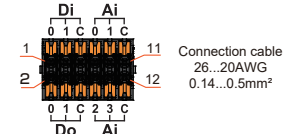
OPT Connector



Pin	Col	i2c	RS232	RS485
1	BR	3.3V/5V/None*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

* power is no output by default.

IO Connector



Pin	Signal	Pin	Signal
1	Di0	7	Ai0
2	Do0	8	Ai2
3	Di1	9	Ai1
4	Do1	10	Ai3
5	Di-C	11	Ai-C
6	Do-C	12	Ai-C

Ai-C and 0V power supply are connected internally.

LED

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON
PWR	Off	No IO-Link Pow
(GR)	On	IO-Link Pow OK
	On	IO-Link Pow Fail

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	Main	GNSS	Aux
Wired LAN+Wireless LAN	WL/BT	---	---
Wired LAN+Wireless LAN+LTE	Main	GNSS	WL/BT

<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

	3.3V	1	2	5V	
SDA3	GPIO2	3	4	5V	IO Pow.5V
SCL3	GPIO3	5	6	Ground	
	GPIO4	7	8	GPIO14	
IO Pow. 0V	Ground	9	10	GPIO15	
Di1	GPIO17	11	12	GPIO18	Do0
	GPIO27	13	14	Ground	IO Pow. 0V
	GPIO22	15	16	GPIO23	
IO Pow.3.3V	3.3V	17	18	GPIO24	
	GPIO10	19	20	Ground	
	GPIO9	21	22	GPIO25	
	GPIO11	23	24	GPIO8	
	Ground	25	26	GPIO7	
	ID_SD	27	28	ID_SC	
	GPIO5	29	30	Ground	
	GPIO6	31	32	GPIO12	
	GPIO13	33	34	Ground	
Do1	GPIO19	35	36	GPIO16	Di0
	GPIO26	37	38	GPIO20	
	Ground	39	40	GPIO21	

System Connection [SD].

System Connection [IO]

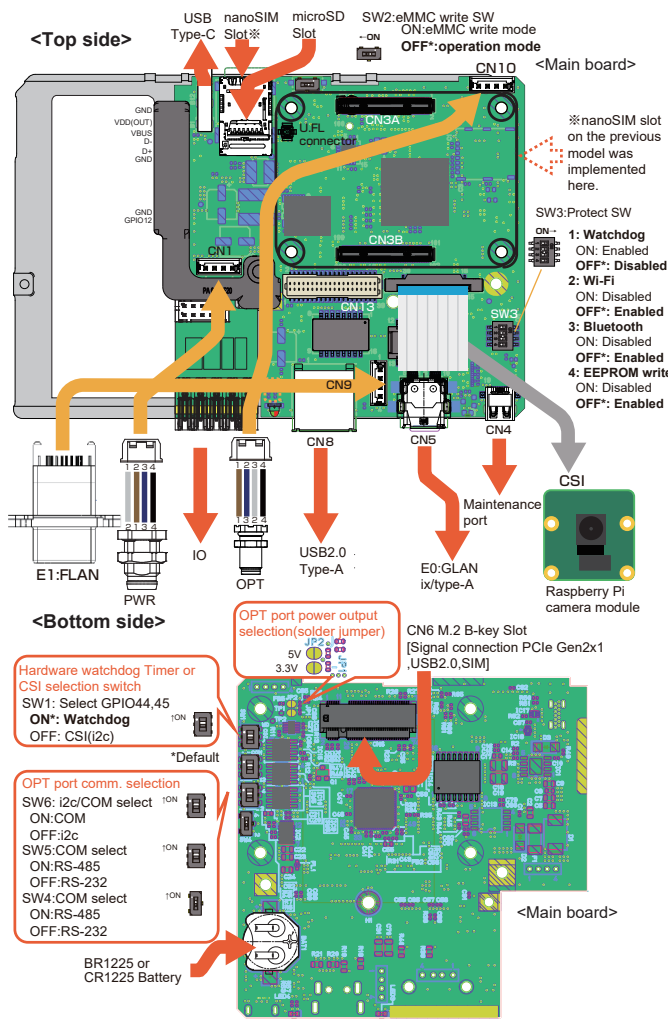
⚠ The GPIO of M4 is 3.3V level. The total GPIO load is up to 50mA. For detailed specifications, please refer to the CM4 datasheet.

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 BASIC RJ Plus IP20

Internal details



Device List

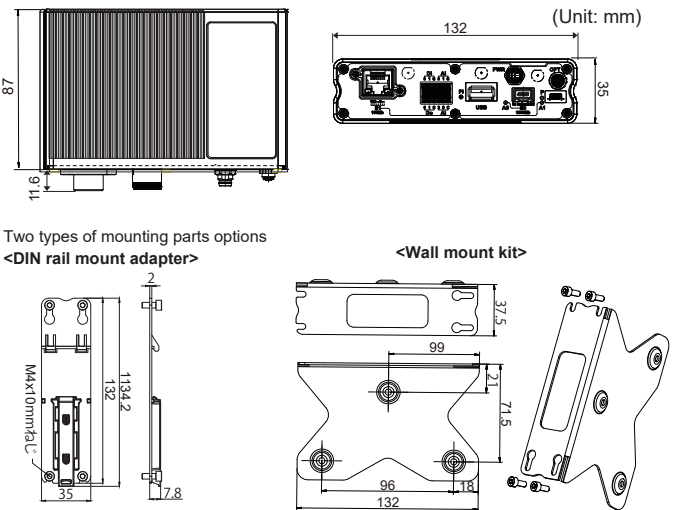
Signal	Device	Port or Connect	Comments
E0:GLAN(Reserv)	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0:GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0:GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/-	i2c0:GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM1	3-wire max.250kbps
OPT:RS-485	MCP2200-I	ttyACM1	2-wire max.400kbps
CSI:i2c	CM4/GPI44,45	GPIO44,45/i2c-1	i2c1:GPIO44,45 / no use WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1:Normal High, SET2:Normal Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WD
Di0,1	CM4	GPIO16,17/In	Photocoupler Input DC5V ~ 24V, +/-Com. Support
Do0,1	CM4	GPIO18,19/Out	Photorelay Output Max.DC48V, 250mA,+/-Com. Support
Ai0,1,2,3	ADS1015	i2c-1/0x48	Resolution 12bit, Ai 4ch,0-5V/0-2000cnt FSR = ±2.048 V, single-ended inputs

(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Dimensions and installation adapter

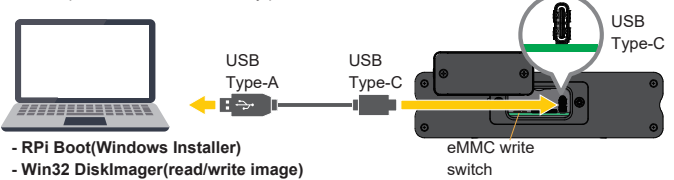


Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
		2m	21348100489020
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
		2m	33480653830020
	to RJ45 Plug	0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna IP20/TG.55.8113		LANTIP2001
	LTE flat antenna IP67/GSA.8835.A.101111	1m	LANTIP6701
	LTE magnetic mount antenna IP65/GA.130.201111	2m	LANTIP6501
	3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001	2m	LANTIP6702

Software

The CM4's onboard eMMC will be the boot device for this unit. Booting from an SSD is also possible. microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, this The USB port is an eMMC write-only port.



- RPi Boot(Windows Installer)
- Win32 DiskImager(read/write image)

Ordering information

[Part Number]		2: CM4 IP20 type	R: Wired	W: Wireless	revision number	IP20 65 RJ Plus
2RJ1000R331						
Option (OPT) interface		Expansion interface		RAM size [GB]		
1 RS-232C[standard]		0 None		1 1		
2 I2C				2 2		
3 RS-485				3 4[standard]		
				4 8		
				eMMC size [GB]		
				1 8		
				2 16		
				3 32[standard]		
				4 32/SSD128GB		
				5 32/SSD256GB		
				6 32/SSD512GB		
				4,5,6: NVMe fast SSD (Temperature 0-55°C)		
				Add-on software		
				0 None[standard]		
				Accessory		
				1 Reserved		
				L LTE		

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PL-R4 BASIC Plus IP65



Picture



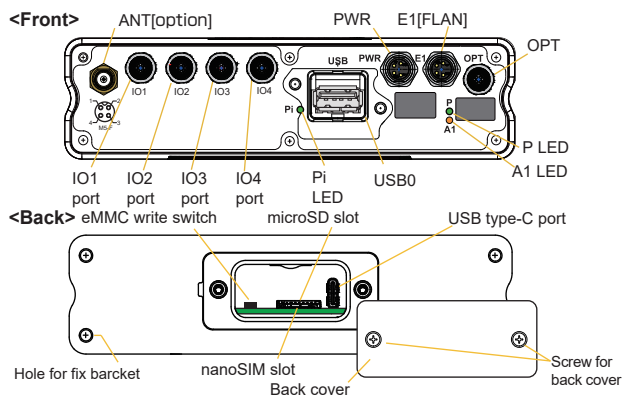
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front Back Internal
LED, Button	P: Power status, A1: LAN status, PWR:IO-Link power Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	DC10.7V~28.8V/10W (incl.USB 500mA x1)
Temperature	Operating Temp.: -20~60 °C, Storage: -25~85 °C
Humidity	Operating Humi.: 0~95%(non-condensing)
Waterproof grade	IP65
housing material	Aluminum powder coating
Dimensions/Weight	W132xD89xH35mm (excluding protrusions)/Approx.540g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2
	Radio frequency electromagnetic fields EN 61000-4-3
	Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Optional)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part



Features

- Industrial Raspberry Pi 4(CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5 connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

<Connector pin layout>

PWR connector



M8 A-coded
4pin Male

Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

V1: Main power supply
V2: IO power supply

E1 connector [FLAN]



M8 A-coded
4pin Female

Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

IO Connector



M5
4pin Female

Pin	Col.	IO1	IO2	IO3	IO4
1	BR	24VDC(V2)			
2	WH	Ai0	Ai1	Ai2	Ai3
3	BL	0V(V2)			
4	BK	Di0	Di1	Do0	Do1

OPT Connector



M5
4pin Female

Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/None*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

* power is no output by default.

IO Connector

Pin	Col.	IO1	IO2	IO3	IO4
1	BR	24VDC(V2)			
2	WH	Ai0	Ai1	Ai2	Ai3
3	BL	0V(V2)			
4	BK	Di0	Di1	Do0	Do1

OPT Connector

Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/None*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

* power is no output by default.

<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A1(OR)	BK	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<ANT SMA port> [Option]

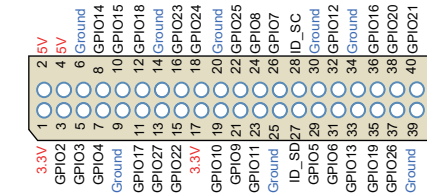
Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	---	Main	---
Wired LAN+Wireless LAN	---	WL/BT	---
Wired LAN+Wireless LAN+LTE	---	None	---

<CSI>[Internal]

Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM1_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPIO45]
6	CAM1_D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

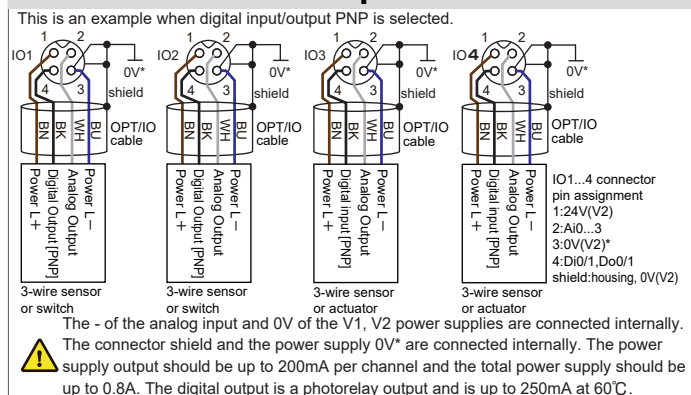
<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)



The total GPIO load is up to 50mA. For detailed specifications, please check the CM4 datasheet.

