

Xplorer CM5 : Integrated Wireless & Positionning Options

November 2024

Module	Function	Tested	Region	Module / Chipset	SMAs	Antennas / Frequencies / bands	Certification	Power Max	Sensitivity / Perf / Data Rate	Protocols
RPI CM5 (Default)			Global	CYW43455	WiFi / BT	2.4 & 5.0 Ghz			Iperf3: TX/RX=217.6/216.3 Mbps	Dual-band 802.11ac Wi-Fi 5 Bluetooth 5.0 / Bluetooth Low Energy (BLE)
Matter Option (Soldered)	Matter/Zigbee	Pending	Global	MGM240PB32VNA3	LPWAN	2.4 Ghz	EU,FCC,UKCA,ISED,C,MIC,KC	19.9 dBm	-106 dBm @ 250 kbps O-QPSK	Matter, Open Thread Zigbee Bluetooth Low Energy 5.4 (1&2 Mbps, Long Range), Bluetooth mesh Proprietary, Multi-protocol
LoRa Option (Soldered)	Lora/SigFox	On PI5	EU, AS, RC1, RC3	LSM100A	LPWAN	EU: 863-870 Mhz AS: 923 Mhz	CE	15 dBm	-136 dBm @ BW=125KHz, SF=12 -124 dBm @ 0.6Kbps	LoRa SigFox
			US, AU, RC2, RC4	LSM110A	LPWAN	US: 902-928 Mhz AU: 915-928 Mhz AS: 923 Mhz	FCC, ANZ	22 dBm	-129 dBm -124 dBm	LoRa SigFox
M.2 key B 22x30 to 31.4x42	LTE-cat 3 + GNSS	On CM4	EU, US, EMEA	Huawei ME936	LTE1, GNSS	LTE-FDD (B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B20)	FCC, PTCRB, GCF		100(DL)/50(UL)	LTE Cat 3, DC-HSPA+/HSPA+/HSPA/UMTS GNSS: GPS Standalone, A-GPS, GPS XTRA, Glonass
	4G/LTE + GNSS	No		Fibocom L860-GL / Fibocom L860-GL-16	LTE1, LTE2, GNSS	LTE FDD : LTE FDD: Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 21, 25, 26, 28, 29, 30, 32, 66 LTE TDD: B38/39/40/41/42 UMTS: Band 1, 2, 4, 5, 8	CE / CCC / FCC / GCF / PTCRB etc. 100+ countries certification		1000(DL)/150(UL) , eSIM DL-MIMO: 2*2, 4*2, 4*4 DL 4x4 MIMO: Band 1,2,3,4,7,30,40,41NB, 66	3G/4G 4G LTE CAT16, 4 x 4 MIMO GNSS: GPS/BDS/GLONASS/Galileo 1
	4G/LTE/ Starlink DTC + GNSS	On CM4, DTC to be tested	Global	Simcom SIM7600G-H-M.2	LTE1, LTE2, GNSS	LTE-FDD (B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28/B66) LTE-TDD (B34/B38/B39/B40/B41) WCDMA (B1/B2/B4/B5/B6/B8/B19) GSM (850/900/1800/1900MHz)	CE(RED),NCC,FCC,IC,RCM, CCC,Telec,Jate,Anatel		150(DL)/50(UL)	LTE-TDD/ LTE-FDD/HSPA+/GSM/GPRS/EDGE GNSS: GPS, Beidou, GLONASS, GALILEO, QZSS !! 31.4mm wide module !!
