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Universal Hub Hardware Specifications Manual MA-2080-B

Functional meets simple

The Next Generation IoT and Telemetry Solution has arrived.
With a future-proof, expansion ready design, functional truly meets simple.

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Life support – This product is not designed for use in life support appliances or systems where malfunction of these products can reasonably be expected to result in personal injury.

RF Industries' customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify RF Industries for any damages resulting from such application.

Right to make change - RF Industries reserves the right to make changes, without notice, in the products, including circuits and software, described or contained herein in order to improve design and/or performance.

Some features outlined in this manual may require an updated firmware and/or GUI to work. Please contact RF Industries for more information.

RF EXPOSURE AND ELECTRICAL SAFETY

The use of this modem in any other type of host configuration that may not comply with the RF exposure requirements should be avoided. During operation, a minimum of 20 cm (8 inches) should be maintained between the antenna, whether extended or retracted, and the user's/bystander's body (excluding hands, wrists, feet, and ankles) to ensure RF exposure compliance in accordance with ARPANSA guidelines. The modem is not designed, nor intended, for use in applications within 20 cm (8 inches) of the body of the user. Continued operational compliance of the modem relies upon it being used with an AS/NZS 60950.1 approved SELV power supply.

Cautions

This modem has been tested and found to comply with the limits pursuant to relevant ACMA Standards. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This modem generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause detrimental interference to other radio communication networks and devices. Use only the supplied or approved antenna. Unauthorized antennas, modifications, or attachments could impair performance, damage the modem, or result in violation of RF exposure regulations.

There is no guarantee that electromagnetic interference will not occur in a particular installation. If the modem does cause detrimental interference in radio and television reception, which can be verified by turning the modem on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving radio or TV antenna
- Increase the separation between the modem and the receiver
- Contact RF Industries Maxon Technical Support for assistance.

Changes or modifications to the modem that are implemented without the express consent of RF Industries Pty. Ltd. void the product warranty and terminate the user's authority to use the modem.

General Safety

RF Interference Issues: Avoid possible radio frequency (RF) interference by carefully following safety guidelines below:

- Switch OFF the modem when in an aircraft. The use of cellular devices in an aircraft is illegal. It may endanger the operation of the aircraft and/or disrupt the cellular network. Failure to observe this instruction may lead to suspension or denial of cellular services to the offender, legal action, or both.
- Switch OFF the modem in the vicinity of gasoline or diesel fuel pumps or before filling a vehicle with fuel.
- Switch OFF the modem in hospitals and any other places where medical equipment may be in use.
- Respect restrictions on the use of radio equipment in fuel depots, chemical plants, or in areas of blasting operations.
- There may be hazards associated with the operation of your modem in the vicinity of inadequately protected personal medical devices such as hearing aids and pacemakers. Please consult the manufacturers of the medical device to determine if it is adequately protected.
- Operation of the modem in the vicinity of other electronic equipment may cause interference to the equipment if it is inadequately protected. Observe any warning signs and manufacturers' recommendations.
- The modem contains sensitive electronic circuitry. Do not expose the modem to any liquids, high temperatures or shock. The modem is not waterproof. Please keep it dry and store it in a cool, dry place.
- Only use original accessories or accessories that are authorized by the manufacturer. Using unauthorized accessories may affect your modem's performance, damage your modem and violate related national regulations.
- Always handle the modem with care. There are no user serviceable parts inside the modem. Unauthorized dismantling or repair of the modem will void the warranty.

NOTE:



- * The product needs to be supplied by a limited power source or the power supply provided. Otherwise, safety will not be ensured.
- * Do not affix the modem in an open area where it is liable to lightning-strike hazard.

Vehicle Safety

- Do not use the modem whilst driving.
- Respect national regulations on the use of cellular devices in vehicles. Road safety always comes first.
- If incorrectly installed in a vehicle, the operation of the modem could interfere with the correct functioning of vehicle electronics. To avoid such problems, ensure that the installation has been carried out by qualified personnel.
- Verification of the protection and interference-free performance of vehicle electronics should be a part of the installation procedure

Potentially Unsafe Areas

Posted Facilities: Turn off the modem in any facility or area when posted notices require you to do so.

Blasting Areas: Turn off the modem where blasting is in progress. Observe restrictions and follow any regulations or rules.

Potentially Explosive Atmospheres: Turn off the modem when you are in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks in such areas could cause an explosion or fire, resulting in bodily injury or death.

