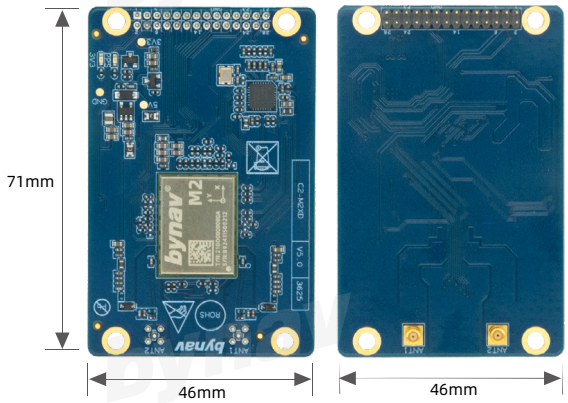
C2-M20D/C2-M21D

GNSS/INS High-precision Positioning & Heading Board

The C2 high-precision positioning and dual-antenna heading board is based on the Bynav Technology M20D/M21D modules, it measures 71.0 × 46.0 × 11.5 mm and supports 28-pin dual-row headers for power supply and communication (1 Ethernet port and 3 serial ports)[10].



Interface

28 pin dual-row header with a pin spacing of 2.0mm

No.	Pin Name	I/O	Description	Note
1	-	/		Floating
2	-	/		Floating
3	ETH_LINK_ACT	O	Ethernet Port Connection Indication Signal	3.3V LVTTL, Float When Not in Use
4	VCC_3V3_ENETA	O	Ethernet Port 3.3V Output	Float When Not in Use
5	-	/		Without Internal Connection
6	VCC_3V3	PWR	Power Supply	+3.15V~+3.45V, Ripple Wave ≤ 50mVpp
7	ANT1/DV	O	Default ANT1: Antenna 1 Indicator DV: Heading Success Indicator, Active High	3.3V LVTTL, Float When Not in Use
8	RXD3	I	COM3 Serial Port Input	3.3V LVTTL, Float When Not in Use
9	RESETIN_N	I	Reset Input	Reset Software, Active Low, Reset Signal Width > 10ms, Float When Not in Use
10	ANT2	O	Antenna 2 Indicator	3.3V LVTTL, Float When Not in Use
11	EVENTIN	I	External Input Trigger Signal	3.3V LVTTL, Float When Not in Use
12	-	/		Floating
13	TXD3	O	COM3 Serial Port Output	3.3V LVTTL, Float When Not in Use
14	GND	PWR	Signal and Power Grounding	GND
15	TXD1	O	COM1 Serial Port Output	3.3V LVTTL, Float When Not in Use
16	RXD1	I	COM1 Serial Port Input	3.3V LVTTL, Float When Not in Use
17	GND	PWR	Signal and Power Grounding	GND
18	TXD2	O	COM2 Serial Port Output	3.3V LVTTL, Float When Not in Use
19	RXD2	I	COM2 Serial Port Input	3.3V LVTTL, Float When Not in Use
20	GND	PWR	Signal and Power Grounding	GND
21	PV/DIFF	O	Default DIFF: differential data indicator PV: positioning success indicator, active high	3.3V LVTTL, Float When Not in Use
22	GND	PWR	Signal and Power Grounding	GND
23	PPS	O	1pps output	3.3V LVTTL, The Defualt Pulse Width is 1ms, Float When Not in Use
24	-	/		Floating
25	ETH_TD_P	I/O	10M/100M 网口 TX+	Analog, Connect to TD+, Float When Not in Use
26	ETH_RD_P	I/O	10M/100M 网口 RX+	Analog, Connect to RD+, Float When Not in Use
27	ETH_TD_N	I/O	10M/100M 网口 TX-	Analog, Connect to TD-, Float When Not in Use
28	ETH_RD_N	I/O	10M/100M 网口 RX-	Analog, Connect to RD-, Float When Not in Use

RF Interface ×2

Interface	MMCX
Power Supply	5 V
Max. Current	200 mA
Characteristic Impedance	500 Ω

Performance

Constellation

GPS, BDS, GLO, GAL, QZSS

Number of Channel

1500

GNSS Band

Master Antenna	
BDS	B1I, B2I, B1C*, B2b (PPP)*
GPS	L1 C/A, L1C*, L2
GLO	G1, G2
GAL	E1, E5b
QZSS	L1 C/A, L1C*, L2
Slave Antenna	
BDS	B1I, B2I, B1C*
GPS	L1 C/A, L1C*, L2C
GLO	G1, G2
GAL	E1, E5b
QZSS	L1 C/A, L1C*, L2