	4G/LTE + GNSS	On CM4	EU	Huawei ME906s-158	LTE1, GNSS	LTE (FDD) B1/B2/B3/B5/B7/B8/B20/B28 Quad-band DC-HSPA+/HSPA+/HSPA/UMTS B1/B2/B5/B8 Quad-band EDGE/GPRS/GSM 1900/1800/900/850 MHz			MiMo	HSPA / UMTS / EDGE / LTE 4G / NGFF GNSS: GPS Standalone, A-GPS, GPS XTRA, Glonass
	5G NR/LTE-FDD/LTE-TDD/HSPA + GNSS	On PI5		SIM8202G_M2 SIM8262E_M2 SIM8262A_M2	LTE1, LTE2, GNSS	Sub-6G: n1,n2,n5,n7,n12,n13,n14,n18,n20,n25,n30,n41, n48,n66,n71,n77,n78,n79 LTE-FDD: B1,B2,B4,B5,B7,B12,B13,B14,B17,B18,B19,B25, B26,B29,B30,B66,B71 LTE-TDD: B38,B41,B42,B43, B46,B48 WCDMA: B1 B2 B4 B5 B8			MiMo 4 antennas Sub-6G: 2.4 Gbps (DL) / 500 Mbps(UL) LTE: 1 Gbps(DL)/ 200 Mbps(UL)	3GPP R15 or R16, Sub-6G, LTE, HSPA+ GNSS: GPS, GLONASS, Beidou, Galileo, and QZSS
	5G R17 / LTE Cat 4 / NB-IoT / (IoT-NTN ?) + GNSS	No	600 mobile carriers in 200+ countries	Telit FN920C04	LTE1, LTE2, GNSS	GNSS L1 + L5	FCC, CE/RED, ISED, RCM, NCC, JATE-TELEC, GCF/PTCRB		220(DL)/50(UL) eSIM	2G/3G/4G/CAT-M/NB-IoT & 5G GPS, BeiDou, GLONASS, Galileo
	LTE-A Cat 6	No		Quectel EM060K-GL M.2	LTE1, LTE2, GNSS				300(DL)/50(UL) eSIM	LTE-A Cat 6, UMTS/HSPA, 3GPP Release 12 GPS, GLONASS, BDS, Galileo, QZSS
	5GNR / LTE + GNSS (Sub 6G, UMTS)	No		Foxconn T99W175	LTE1, LTE2, GNSS	GPS L1 (1575.42 MHz) GLONASS L1 (1602 MHz) Beidou B1 (1561.098 MHz) Galileo E1 (1575.42 MHz)			2000(DL)/150(UL) 4x4 MIMO	5GNR (Sub 6G), LTE, UMTS (HSDPA/HSUPA/HSPA+DC-HSPA+), 2x SIM + eSIM GNSS dual frequency :GPS/Glonass/ Beidou/ Galileo
	WiFi Halow	No		Alfa AHM27292U / NRC729	LPWAN	866 MHz (EU), 915 MHz (US), 922 MHz (KR) 924 MHz (JP), 847 MHz (TW)			15 Mbps	IEEE 802.11ah draft 8.0, sub 1 GHz standalone
	BLE+LoRa	No		Fanstel M262X840XE	LPWAN		FCC		29.2 dBm, 125 kbps @ 15 Km or 9 miles	BLE+LoRa
	LoRAWAN Concentrator	No		n-Fuse LRWCC3 / SX1303	LPWAN	868 XOR 915 Mhz			27dBm, -140dBm, BW125Khz	
	SDR	No		Sidekiq	LPWAN	70 MHz to 6 GHz				2x 70 MHz to 6 GHz, BW up to 50 MHz per channel
	GNSS			AUVIDEA GPS / NEO M8M	GNSS					GPS, GLONASS, Galileo , BeiDou
	GNSS	No		ConnectTech / NEO-7N, M8N, M8L	GNSS	MSG095, VTGPSA-9, Active GPS/GLONASS			Timepulse	GPS, GLONASS, QZSS, Galileo UBX, RTCM, and NMEA protocols
	GNSS+(RTK)+(UDR)+(Time)	No		LOCOSYS M.2-Family	GNSS				10Hz, 3x acc + 3x gyro, <1cm TRK	GPS+GLONASS+BeiDou+GALILEO+ QZSS, SBAS (WAAS, EGNOS, MSAS, GAGAN)
	UHF RFID	No		MTI M.2 UHF RFID	LPWAN	860 - 960 MHz		27 dBm		EPGlobal Class 1 Gen2 (ISO 18000-63)
M.2 key E / A+E 2230 to 3042 On Xplorer CM5 Type E Only	WiFi MiMo, BT	No		ST60-2230C-UU	TDB	2.4 & 5.0 Ghz			18dBm, -95dBm, 866,7Mbits/s	dual band 2x2 802.11ac WLAN plus Bluetooth 5.1 dual mode
	WiFi 6, BT 5.3	No		M2-JODY-W3	TDB (3x ant)					WiFi 6, 802.11 ax, BT 5.3
	WiGig, WiFi, BT	No		Intel AC 17265	WiFi / BT	60Ghz, 2.4Ghz			WiGig : 4.7Gbps, Wifi : 867Mbps	WiGig, IEEE 802.11ad, Wifi Mimo 802.11ac, BT (30x30mm !!!)