Areas with a potentially explosive atmosphere are often but not always clearly marked. They

include:

- Fuelling areas such as gas or petrol stations
- Below deck on boats
- Transfer or storage facilities for fuel or chemicals
- Vehicles using liquefied petroleum gas, such as propane or butane
- Areas when the air contains chemicals or particles such as grain, dust or metal powders
- Any other area where you would normally be advised to turn off machinery of any kind

Concentrated Electromagnetic Activity: Avoid using the modem within areas of high electromagnetic wave activity or within enclosed metallic structures e.g. lifts.

CONTACT INFORMATION

In keeping with RF Industries' dedicated customer support policy, we encourage you to contact us.

TECHNICAL:

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REVISION HISTORY

– Product Information

Product	Universal Hub Cellular Ethernet Modem Router
Model	MA-2080-B
Document Type	PDF
Current Revision	0.4
Status of the Document	Preliminary Release
Revision Date	September 2019
Total Number of Pages	16

– Revision History

Level	Date	History
0.1	Jan 2019	Preliminary Release
0.2	Feb 2019	Added Digital IO electrical specs
0.3	July 2019	Standardise SMA interface descriptions
0.4	Sept 2019	Corrected device dimensions (width)

PRODUCT OVERVIEW

The RFI Universal Hub is a unique and intelligent fusion of 4G capabilities with advanced functionality of a modem/router, all encased in a durable & robust metal casing.

The Universal Hub Base Model features dual-SIM capabilities and wired WAN, providing advanced redundancy functionality. The LTE-Advanced connectivity with dual MIMO antennas means you can now have faster internet connections, and an array of connectivity options including RS232/RS485, 2 x Ethernet Ports and 4 x Digital IO's make the device a rugged cellular modem/router suitable for a diverse range of industrial networking and M2M applications.

HARDWARE SPECIFICATIONS

Cellular Specifications

Network and Bands	Data Rates	TX Power	RX Sensitivity
LTE FDD: B1(2100MHz), B3(1800MHz), B5(850MHz), B7(2600MHz), B8(900MHz), B18(800MHz), B19(800MHz), B21(1500MHz), B28 (700MHz) LTE TDD: B38(2600MHz), B39(1900MHz), B40(2300MHz) UMTS: B1(2100MHz), B5(850MHz), B6(850MHz), B8(900MHz), B9(1800MHz), B19(800MHz)	LTE-FDD: 300Mbps DL Max. 50Mbps UL Max. LTE-TDD: 222Mbps DL Max. 26Mbps UL Max. DC-HSPA+: 42Mbps DL Max. 5.76Mbps UL Max. HSPA+: 21Mbps DL Max. 5.76Mbps UL Max.	+23dBm \pm 1dB	< -97 dBm

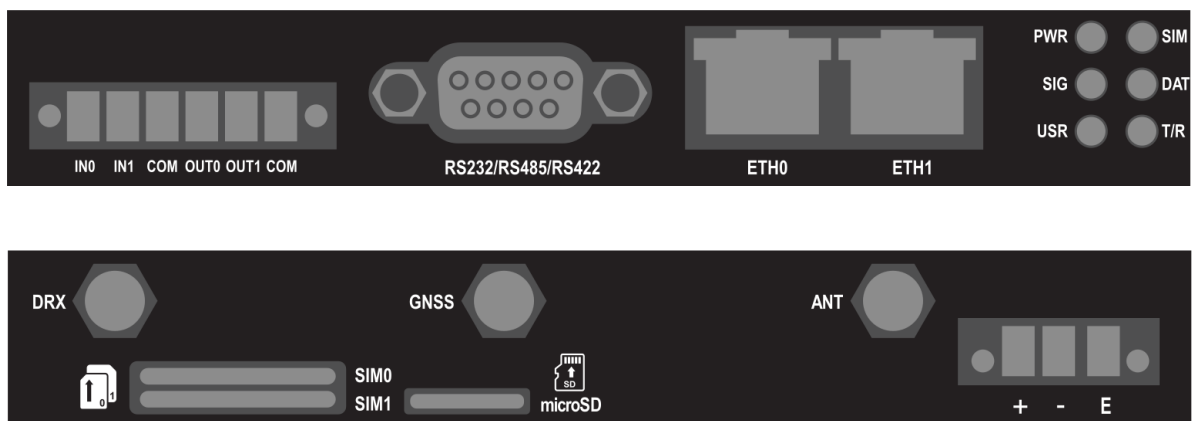
GNSS Specifications

Parameter	Specifications
Satellite channels	Maximum 30 channels (16 GPS, 14 GLONASS) Simultaneous tracking
Protocols	NMEA 0183 V3.0
Accuracy	Horizontal: < 2 m (50%); < 5 m (90%) Altitude: < 4 m (50%); < 8 m (90%) Velocity: < 0.2 m/s
Acquisition	Hot start: 1 s Warm start: 29 s Cold start: 32 s
Sensitivity	Tracking: -160 dBm Acquisition (Assisted): -158 dBm Acquisition (Standalone): -145 dBm

