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SMART SOLUTIONS FOR A CHANGING WORLD

MTX-GTW II-R

HARDWARE USER **GUIDE**

www.mtxm2m.com

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IMPORTANT INFORMATION

This technical description contains important information for the start up and use of the MTX-GTW II-R. Read it carefully before you start working with the MTX-GTW II-R. The warranty will be void should damage occur due to non-compliance with these instructions for use. We cannot accept any responsibility for consequential loss.

SERVICE AND SUPPORT

To contact customer support please contact your local distributor/sales agent or use the contact details below:

Address: Alejandro Sánchez 109, 28019 Madrid (Spain)
Email: gsmsupport@matrix.es
Website: mtxm2m.com

REVISION INFORMATION

REVISION	DATE	AUTHOR	CHANGES
1.0	2018/10	EG	First draft

DESCRIPTION

The MTX-GTW II-R is designed to be driven by the TQMa28 module and offers PC core functionalities and standard interfaces. This user guide provides information about the components, features, connectors and signals available on the MTX-GTW II-R.

1. Hardware Revisions

HARDWARE REVISION	STARTING PRODUCTION DATE	CHANGES
1.02	2018/10	Initial version

2. Firmware Revisions

FIRMWARE REVISION	STARTING PRODUCTION DATE	CHANGES
1.00	2018/10	Initial release

WARRANTY

The information contained within this user guide, including but not limited to any product specification, is subject to change without notice. Matrix Electronica provides no warranty with regard to this user guide or any other information contained herein and hereby expressly disclaims any implied warranties of merchantability or fitness for any particular purpose with regard to any of the foregoing. Matrix Electronica assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the uses guide. In no event shall Matrix Electronica be liable for any incidental, consequential, special, or exemplary damages, whether based on tort, contract or otherwise, arising out of or in connection with this user guide or any other information contained herein or the use thereof.