IO connection example

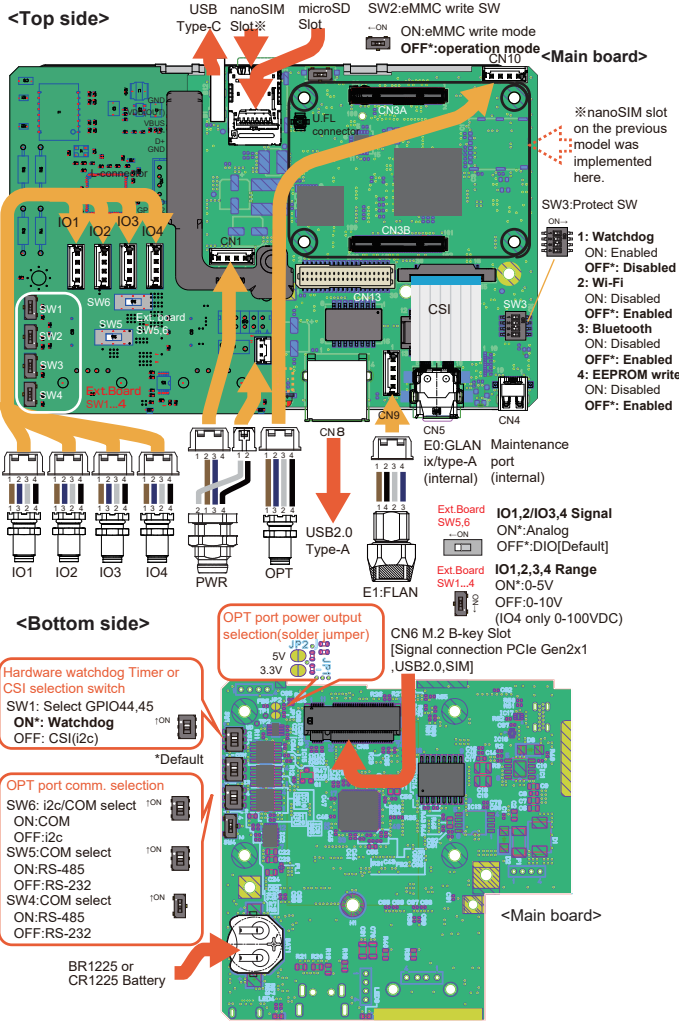


All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 BASIC Plus IP65

Internal details



Device List

Signal	Device	Port or Connect	Comments
E0:GLAN(Reserv)	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0:GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0:GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/---	i2c0:GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM1	3-wire max.250kbps
OPT:RS-485	MCP2200-I	ttyACM1	2-wire max.400kbps
CSI:i2c	CM4/GPI44,45	GPIO44,45/i2c-1	i2c1:GPIO44,45 / no use WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1:Normal High, SET2:Normal Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WD
IO-Link	IO-Link board	ttyACM0	

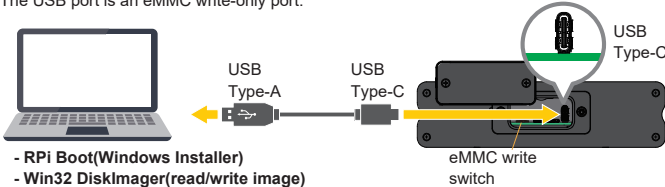
(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

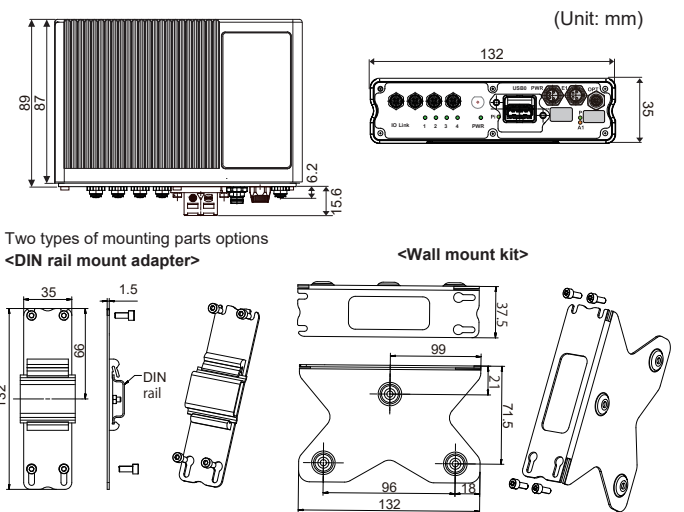
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The CM4's onboard eMMC will be the boot device for this unit. Booting from an SSD is also possible. microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, this The USB port is an eMMC write-only port.



Dimensions and installation adapter



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
		2m	21348100489020
E1[FLAN] cable	M8 A-code 4 pin male to RJ45 Plug	1m	M8M4RM4010LI
	M8 A-code 4 pin male to RJ45 Jack	2m	M8M4RM4020LI
		0.2m	T17001449
OPT/IO cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
PushPull cable	PushPull USB to standard USB 2.0 Type-A	1m	09454451911
		2m	09454451913
		5m	09454451915
PushPull cover	PushPull protection cap	Short	09458450009
	PushPull easy cover	Long	09458450015
		NBR	PPCAP01
Dust cap	for M8 Male(PWR)/IP67		CAPM8M6701
	for M8 Femal (E1)/IP67		CAPM8F6701
	for M5 Female(OPT, IO-Link)/IP67		CAPM5F6701
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna LTE	LTE monopole antenna IP20/TG.55.8113		LANTIP2001
	LTE flat antenna IP67/GSA.8835.A.101111	1m	LANTIP6701
	LTE magnetic mount antenna IP65/GA.130.201111	2m	LANTIP6501
	3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001	2m	LANTIP6702

Ordering information

[Part Number] 1RBP1 1 0 0 R 3 3 1 IP65 IO model

1: CM4 IP65 type
R: Wired
W: Wireless
revision number

Option (OPT) interface		Digital Input/Output	
1	RS-232C[standard]	1	In PNP, Out PNP[Std]
2	I2C		
3	RS-485		

RAM size [GB]		eMMC size [GB]	
1	1	1	8
2	2	2	16
3	4[standard]	3	32[standard]
4	8	4	32/SSD128GB
		5	32/SSD256GB
		6	32/SSD512GB
		4,5,6: NVMe fast SSD (Temperature 0-55°C)	

Add-on software		Accessory	
0	None[standard]	0	None[standard]
		1	Reserved
		L	LTE

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 USB IP20



Picture



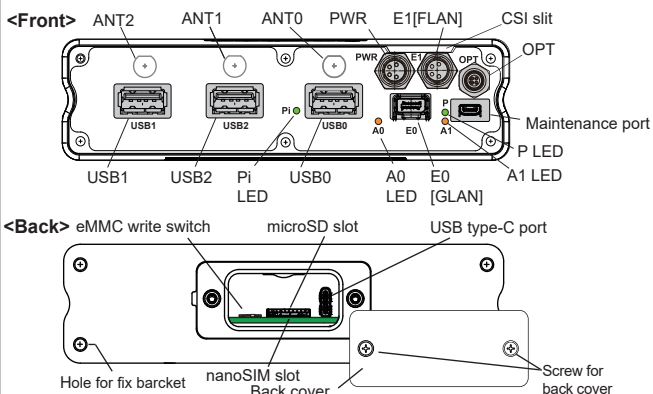
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front Back Internal
LED, Button	P: Power status, A0,1: LAN status Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	USB:DC10.7V...28.8V/ 17.5W(incl.USB 500mAx3)
Temperature	Operating Temp.: -20...60°C, Storage:-25...85°C
Humidity	Operating Humi.:0...95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87.1 x H35 mm (excluding protrusions)
Weight	USB:Approx.560g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2 Radio frequency electromagnetic fields EN 61000-4-3 Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Optional)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

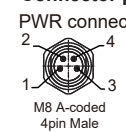


Features

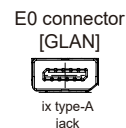
- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

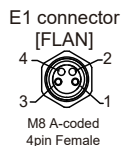
<Connector pin layout>



Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

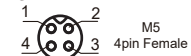


Pin	Signal
1	TX+
2	TX-
3	N.C.
4	N.C.
5	N.C.
6	RX+
7	RX-
8	N.C.
9	N.C.
10	N.C.



Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX+

OPT connector



Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.

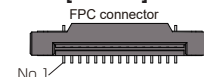
<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Blk	E0 active
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	Red	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	Main	GNSS	Aux
Wired LAN+Wireless LAN	WL/BT	---	---
Wired LAN+Wireless LAN+LTE	Main	GNSS	WL/BT

<CSI>[Internal]



<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPIO45]
6	CAM1_D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

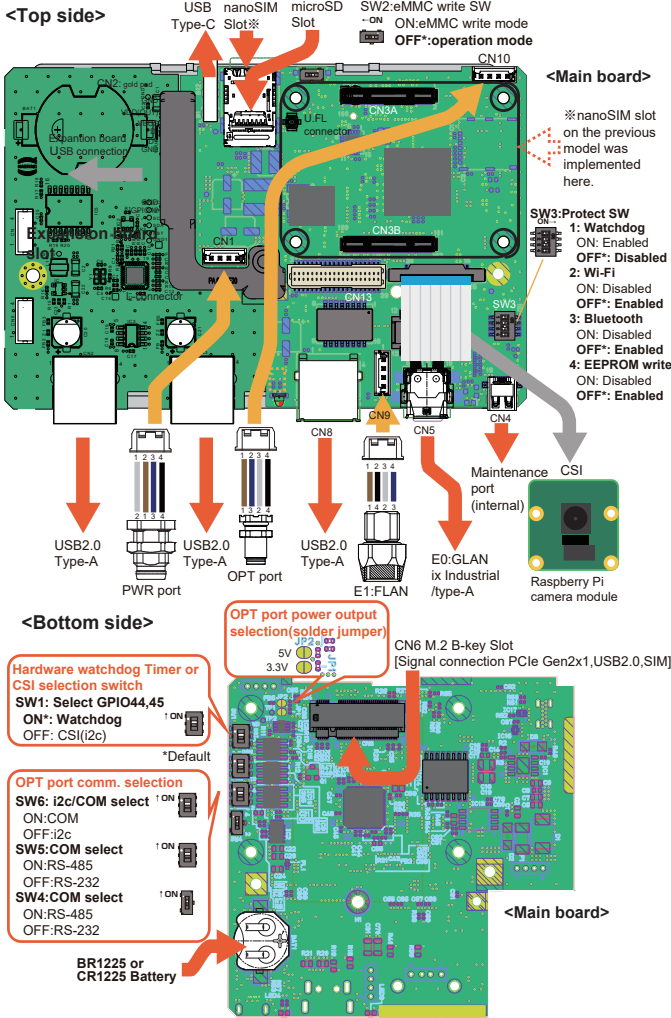
The GPIOs of CM4 are 3.3V level.

The total GPIO load is up to 50mA. For detailed specifications, please check the CM4 datasheet.



PL-R4 USB IP20

Internal details



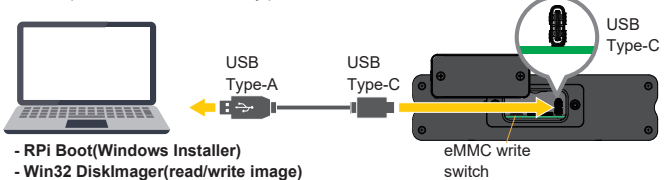
Device List

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c0-0/x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c0-0/x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c0-0/-	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI:i2c	CM4/GPI44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

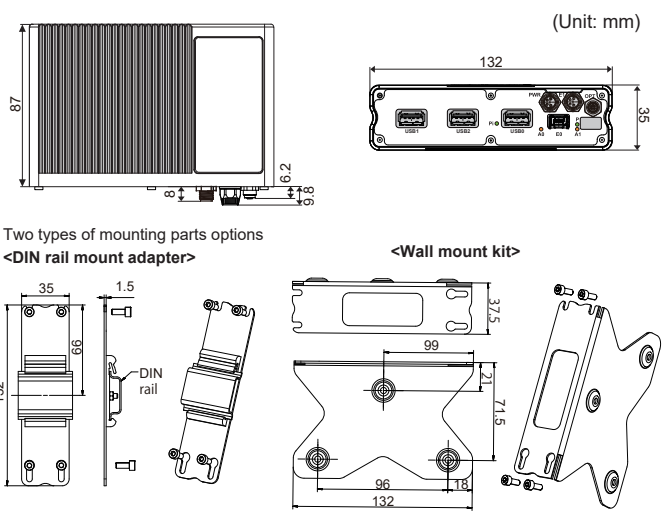
Watchdog (WD) timer and CSI connection
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The CM4's onboard eMMC will be the boot device for this unit. Booting from an SSD is also possible. microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, this The USB port is an eMMC write-only port.



Dimensions and installation adapter



Optional accessories

Optional accessories	Part Number
PWR cable	M8 A-code 4-pin female to open end 1m 21348100489010 2m 21348100489020
E1[FLAN] cable	M8 A-code4 pin male to RJ45 Plug 1m M8M4RM4010LI 2m M8M4RM4020LI 0.2m T17001449
OPT cable	M5 4-pin male to open end 1m M5M4010G0 2m M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug 1m 33480653830010 2m 33480653830020 0.2m T17001450IX
Mount kit	DIN rail mount adapter 20952000004 wall mount kit 20953000007
Antenna for LTE	LTE monopole antenna IP20/TG.55.8113 LANTIP2001 LTE flat antenna IP67/GSA.8835.A.101111 1m LANTIP6701 LTE magnetic mount antenna IP65/GA.130.201111 2m LANTIP6501 3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001 2m LANTIP6702

Ordering information

[Part Number] 2RUB1 0 0 0R3 3 1 IP20 USB model

Option (OPT) interface: 1 RS-232C[standard], 2 I2C, 3 RS-485

Expansion interface: 0 None

Add-on software: 0 None

RAM size [GB]: 1 1, 2 2, 3 4[standard], 4 8

eMMC size [GB]: 1 8, 2 16, 3 32[standard], 4 32/SSD128GB, 5 32/SSD256GB, 6 32/SSD512GB

4,5,6: NVMe fast SSD (Temperature 0-55°C)

Accessory: 0 None[standard], 1 Reserved, L LTE

All data given are in line with the actual state of art and therefore not binding. PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 USB IP65



Picture



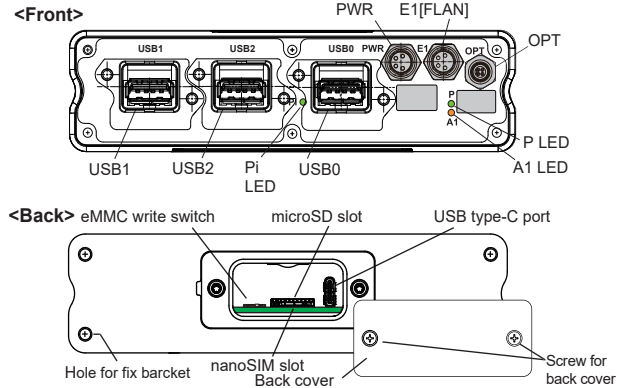
Product Specifications

Processor		Broadcom BCM2711, Quad core @ 1.5GHz	
Memory		RAM4GB, eMMC32GB (Depend on model)	
OS		Raspberry Pi OS	
Interface	Front	1x PWR	: Power input, 2-line
		1x LAN	: FLAN 1ch
		1x OPT*1	: i2c/RS-232/485 selectable
		3x USB	: PushPull USB2.0 Host Type-A
	Back	1x USB-C	: USB Type-C(eMMC writing only)
		1x SW	: eMMC write switch
		1x microSD	: microSD slot
	Internal	1x M.2 slot B-key*2, 1x nanoSIM slot	
		1x CSI, 1xGPIO 40p	
LED, Button		P: Power status, A1: LAN status Pi: User custom/WD error	
RTC/NVRAM		BR1225[or CR1225] Backup RTC	
Watchdog		Built-in hardware watchdog	
Power/Consumption		USB: DC10.7V...28.8V/17.5W(incl. USB 500mAx3)	
Temperature		Operating Temp.: -20...60°C, Storage: -25...85°C	
Humidity		Operating Humi.: 0~95%(non-condensing)	
IP grade		IP65	
housing material		Aluminum powder coating	
Dimensions		W132 x D89x H35 mm (excluding protrusions)	
Weight		USB: Approx.570g	
Vibration/shock		IEC 60068-2-6 / IEC 60068-2-27	
EMI		Radiated emissions EN55016-2-3	
EMS	Electrostatic radiation immunity		EN 61000-4-2
	Radio frequency electromagnetic fields		EN 61000-4-3
	Fast transient burst		EN 61000-4-4
Installation method		DIN rail mounting, wall mounting(Optional)	

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

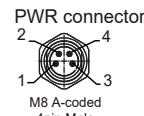


Features

- Industrial Raspberry Pi 4
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible(Ubuntu require RAM4G or more)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5 connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

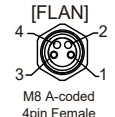
Interface

<Connector pin layout>



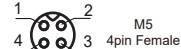
Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

E1 connector



Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

OPT connector



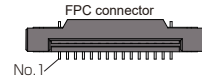
Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.