	LTE + BLE 4.1	No		NGFF595A-L	TBD	57~64Ghz			MCS0, MCS1 (385Mbps) ~ MCS12 (4.6Gbps)	WiGig, IEEE 802.11ad-2012, IEEE 802.11ac + 4.1 BT + ANT+
	NB-IoT + LTE-M + GNSS	No		LTEC-BG77-M2	LPWAN				Cat M1: 588 kbps (DL)/ 1119 kbps (UL) Cat NB2: 127 kbps (DL)/ 158.5 kbps (UL)	3GPP Rel. 14, LTE Cat M1, NB2 GNSS: GPS, GLONASS, BeiDou, Galileo and QZSS
	IoT-NTN (Skylo)	No	US, EU (MAP)	Blues Starnote / Quectel CC660D-LS		B23, B255, B256	Pending		IP (UDP), 20 packets/min, 256 bytes Latency = 10s	3GPP Rel-17 NB-NTN (IoT-NTN)
	Zigbee/Thread/BT/ Matter?			ZBC-M2-1630/EFR32MG24/MGM240P	LPWAN	2.4 Ghz			20 dBm	ZigBee, Thread, Bluetooth 5.3 and multi-protocol
	LoRa	No		WISE-1510	LPWAN	863-870MHz (EU), 902-928MHz (US), 920-928MHz (JP), 470-510 MHz (CN), 920-925MHz (TW)				LoRaWAN / LoRa Private Network
	SDR	No		uSDR / LMS6002D	LPWAN	300 - 3700 MHz			30.72 Msps	Full-duplex TX & RX, 300 - 3700 MHz
	GNSS	No		AUVIDEA GPS / NEO M8M	GNSS					GPS, GLONASS, Galileo , BeiDou
	GNSS	No		ConnectTech / NEO-7N, M8N, M8L	GNSS	MSG095, VTGPSA-9, Active GPS/GLONASS			Timepulse	GPS, GLONASS, QZSS, Galileo UBX, RTCM, and NMEA protocols
	GNSS + UDR	No		RYM8838 / CXD5608AGF	GNSS				3D inertial sensors engine, 1hz, 1m	GPS/Glonass/SBAS/QZSS/Galileo/BeiDou Untethered Dead Reckoning(UDR)
	GNSS RTK	No	Global	simpleRTK2B / ZED-F9R	GNSS	L1, L2 and E5b			fusion rate 30hz <1cm with a base station up to 35km <1cm with NTRIP up to 35km <4cm with SSR corrections <1.5m in standalone mode <0.9m standalone with SBAS coverage	GPS: L1C/A L2C GLONASS: L1OF L2OF Galileo: E1-B/C E5b BeiDou: B1I B2I QZSS: L1C/A L2C SBAS: WAAS, EGNOS, MSAS, GAGAN and SouthPAN
	Sub-GHz transceiver	No		VUHF / AX5043						Experimental
M.2 key M 2230 to 3042	No RF module in this format, very few in 2280 : Xsquare communications XS5G3 (5G+GNSS in 52mm), SDR and HarsPro Radio									

LoRa Region :	
EU - RC1:	Europe: European Union, Andorra, Liechtenstein, Norway, Serbia, Switzerland, Ukraine, United Kingdom; Overseas: French Guiana, French Polynesia, Guadeloupe, Martinique Mayotte, New Caledonia, Reunion; Middle East and Africa: Botswana, Ivory Coast, Kenya, Mauritius, Namibia, Nigeria, Oman, Senegal, South Africa, Swaziland, United Arab Emirates
US - RC2 :	Brazil, Canada, Mexico, Puerto Rico, United States
AS - RC3:	Japan
AU - RC4 :	Latin America: Argentina, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay. Asia-Pacific: Australia, Hong Kong, Indonesia, Malaysia, New Zealand, Singapore, Taiwan, Thailand.