



## User Manual of C2-CPU radio board

### **Product Description**

Koyo Electronics C2-CPU module has been specifically designed to interface with software applications, smart device applications and industrial control equipment designed and marketed by Koyo electronics as well as other industrial control equipment that utilize the Modbus and Modbus TCP protocols. The C2-CPU utilizes the global license-free 2.4GHz band at output power levels that are compatible with government regulations throughout the world.

C2-CPU radio board uses Espressif Systems "ESP32-PICO-D4" Radio module. C2-CPU radio board includes complete Wi-Fi, Bluetooth and BLE.



General Specifications

C2-CPU has the following main features.

Items		C2-02CPU	C2-03CPU
Memory	ROM	Internal 1Mbyte + External 2Mbyte	
	RAM	Internal 320 Kbyte + External 256 Kbyte (backup)	
Ladder instruction set		CLICK PLC instruction set	
User program size		8,000 steps	
User memory size		8,000 words	
PLC mode switch		1 (RUN/STOP)	
I/O Slot	Internal I/O	N/A(Optional)	
	Slot-0 Support	Yes (max.2 TBD)	
	Expansion I/O	Yes (max. 8modules )	
Com. Port	USB port Programming	Yes(Device) (For programming and providing 5VDC power. Micro USB-B.)	
	Ethernet (RJ-45)	None	Yes(10/100)
	Serial Port RS-232 (RJ-12)	None	Yes
	Serial Port RS-485 (Terminal Block)	None	Yes
	WLAN (with internal antenna and RP-SMA connector for external antenna)	None	Yes (Antenna Optional common Bluetooth)
	Bluetooth with Antenna	None	Yes (Antenna Optional common Wi-Fi)
Status Indicator	WLAN Status	None	1
	Bluetooth Status	None	1
	CPU LED Status	3 (PWR / RUN / ERR)	
	Ethernet LED Status	2(LINK/ACT 10/100)	
	Serial Status	None	2(RX, TX)
Others	SDC Status	None	1
	Micro SDC (SDHC compatible)	None	Yes
	RTC	Yes (Backup)	
Power	Battery	Yes (with Battery Holder) (Battery can be D0-MC-BAT)	
	Input Voltage	24VDC (4pin terminal block)	
	Power Fail Detect	None	Yes
Software	USB Supply	5VDC (Via USB Programming port)	
	Running Edit	Yes	



Item	Specification
<i>Ambient Operating Temperature</i>	32°F to 131°F (0°C to 55°C)
<i>Storage Temperature</i>	-4°F to 158°F (-20°C to 70°C) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
<i>Ambient Humidity</i>	30% to 95% (Non-condensing)
<i>Environmental air</i>	No corrosive gasses, The level for the environmental pollution = 2
<i>Vibration Resistance</i>	IEC60068-2-6 (Test Fc) 5-9Hz:3.5mm amplitude, 9-150Hz 1.0G 10 sweep cycles per axis on each of 3 mutually perpendicular axes.
<i>Shock Resistance</i>	IEC60068-2-27 (Test Ea) 15G peak, 11ms duration, 3 shocks in each direction per axis, on 3 mutually perpendicular axes.
<i>Voltage withstand (Dielectric)</i>	1500VAC, 1 minute (between G - 24V IN)
<i>Insulation Resistance</i>	500VDC, 10M ohm (between G - 24V IN)
<i>Noise Immunity</i>	<EN61131-2> EN61000-4-2 (ESD): 4kV(Contact Discharge) 8kV(Air Discharge) EN61000-4-3 (RFI): 10V/m(80MHz-1GHz) ,3V/m(1.4GHz-2.0GHz 1V/m(2.0GHz-2.7GHz EN61000-4-4 (FTB) : 2kV ,positve/negative , 5kHz(DC Power Port) 1kV ,positve/negative , 5kHz (I/O and Commnication Port) EN61000-4-5 (Surge): 0.5kV/1kV line to line 0.5kV/1kV line to earth EN61000-4-6 (Conducted): 10V ,0.15MHz – 80MHz EN61000-4-8 (Power frequency magnetic field immunity) : 30A/m <Local Test> RFI : 145MHz, 440Mhz 5W @ 15cm Impulse Immunity : 1000V @ 1uS pulse
<i>Emission</i>	EN55011 Class A (Radiated RF emission)
<i>Technical standard</i>	UL61010 CE ( EN61131-2 ) CUL Canadian C22.2 RoHS (2011/65/EU and amendment(EU)2015/863)
<i>Radio standard (TBD)</i>	FCC part15C RED Article3.2 IC RSS-247 MIC Notice No.88 RCM
<i>Other standard</i>	Bluetooth SIG , SD asociate