<LED>

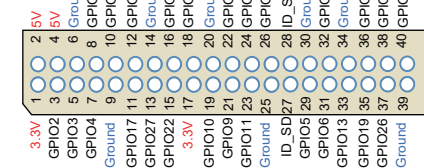
LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Bk	E0 active
A1(OR)	Bk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<CSI>[Internal]



<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

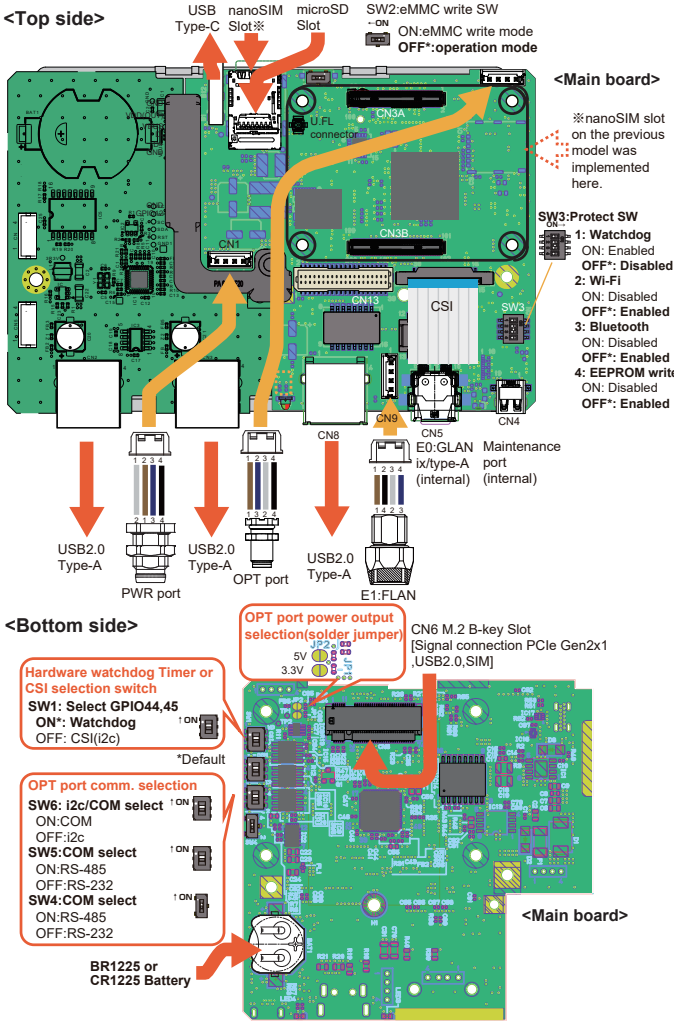


The GPIOs of CM4 are 3.3V level.
The total GPIO load is up to 50mA. For detailed specifications, please check the CM4 datasheet.



PL-R4 USB IP65

Internal details



Device List

Signal	Device	Port or connection	Comments
E0: GLAN	CM4	eth0	10/100/1000Mbps
E1: FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c0-0/x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c0-0/x68	i2c0: GPIO0,1
OPT: i2c	CM4/GPIO0,1	i2c0-0/---	i2c0: GPIO0,1
OPT: RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT: RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI: i2c	CM4/GPIO44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

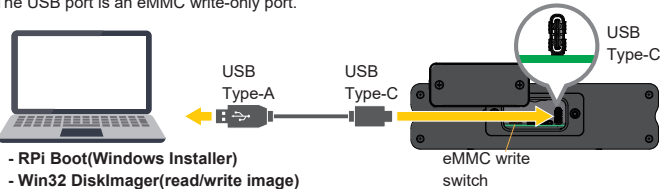
(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

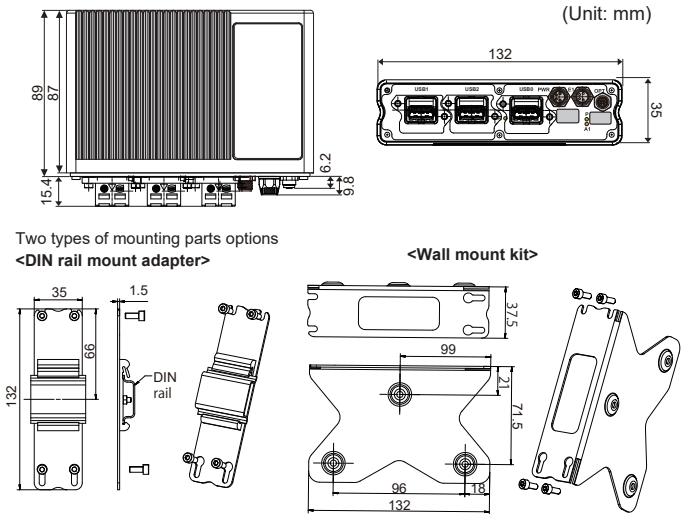
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The CM4's onboard eMMC will be the boot device for this unit. Booting from an SSD is also possible. microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, this The USB port is an eMMC write-only port.



Dimensions and installation adapter



Optional accessories

Optional accessories		Part Number	
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
		2m	21348100489020
E1[FLAN] cable	M8 A-code 4 pin male to RJ45 Plug	1m	M8M4RM4010LI
		2m	M8M4RM4020LI
	M8 A-code 4 pin male to RJ45 Jack	0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
PushPull cable	PushPull USB to standard USB 2.0	1m	09454451911
	Type-A	2m	09454451913
		5m	09454451915
PushPull cover	PushPull protection cap	Short	09458450009
		Long	09458450015
	PushPull easy cover	NBR	PPCAP01
Dust cap	for M8 Male(PWR)/IP67		CAPM8M6701
	for M8 Femal(E1)/IP67		CAPM8F6701
	for M5 Female(OPT, IO-Link)/IP67		CAPM5F6701
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007

Ordering information

[Part Number] 1RUB1 0 0 0R 3 3 1

1: CM4 IP65 type
R: Wired

revision number

IP65 USB model

Option (OPT) interface

1	RS-232C[standard]
2	i2c
3	RS-485

Expansion interface

0	None
---	------

RAM size [GB]

1	1
2	2
3	4[standard]
4	8

eMMC size [GB]

1	8
2	16
3	32[standard]
4	32/SSD128GB
5	32/SSD256GB
6	32/SSD512GB

4,5,6: NVMe fast SSD (Temperature 0-55°C)

Add-on software

0	None[standard]
---	----------------

Accessory

0	None[standard]
1	Reserved
L	LTE[not select]

All data given are in line with the actual state of art and therefore not binding. PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 GPIO IP20



Picture

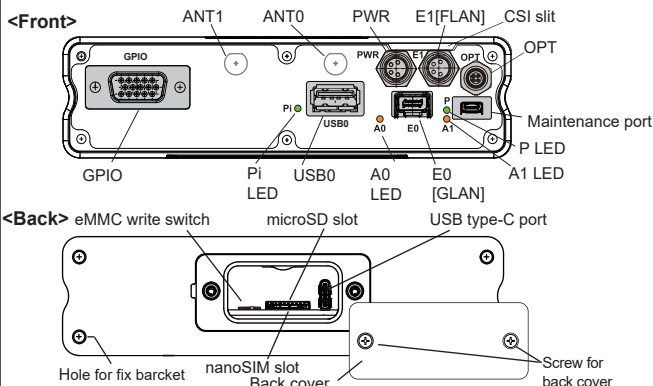


Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR : Power input, 2-line
	2x LAN : FLAN 1ch, GLAN 1ch
	1x OPT*1 : i2c/RS-232/485 selectable
Back	1x USB : USB2.0 Host Type-A
	1x GPIO : D-SUB15p GPIO12ch, GND, 3.3V, 5V
	[Option] 1x WLAN IEEE 802.11 b/g/n/ac
	Bluetooth 5.0, BLE
Internal	[Option] 1x LTE(M.2 slot/EM7431)
	1x USB-C : USB Type-C(eMMC writing only)
	1x SW : eMMC write switch
	1x microSD : microSD slot
LED, Button	1x M.2 slot B-key*2, 1x nanoSIM slot
	1x CSI, 1xGPIO 40p
	P: Power status, A0, 1: LAN status
	Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	GPIO:DC10.7V...28.8V/ 12W(incl. USB 500mAx1)
Temperature	Operating Temp.: -20~60°C, Storage:-25~85°C
Humidity	Operating Humi.:0~95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	GPIO:Approx.550g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2
	Radio frequency electromagnetic fields EN 61000-4-3
	Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Optional)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.
*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

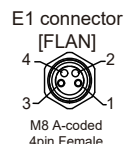
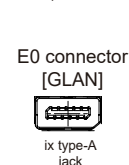
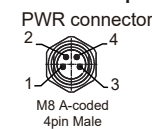


Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC does not use SD memory for boot
- microSD slot for data storage
- Internal M.2 slot for SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

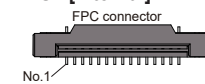
<Connector pin layout>



<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Blk	E0 active
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<CSI>[Internal]



<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

D-sub15p-14	3.3V	1	2	5V	D-sub15p-15
D-sub15p-2	GPIO2	3	4	5V	
D-sub15p-3	GPIO3	5	6	Ground	D-sub15p-1
D-sub15p-4	GPIO4	7	8	GPIO14	
	Ground	9	10	GPIO15	
		11	12	GPIO18	
		13	14	Ground	
		15	16	GPIO23	
	3.3V	17	18	GPIO24	
D-sub15p-10	GPIO10	19	20	Ground	
D-sub15p-9	GPIO9	21	22	GPIO25	
D-sub15p-11	GPIO11	23	24	GPIO8	D-sub15p-8
	Ground	25	26	GPIO7	D-sub15p-7
		27	28	ID_SC	
D-sub15p-5	GPIO5	29	30	Ground	
D-sub15p-6	GPIO6	31	32	GPIO12	D-sub15p-12
D-sub15p-13	GPIO13	33	34	Ground	
		35	36	GPIO16	
		37	38	GPIO20	
	Ground	39	40	GPIO21	

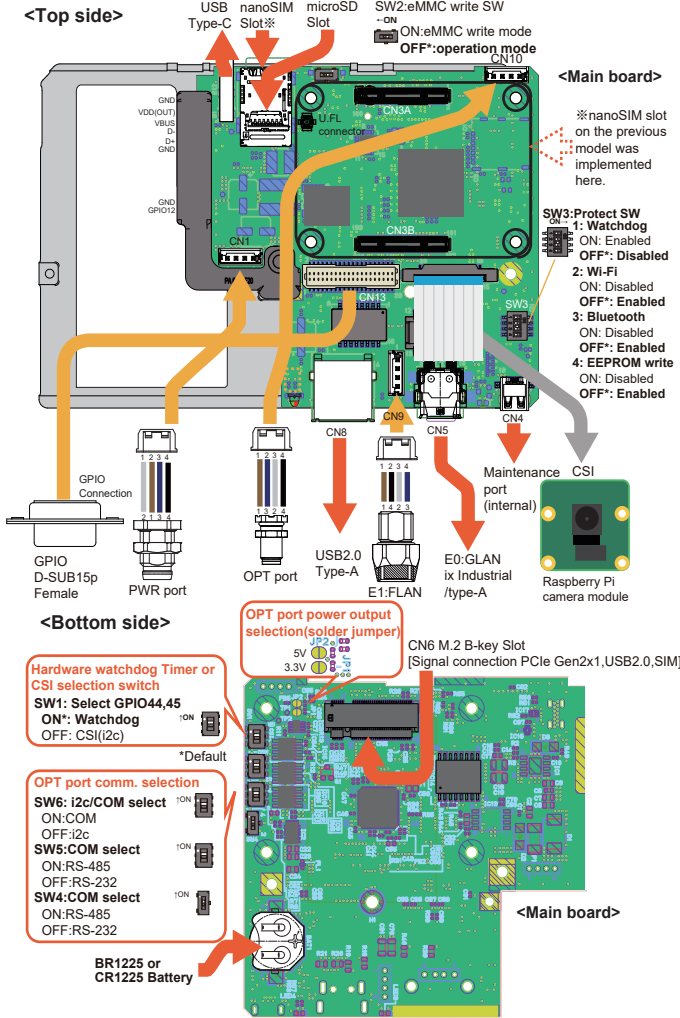
⚠ The GPIOs of CM4 are 3.3V level. The total GPIO load is up to 50mA.
For detailed specifications, please refer to the CM4 datasheet.