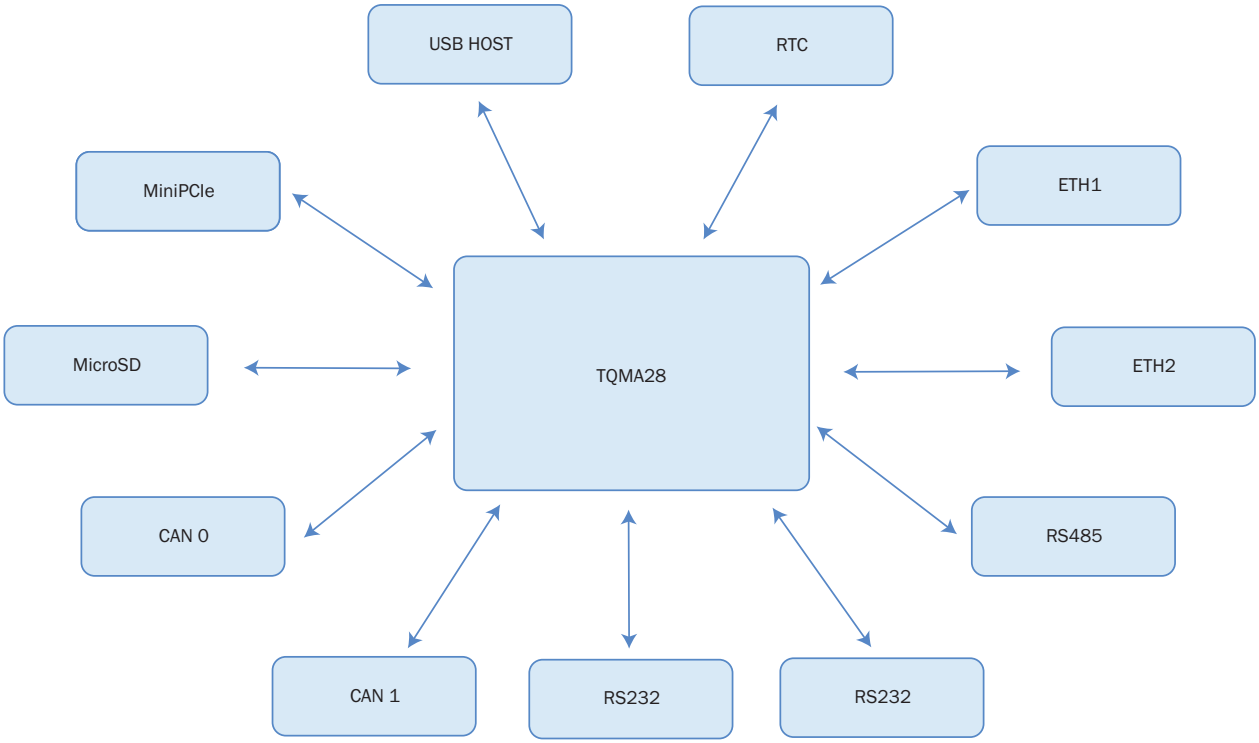
REFERENCES

- STK-MBa28 User Manual
- TQMa28 User Manual
- iMX28 Freescale Reference Manual

TECHNICAL DATA

1. System Architecture and System Functionality

1.1 Block Diagram



1.2 Technical Data Electronics

The interfaces and system components listed are implemented on the MTX-GTW II-R. Due to the fact that the board can be installed in a casing, the interfaces are divided into external and internal interfaces.

1.2.1 External Interfaces

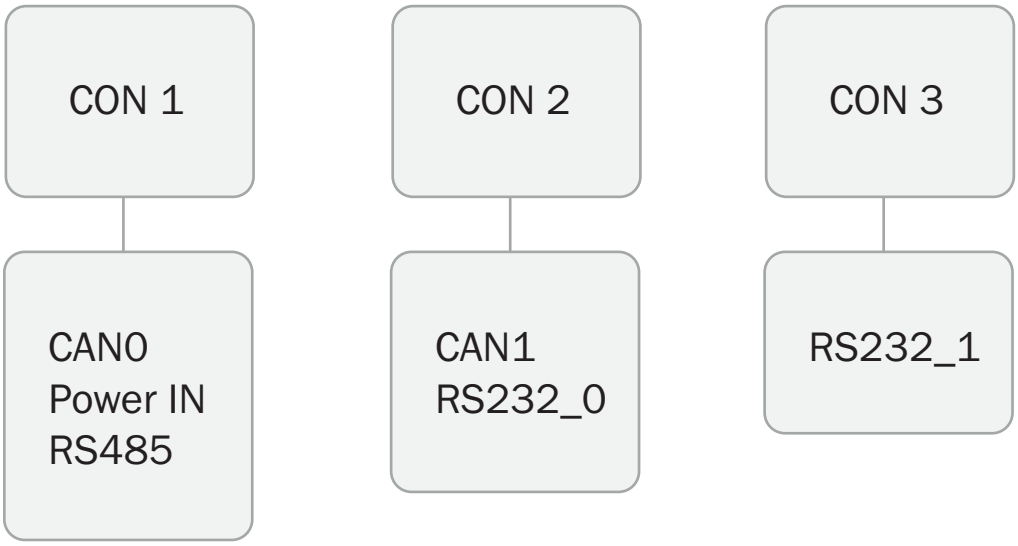
- 2x Ethernet 10/100
- 1x USB HOST 2.0
- 2x CAN
- 2x RS232
- 1x RS485
- 1x microSD
- 3x RF Connectors (Optional)
- 2x status LEDs
- 2x DIP switch

1.2.2 Internal Interfaces

- 1x TQMA28
- 1x miniPCIe Card
- 1x expansion connector

1.3 Circular Connectors

- Amphenol type M8AS-06PMMR-SF8001
- Aerial connector compatible: Amphenol 8A-06FFM-SL7A