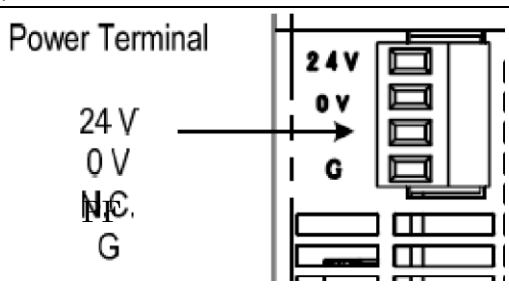


"Value & Technology"

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<i>Weight</i>	C2-01CPU	C2-02CPU	C2-03CPU
	TBD	TBD	TBD

## Power Supply Specifications

Item		Specification
Voltage Withstand(dielectric)		No Isolation
Operating Voltage Range		24 VDC(Class2 or SELV(Safety Extra-Low Voltage) or Limited Energy Circuit power supply)
Input Voltage Range		20.0 – 28.0 VDC
Power Consumption		C2-02CPU
		C2-03CPU
		TBD
Maximum Inrush Current		30A @1ms
Fuse (Not replaceable)		No
Recommended add external fuse		T.B.D
Acceptable External Power Drop		Max. 10ms (AC Power Failure with C0-00AC or C0-01AC))
Polarity Protected		The DC is reverse polarity protected
Supply Connector	<i>Terminal Type</i>	3.5mm pitch pluggable terminal block
	<i>Wire range</i>	16-28 AWG
	<i>Wire strip length</i>	7.0mm
	<i>Wire Specification</i>	Supported temperature : Over 60 degreeC Material : Copper
	<i>Screws torque</i>	2.0 – 2.2 lb-inch (0.22 – 0.25 Nm)
	<i>Screw Size</i>	M2
	<i>Number of Pin</i>	4 pin terminal block
	<i>Screw driver Size</i>	DN-SS1 or compatible one (Insulated Slotted Screwdriver 0.4 x 2.5 x 75mm)
	<i>Pin assignment</i>	<p>Power Terminal</p>  <p>24 V 0 V NC G</p>
Optional	Possible to use C0-00AC or C0-01AC Power Supply Module (Recommended external fuse : ***)	

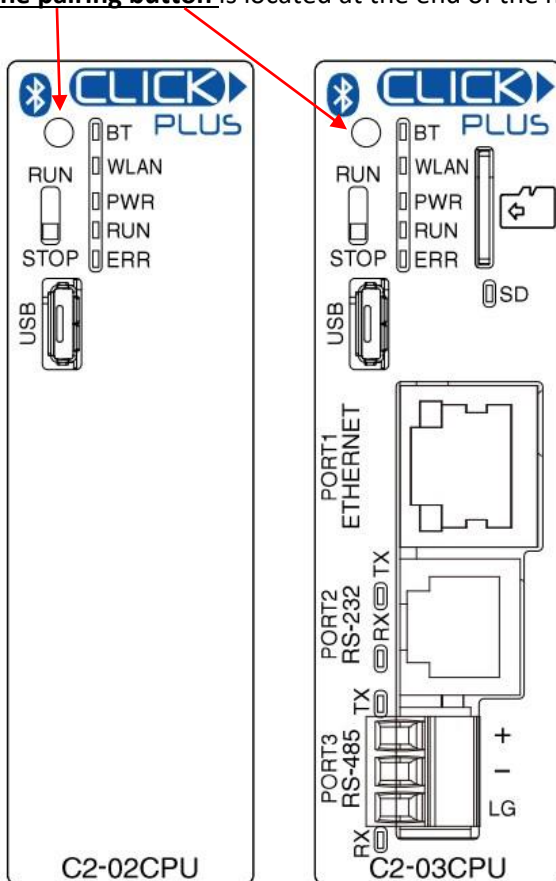
LED Indicators

	PWR	RUN	ERR
	Green	Green	Red
ON	Power Good	PLC Run Mode	Self-diagnostic error
Blink	---	Initializing System	Self-diagnostic warning
OFF	Power Failure	PLC Program Mode	No Error

The pairing button

Host(C2-02CPU,C2-03CPU,C2-02CPU-2 and C2-03CPU-2 are has a pairing button.

**The pairing button** is located at the end of the hole and cannot be pressed with a finger.



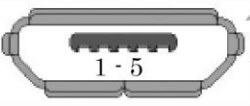


Host(CLICK PLUS CPU) into the pairing mode(provisioning mode) following method.