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 GPIO IP20

Internal details



Device List

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/-	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI:i2c	CM4/GPI44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

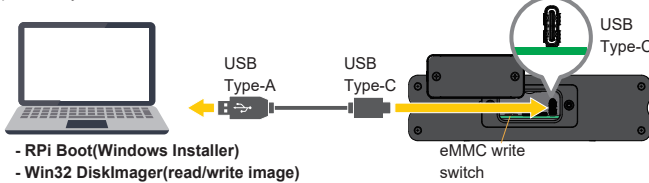
(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

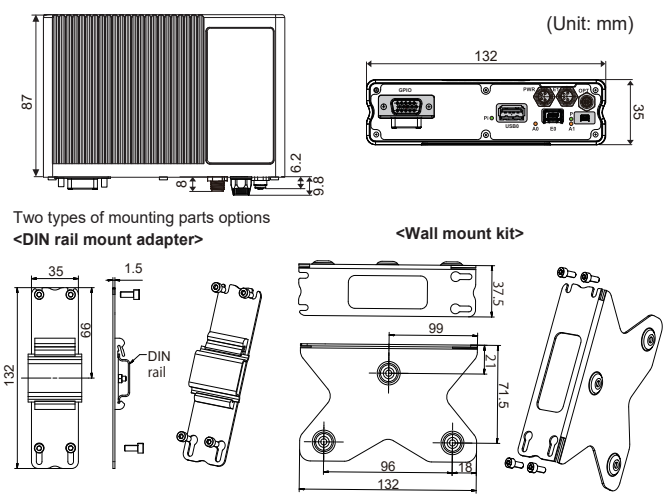
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The boot device of this unit is the onboard eMMC of CM4. Booting from an SSD is also possible. The microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, the USB port is only for eMMC write.



Dimensions and installation adapter



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
E1[FLAN] cable	M8 A-code4 pin male to RJ45 Plug	2m	21348100489020
	to RJ45 Plug	1m	M8M4RM4010LI
	to RJ45 Plug	2m	M8M4RM4020LI
	to RJ45 Plug	0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
	to RJ45 Plug	2m	33480653830020
	to RJ45 Plug	0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna IP20/TG.55.8113		LANTIP2001
	LTE flat antenna IP67/GSA.8835.A.101111	1m	LANTIP6701
	LTE magnetic mount antenna IP65/GA.130.201111	2m	LANTIP6501
	3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001	2m	LANTIP6702

Ordering information

[Part Number] 2RUG1 0 0 0R3 3 1

2: CM4 IP20 type
R: Wired
W: Wireless
revision number
GPIO model

Option (OPT) interface
1 RS-232C[standard]
2 I2C
3 RS-485

Expansion interface
0 None

RAM size [GB]
1 1
2 2
3 4[standard]
4 8

eMMC size [GB]
1 8
2 16
3 32[standard]
4 32/SSD128GB
5 32/SSD256GB
6 32/SSD512GB
4,5,6: NVMe fast SSD (Temperature 0-55°C)

Add-on software
0 None

Accessory
0 None[standard]
1 Reserved
L LTE

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 USB GPIO IP20



Picture



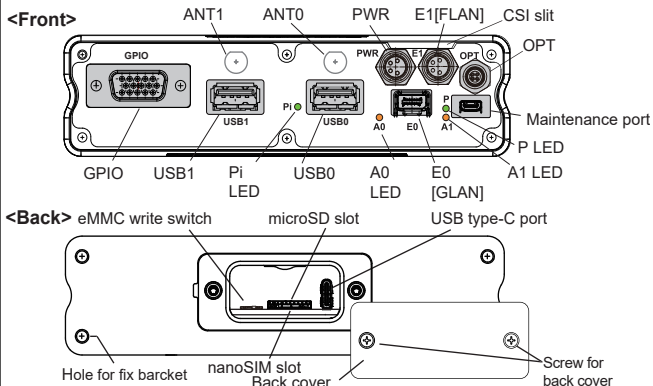
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR :Power input, 2-line
	2x LAN : FLAN 1ch, GLAN 1ch
	1x OPT*1 : i2c/RS-232/485 selectable
Back	2 x USB : USB2.0 Host Type-A
	1x GPIO : D-SUB15p GPIO12ch, GND, 3.3V, 5V
	[Option]1x WLAN IEEE 802.11 b/g/n/ac
	Bluetooth 5.0, BLE
Internal	[Option]1x LTE(M.2 slot/EM7431)
	1x USB-C : USB Type-C(eMMC writing only)
	1x SW : eMMC write switch
	1x microSD : microSD slot
LED, Button	1x M.2 slot B-key*2, 1anox microSIM slot
	1x CSI, 1xGPIO 40p
	P: Power status, A0,1: LAN status
	Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	USB/GPIO:DC10.7V...28.8V/ 15W(incl. USB 500mAx2)
Temperature	Operating Temp.: -20~60°C, Storage:-25~85°C
Humidity	Operating Humi.:0~95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	USB/GPIO: Approx.570g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2
	Radio frequency electromagnetic fields EN 61000-4-3
	Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Optional)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part

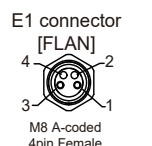
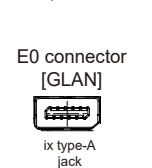
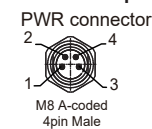


Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible(Ubuntu require RAM4G or more)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

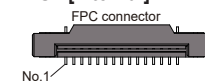
<Connector pin layout>



<LED>

LED	Sts.	Comments
P(OR)	Off	No power supply
	On	Power OK
A0(OR)	Blk	E0 active
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(OR)	Off	User OFF
	On	User ON

<CSI>[Internal]



<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

D-sub15p-14	3.3V	1	2	5V	D-sub15p-15
D-sub15p-2	GPIO2	3	4	5V	
D-sub15p-3	GPIO3	5	6	Ground	D-sub15p-1
D-sub15p-4	GPIO4	7	8	GPIO14	
	Ground	9	10	GPIO15	
	GPIO17	11	12	GPIO18	
	GPIO27	13	14	Ground	
	GPIO22	15	16	GPIO23	
	3.3V	17	18	GPIO24	
D-sub15p-10	GPIO10	19	20	Ground	
D-sub15p-9	GPIO9	21	22	GPIO25	
D-sub15p-11	GPIO11	23	24	GPIO8	D-sub15p-8
	Ground	25	26	GPIO7	D-sub15p-7
	ID_SD	27	28	ID_SC	
D-sub15p-5	GPIO5	29	30	Ground	
D-sub15p-6	GPIO6	31	32	GPIO12	D-sub15p-12
D-sub15p-13	GPIO13	33	34	Ground	
	GPIO19	35	36	GPIO16	
	GPIO28	37	38	GPIO20	
	Ground	39	40	GPIO21	



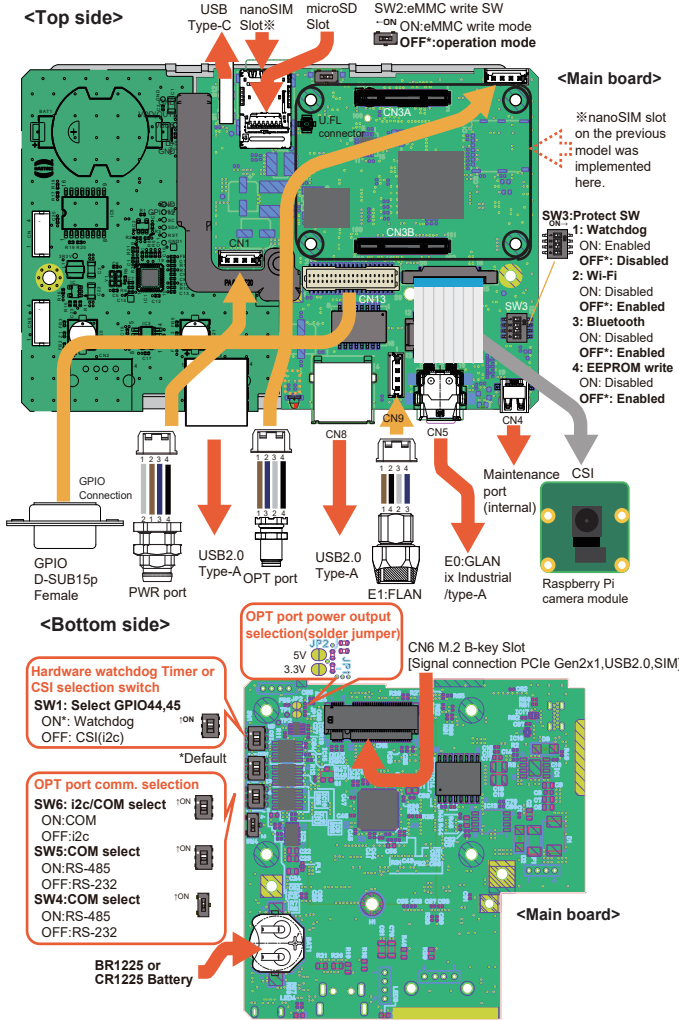
The GPIOs of CM4 are 3.3V level. The total GPIO load is up to 50mA.
For detailed specifications, please check the CM4 datasheet.

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 USB GPIO IP20

Internal details



Device List

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/---	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM0	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM0	2-wire, max. 400kbps
CSI:i2c	CM4/GPII44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

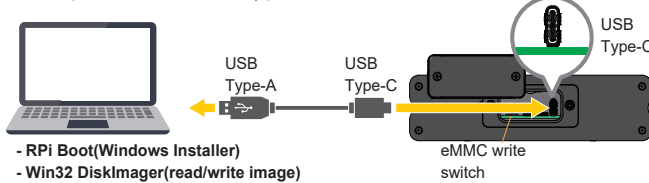
(Note) It may be changed depending on the Raspberry Pi OS side.

Watchdog (WD) timer and CSI connection

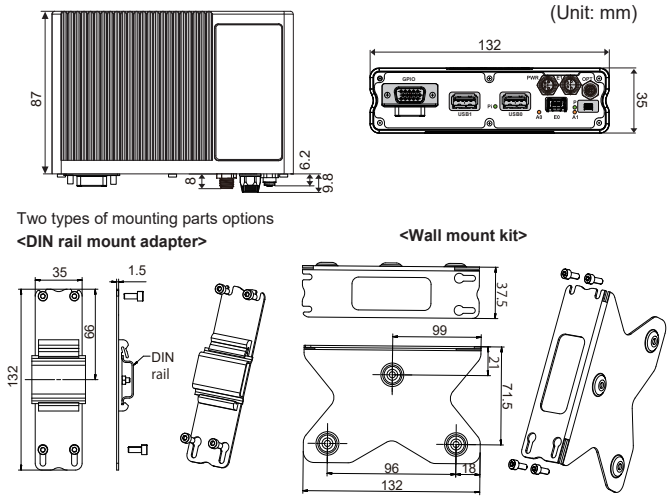
SW1: Watchdog or CSI can be switched by selecting GPIO44,45. Watchdog (WD) and CSI cannot be used at the same time. When WD is selected, GPIO44 and 45 are for WD operation. In addition, when SW3: No.1 of protection SW is off, the reset is forcibly disabled. When CSI is selected, GPIO44 and 45 are used as i2c for CSI.

Software

The CM4's onboard eMMC will be the boot device for this unit. Booting from an SSD is also possible. microSD slot is not for system boot. Turn on the eMMC write switch, connect the USB cable, and use the rpiboot program to read and write images. In addition, this The USB port is an eMMC write-only port.



Dimensions and installation adapter



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
		2m	21348100489020
E1[FLAN] cable	M8 A-code4 pin male to RJ45 Plug	1m	M8M4RM4010LI
		2m	M8M4RM4020LI
		0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
		2m	33480653830020
		0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna IP20/TG.55.8113		LANTIP2001
	LTE flat antenna IP67/GSA.8835.A.101111	1m	LANTIP6701
	LTE magnetic mount antenna IP65/GA.130.201111	2m	LANTIP6501
	3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001	2m	LANTIP6702

Ordering information

[Part Number] 2RU11 0 0 0R3 3 1 IP20 GPIO model

2: CM4 IP20 type
R: Wired
W: Wireless
revision number

Option (OPT) interface	Expansion interface	RAM size [GB]	eMMC size [GB]	Add-on software	Accessory
1 RS-232C[standard]	0 None	1 1	1 8	0 None	0 None[standard]
2 I2C		2 2	2 16		1 Reserved
3 RS-485		3 4[standard]	3 32[standard]		L LTE
		4 8	4 32/SSD128GB		
			5 32/SSD256GB		
			6 32/SSD512GB		

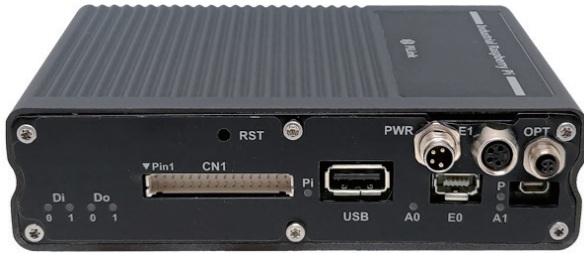
4,5,6: NVMe fast SSD (Temperature 0-55°C)

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

PL-R4 DIO IP20



Picture



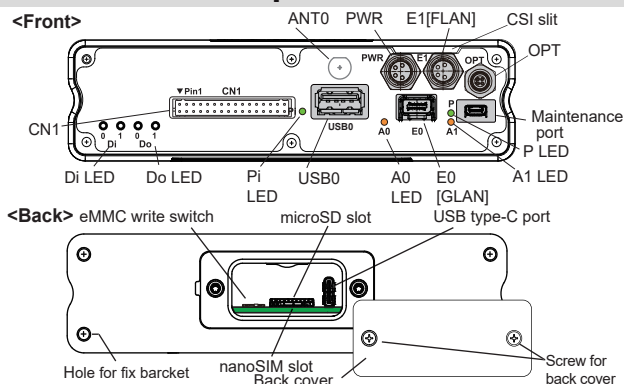
Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR : Power input, 2-line 2x LAN : FLAN 1ch, GLAN 1ch 1x OPT*1 : i2c/RS-232/485 selectable 1x USB : USB2.0 Host Type-A 1x CN1 : Di16ch[14ch] (PNP)/2.4mA at 24VDC Do8ch(PNP)/Pushpull0.1A, High-side0.5A COM 1ch RS-232/RS485(2w) CAN 1 or 2ch/CAN 2.0B, CAN FD 1Mbps [Option]1x WLAN IEEE 802.11 b/g/n/ac, Bluetooth5.0, BLE [Option]1x LTE(M.2 slot/EM7431)
	Back
	1x USB-C : USB Type-C(eMMC writing only) 1x SW : eMMC write switch 1x microSD : microSD slot
	Internal
	1x CSI, 1xGPIO 40p
LED, Button	P: Power status, A0,1: LAN status, Di/Do, Pi: User custom/WD error, Di/Do: CN1-Di/Do status
RTC/NVRAM	BR1225[or CR1225] Backup RTC, MCP79410-I:CR1632 backup RTC, NVRAM
Watchdog	Built-in hardware watchdog
Power/Consumption	DC10.7V...28.8V/13.5W(incl. USB 500mA x1)
Temperature	Operating Temp.: -20...60°C, Storage: -25...85°C
Humidity	Operating Humi.: 0...95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	DIO: Approx.570g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2 Radio frequency electromagnetic fields EN 61000-4-3 Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting(Option)

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.