Interface Specifications

Type	Specifications
LAN	2x 10/100/1000 Base-T Ethernet ports(RJ45), Auto MDI/MDIX 1.5kV magnetic isolation protection
Serial	1x DB9 female port, 15kV ESD Protection (IEC 61000-4-2 Air Gap) Data bits: 5, 6, 7, 8 Stop bits: 1, 2 Parity: NONE, EVEN, ODD Baud rate: 1200 ~ 115200 bps
SIM/UIM	2x 3V/1.8V UIM Interfaces 15kV ESD Protection (IEC 61000-4-2 Air Gap)
Memory Card	1x Micro SD Card slot
Antenna	ANT: Cellular Primary, SMA female, 50 ohms DRX: Cellular Diversity/MIMO, SMA female, 50 ohms GNSS: SMA female, 50 ohms
Digital I/O	6-Way Phoenix Terminal, Galvanic Isolated
Power	3-Way Phoenix Terminal, reverse polarity and overvoltage protection
LED Indicator	"PWR", "SIM", "SIG", "DAT", "USR", "T/R"

Device Panel Labels:



Warning: make sure the proper orientations of the SIM cards and micro SD card indicated on the device label when inserting the cards.

Serial Port (DB9F) Pinouts

RS232 Interface

DB9F PIN	Description	Direction
1	Data Carrier Detect (DCD)	OUT
2	Transmit Data (TxD)	OUT
3	Receive Data (RxD)	IN
4	Data Terminal Ready (DTR)	IN
5	Ground	-
6	Data Set Ready (DSR)	OUT
7	Clear to Send (CTS)	IN
8	Request to Send (RTS)	OUT
9	Ring Indicator (RI)	OUT

RS422/485 Interface

DB9F PIN	RS422	RS485
2	Noninverting Output (T+)	Noninverting Data (D+ / A)
3	Noninverting Input (R+)	-
5	Ground	Ground-
7	Inverting Input (R-)	-
8	Inverting Output (T-)	Inverting Data (D- / B)
All other Pins	-	-

Recommended Antenna Specifications

Parameter	Specifications
Cellular Antenna	LTE: Multi-band 2x2 MIMO antenna system (ANT/DRX) 3G: Multi-band antenna system with diversity (ANT/DRX)
GNSS Antenna	Wide-band GNSS: 1560–1606 MHz recommended Narrow-band GPS: 1575.42 MHz ± 2 MHz minimum Narrow-band GLONASS: 1601.72 MHz ± 4.2 MHz minimum

Electrical Characteristics

Power Source

Parameter	Values / Ratings
Power Input	DC 12V / 1.5A *
Voltage Range	DC 9 – 48V
Power Consumption	Standby: 170mA @12VDC Communication 250~500mA @12VDC Power Saving Mode: tbd @12 VDC

* Recommend using DC 12VDC/1.5A power adaptor available from RFI/Maxon.

Digital IO

Parameter	Values / Ratings
Digital Input	Applied Voltage: 12V Max. Load Current: 10mA Max. Applied Reversed Voltage: 5V Max. Input Frequency: 1kHz Max.
Digital Output	Applied Voltage: 50V Max. Load Current: 30mA Max. Applied Reversed Voltage: 5V Max. Output Frequency: 1kHz Max.

Mechanical Characteristics

Parameter	Ratings / Values
Housing	Aluminium and ABS, IP30 Protection IP54 protection optional (please contact RFI/Maxon for details)
Dimensions	145 (L) x 122 (W) x 30 (H) mm
Weight	295g (approx.)
Mounting	DIN Rail or Wall Mounting Accessories

Environmental Specifications

Parameter	Ratings / Values
Operating Temperature	-35 ~ +70 °C
Storage Temperature	-40 ~ +85°C
Humidity	95% (Non-condensing)

Regulatory Compliances and Certificates

ACMA

CE, GCF (module only)

RoHS (both modem and module)

Carrier Approvals* - (Please contact RFI/Maxon for more information)