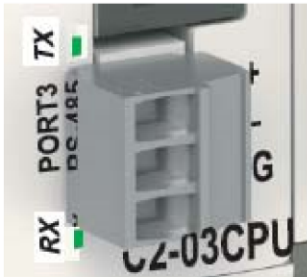
- (1)Factory default condition
- (2)Press and hold the pairing button for 3 seconds during PLC is in STOP Mode.

The pairing button is located at the end of the hole and cannot be pressed with a finger.



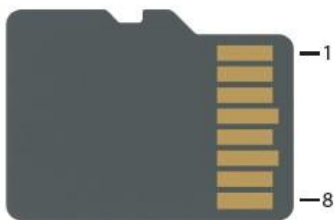

CommunicationPorts

Item	Description				
USB Port for Programming Port	Communications ratings	USB2.0 Full speed (12Mbps)			
	Connector	Micro USB Type B connector			
	Pin Assignment		1	VBUS	5V Power supply in
			2	D -	Differential signal+
			3	D +	Differential signal-
			4	NC	(ID is not used)
		5	GND	GND	
	BUS Power	Yes , Max 500mA 5VDC Operate condition (when supply USB bus power) >Firmware update and Project update >Stop WLAN and Bluetooth function >Stop access the modules on Optional I/O bus >Stop access the modules on Slot-0 bus			
	Recommended cable	USB-CBL-AMICB6 <i>*We do not want to recommend this cable that is not shielded.</i>			
	USB Cable lengths	Max. 15 feet			
Ethernet	Communications ratings	10/100 BASE-T			
	Cable specification	Category 5			
	Auto MDI / MDI-X	Yes			
	Connector	RJ45			
	Pin Assignment		1	TD+	Transmit data(+)
			2	TD-	Transmit data(-)
			3	RD+	Receive data(+)
			4	-	No connect
		5	-	No connect	
		6	RD-	Receive data(-)	
		7	-	No connect	
		8	-	No connect	
Status LED	LINK / ACT				
		No.	Color	ON	OFF
		LED1	Green	LINK (Always ON)	-
Default Setting	IP address acquisition by DHCP In the case of two consecutive acquisition failure, set the following IP Address forcibly. IP address : 192.168.0.10 Net Mask : 255.255.0.0 Default Gateway : 0.0.0.0				
	LED2 : Yellow 100M : 10M - : -				
Port2 for Standard Communication Port	Communications ratings	Conforms to RS232C			
	Conditions for Communications with external devices	Baud rate: 2400,4800,9600, 19200, 38400 , 57600 , 115.2k bps Data bit : 7bit , 8bit Parity: None, ODD, Even Stop bit: 1bit , 2bit			
	Connector	RJ12 Phone Jack			
	Pin Assignment / Status Lamp		1	GND	Ground
		2	5Vout	5V output 200mA	
		3	RXD	Receive data (232C)	
		4	TXD	Transmit data (232C)	
		5	RTS	Request to send(232C)	
		6	GND	Ground	

	Power Supply to HMI (EA1 or EA3 series)	Supply : 5V 200mA
Port3 for PLC Communication Port	Communications ratings	Conforms to RS-485
	Conditions for communications with external devices	Baud rate: 2400,4800,9600, 19200, 38400,57600,115.2k bps Data bit : 7bit , 8bit Parity: None, ODD, Even Stop bit: 1bit , 2bit
	Connector	3-Wire terminal Block
	Terminal Type	Removable connector (Phoenix Contact: MC1.5/3-ST-3.5GY)
	Wire range	16-28 AWG
	Wire Specification	Supported temperature : Over 60 degreeC Material : Copper
	Screws torque	Min 0.22Nm (1.95lb-in)
	Number of Pin	3 pin terminal block
	Screw driver Size	DN-SS1 or compatible one (Insulated Slotted Screwdriver 0.4 x 2.5 x 75mm)
	Pin Assignment	(1)+ : Differential signal + (2)- : Differential signal - (3)LG: Logic Ground
Status LED		