*2 Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part



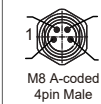
Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC does not use SD memory for boot
- microSD slot for data storage
- Internal M.2 slot for SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

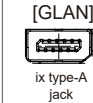
<Connector pin layout>

PWR connector



Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

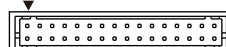
E0 connector



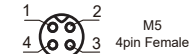
Pin	Signal
1	10/100M
2	TX+
3	TX-
4	N.C.
5	N.C.
6	RX+
7	RX-
8	N.C.
9	N.C.
10	N.C.

<CN1 port>

[JST/PHD 32pin connector]



OPT connector



Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.

E1 connector



Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

Connection side Harness side

- Housing 32-pin: PHDR-32VS

- Contact: BPHD/SPHD-001T-P0.5

AWG26...22/Outer diameter Φ1.0...1.5mm

- Contact: BPHD/SPHD-002T-P0.5

AWG28...24/Outer diameter Φ0.9...1.5mm

Pin	1	3	5	7	9	11	13	15*	17	19	21	23	25	27	29	31
Signal	Di 0	Di 2	Di 4	Di 6	Di 8	Di 10	Di 12	Di14 or CAN 1+	Di 16	Do 0	Do 2	Do 4	Do 6	RS232(Tx) /RS485(+)	RS232/ 485 SG	CAN 0+
Digital Input(PNP)																
Pin	2	4	6	8	10	12	14	16*	18	20	22	24	26	28	30	32
Signal	Di 1	Di 3	Di 5	Di 7	Di 9	Di 11	Di 13	Di14 or CAN 1-	Di 17	Do 1	Do 3	Do 5	Do 7	RS232(Rx) /RS485(-)	Di COM	CAN 0-
Digital Output(PNP)																

*: This signal changes depending on the can1/2 port selection.

! The rating per digital output point is 0.1A in the default setting. Make sure that the total current value does not exceed 1A. For protection, an automatic reset fuse is built into the device.

<GPIO>[Internal] RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)

3V	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
5V	5V	Ground	GPIO2	GPIO3	GPIO4	GPIO5	GPIO6	GPIO7	GPIO8	GPIO9	GPIO10	GPIO11	GPIO12	GPIO13	GPIO14	GPIO15	GPIO16	GPIO17	GPIO18	GPIO19	GPIO20	GPIO21	GPIO22	GPIO23	GPIO24	GPIO25	GPIO26	GPIO27	GPIO28	GPIO29	GPIO30	GPIO31
:System Used (extension board CN10)																																
:System Used (extension board CN6)																																
:System Used (SD)																																

! The GPIOs of CM4 are 3.3V level. The total GPIO load is up to 50mA. For detailed specifications, please refer to the CM4 datasheet.

<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Blink	E0 active
A1(OR)	Blink	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON
Di0,1	Off	Di OFF
	On	Di ON
Do0,1	Off	Do OFF
	On	Do ON

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	---	---	Main
Wired LAN+Wireless LAN	---	---	WL/BT
Wired LAN+Wireless LAN+LTE	---	---	None

<CSI>[Internal]



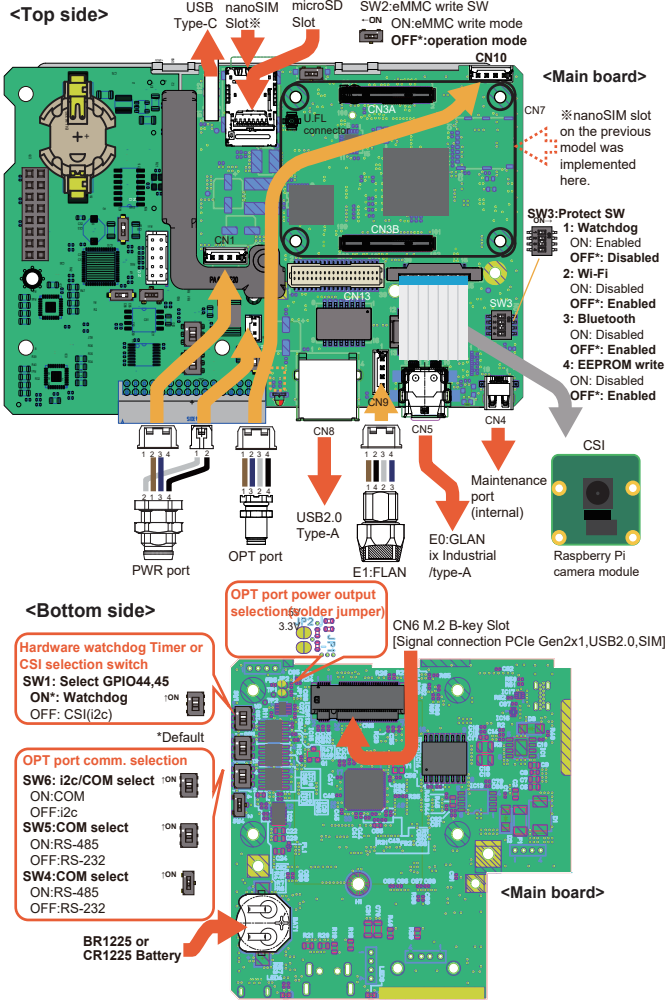
Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPIO45]
6	CAM1_D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

All data given are in line with the actual state of art and therefore not binding.
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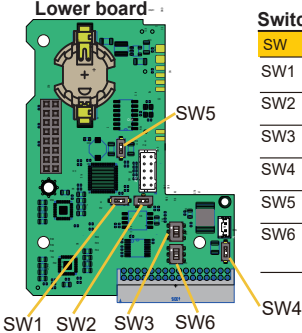
PL-R4 DIO IP20

Internal details



Internal DIP switch setting

The board on the left side of MCIA-R4 is the IO board. Only the lower board is mounted on the DIO model. Analog range and serial communication can be selected by switching the switch.



Switch setting list		
SW	Name	Setting
SW1	Do Sig. select	OFF*: PushPull High 0.1A ON: Highside Low 0.5A
SW2	RS comm.	OFF: RS-232C ON*: RS-485
SW3	RS comm.	OFF: RS-232C ON*: RS-485
SW4	CAN0 terminator	OFF: Terminator OFF ON*: Terminator ON
SW5	CAN1 terminator	OFF: Terminator OFF ON*: Terminator ON
SW6	CAN/DI select	Switchable by product model OFF*: 1port (CAN1 not implemented) ON: 2port (CAN0, 1 implemented)

*: Default configuration

Device List

Main board side device

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60*	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPIO0,1	i2c-0/---	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM1	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM1	2-wire, max. 400kbps
CSI:i2c	CM4/GPII44,45	GPIO44,45/i2c-1	i2c1: GPIO44,45 / when not using WD
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

* Not recognized at i2c bus speed of 400kHz or higher. Therefore, it does not conflict with MCP2478.

IO expansion board side device

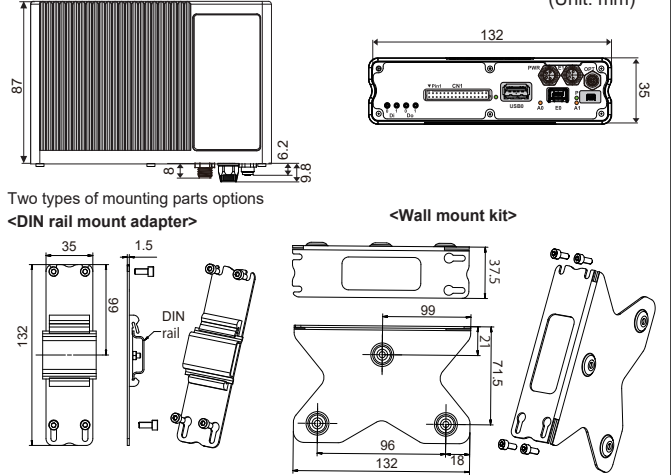
Signal	Device	Port or connection	Comments
DI0...DI15	MCP23S17	spidev1.0/0	Lower board
DO0...DO7	MCP23S17	spidev1.0/1	Lower board[1,1/0 JP selectable]
Spare	---	spidev1.1	Lower board
CAN0	MCP2518FD	spidev0.0:can0	Lower board
CAN1	MCP2518FD	spidev0.1:can1	Lower board
RTC,NVRAM*1	CP74910	i2c-5/0x57,6F	Lower board
RS-232/485	TXD1,RXD1	ttyAMA0	Lower board

RS232 3w Max.250kbps
RS485 2w Max.500kbps

*1 When using MCP79410 on the Raspberry Pi OS side, NVRAM cannot be connected on the Codesys side.

Dimensions and installation adapter

(Unit: mm)



Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code 4-pin female to open end	1m	21348100489010
		2m	21348100489020
E1[FLAN] cable	M8 A-code4 pin male to RJ45 Plug	1m	M8M4RM4010LI
	to RJ45 Plug	2m	M8M4RM4020LI
		0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
	to RJ45 Plug	2m	33480653830020
		0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna IP20/TG.55.8113		LANTIP2001
	LTE flat antenna IP67/GSA.8835.A.101111	1m	LANTIP6701
	LTE magnetic mount antenna IP65/GA.130.201111	2m	LANTIP6501
	3in1 antenna[GPS+2x4G] IP67/MA256.A.LBI.001	2m	LANTIP6702

Ordering information

[Part Number] 2RJ1 0 0 0R3 3 1		2: CM4 IP20 type R: Wired W: Wireless revision number	DIO model
Option (OPT) interface		Expansion interface	COM port, CAN port
1	RS-232C[standard]	1	RS-232Cx1, CANx1port
2	I2C	2	RS-485x1, CANx1port [standard]
3	RS-485	3	RS-232Cx1, CANx2port
		4	RS-485x1, CANx2port
Add-on software		0	None
RAM size [GB]		1	1
		2	2
		3	4[standard]
		4	8
eMMC size [GB]		1	8
		2	16
		3	32[standard]
		4	32/SSD128GB
		5	32/SSD256GB
		6	32/SSD512GB
4,5,6: NVMe fast SSD (Temperature 0-55°C)		Accessory	
		0	None[standard]
		1	Reserved
		L	LTE

All data given are in line with the actual state of art and therefore not binding. PLink reserves the right to modify designs without giving the relevant reasons.



PL-R4 Multi IO IP20

<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Blink	E0 active
A1(OR)	Blink	E1 active
P(RD)	Off	WD Normal
	On	WD Error
P(GR)	Off	User OFF
	On	User ON
Di0,1	Off	Di OFF
	On	Di ON
Do0,1	Off	Do OFF
	On	Do ON
USR	Off	User On/Off
	On	

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	---	---	Main
Wired LAN+Wireless LAN	---	---	WL/BT
Wired LAN+Wireless LAN+LTE	---	---	None

<CSI>[Internal]

Pin	Signal	Pin	Signal
1	GND	9	CAM1_C_P
2	CAM1_D0_N	10	GND
3	CAM1_D0_P	11	CAM_GPIO
4	GND	12	NC
5	CAM1_D1_N	13	I2C1_SCL[GPI045]
6	CAM1_D1_P	14	I2C2_SDA[GPI044]
7	GND	15	3.3V
8	CAM1_C_N	16-30	NC

Device List

Main board side device

Signal	Device	Port or connection	Comments
E0:GLAN	CM4	eth0	10/100/1000Mbps
E1:FLAN	LAN9514i	eth1	10/100Mbps
Security IC (option)	ATECC608B	i2c-0/0x60	i2c0: GPIO0,1
RTC	DS3231SN	i2c-0/0x68	i2c0: GPIO0,1
OPT:i2c	CM4/GPI00,1	i2c-0/---	i2c0: GPIO0,1
OPT:RS-232	MCP2200-I	ttyACM1	3-wire, max. 250kbps
OPT:RS-485	MCP2200-I	ttyACM1	2-wire, max. 400kbps
CSI:i2c	CM4/GPI44,45	i2c1: GPIO44,45 / when not using WD	
CSI	CM4/CAM1	CAM1	MIPI CSI-2 2-lanes
WD Enable	MAX6373KA+T	GPIO44/Out	SET0 (SET1: Always High, SET2: Always Low)
WD Reset	MAX6373KA+T	GPIO45/Out	WDI

* Not recognized at i2c bus speed of 400kHz or higher. Therefore, it does not conflict with MCP4728.