1.4 Technical Data Mechanics, Design

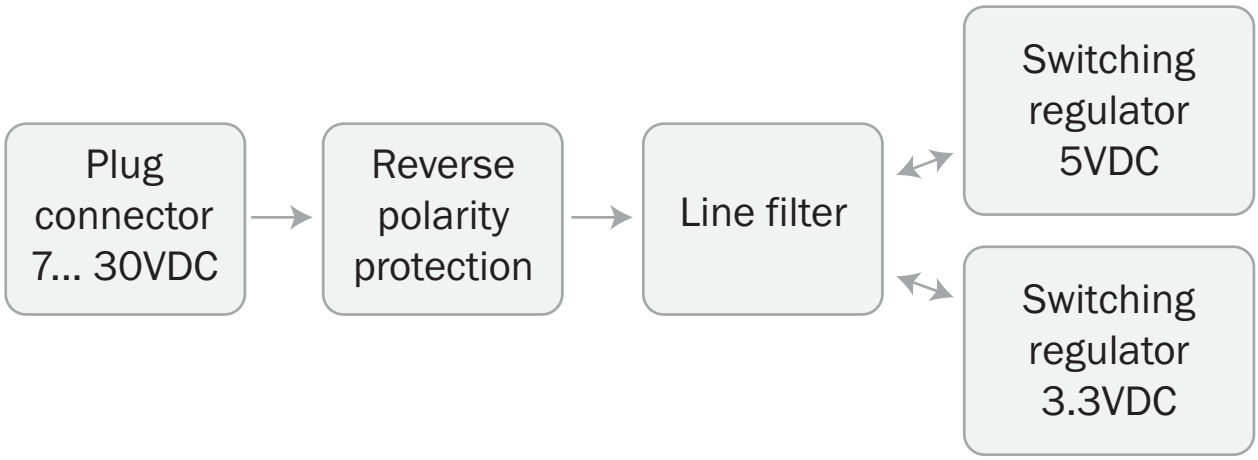
- 112x40x72 (length x height x width)
- Aluminium enclosure
- DIN rail assembly ready

ELECTRONIC SPECIFICATIONS

1. External Interfaces

1.1 Power Supply

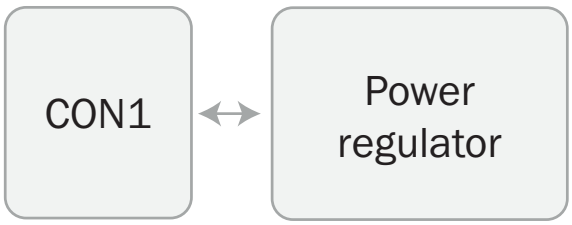
For protective and EMC reasons the supply input of the MTX-GTW II-R is designed very robustly.



PARAMETER	MIN.	TYPE	MAX.	UNIT
DC input voltage	7	24	30	V
Power consumption		<2		W

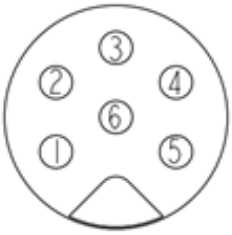
Maximum device power consumption depends on different conditions and should be obtained on field. Some of the parameters that can increase the power consumption are:

- MiniPCIe Card connected
- USB external devices connected



The following tables show the configuration of the CON1:

PIN	SIGNAL	TYPE	REMARK
3	+VIN	P	DC power in +
4	-VIN	P	DC power in -



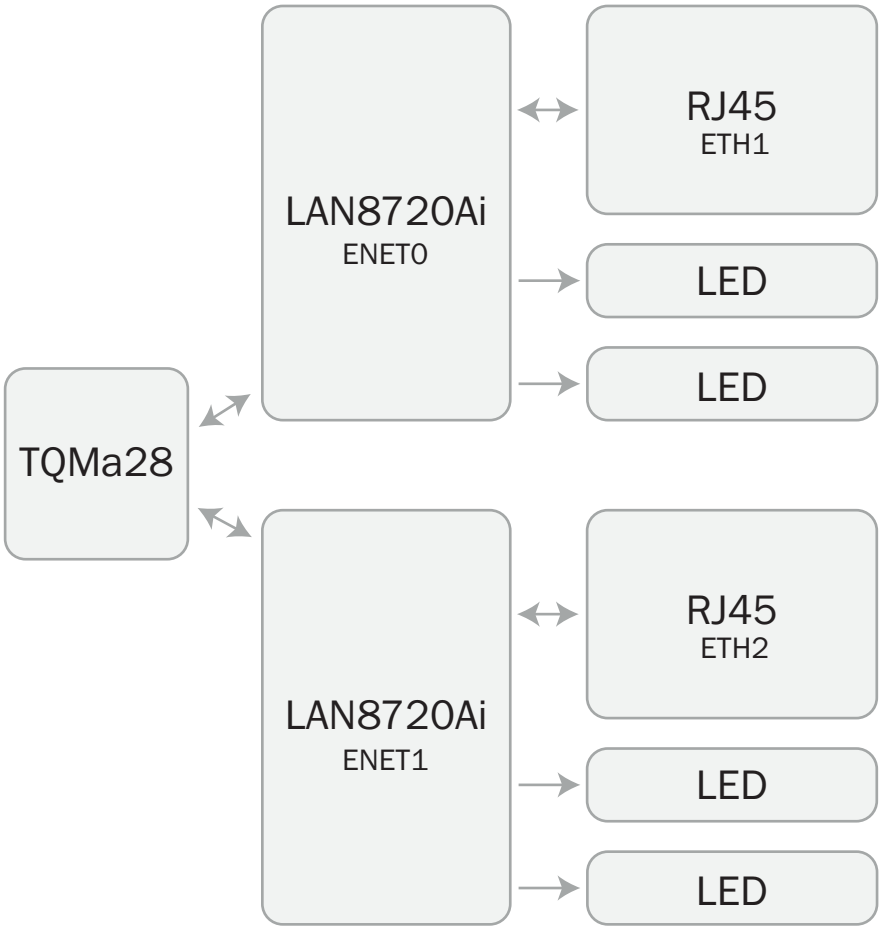
1.2 USB HOST

The USB HOST interface of the TQMa28 (USB0) is offered as an USB A-Type.

Type of media:	USB HOST 2.0 Hi-Speed, 5V bus voltage (limited to 500mA)
Interface on module:	USB HOST
Signal characteristic:	Compatible with the Universal Serial Bus Specification REV. 2.0
ESD protection:	±15kV human body model

1.3 Ethernet

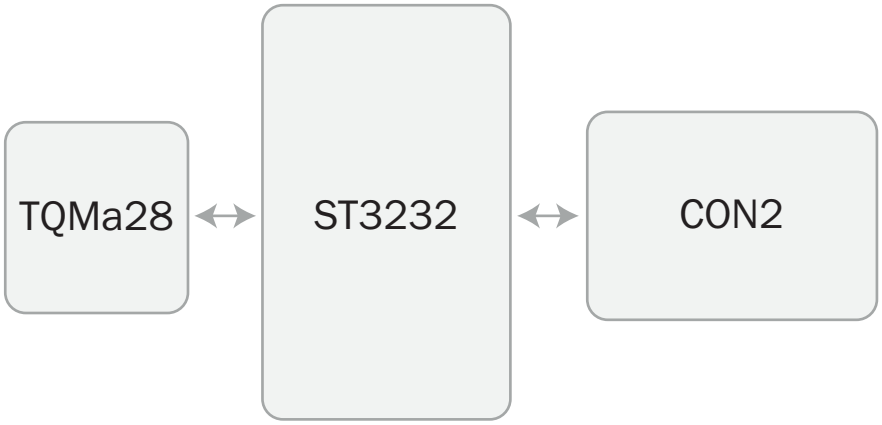
The MTX-GTW II-R directly drives the ETH0 and ETH1 interfaces. The SMSC LAN8720Ai is used as a PHY.



Type of media:	10/100 Mbit
Signal characteristic:	Compatible with the IEEE-802.3 standard
Status LEDs:	2
Modes:	MDI, Auto-MDIX
Interface on module:	RMII/ENET0/ENET1

1.4 RS232 1

The AUART1 interface of the TQMA28 drives the RS232 interface of the MTX-GTW II-R by default. The Maxim ST3232EBDR is used as a driver.