SD Card Slot

SD Card Slot	Type	microSD ,microSDHC																			
	Connector	<p>(This illustration is the back side of the SD memory card)</p>  <table border="1" data-bbox="1198 499 1374 728"> <thead> <tr> <th>Pin</th> <th>SD</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DAT2</td> </tr> <tr> <td>2</td> <td>CD/DAT3</td> </tr> <tr> <td>3</td> <td>CMD</td> </tr> <tr> <td>4</td> <td>VDD</td> </tr> <tr> <td>5</td> <td>CLK</td> </tr> <tr> <td>6</td> <td>VSS</td> </tr> <tr> <td>7</td> <td>DAT0</td> </tr> <tr> <td>8</td> <td>DAT1</td> </tr> </tbody> </table>		Pin	SD	1	DAT2	2	CD/DAT3	3	CMD	4	VDD	5	CLK	6	VSS	7	DAT0	8	DAT1
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7	DAT0																				
8	DAT1																				
Format	FAT32																				
Size	Max. 32GB																				
Status Lamp		<table border="1" data-bbox="767 922 1418 1189"> <thead> <tr> <th>Status</th> <th>SD LED</th> </tr> </thead> <tbody> <tr> <td>Mount</td> <td>ON</td> </tr> <tr> <td>Not mount</td> <td>OFF</td> </tr> <tr> <td>In access</td> <td>Blinking</td> </tr> </tbody> </table>		Status	SD LED	Mount	ON	Not mount	OFF	In access	Blinking										
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## ESP32-PICO-D4 Specifications

Categories	Items	Specifications
Certification	Bluetooth certification	BQB
Wi-Fi	Protocols	802.11 b/g/n (802.11n up to 150 Mbps)
		A-MPDU and A-MSDU aggregation and 0.4 $\mu$ s guard interval support
	Frequency range	2.4 ~ 2.5 GHz
Bluetooth	Protocols	Bluetooth V4.2 BR/EDR and Bluetooth LE specification
	Radio	NZIF receiver with -97 dBm sensitivity
		Class-1, class-2 and class-3 transmitter
		AFH
Audio	CVSD and SBC	
Hardware	Module interfaces	ADC, DAC, touch sensor, SD/SDIO/MMC Host Controller, SPI, SDIO/SPI Slave Controller, EMAC, motor PWM, LED PWM, UART, I <sup>2</sup> C, I <sup>2</sup> S, infrared remote controller, GPIO, pulse counter
	On-chip sensor	Hall sensor
	Integrated crystal	40 MHz crystal
	Integrated SPI flash	4 MB
	Operating voltage/Power supply	3.0 V ~ 3.6 V
	Operating current	Average: 80 mA
	Minimum current delivered by power supply	500 mA
	Operating temperature range	-40 °C ~ 85 °C
	Package size	(7.000±0.100) mm×(7.000±0.100) mm×(0.940±0.100) mm
	Moisture sensitivity level (MSL)	Level 3



## Wi-Fi Radio Characteristics

Description	Min	Typical	Max	Unit
Operating frequency range <i>note1</i>	2412	-	2484	MHz
Output impedance <i>note2</i>	-	50	-	Ω
<b>TX power <i>note3</i></b>				
Output power of PA for 72.2 Mbps	13	14	15	dBm
Output power of PA for 11b mode	19.5	20	20.5	dBm
<b>Sensitivity</b>				
DSSS, 1 Mbps	-	-98	-	dBm
CCK, 11 Mbps	-	-91	-	dBm
OFDM, 6 Mbps	-	-93	-	dBm
OFDM, 54 Mbps	-	-75	-	dBm
HT20, MCS0	-	-93	-	dBm
HT20, MCS7	-	-73	-	dBm
HT40, MCS0	-	-90	-	dBm
HT40, MCS7	-	-70	-	dBm
MCS32	-	-89	-	dBm
<b>Adjacent channel rejection</b>				
OFDM, 6 Mbps	-	37	-	dB
OFDM, 54 Mbps	-	21	-	dB
HT20, MCS0	-	37	-	dB
HT20, MCS7	-	20	-	dB



The C2-CPU Wi-Fi Radio and Baseband support the following features:

- 802.11b/g/n
- 802.11n MCS0-7 in both 20 MHz and 40 MHz bandwidth
- 802.11n MCS32 (RX)
- 802.11n 0.4  $\mu$ s guard-interval
- up to 150 Mbps of data rate
- Receiving STBC 2x1
- Up to 20.5 dBm of transmitting power
- Antenna diversity

ESP32 supports antenna diversity with an external RF switch. One or more GPIOs control the RF switch and selects the best antenna to minimize the effects of channel fading.



Bluetooth BR Radio Characteristics.