IO expansion board side device

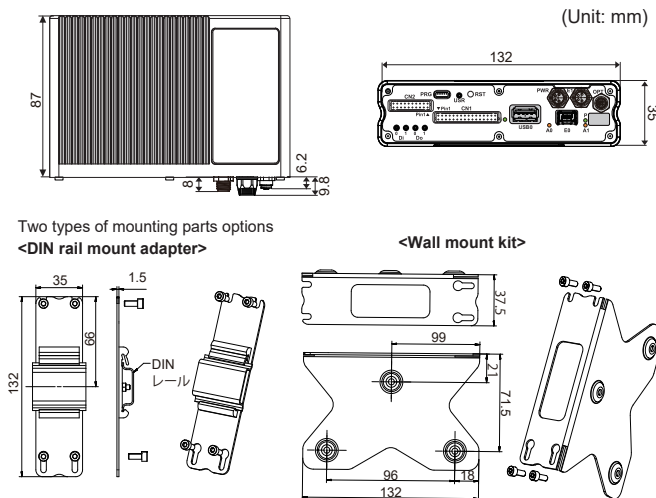
Signal	Device	Port/Address	Comments
Di0...Di15	MCP23S17	spidev1.0/0	Lower board
Do0...Do7	MCP23S17	spidev1.0/1	Lower board[1.1/0JP selectable]
Reserve	---	spidev1.1	Lower board
Ext.SPI	---	spidev1.2	Upper board
CAN0	MCP2518FD	spidev0.0:can0	Lower board
CAN1	MCP2518FD	spidev0.1:can1	Lower board
Ai0...Ai3	ADS1115	i2c-1/0x48	Upper board[CSI i2c-3/0x48]
Ao0...Ao1	MCP4728	i2c-5/0x60	Upper board[i2c-0 JP selectable]
RTC,NVRAM*1	MCP74910	i2c-5/0x57,6F	Lower board
RS-232/485	TXD1,RXD1	ttyAMA0	Lower board RS232 3w Max.250kbps RS485 2w Max.500kbps
STM32 VCOM	STM32-VCOM	ttyACM0	Upper board Max.921.6kbps[vcom]
STM32 DIO*2	STM GPIO	---	Upper board

*1 When using RTC on the Raspberry Pi OS side, NVRAM cannot be connected on the Codesys side.
*2 The default protocol to access IO and LED of STM32 is ModbusRTU.

STM32 ModbusRTU link map (slave address 1)

<Digital Input / Modbus Holding Register>		<Digital Output / Modbus Holding Register>	
memory offset word/bit	STM32 Link word/bit	memory offset word/bit	STM32 Link word/bit
0/0...7(used8...15)	Di0 ... Di7	10/0...3(used4...15)	Do0 ... Do3
1...9/0...15	Reserved	11/0...1(used2...15)	LED Red, Green
		12...19/0...15	Reserved

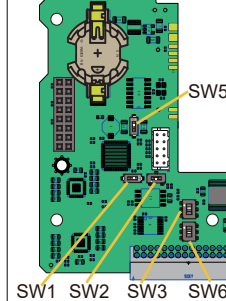
Optional accessories



Internal DIP switch setting

The board on the left side of MCIA-R4 is the IO board. Only the lower board is mounted on the DIO model. Analog range and serial communication can be selected by switching the switch.

Lower board



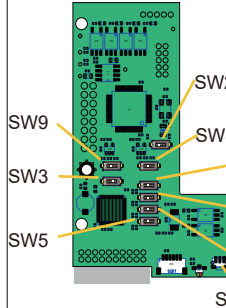
Switch setting list

SW	Name	Setting
SW1	Do Sig. select	OFF*:PushPull High 0.1A ON:Highside Low 0.5A
SW2	RS comm.	OFF:RS-232C ON*:RS-485
SW3	RS comm.	OFF:RS-232C ON*:RS-485
SW4	CAN0 terminator	OFF:Terminator OFF ON*:Terminator ON
SW5	CAN1 terminator	OFF:Terminator OFF ON*:Terminator ON
SW6	CAN/DI select	Switchable by product model OFF*:1port(CAN1not implemented) ON:2port(CAN0,1implemented)

*: Default configuration

Upper board

(DIO model is not mounted)



Switch setting list

SW	Name	Setting
SW1	STM32 Reset	OFF*:Invalid ON:Valid
SW2	STM32 Boot0	OFF:Invalid ON*:User Flash
SW3	Do Sig. select	OFF*:PushPull High 0.1A ON:Highside Low 0.5A
SW4	Ai0	OFF:0-10VDC ON*:0-5VDC
SW5	Ai1	OFF:0-10VDC ON*:0-5VDC
SW6	Ai2	OFF:0-10VDC ON*:0-5VDC
SW7	Ai3	OFF:0-10VDC ON*:0-5VDC
SW8	Ao0	OFF:0-10VDC ON*:0-5VDC
SW9	Ao1	OFF:0-10VDC ON*:0-5VDC

*: Default configuration

Optional accessories

Optional accessories			Part Number
PWR cable	M8 A-code	1m	21348100489010
	4-pin female to open end	2m	21348100489020
E1[FLAN] cable	M8 A-code4 pin male	1m	M8M4RM4010LI
	to RJ45 Plug	2m	M8M4RM4020LI
	to RJ45 Plug	0.2m	T17001449
OPT cable	M5 4-pin male to open end	1m	M5M4010G0
		2m	M5M4020G0
E0[GLAN] ix cable	ix plug to RJ45 plug	1m	33480653830010
		2m	33480653830020
	to RJ45 Plug	0.2m	T17001450IX
Mount kit	DIN rail mount adapter		20952000004
	wall mount kit		20953000007
Antenna for LTE	LTE monopole antenna		LANTIP2001
	IP20/TG.55.8113		
	LTE flat antenna	1m	LANTIP6701
	IP67/GSA.8835.A.101111		
	LTE magnetic mount antenna	2m	LANTIP6501
	IP65/GA.130.201111		
	3in1 antenna[GPS+2x4G]	2m	LANTIP6702
	IP67/MA256.A.LBI.001		

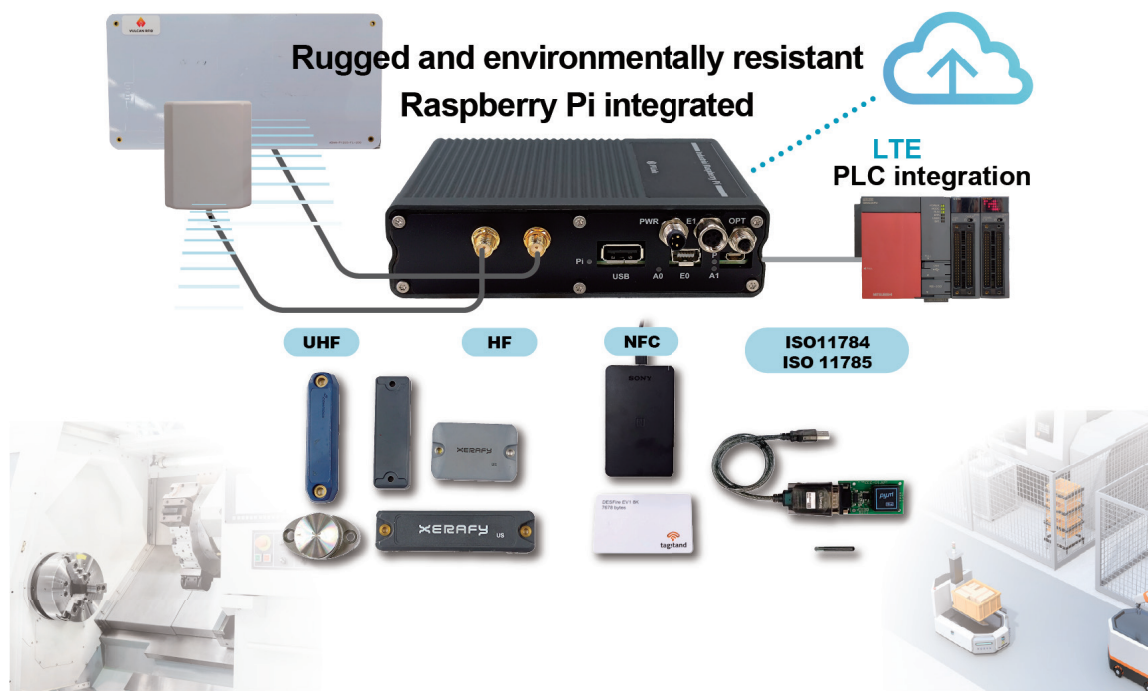
Ordering information

[Part Number] 2RJ11 0 0 0R3 3 1		Multi IO model	
Option (OPT) interface		Expansion interface COM port, CAN port	
1	RS-232C[standard]	1	RS-232Cx1, CANx1port
2	I2C	2	RS-485x1, CANx1port [standard]
3	RS-485	3	RS-232Cx1, CANx2port
		4	RS-485x1, CANx2port
Add-on software		Accessory	
0 None		0 None[standard]	
		1 Reserved	
		L LTE	

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

Datasheet

All-in-one RFID reader



PC-less Raspberry Pi Integrated RFID Reader

The PL-R4 RFID IP20 integrated RFID reader, based on an industrial Raspberry Pi, operates independently without a PC. This significantly contributes to simplified system configuration, reduced installation space requirements, and cost savings. It also excels in the durability and stability demanded by industrial environments, making it suitable for harsh installation conditions.

Compatible with four RFID standards

The device supports the UHF band (860–960 MHz), HF band (13.56 MHz), NFC (Near Field Communication), and the ISO 11784/11785 standard used for animal identification. This enables the reading and writing of diverse RFID tags with a single unit. It covers diverse RFID needs across manufacturing, logistics, and other industries with a single device, enabling centralised management and improved maintainability through standardised equipment.

High scalability

The PL-R4 RFID IP20 can be optionally equipped with an M.2 SSD and WiFi/LTE communication capabilities. Adding the LTE communication option enables direct internet connectivity from the field, allowing flexible operation even in locations without established wired networks. Acquired RFID data can be transmitted, stored, and analysed in real time by integrating with cloud services such as AWS. This enables advanced RFID operations, including centralised management from remote locations, improved operational efficiency through data utilisation, and enhanced traceability.

RFID standard	UHF band (Ultra High Frequency)	HFband (High Frequency)	NFC (Near Field Communication)	ISO 11784/ISO11785 (Specification for Animal Individual Identification)
PL-R4 RFID IP20	All covered			
International standard	ISO/IEC 18000-6C (EPC Gen2)	ISO/IEC18000-3	ISO/IEC 14443, 18092	ISO 11784 (Data structures) ISO 11785 (Communication method)
Communication range	Long range Approximately several metres to 10 metres (depending on the environment)	Medium range Approximately several centimetres to one metre	Close range Several centimetres (typically under 10 cm)	Short distance Several centimetres to tens of centimetres
Features	Long-range communication Supports simultaneous reading of multiple tags	Stable Communication Somewhat resistant to the effects of metals and water	Two-way communication possible Supports communication between smartphones and devices	Highly durable identification applications Exceptionally resistant to metals and water
Frequency band	860MHz (Europe) 920MHz (United States and Japan)	13.56 MHz	13.56 MHz (Part of the HF band)	134.2 kHz (LF band)
Primary industrial applications	Railway and other moving object detection Automatic pallet identification	Fixture and component tracking Part identification and automatic component recognition	Worker authentication/attendance records, Equipment configuration changes, maintenance work records, etc.	AGV route determination/tracking control, Parts identification in metal and liquid environments
Communication speed	High speed (several hundred kbps and above)	Medium speed (tens to hundreds of kbps)	Medium speed (106 ~ 424 kbps)	Low speed (Several kbps)
Tag cost	Low-cost (for mass production)	Moderate	Moderate to expensive	Low to moderate



PL-R4 RFID IP20

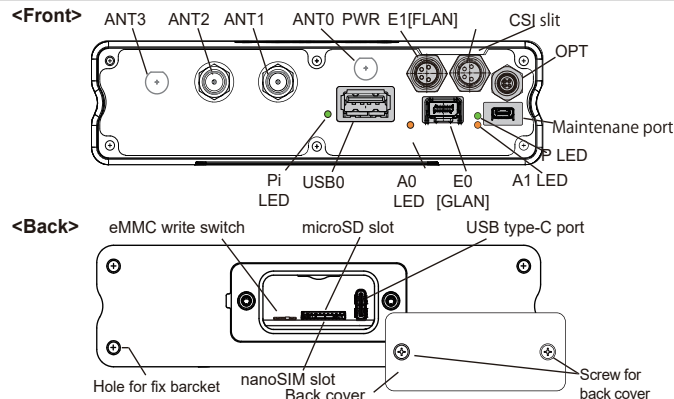
Picture



Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front Back Internal
LED, Button	P: Power status, A0,1: LAN status Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	BASIC:DC10.7V...28.8V/ 12W(incl.USB 500mA x1)
Temperature	Operating Temp.: -20...60°C, Storage:-25...85°C
Humidity	Operating Humi.:0...95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	BASIC:Approx.540g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions EN55016-2-3
EMS	Electrostatic radiation immunity EN 61000-4-2 Radio frequency electromagnetic fields EN 61000-4-3 Fast transient burst EN 61000-4-4
Installation method	DIN rail mounting, wall mounting (Option)

Details of each part



Features

- Industrial Raspberry Pi 4 (CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- Zebra Technologies RE40 UHF RFID chip [Technical Regulation No. 201-200451]
- Reading distance: up to 2 m
- Various antennas and industrial RFID tags are available (please contact us)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5, ix connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- Internal M.2 slot for SSD and WWAN expansion
- Rasp40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

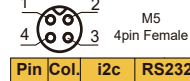
<Connector pin layout>

PWR connector



Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

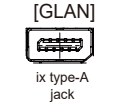
OPT connector



Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

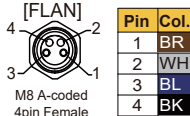
*1 pin for power output is no output by default.

E0 connector



Pin	Signal
1	TX+
2	TX-
3	N.C.
4	N.C.
5	N.C.
6	RX+
7	RX-
8	N.C.
9	N.C.
10	N.C.