Transfer rate: Up to 250Kbit/s

Interface on module: AUART1

Handshake: None

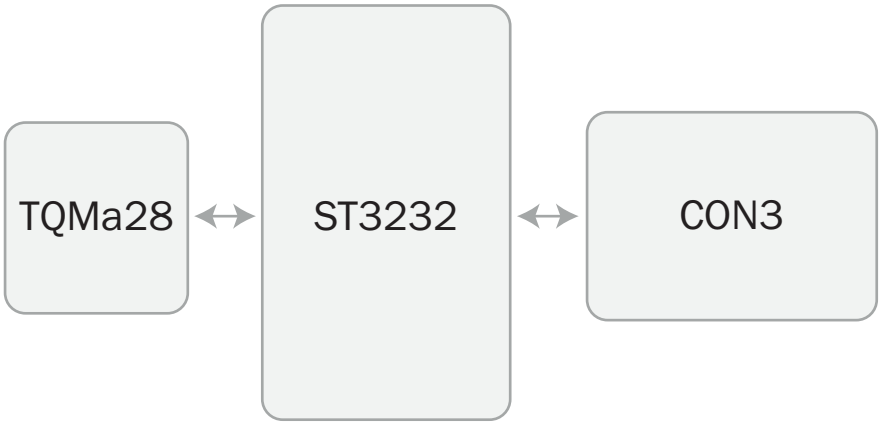
ESD protection: ±15kV human body model

The following tables show the configuration of the CON2:

PIN	SIGNAL	TYPE	REMARK
5	TXD0	O	Transmit Data
6	RXD0	I	Receive Data
4	GND	P	Ground

1.5 RS232 2

The AUART3 interface of the TQMA28 drives the RS232 interface of the MTX-GTW II-R by default. The Maxim ST3232EBDR is used as a driver.



Transfer rate: Up to 250Kbit/s

Interface on module: AUART3

Handshake: RTS# used for clearing the transmission direction

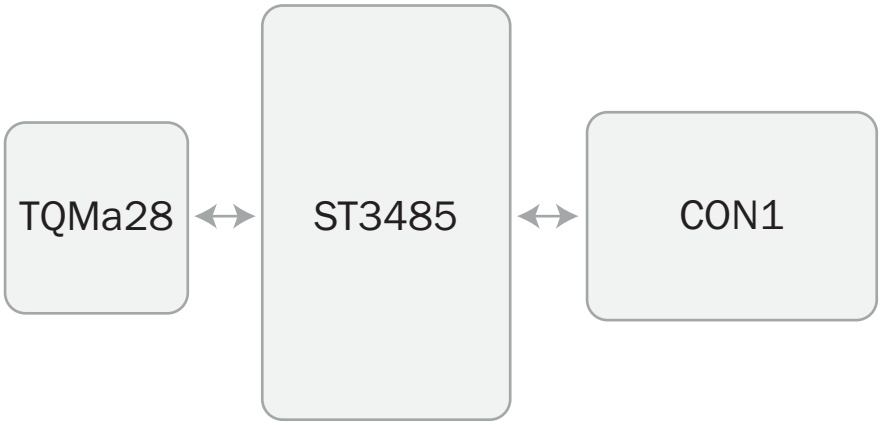
ESD protection: ±15kV human body model

The following tables show the configuration of the CON3:

PIN	SIGNAL	TYPE	REMARK
1	RTS1	O	Request to send
2	CTS1	I	Clear to send
4	GND	P	Ground
5	TXD1	O	Transmit data
6	RXD1	I	Receive data

1.6 RS485

The AUART0 interface of the TQMA28 drives the RS485 interface of the MTX-GTW II-R by default. The Maxim ST3485EBDR is used as a driver.