### Receiver – Basic Data Rate

Parameter	Conditions	Min	Typ	Max	Unit
Sensitivity @0.1% BER	-	-	-94	-	dBm
Maximum received signal @0.1% BER	-	0	-	-	dBm
Co-channel C/I	-	-	+7	-	dB
Adjacent channel selectivity C/I	F = F0 + 1 MHz	-	-	-6	dB
	F = F0 - 1 MHz	-	-	-6	dB
	F = F0 + 2 MHz	-	-	-25	dB
	F = F0 - 2 MHz	-	-	-33	dB
	F = F0 + 3 MHz	-	-	-25	dB
	F = F0 - 3 MHz	-	-	-45	dB
Out-of-band blocking performance	30 MHz ~ 2000 MHz	-10	-	-	dBm
	2000 MHz ~ 2400 MHz	-27	-	-	dBm
	2500 MHz ~ 3000 MHz	-27	-	-	dBm
	3000 MHz ~ 12.5 GHz	-10	-	-	dBm
Intermodulation	-	-36	-	-	dBm

### Transmitter – Basic Data Rate

Parameter	Conditions	Min	Typ	Max	Unit
RF transmit power	-	-	0	-	dBm
Gain control step	-	-	3	-	dBm
RF power control range	-	-12	-	+9	dBm
+20 dB bandwidth	-	-	0.9	-	MHz
Adjacent channel transmit power	F = F0 ± 2 MHz	-	-47	-	dBm
	F = F0 ± 3 MHz	-	-55	-	dBm
	F = F0 ± > 3 MHz	-	-60	-	dBm
$\Delta f_{1avg}$	-	-	-	155	kHz
$\Delta f_{2max}$	-	133.7	-	-	kHz
$\Delta f_{2avg}/\Delta f_{1avg}$	-	-	0.92	-	-
ICFT	-	-	-7	-	kHz
Drift rate	-	-	0.7	-	kHz/50 $\mu$ s
Drift (DH1)	-	-	6	-	kHz
Drift (DH5)	-	-	6	-	kHz



Bluetooth EDR Radio Characteristics.

**Receiver – Enhanced Data Rate**

Parameter	Conditions	Min	Typ	Max	Unit
$\pi/4$ DQPSK					
Sensitivity @0.01% BER	-	-	-90	-	dBm
Maximum received signal @0.01% BER	-	-	0	-	dBm
Co-channel C/I	-	-	11	-	dB
Adjacent channel selectivity C/I	F = F0 + 1 MHz	-	-7	-	dB
	F = F0 - 1 MHz	-	-7	-	dB
	F = F0 + 2 MHz	-	-25	-	dB
	F = F0 - 2 MHz	-	-35	-	dB
	F = F0 + 3 MHz	-	-25	-	dB
	F = F0 - 3 MHz	-	-45	-	dB
8DPSK					
Sensitivity @0.01% BER	-	-	-84	-	dBm
Maximum received signal @0.01% BER	-	-	-5	-	dBm
C/I c-channel	-	-	18	-	dB
Adjacent channel selectivity C/I	F = F0 + 1 MHz	-	2	-	dB
	F = F0 - 1 MHz	-	2	-	dB
	F = F0 + 2 MHz	-	-25	-	dB
	F = F0 - 2 MHz	-	-25	-	dB
	F = F0 + 3 MHz	-	-25	-	dB
	F = F0 - 3 MHz	-	-38	-	dB



**Transmitter – Enhanced Data Rate**

Parameter	Conditions	Min	Typ	Max	Unit
RF transmit power	-	-	0	-	dBm
Gain control step	-	-	3	-	dBm
RF power control range	-	-12	-	+9	dBm
$\pi/4$ DQPSK max $w_0$	-	-	-0.72	-	kHz
$\pi/4$ DQPSK max $w_i$	-	-	-6	-	kHz
$\pi/4$ DQPSK max $ w_i + w_0 $	-	-	-7.42	-	kHz
8DPSK max $w_0$	-	-	0.7	-	kHz
8DPSK max $w_i$	-	-	-9.6	-	kHz
8DPSK max $ w_i + w_0 $	-	-	-10	-	kHz
$\pi/4$ DQPSK modulation accuracy	RMS DEVM	-	4.28	-	%
	99% DEVM	-	100	-	%
	Peak DEVM	-	13.3	-	%
8 DPSK modulation accuracy	RMS DEVM	-	5.8	-	%
	99% DEVM	-	100	-	%
	Peak DEVM	-	14	-	%
Parameter	Conditions	Min	Typ	Max	Unit
In-band spurious emissions	$F = F_0 \pm 1$ MHz	-	-46	-	dBm
	$F = F_0 \pm 2$ MHz	-	-40	-	dBm
	$F = F_0 \pm 3$ MHz	-	-46	-	dBm
	$F = F_0 +/ - > 3$ MHz	-	-	-53	dBm
EDR differential phase coding	-	-	100	-	%



Bluetooth LE Radio Characteristics.