E1 connector



Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

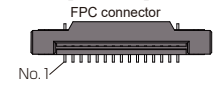
<LED>

LED	Sts.	Comments
P(OR)	Off	No power supply
	On	Power OK
A0(OR)	Blk	E0 active
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(OR)	Off	User OFF
	On	User ON

<ANT SMA port> [Option]

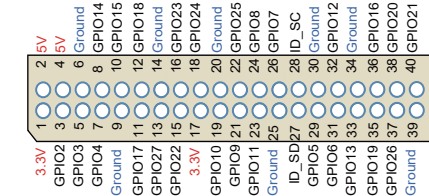
Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	Main	GNSS	Aux
Wired LAN+Wireless LAN	WL/BT	---	---
Wired LAN+Wireless LAN+LTE	Main	GNSS	WL/BT

<CSI>[Internal]



<GPIO>[Internal]

RasPi GPIO40pin (same layout as Raspberry Pi 40pin BM40B-SRDS-G-TF)



The GPIOs of CM4 are 3.3V level.
The total GPIO load is up to 50mA. For detailed specifications, please refer to the CM4 datasheet.

Ordering information

[Part Number]	2RRF1 000R 33 1	IP20 RFID model
Option (OPT) interface	1 RS-232C[standard]	
	2 I2C	
	3 RS-485	
Expansion interface	0 None	
	1 Reserved	
	L LTE	
Add-on software	0 None	
Accessory	0 None[standard]	
	1 Reserved	
	L LTE	
eMMC size [GB]	1 8	
	2 16	
	3 32[standard]	
	4 32/SSD128GB	
	5 32/SSD256GB	
	6 32/SSD512GB	

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

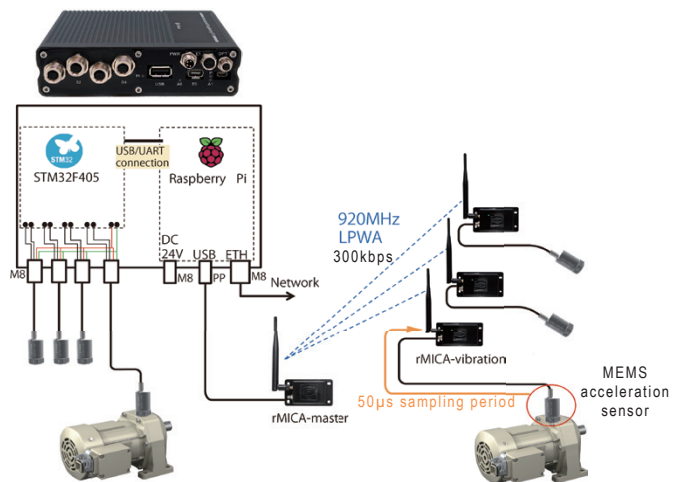
Condition Monitoring Predictive Maintenance

MEMES sensing

This is an example of diagnostic and predictive maintenance of motor faults using a MEMS accelerometer mounted on a state-of-the-art MEMS chip. The MEMS acceleration sensor mounted on the motor can be connected directly to an industrial Raspberry Pi with an integrated STM32 microcontroller or to a wireless sensor box.

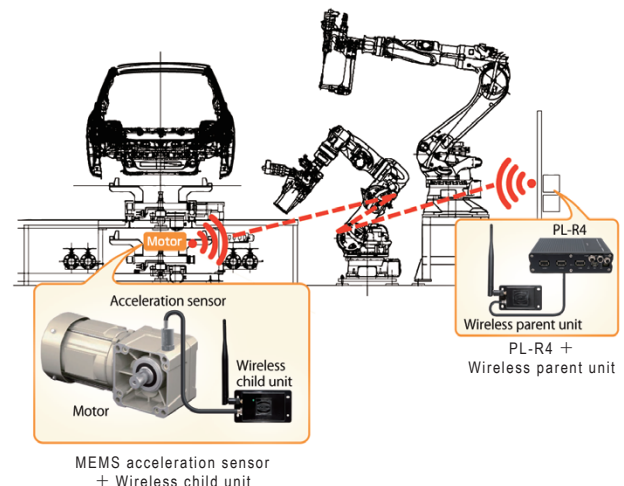
In this project, measurement data is sent via a wireless sensor box [child unit] to a wireless base station [parent unit] attached to an Industrial Raspberry Pi at a sampling interval of 50 μ s and at a rate of approximately 300 kbps, using 920 MHz sub-giga-band communication, with just under 20,000 measurement points per measurement. The measurement frequency is approximately five times per day, but at this frequency the wireless sensor box can operate for 3-5 years without battery replacement. The raw data received by the industrial Raspberry Pi is always mathematically processed by the open-source Scipy software on the Raspi, such as FFT and Envelope Transforms, and then graphs are drawn, faults are identified and data files are sent to the higher-level system [customer server].

Despite not requiring a database of machine constants for each motor, the system can detect faults in advance with extremely high accuracy by continuously measuring and comparing the fault evaluation index with the normal state at the start of operation. The condition monitoring application is available free of charge, including source code, and can be freely customised by adding screen configurations, decision algorithms, machine learning logic, etc.



Next Generation Wireless Sensing

With the shift to IoT in manufacturing sites, there is a growing need for wireless sensing of equipment distributed throughout plants and factories. In many cases, continuous measurement is not required for equipment condition monitoring and maintenance, and by reducing equipment and construction costs through the use of wireless technology, it is now possible to monitor small equipment that was previously difficult to install. PiLink develops and sells wireless sensor network devices using 920 MHz band LPWA for the domestic market and 860 MHz band and 2.4 GHz band (ZigBee) for the overseas market according to the radio wave certification conditions of each country. However, with our unique modulation method and retransmission/playback method, we can transmit approximately 20,000 sensor data points in about 5 seconds (transmission distance: 20 to 30 m). In addition, the transmission data and timing can be changed by custom development according to the customer's needs. For example, if you want to transmit only the judgment score by performing judgment scoring such as FFT on the child unit side, you can choose the LoRa method that can transmit data up to 500 m to 1 km despite its low transmission speed.





PL-R4 SENSOR IP20

Picture

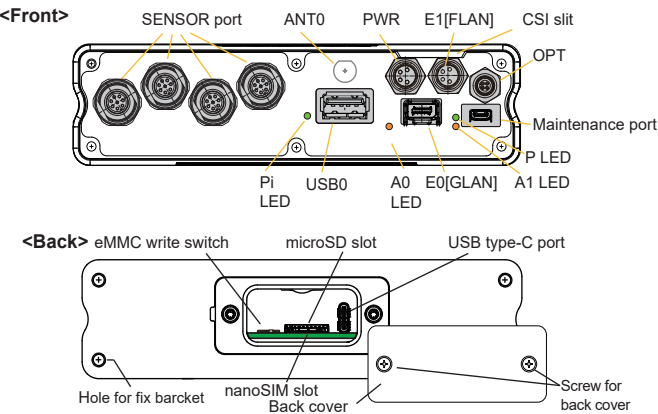


Product Specifications

Processor	Broadcom BCM2711, Quad core @ 1.5GHz
Memory	RAM4GB, eMMC32GB (Depend on model)
OS	Raspberry Pi OS
Interface	Front
	1x PWR : Power input, 2-line
	2x LAN : FLAN 1ch, GLAN 1ch
	1x OPT*1 : i2c/RS-232/485 selectable
Back	1x USB : USB2.0 Host Type-A
	4x SENSOR1/2/3/4 : M8 8p Female
	1x Maintenance port: System reserved
	[Option]1x WLAN IEEE 802.11 b/g/n/ac
Internal	Bluetooth 5.0, BLE
	1x USB-C : USB Type-C(eMMC writing only)
	1x SW : eMMC write switch
	1x microSD : microSD slot
LED, Button	1x M.2 slot B-key*2, 1x nanoSIM slot
	1x CSI, 1xGPIO 40p
	P: Power status, A0,1: LAN status
	Pi: User custom/WD error
RTC/NVRAM	BR1225[or CR1225] Backup RTC
Watchdog	Built-in hardware watchdog
Power/Consumption	GPIO:DC10.7V...28.8V/ 12W(incl. USB 500mAx1)
Temperature	Operating Temp.: -20~60°C, Storage: -25~85°C
Humidity	Operating Humi.: 0~95%(non-condensing)
IP grade	IP20
housing material	Aluminum powder coating
Dimensions	W132 x D87 x H35 mm (excluding protrusions)
Weight	GPIO:Approx.610g
Vibration/shock	IEC 60068-2-6 / IEC 60068-2-27
EMI	Radiated emissions
	EN55016-2-3
	Electrostatic radiation immunity
	EN 61000-4-2
EMS	Radio frequency electromagnetic fields
	EN 61000-4-3
Installation method	Fast transient burst
	EN 61000-4-4
DIN rail mounting, wall mounting(Option)	

*1 The speed is variable, but data bits 8, parity N, and stop bits 1 are fixed.
*2 A 128GB SSD is installed as the default specification.
Not a full pin connection. USB2.0, PCIe, and SIM are connected.

Details of each part



Features

- Industrial Raspberry Pi 4(CM4)
- New processor, up to 2x faster than CM3
- Raspberry Pi OS compatible (Ubuntu requires 4GB or more RAM)
- DC12/24V power input
- Wide operating temperature range and high noise resistance
- M8, M5 connectors with high vibration resistance and connection reliability
- Robust aluminum die-cast housing
- Supports wall mount and DIN rail mount
- On-board eMMC (SD card is not used for boot)
- microSD slot for data storage
- M.2 slot inside SSD and WWAN expansion
- Raspi40p connector for expansion board
- Built-in battery backup RTC
- Highly reliable hardware watchdog

Interface

<Connector pin layout>

PWR connector

M8 A-coded 4pin Male

Pin	Col.	Signal
1	BR	24VDC(V1)
2	WH	24VDC(V2)
3	BL	0V(V1)
4	BK	0V(V2)

E0 connector [GLAN]

ix type-A jack

Pin	Signal
1	TX+
2	TX-
3	N.C.
4	N.C.
5	N.C.
6	RX+
7	RX-
8	N.C.
9	N.C.
10	N.C.

E1 connector [FLAN]

M8 A-coded 4pin Female

Pin	Col.	Signal
1	BR	TX+
2	WH	RX+
3	BL	RX-
4	BK	TX-

OPT connector

M5 4pin Female

Pin	Col.	i2c	RS232	RS485
1	BR	3.3V/5V/none*1		
2	WH	SCL	TXD	A
3	BL	0V(RS232:SG)		
4	BK	SDA	RXD	B

*1 pin for power output is no output by default.
Sensor S1/2/3/4 communication port

M8 A-coded 8pin Female

Pin	Signal
1	Connection confirmation
2	+5VA (5V analog voltage supply)
3	Vout (accelerometer analog voltage output)
4	GNDA (Analog GND)
5	I2C SCL
6	+3V3 (3.3V digital power supply for I2C)
7	I2C SDA
8	GNDD (Digital GND)

<LED>

LED	Sts.	Comments
P(GR)	Off	No power supply
	On	Power OK
A0(OR)	Blk	E0 active
A1(OR)	Blk	E1 active
Pi(RD)	Off	WD Normal
	On	WD Error
Pi(GR)	Off	User OFF
	On	User ON

<ANT SMA port> [Option]

Type	ANT2	ANT1	ANT0
Wired LAN	---	---	---
Wired LAN+LTE	---	---	---
Wired LAN+Wireless LAN	---	---	WL/BT
Wired LAN+Wireless LAN+LTE	---	---	---

<CSI>[Internal]

FPC connector

No.1

Pin	Signal	Pin	Signal
1	GND	9	CAM1 C_P
2	CAM1 D0_N	10	GND
3	CAM1 D0_P	11	CAM GPIO
4	GND	12	NC
5	CAM1 D1_N	13	I2C1_SCL[GPIO45]
6	CAM1 D1_P	14	I2C2_SDA[GPIO44]
7	GND	15	3.3V
8	CAM1 C_N	16-30	NC

Ordering information

[Part Number] 2RSN1 0 0 0 R 4 3 1

R: Wired
W: Wireless

revision number

IP20 SENSOR model

Option (OPT) interface

1	RS-232C[standard]
2	I2C
3	RS-485

Expansion interface

0	None
---	------

RAM size [GB]

1	1
2	2
3	4[standard]
4	8

eMMC size [GB]

1	8
2	16
3	32
4	32/SSD128GB [standard]
5	32/SSD256GB
6	32/SSD512GB

4,5,6: NVMe fast SSD (Temperature 0-55°C)

Add-on software

0	None[standard]
---	----------------

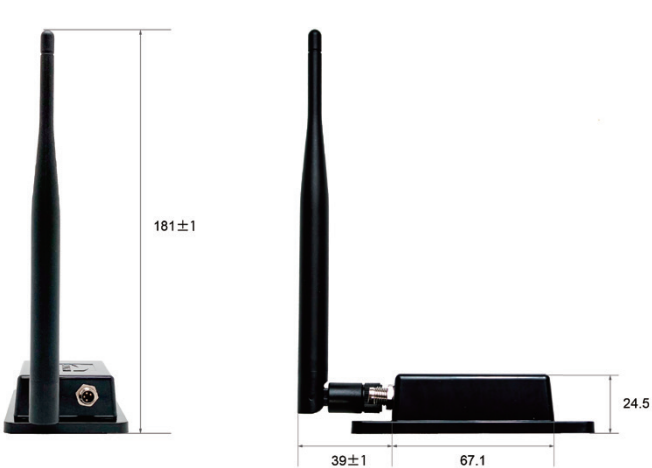
Accessory

0	None[standard]
---	----------------

All data given are in line with the actual state of art and therefore not binding.
PiLink reserves the right to modify designs without giving the relevant reasons.

*This model is designed for a condition monitoring application [wired type]. Some specifications differ from models for normal applications.