Transfer rate: Up to 12Mbit/s

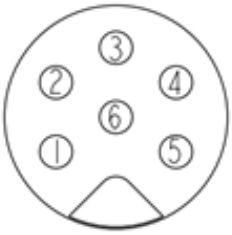
Interface on module: AUART0

Handshake: None

ESD protection: ±15kV human body model

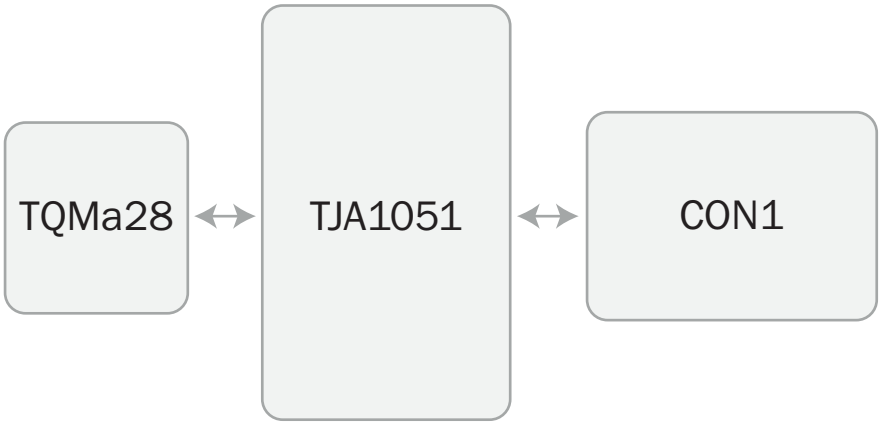
The following tables show the configuration of the CON1:

PIN	SIGNAL	TYPE	REMARK
5	RS485_A	I/O	Transmit Data
6	RS485_B	I/O	Receive Data



1.7 CAN 0

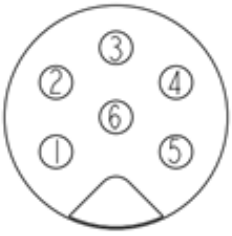
The CAN 0 port of the TQMA28 directly drives the interface on the MTX-GTW II-R. The NXP TJA1051T/3 is used as a CAN transceiver.



Transfer rate:	Up to 1Mbit/s
Interface on module:	CAN_0
Handshake:	Compatible with the ISO-11898 standard (CAN 2.0B)
ESD protection:	±8kV human body model

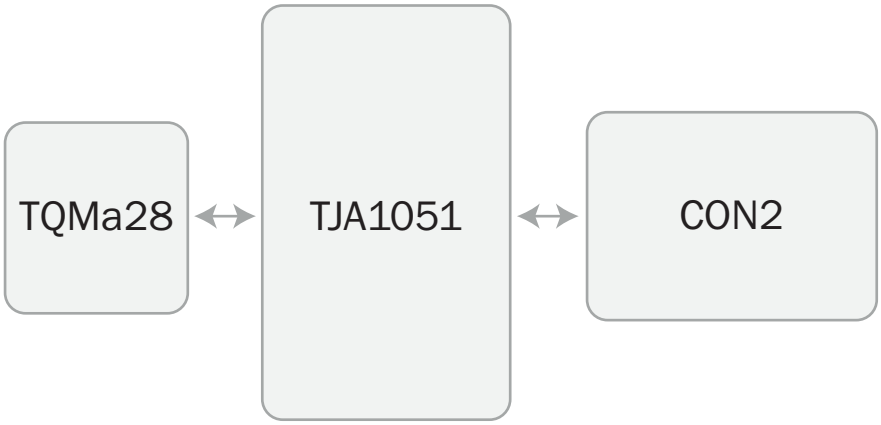
The following tables show the configuration of the circular connector of the CAN interface:

PIN	SIGNAL	TYPE	REMARK
1	CAN 0_H	I/O	CAN High-Level I/O
2	CAN 0_L	I/O	CAN Low-Level I/O



1.8 CAN 1

The CAN 1 port of the TQMA28 directly drives the interface on the MTX-GTW II-R. The NXP TJA1051T/3 is used as a CAN transceiver.



Transfer rate: Up to 1Mbit/s

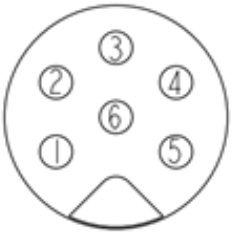
Interface on module: CAN_1

Handshake: Compatible with the ISO-11898 standard (CAN 2.0B)

ESD protection: ±8kV human body model

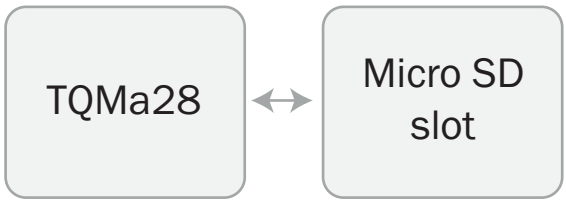
The following tables show the configuration of the circular connector of the CAN interface:

PIN	SIGNAL	TYPE	REMARK
1	CAN 1_H	I/O	CAN High-Level I/O
2	CAN 1_L	I/O	CAN Low-Level I/O



1.9 Micro SD

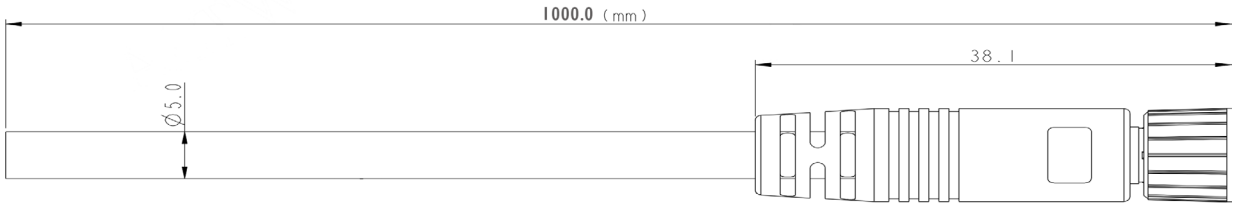
The SD card bus of the TQMa28 is accessible by a micro SD holder located in the back.



1.10 External Cables for Interfaces

You can connect to CON1, CON2 and CON3 with Amphenol M8AS-06PMMR-SF80001 compatible connectors.

You can request for matching connectors with our Matrix part number 118001033



2. Internal Interfaces

2.1 TQMa28

The core of the MTX-GTW II-R is the TQ Components TQMa28 module. The following table shows the key features of this module.

FEATURE	DESCRIPTION
Processor	Freescale iMX287 @ 454MHz
RAM	128MB DDR2
FLASH	4GB eMMC
EEPROM	32Kb

Detailed information about this module can be found on the following link:

http://www.tq-group.com/en/products/industry-pcs/prod/embedded-modul-tqma28/extb/Main/productdetail/

2.2 MiniPCIe Card

A miniPCIe Card slot (also known as Mini PCI Express, Mini PCIe and Mini PCI-E) is available on the MTX-GTW II-R. The following table shows the buses supported by the device:

BUS	REMARK
USB	USB 2.0
SIM	UIM signals for GSM and WCDMA applications
Diagnostics LEDs	LED_WWAN#
Control signals	PERST#, WDISABLE#

The miniPCIe connector power pins can be switched ON/OFF by GPIO 0_27.

GPIO 0_4 is connected to PERST pin (active low).

GPIO 0_5 is connected to W_DISABLE pin (active low).

One of the following miniPCIe Cards, already tested by Matrix Electronica, can be included on the MTX-GTW II-R:

	3000	3010	3011	3030	3100	3130	4000	4011	4040
GSM CSD	X	X	X	X	X	X			
2G (GPRS EDGE)	X	X	X	X	X	X	X	X	X
3G (UMTS HSPA)	X	X	X	X	X	X	X	X	X
4G (LTE Cat.1)							X	X	X
Java (Embedded J2ME)	X	X	X	X	X	X	X	X	X
Micro SIM holder	X	X	X	X	X	X	X	X	X
GPS receiver					X	X			
WiFi 2.4GHz		X1	X1					X	X
Bluetooth 4.0 Low Energy		X1	X1					X	X
WiFi 5Hz/2.4GHz (operating temperature 0-60ºC)		X1		X1		X			X

3. User Interfaces

3.1 Status LED

The MTX-GTW II-R has two LEDs to inform the user about different status conditions. The following table shows the different LED indications.

LED	STATUS REMARK
Down (green)	On when 5VCC power is good
Up (yellow)	Defined by user with GPIO 3_6 (active low)

3.2 DIP Switches

The MTX-GTW II-R has two DIP switches configurable by the user. The following table shows the configuration.