**Receiver**

Parameter	Conditions	Min	Typ	Max	Unit
Sensitivity @30.8% PER	-	-	-97	-	dBm
Maximum received signal @30.8% PER	-	0	-	-	dBm
Co-channel C/I	-	-	+10	-	dB
Adjacent channel selectivity C/I	F = F0 + 1 MHz	-	-5	-	dB
	F = F0 - 1 MHz	-	-5	-	dB
	F = F0 + 2 MHz	-	-25	-	dB
	F = F0 - 2 MHz	-	-35	-	dB
	F = F0 + 3 MHz	-	-25	-	dB
	F = F0 - 3 MHz	-	-45	-	dB
Out-of-band blocking performance	30 MHz ~ 2000 MHz	-10	-	-	dBm
	2000 MHz ~ 2400 MHz	-27	-	-	dBm
	2500 MHz ~ 3000 MHz	-27	-	-	dBm
	3000 MHz ~ 12.5 GHz	-10	-	-	dBm
Intermodulation	-	-36	-	-	dBm

**Transmitter**

Parameter	Conditions	Min	Typ	Max	Unit
RF transmit power	-	-	0	-	dBm
Gain control step	-	-	3	-	dBm
RF power control range	-	-12	-	+9	dBm
Adjacent channel transmit power	F = F0 ± 2 MHz	-	-52	-	dBm
	F = F0 ± 3 MHz	-	-58	-	dBm
	F = F0 ± > 3 MHz	-	-60	-	dBm
Δf1avg	-	-	-	265	kHz
Δf2max	-	247	-	-	kHz
Δf2avg/Δf1avg	-	-	-0.92	-	-
ICFT	-	-	-10	-	kHz
Drift rate	-	-	0.7	-	kHz/50 μs
Drift	-	-	2	-	kHz





## Bluetooth Radio and Baseband.

The Bluetooth Radio and Baseband support the following features:

- Class-1, class-2 and class-3 transmit output powers, and a dynamic control range of up to 24 dB
- $\pi/4$  DQPSK and 8 DPSK modulation
- High performance in NZIF receiver sensitivity with over 97 dB of dynamic range
- Class-1 operation without external PA
- Internal SRAM allows full-speed data-transfer, mixed voice and data, and full piconet operation
- Logic for forward error correction, header error control, access code correlation, CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping
- ACL, SCO, eSCO and AFH
- A-law,  $\mu$ -law and CVSD digital audio CODEC in PCM interface
- SBC audio CODEC
- Power management for low-power applications
- SMP with 128-bit AES



Operational details about the Bluetooth radio.

Test Mode:BT TX

Power Level:0,1,2,3,4,5,6,7

Channel:

0/2402							
0/2402	10/2412	20/2422	30/2432	40/2442	50/2452	60/2462	
1/2403	11/2413	21/2423	31/2433	41/2443	51/2453	61/2463	70/2472
2/2404	12/2414	22/2424	32/2434	42/2444	52/2454	62/2464	71/2473
3/2405	13/2415	23/2425	33/2435	43/2445	53/2455	63/2465	72/2474
4/2406	14/2416	24/2426	34/2436	44/2446	54/2456	64/2466	73/2475
5/2407	15/2417	25/2427	35/2437	45/2447	55/2457	65/2467	74/2476
6/2408	16/2418	26/2428	36/2438	46/2448	56/2458	66/2468	75/2477
7/2409	17/2419	27/2429	37/2439	47/2449	57/2459	67/2469	76/2478
8/2410	18/2420	28/2430	38/2440	48/2450	58/2460	68/2470	77/2479
9/2411	19/2421	29/2431	39/2441	49/2451	59/2461	69/2471	78/2480

Hoppe:Tes/No

Data Rate: 1M=BLE, BR(GFSK), 2M=EDR ( $\pi/4$  DQPSK), 3M=EDR(8DPSK)

1M_DH1_1010	
1M_DH1_00001111	
1M_DH1_prbs9	
1M_DH3_1010	
1M_DH3_00001111	1M=BLE, BR (GFSK)
1M_DH3_prbs9	
1M_DH5_1010	
1M_DH5_00001111	
1M_DH5_prbs9	
2M_DH1_1010	
2M_DH1_00001111	
2M_DH1_prbs9	
2M_DH3_1010	
2M_DH3_00001111	2M=EDR ( $\pi/4$ DQPSK)
2M_DH3_prbs9	
2M_DH5_1010	
2M_DH5_00001111	
2M_DH5_prbs9	
3M_DH1_1010	
3M_DH1_00001111	
3M_DH1_prbs9	
3M_DH3_1010	
3M_DH3_00001111	3M=EDR (8DPSK)
3M_DH3_prbs9	
3M_DH5_1010	
3M_DH5_00001111	
3M_DH5_prbs9	