Anti-jamming*

Single-frequency, Multitone, Sweeping, Pulse, Narrowband;

Interference-Signal Ratio: 65 dBc

Horizontal Positioning Accuracy (RMS)[1,2]	
Single Point	1.5 m
RTK	1.0 cm + 1 ppm
Vertical Positioning Accuracy (RMS)[1,2]	
Single Point	2.5 m
RTK	1.5 cm + 1 ppm
Heading Accuracy (RMS) [1,2]	0.2° /1m baseline
Time To First Fix	
Cold Start [3,5]	30 s
Hot Start [4,5]	5 s
RTK Initialization[1]	5 s
Re-acquisition Time	≤ 1s
Timing Accuracy (RMS) [7]	≤ 20 ns
Velocity Accuracy [6]	0.03m/s
RTK Solution Delay	50 ms
DR Accuracy (2σ) [10]	C2-M21D 0.8%

Default Output Rate

Model	C2-M20D	C2-M21D
GNSS Observation [8]	10 Hz	10 Hz
GNSS Result [8]	10 Hz	5 Hz
INS Result	-	100 Hz
IMU Raw Data	-	100 Hz

IMU

	Model	C2-M20D	C2-M21D
Gyroscope	Measure Range (° /s)	-	± 300
	Angle Random Walk (° /h)	-	0.5
	Bias instability (° /h)	-	5
	Bias (° /s)	-	0.3
	Scale Error	-	4‰
	Cross Coupling Error	-	1.7‰ (0.1°)
Accelerometer	Measure Range (g)	-	± 16
	Velocity random walk (m/s/ √ h)	-	0.3
	Bias instability (μg)	-	50
	Bias (mg)	-	5
	Scale Error	-	2‰
	Cross Coupling Error	-	0.9‰ (0.05°)

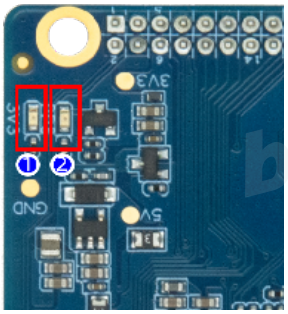
Mechanical and Electrical

Model	C2-M20D	C2-M21D
Size (mm)	71.0 × 46.0 × 11.5	
Weight (g)	17	
Power Consumption (mW)[9]	820	830

Environment

Operation Temperature	-40° C ~ +85° C
Storage Temperature	-40° C ~ +105° C
Humidity	95% Non-condensing

Indicator



No.	Indicator LED	Color	Description
1	Power Supply Indicator (3.3V)	Green	Indicator Light Steady On when Voltage is Greater than 2.7V
2	PPS Indicator	Green	PPS Output Indicator Light Blinks

Note:

1. Typical value.Performance will be affected by GNSS status, satellites' location, baseline length, multipath and other interference;
2. Using 1 km baseline and the receiver with good antenna performance, without considering possible errors due to antenna phase center offset;
3. Typical value. The time taken from power-on to the first output of a valid single-point position after clearing ephemeris/almanac/coarse position and time information.
4. Typical value. The time taken from power-on to the first output of a valid single-point position when the receiver has stored valid ephemeris/almanac/coarse position and relatively accurate time information (with an error of less than 5 minutes). The special firmware supports a 3-second hot start, but the firmware not support the network port;
5. -130dBm and more than 12 satellites are available;
6. Open sky without any obstruction, 99%@ static;
7. Optional. Bias caused by RF and antenna is not included;
8. M20D can support 20Hz in special firmware. M21D can support 10Hz in special firmware;
9. Typical value. Power of antenna and peripherals is not included;
10. When odometer is connected and vehicle model is used.

* Optional, supported in special firmware.

More information, please refer to

www.bynav.com

Wechat Official Account

Please contact us for more information of products!

Address: Building 12, Phase 1, Zhongdian Software Park, No.39 Jianshan Road, High-tech Zone, Changsha, Hunan 410205, China

Tel.: +86-731-8505 8117

Email: en@bynav.com

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