

MC2X8-R

Industrial cellular router (3G/4G/5G) + WiFi 6e (802.11ax)

Description:

The MC2X8-R connects components that communicate via Ethernet LAN or serial interfaces to other networks via WLAN or 5G (LTE).

The typical usage area for the MC2X8-R is machine-to-machine communication, locally over WLAN as well as remotely connected over mobile networks (5G).

Properties:

Hardware:

- Processor: iMX8 (NXP)
- Memory: 512MByte DDR4-RAM and 4GB Flash
- WiFi: 802.11ax for 2.4 + 5 GHz WiFi6 + 6GHz WiFi6e
- Cellular: 5G/LTE RedCap
- Navigation: Multi-constellation GNSS
- Ethernet: 2 x Gigabit LAN interface
- Serial: 1 x RS232 or RS485 serial interface
- USB: 1 x USB2 Port also for interface extensions
- IO: 1 x relay switch (dependent on power connector)
1 x aux input (dependent on power connector)
- Power supply: 12-60V or 802.3af PoE via LAN Port 1
- Housing: Robust aluminum housing with various mounting options

Functions:

- Configuration via website, REST-API or by using the MC-Config program.
- Different bridge modes to connect the LAN clients.
 - NAT
 - Single Client NAT
 - VPN (openVPN, Wireguard or IPSec)
- WEP, 802.11i WPA-WPA2-WPA3-AES-TKIP-PSK
- WPA Enterprise 802.1x PEAP LEAP TLS TTLS
- Certificate management for authentication via 802.1x
- SCEP (Simple Certificate Enrollment Protocol)
- MQTT-Client
- Connects worldwide to 3G, 4G or 5G networks
- Precedence selection to prefer WLAN over LTE and vice versa
- Serial-Client via TCP or UDP or MQTT
- ipv6 + ipv4



Device Options:

Mounting:

- 1) side mounting brackets (MC2X8-R-SL...)
- 2) DIN rail mounting clip (MC2X8-R-SC...)

Power supply connection:

- 1) 5 pol. M12 connector (MC2X8-R-Sx-M12)
 - always with relay
- 2) 8pol terminal block (MC2X8-R-Sx-WK8)
 - always with relay and auxiliary input

Antenna connector WLAN:

- 1) 2 x RP-SMA

Antenna connector 5G:

- 1) 4 x LTE antenna SMA

Serial Interface:

- 1) 1 x RS232 (Standard)
- 2) 1 x RS485
- 3) 1 x RS422

Technical data:

Specification:	
Ethernet	2 x 10/100/1000 MBit Auto MDI/MDIX
Serial	1 x RS232, 300-460,8 KBit/s, RTS, CTS, DSR, DTR or RS485
USB	1 x USB 2.0 to connect printers or USB adapter with various other interfaces
Relay	1 x change-over switch max 1A@24V, max 125VAC
AUX-Input	1 x galv. isolated 10 – 60V
Antenna connectors	2 x RPSMA (WiFi) 4 x SMA (5G)
Sim card slot	1 x Standard/Mini-SIM slot
Power supply	12 – 60 VDC or 802.3af PoE via the LAN Port
Energy consumption	max 15W (4.5W idle)
Operating temperature range	0-60°C
Dimensions	105x125x35mm
Weight	ca. 500g

WLAN-Interface:

IEEE 802.11b Section	
Radio and Modulation Schemes	DQPSK , DBPSK and CCK with DSSS
Operating Frequency	2400 ~ 2483.5MHz ISM band
Channel Numbers	13 channels for Worldwide
Data Rate	at most 11Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain and at room Temp. 25°C 20.5±2 dBm at 11Mbps
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤8% at room Temp 25°C -83 dBm for 11Mbps

IEEE 802.11g Section	
Radio and Modulation Schemes	QPSK , BPSK , 16QAM ,64QAM with OFDM
Operating Frequency	2400 ~ 2483.5MHz ISM band
Channel Numbers	13 channels for Worldwide
Data Rate	at most 54 Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain and at room Temp. 25°C 17±2 dBm at 54Mbps
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C -71 dBm for 11Mbps

IEEE 802.11a Section	
Radio and Modulation Schemes	QPSK , BPSK , 16QAM ,64QAM with OFDM
Operating Frequency	5.15~5.25 GHz 5.25~5.35 GHz 5.47~5.725 GHz 5.725~5.825 GHz
Data Rate	at most 54 Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain and at room Temp. 25°C 17±2 dBm at 54Mbps
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C -71 dBm for 11Mbps

IEEE 802.11n Section	
Radio and Modulation Schemes	QPSK , BPSK , 16QAM ,64QAM with OFDM
Operating Frequency	2.4GHz :2400 ~ 2483.5MHz for ISM band 5.15~5.25 GHz 5.25~5.35 GHz; 5.47~5.725 GHz 5.725~5.825 GHz;
Data Rate	at most 300 Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain and at room Temp. 25°C 2.4 GHz Band: 16.5±2dBm at HT20 MCS7 16±2dBm at HT40 MCS7 5 GHz Band: 16±2dBm at HT20 MCS7 16±2dBm at HT40 MCS7
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C 2.4 GHz Band: -69dBm at HT20 MCS7 -66dBm at HT40 MCS7 5 GHz Band: -69dBm at HT20 MCS7 -66dBm at HT40 MCS7