Test Mode:BT RX

Channel:

0/2402							
0/2402	10/2412	20/2422	30/2432	40/2442	50/2452	60/2462	
1/2403	11/2413	21/2423	31/2433	41/2443	51/2453	61/2463	70/2472
2/2404	12/2414	22/2424	32/2434	42/2444	52/2454	62/2464	71/2473
3/2405	13/2415	23/2425	33/2435	43/2445	53/2455	63/2465	72/2474
4/2406	14/2416	24/2426	34/2436	44/2446	54/2456	64/2466	73/2475
5/2407	15/2417	25/2427	35/2437	45/2447	55/2457	65/2467	74/2476
6/2408	16/2418	26/2428	36/2438	46/2448	56/2458	66/2468	75/2477
7/2409	17/2419	27/2429	37/2439	47/2449	57/2459	67/2469	76/2478
8/2410	18/2420	28/2430	38/2440	48/2450	58/2460	68/2470	77/2479
9/2411	19/2421	29/2431	39/2441	49/2451	59/2461	69/2471	78/2480

Ulap:

0x6BC6967e  
0x6BC6967e  
custom

Itaddr:

0x0  
0x0  
custom

Date Rate:

1M\_DH1\_prbs9  
1M\_DH1\_prbs9  
1M\_DH3\_prbs9  
1M\_DH5\_prbs9  
2M\_DH1\_prbs9  
2M\_DH3\_prbs9  
2M\_DH5\_prbs9  
3M\_DH1\_prbs9  
3M\_DH3\_prbs9  
3M\_DH5\_prbs9



Test Mode:BLE TX

Power Level:

0  
0  
1  
2  
3  
4  
5  
6  
7  
8

Channel:

0/2404			
0/2404	10/2424	20/2446	30/2466
1/2406	11/2428	21/2448	31/2468
2/2408	12/2430	22/2450	32/2470
3/2410	13/2432	23/2452	33/2472
4/2412	14/2434	24/2454	34/2474
5/2414	15/2436	25/2456	35/2476
6/2416	16/2438	26/2458	36/2478
7/2418	17/2440	27/2460	37/2402
8/2420	18/2442	28/2462	38/2426
9/2422	19/2444	29/2464	39/2480

Syncw:

0x71764129  
0x0  
0x71764129  
custom

Date Rate:

LE\_1010  
LE\_1010  
LE\_00001111  
LE\_prbs9

Test Mode:BLE RX

Channel:

0/2404			
0/2404	10/2424	20/2446	30/2466
1/2406	11/2428	21/2448	31/2468
2/2408	12/2430	22/2450	32/2470
3/2410	13/2432	23/2452	33/2472
4/2412	14/2434	24/2454	34/2474
5/2414	15/2436	25/2456	35/2476
6/2416	16/2438	26/2458	36/2478
7/2418	17/2440	27/2460	37/2402
8/2420	18/2442	28/2462	38/2426
9/2422	19/2444	29/2464	39/2480

Syncw:

0x71764129  
0x71764129  
custom

Date Rate:

LE\_prbs9  
LE\_prbs9



## Antenna information

C2-CPU radio board may only be used with the following antennas;

Antenna Info	Antenna1	Antenna2
Manufacturer	TAOGLAS	TAOGLAS
Specification File Name	GW.26.0151.pdf	G30.B.108111.pdf *1
Model number(Manufacturer)	GW.26.0151	G30.B.308151.ha
Model number(AutomationDirect.com)	SE-ANT210	SE-ANT250
Gain (dBi)	Less than 1.8dBi	Less than 1.5dBi
Description(e.g. dipole, yagi, patch, etc.)	Monopole (Direct Mount)	Monopole (Panel Mount)
Radiation	Omni-directional	Omni-directional
Cable	N/A	3m(9.8ft)
Connector type.	RP-SMA	RP-SMA

\*1:There is two change from "G30.B.108111" to "G30.B.308151.ha"

Change1:"G30.B.308151.ha" is "G30.B.108111" of connector changed from SMA to RP-SMA.

Change2:"G30.B.308151.ha" of cable length is 3m(9.8ft) "G30.B.108111" is 1m(3.3ft)

Specifications are the same except for connectors

The label C2-02CPU RADIO BOARD of the circuit board.



Size 7mm × 14mm

  209-J00405  
FCC ID:2AVNJ-0001  
IC: 25834-00001  
HVIN:C2-02CPU RADIO BOARD

SKU numbers.

"**C2-02CPU RADIO BOARD**" is for C2-02CPU and C2-02CPU-2



The label C2-03CPU RADIO BOARD of the circuit board.