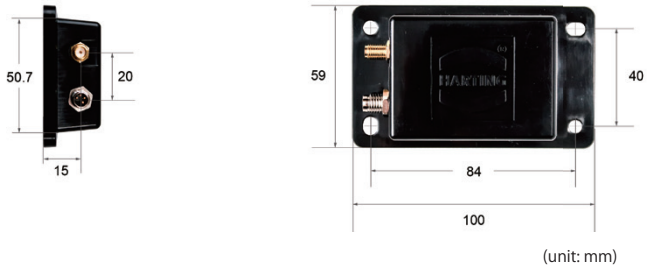
USB wireless base station
rPL-master



- A base station for communicating with the wireless sensor box. connect to a host computer such as PL-R4 via USB.
- Built-in 920MHz wireless module
 - Industry's fastest transmission speed of 300kbps by adoptinga wireless chip manufactured by Semtech in the United States. (200m) achieved.
 - Compatible with frequency bands around the world (requires radio certifi cation separately)
 - USB power supply
 - Dustproof and waterproof IP65

Product specifi cations

Model name	rPL-master
maain chip	FTDI FT234XD-R, SEMTECH SX series
interface	M8 4pin male x 1: USB2.0A RMA female x 1: external antenna
Power	Not required (USB power supply)
IP class	IP65
Certification	TELEC(Wireless)
Wireless standard	Domestic 920MHz band sub-giga standard
Wireless chanel	24 (916MHz) ~ 61 (928MHz)
Wireless output [module]	20mW
Antenna	Omnidirectional 3dBi, RMA male
Host	USB 2.0 A
Housing	Flame-retardant ABS
Operating temp. range -	-15 ~ 60℃
Size WxHxD(mm)	100 x 24.5 x 59
Mounting	4 x M4 screws



Oder information

Maini unit

Model	Part Number
USB wireless base station rPL-master	RPLMSTR01

USB cable

USB cable (PL-R4 or general PC connection)	Part Number
M8 A-coded, 4pin, Female ... USB 2.0A [aux.] 2m	contact us

USB cable (PL-R4, waterproof)	Part Number
M8 A-coded, 4pin, Female...PushPull USB 2.0A 2m	contact us

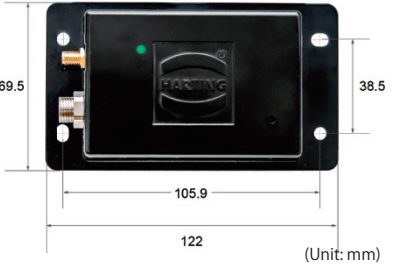


Wireless sensor box for acceleration sensor
rPL-vibration



It processes the readings from the accelerometer probe and wirelessly sends them to the host computer

- Super power saving microcomputer STM32L4 adopted
- Industry's fastest transmission speed of 300kbps by adopting a wireless chip manufactured by Semtech in the United States (200m) achieved.
- Compatible with frequency bands around the world (requires radio certification separately)
- Battery drive, built-in high-capacity long-life battery
- Dustproof and waterproof IP65



■ Product specifications

Model name	rPL-vibration
main chip	STM32 L432K, SEMTECH SX series
interface	M8 8pin Female x 1: sensor input RMA Female x 1: external antenna
Power	Built-in battery: 3.6 V, 13.5 Ah
IP class	IP65
Wireless standard	Domestic 920MHz band sub-giga standard
Wireless channel	24 (916MHz) ~ 61 (928MHz)
Wireless output [module]	20mW
Antenna	Omnidirectional 3dBi, RMA male
Host	Flame-retardant ABS
Housing	TELEC(Wireless)
Operating temp. range -	-15 ~ 60°C
Size WxHxD(mm)	122 x 31 x 69.5
Mounting	4 x M4 screws

■ Order information

● Main unit

Model	Part Number
Wireless box for acceleration sensor rPL-vibration	RPLVIB01

● Accessory

Model	Part Number
Battery for acceleration sensor wireless sensor box	RPLBAT01

Analog voltage output 0-10kHz 1-axis acceleration sensor
sPL-ACC



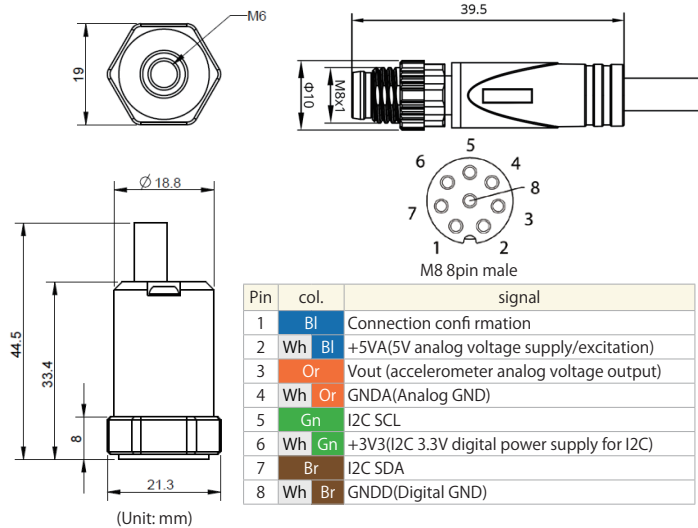
High-precision measurement of vibrations of motors etc., using high-performance MEMS sensors

- Measuring range over 20,000 Hz by adopting the latest MEMS chip Achieves overwhelmingly low noise
- Suitable for motor failure diagnosis
- Built-in temperature sensor (I2C) and low speed 3-axis acceleration sensor (I2C)
- Dustproof and waterproof IP66
- Industrial Raspberry Pi PL-R4 SENSOR or Used by connecting to the wireless sensor box rPL-vibration

Product specifications

Model/Part Number		sPL-ACC / SPLACCR01	
probe		Mounting method	M6 screw
		Operating temp. range	-20 ~ 85℃
		IP rating	IP66
		Material	Hard anodized
		Size	(excl. protrusions and cables)
Attached cable		Length	2m
		Connector	M8 8pinMale
Built-in sensor	1 axis Acceleration sensor (analog voltage output))	Acceleration range	-10g ~ +10g
		Frequency range	0 ~ 10kHz(± 10%)
		Noise level	25 μ g/ √ Hz
		Nominal sensitivity	40mV/g
		Sensitivity due to temp.	± 2%
	Temperature sensor (I2C output)	Linearity error	0.1%FS
		Cross-axis sensitivity	-1 ~ +1%
		Supply voltage	5V
		Temp. sensor range	-40 ~ 125℃
		Temp. sensor accuracy	± 3℃ (-40 ~ 85℃)
	Low speed 3 axis Acceleration sensor (I2C output)	Resolution	10bits
		Supply voltage	3.3V
		Acceleration range	2 ~ 16g
		Sample rate	1Hz
		Resolution	10bits
		Og off set error	- 250 ~ 250mg
		Og off set temp. coefficient	± 1.2mg/℃
		Linearity error ± 0.5%FS	± 0.5%FS
Cross-axis sensitivity	-1 ~ +1%		
	Supply voltage	3.3V	

Probe dimensions M8 connector cable details



DC current sensor
sPL-CUR



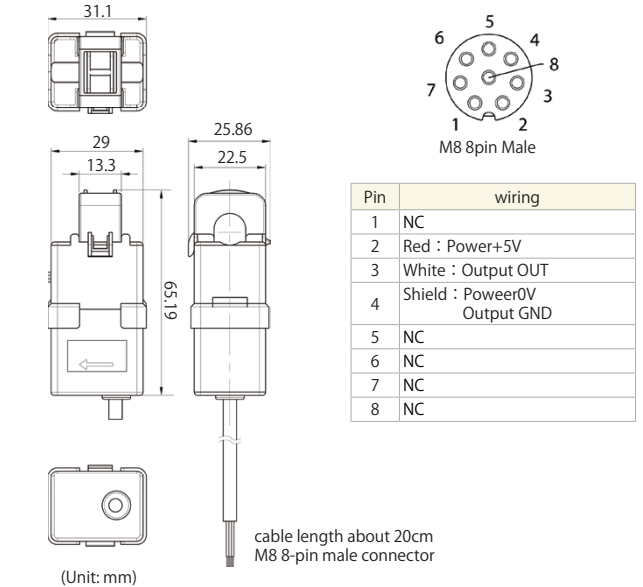
Compact, space-saving, low-cost current sensor

- Space-saving design with a width of 25.9 mm
- Separate type for easy retrofitting
- DC30A φ 10mm
- Response performance of 10 μ sec or less at 0 → rated current
- Easy-to-use +5V single power supply specification

Product specifications

Model/Part Number	sPL-CUR / PLCTF3010DC
Rated current	DC 30A
Allowable current	DC 33A
Output voltage	+30A input : DC +4.5V 0Ainput : DC +2.5V -30A input: DC +0.5V
Attachable wire diameter	Max. φ 10mm
Accuracy	± 2.0%FS
Temp. coefficient	± 0.1%/°C
Response speed	0 → 10 μ sec or less at rated current
Power supply voltage	+5V ± 5%(Single power supply)
Withstand voltage	AC 2000V2000V/1min(Outer case - Output)
Insulation resistance	DC 500V/over100M Ω (Outer case - Output)
Operating temp./humid. range	-10 ~ 65°C / 85%RH (No condensation)
Reference standard	RoHS
Cable	20cm (connector : M8 8pin male)
Wiring	Red : Power +5V White : Output OUT Shield : Power 0V/Output GND
Size / Weight	W25.9 × H65.2 × D31.1mm / approx.36g

Dimensions M8 connector wiring



PL-R4 option accessories

Power cable



Power cable	Part Number	
M8 A-coded, 4pin, Female ...openend	1m	21348100489010
	2m	21348100489020* G10130462*
	5m	21348100489050

*Select by stock and delivery status.

OPT / IOcable

- OPT port[PL-R4 all models]
- IO port (BASIC Plus IP 65 model)



OPT port caable	Part Number	
M5 4pin, Male ... openend	1m	M5M4010GO
	2m	M5M4020GO
	5m	M5M4050GO

PushPull USBcable



PushPull USB cable	Part Number	
PushPull USB 2.0A ... standard USB 2.0Type-A	1m	09454451911
	2m	09454451913
	5m	09454451915

SENSOR cable

SENSOR model S1...S4 port



Sensor cable	Part Number	
M8, 8pin, Male ...opened	2m	T17000113

MEMS sensor extension cable	Part Number	
M8, 8pin male ... M8, 8pin female	3m	T17000130
	8m	T17000131

Dust cap

Waterproof dust caps for M5 and M8 connectors	Part Number	
M8 Male(PWR)		CAPM8M6701
M8 Female (E1 and SENSOR model's S1-S4)		CAPM8F6701
M5 Male (OPTand BASIC Plus IP65model's IO port		CAPM5F6701



Installation adapters

Installation adapters	Part Number	
DIN rail mount adapter		20952000004
Wall mount kit		20953000007

DIN rail mount



Wall mount



The main unit can be installed vertically without taking up much width.

The bottom of the main unit can be installed facing a wall with minimal protrusion.

LTE antenna

LTE antenna	Part Number	
LTE monopole antenna IP20 / TG.55.8113		LANTIP2001
LTE flat antenna IP67 / GSA.8835.A.101111	1m	LANTIP6701
LTE magnetic mount antenna IP65 / GA.130.201111	2m	LANTIP6501
LTE 3-in-1 antenna(GPS + 2x4G MIMO) IP67/ MA256.A.LBI.001	2m	LANTIP6702

Startup power supply kit



General Startup Power Supply Kit	Part Number	
DC24V AC adapter + DC jack		MRPOWK01

LAN calbe

- E1 port [M8]



LAN cable	Part Number	
M12 D-coded, 4pin, Male ... RJ45	1m	M8M4RM4010LI
	2m	M8M4RM4020LI
	5m	M8M4RM4050LI

- E1 port[M8]

Ethernet(E1) port



LAN cable	Part Number	
M8 A-code, 4pin ,male ... J45 jack	0.2m	T17001449

- EO port[ix]

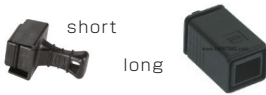
Ethernet(E0)port of PL-R4 IP20 models



LANcable	Part Number	
ix Type A plug ~ RJ45 jack	0.2m	T17001450IX

PushPull protection cover

For PushPull USB ports of the PL-R4 IP65 models.



PushPull protection cover	Part Number	
Short(IP67)		09 45 845 0009
Long(IP67)		09 45 845 0015
Easy cap (can be used with a cutter to cut a slit for the cable.)		PPCAP01

For DIO models and Multio IO models Wiring tool and connector for CN1 and CN2 connectors

Simple Tools & Connectors	
1. crimping pliers	SN-01BM [IWISS]
2. crimp contact	BPHD-002T-P0.5 [JST]
3. connector	1) CN1 PHDR-32VS [JST] 2) CN2 PHDR-20VS [JST]
4. cable	AWG28-24 (Insulator O.D. 0.9-1.5mm)

Supplier Tools & Connectors	
1. crimping tool	YRS-620 [JST]
2. crimp contact	SPHD-002T-P0.5 [JST]
3. connector	1) CN1 PHDR-32VS [JST] 2) CN2 PHDR-20VS [JST]
4. cable	AWG28-24 (Insulator O.D. 0.9-1.5mm)

LTE monopole antenna
SMA screw



LTE flat antenna
Sticker on glass and resin surfaces



LTE magnetic mount antenna
Metal surface mounting



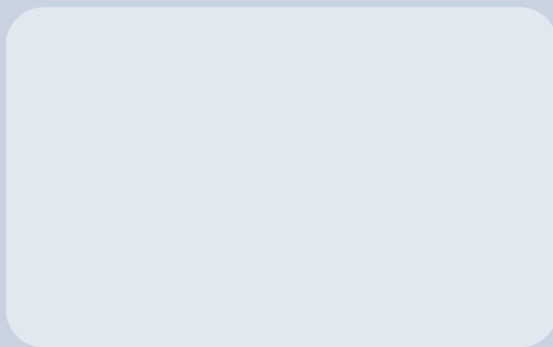
LTE 3-in-1 antenna
Glass/resin surfaces
Adhesive mounting



Cable 1 m

Cable 2m

Cable 2m



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