IEEE 802.11ac Section	
Radio and Modulation Schemes	QPSK, BPS, 16QAM, 64QAM, 256QAM with OFDM
Operating Frequency	2.4GHz :2400 ~ 2483.5MHz for ISM band 5.15~5.25 GHz 5.25~5.35 GHz; 5.47~5.725 GHz 5.725~5.825 GHz;
Data Rate	2.4 GHz: at most 400Mbps 5 GHz: at most 1732Mbps
Media Access Protocol	CSMA/CA with ACK

Transmitter Output Power at Antenna Connector	<p>Typical RF Output Power at each RF chain and at room Temp. 25°C</p> <p>2.4 GHz Band:</p> <p>15±2dBm at VHT20 MCS8 14.5±2dBm at VHT40 MCS9</p> <p>5 GHz Band:</p> <p>15±2dBm at VHT20 MCS8 15±2dBm at VHT40 MCS9 15±2dBm at VHT80 MCS9 15±2dBm at VHT160 MCS9</p>
Receiver Sensitivity at Antenna Connector	<p>Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C</p> <p>2.4 GHz Band:</p> <p>-64 dBm at VHT20 MCS8 -58 dBm at VHT40 MCS9</p> <p>5 GHz Band:</p> <p>-64 dBm at VHT20 MCS8 -58 dBm at VHT40 MCS9 -55 dBm at VHT80 MCS9 -53 dBm at VHT160 MCS9</p>

IEEE 802.11ax Section	
Radio and Modulation Schemes	QPSK, BPS, 16QAM, 64QAM, 256QAM, 1024QAM with OFDMA
Operating Frequency	<p>2.4 GHz :2400 ~ 2483.5MHz for ISM band</p> <p>5.15~5.25 GHz 5.25~5.35 GHz; 5.47~5.725 GHz 5.725~5.825 GHz;</p>
Data Rate	<p>2.4 GHz: at most 573.5Mbps</p> <p>5 GHz: at most 2402Mbps</p>
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	<p>Typical RF Output Power at each RF chain and at room Temp. 25°C</p> <p>2.4 GHz Band:</p> <p>14±2dBm at VHT20 MCS11 13.5±2dBm at VHT40 MC11</p> <p>5 GHz Band:</p> <p>13±2dBm at HE20 MCS11 13±2dBm at HE40 MCS11 12.5±2dBm at HE80 MCS11 12.5±2dBm at HE160 MCS11</p>
Receiver Sensitivity at Antenna Connector	<p>Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C</p> <p>2.4 GHz Band:</p> <p>-58 dBm at HE20 MCS11 -55 dBm at HE40 MCS11</p> <p>5 GHz Band:</p> <p>-57 dBm at HE20 MCS11 -55 dBm at HE40 MCS11 -50 dBm at HE80 MCS11 -47 dBm at HE160 MCS11</p>

IEEE 802.11ax Section (6GHz)	
Radio and Modulation Schemes	QPSK, BPS, 16QAM, 64QAM, 256QAM, 1024QAM with OFDMA
Operating Frequency	6 GHz : 5.930~7.110GHz
Data Rate	at most 2402Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain and at room Temp. 25°C 6 GHz Band: 11±2dBm at HE20 MCS11 11±2dBm at HE40 MCS11 10.5±2dBm at HE80 MCS11 10.5±2dBm at HE160 MCS11
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rates≤10% at room Temp 25°C 6 GHz Band: -55 dBm at HE20 MCS11 -52 dBm at HE40 MCS11 -48 dBm at HE80 MCS11 -46 dBm at HE160 MCS11

5G-Interface:							
<i>Technologies / Bands</i>							
5G	NR SA 3GPP Release 17 RedCap SA operation, Sub-6 GHz n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 79 DL 2 x 2 MIMO n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 79						
LTE	LTE-FDD B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 30/ 66/ 70/ 71 LTE-TDD B34/ 38/ 39/ 40/ 41/ 42/ 43/ 48 DL 2 x 2 MIMO B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 30/ 34/ 38/ 39/ 40/ 41/ 42/ 43/ 48/ 66/ 70/ 71						
GNSS	GPS/ GLONASS/ BDS/ Galileo/ NavIC						
<i>Antennas:</i>	2 Antenna						
<i>GNSS</i>	GPS, GLONASS, BeiDou, Galileo						
<i>Data rates (max.)</i>	<table border="1"> <thead> <tr> <th>Mode</th> <th>Data rate</th> </tr> </thead> <tbody> <tr> <td>5G SA Sub-6</td> <td>223 Mbps (DL)/ 123 Mbps (UL)</td> </tr> <tr> <td>LTE</td> <td>195 Mbps (DL)/ 105 Mbps (UL)</td> </tr> </tbody> </table>	Mode	Data rate	5G SA Sub-6	223 Mbps (DL)/ 123 Mbps (UL)	LTE	195 Mbps (DL)/ 105 Mbps (UL)
Mode	Data rate						
5G SA Sub-6	223 Mbps (DL)/ 123 Mbps (UL)						
LTE	195 Mbps (DL)/ 105 Mbps (UL)						

Order codes:

	Option	Order code
Housing		
	Housing with mounting brackets	MC2X8-R-SL....
	Housing with DIN-rail-clip	MC2X8-R-SC....
Power supply connection		
	M12 connector	MC2X8-R-Sx-M12....
	8pol. Weidmüller terminal block	MC2X8-R-Sx-WK8....
IO-Option	optional, if not included in connector	
	Aux-Input	MC2X8-R-Sx-....-INP
Serial	Standard: 1 x RS232	MC2X8-R-Sx-....
	1 x RS422	MC2X8-R-Sx-xx- RS422
	1 x RS485	MC2X8-R-Sx-xx- RS485