Size 7mm × 14mm



209-J00405

FCC ID:2AVNJ-0001

IC: 25834-00001

HVIN:C2-03CPU RADIO BOARD

SKU numbers.

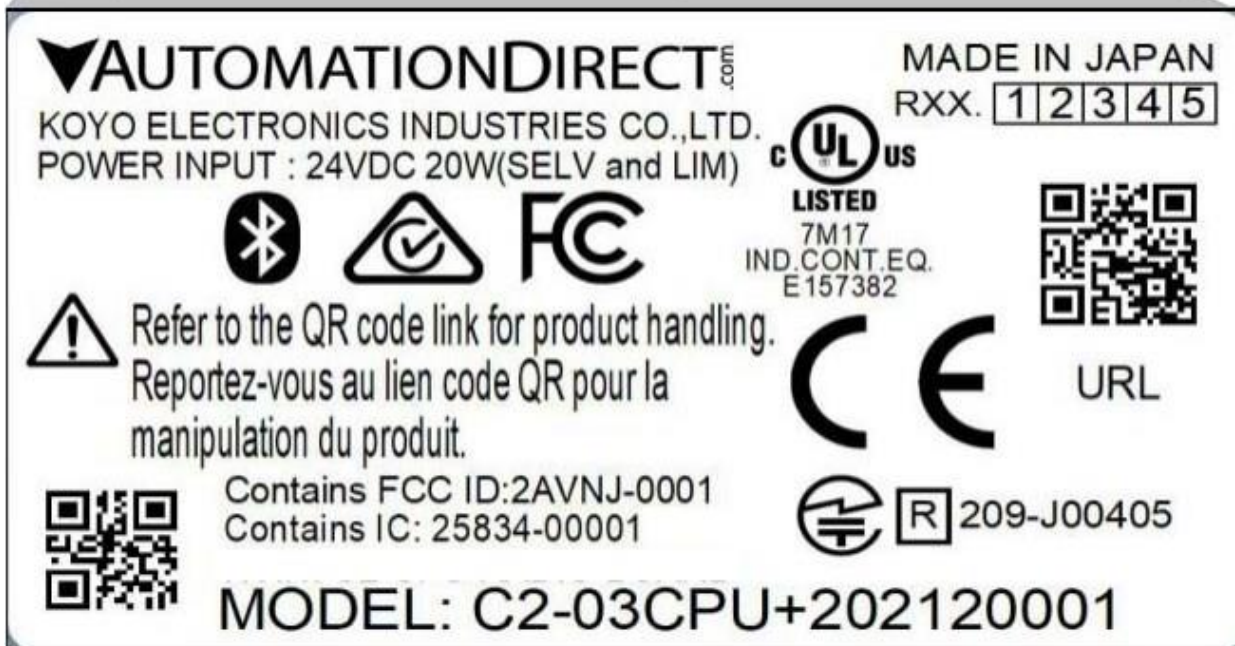
"C2-03CPU RADIO BOARD" is for C2-03CPU and C2-03CPU-2

.Host Products(CLICK PLUS CPU) containing C2-02CPU RADIO BOARD and C2-03CPU RADIO BOARD



**Label Information**  
 1.Label with backside adhesive  
 1) Label substrate: PET WH50 (A)  
 (made by LINTEC)  
 2) Back adhesive PA-T1 (made by LINTEC)  
 2.Ink ribbon . . . B110CX (made by RICHIO)

**Size 24mm × 42mm**



Host of C2-CPU RADIO BOARD has above products label.

The label has a QR code of URL link of manual and the manual has the following warning statements





For FCC

Per FCC 15.19(a)(3) and (a)(4) This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Per FCC 15.21, The user manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For Canadian(ISED) : English

Per RSS-Gen, Section 8.4 This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Per RSS-Gen, Radio apparatus shall comply with the requirements to include required notices or statements to the user of equipment with each unit of equipment model offered for sale.

For Canadian(ISED) : French

Par RSS-Gen, section 8.4 Cet appareil est conforme aux normes RSS exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne doit pas provoquer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant entraîner un fonctionnement indésirable de l'appareil.

Conformément au RSS-Gen, les appareils radio doivent se conformer aux exigences pour inclure les avis ou déclarations requis à l'utilisateur de l'équipement avec chaque unité d'équipement proposée à la vente.



Document Update History

Rev No	Date	Update contents
R01	Feb 18, 2020	P6: The pairing button
		P23: For Canadian(ISED) : French
R04	Mar 27,2020	P22,23,24:Changed label for ISED.
R05	Mar 28,2020	P21:Changed Antenna Information.