SWITCH	DESCRIPTION
1	OFF: normal mode (during power on) ON: recovery mode (during power on)
2	GPIO 0_24 input

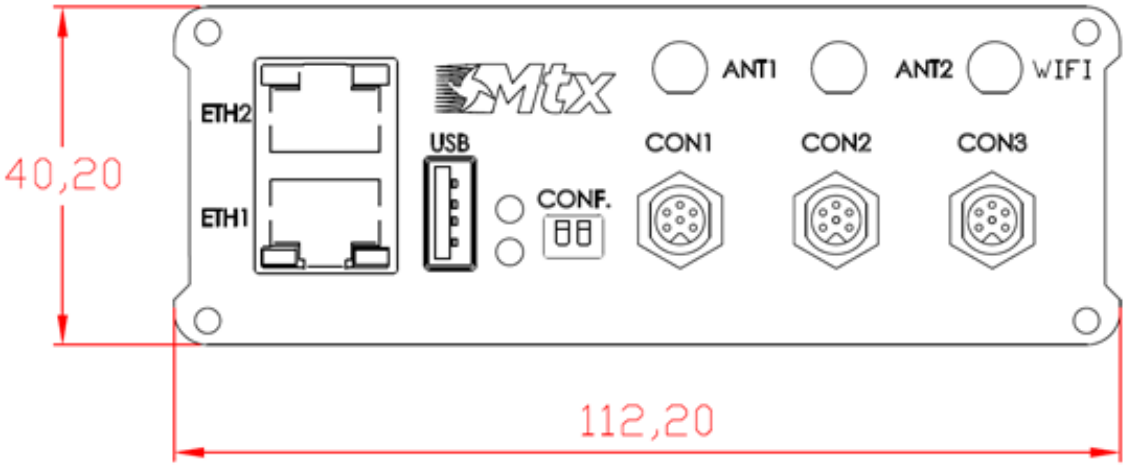
4. System Components

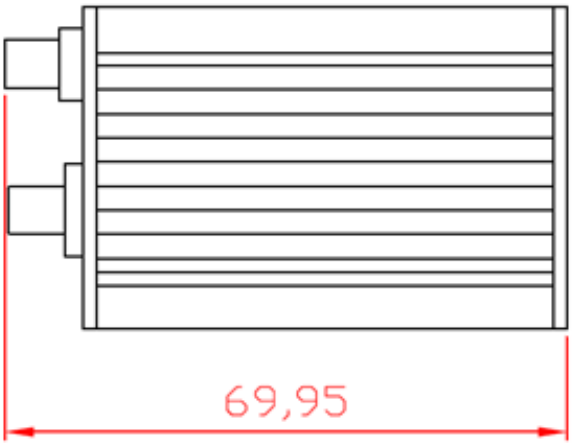
4.1 RTC

An Abracom AB0805 RTC module is on the MTX-GTW II-R board. The RTC is supplied by coin cell battery in order to maintain the information should the main supply be removed.

I2C BUS	POSITION	DEVICE	ADDRESS
1	MTX-GTW II-R	RTC Abracom AB0805	0x69

MECHANICAL DRAWINS (mm)





REQUIREMENTS FOR THE SUPERIOR SYSTEM

The MTX-GTW II-R has an enclosure which protects itself again dust, external impact and contact. However, as the MTX-GTW II-R PCB can be bought as a standalone product, the following points must be taken into consideration.

1. Thermal Management

The main heat source is the TQMa28. Information about the cooling of the TQMa28 is to be taken from its specification.

SAFETY REQUIREMENTS AND PROTECTIVE REGULATIONS

Please read the information in this section before starting your integration work!

1. Safety Instructions

PLEASE READ THESE SAFETY INSTRUCTIONS AND KEEP A COPY OF THEM

- Always ensure that use of the gateway is permitted. The gateway may present a hazard if used in proximity to personal electronic medical devices. As a rule, the gateway must not be used in hospitals, airports or planes.
- Never use the device at a gas station, refuelling point, blasting area or in any other environment where explosives may be present.
- Operating the device close to other electronic devices, such as antennas, television sets, and radios may cause electromagnetic interference.
- This product is intended to be used with the antenna or other radiating element at least 20cm away from any part of the human body. In applications where this rule cannot be applied, the application designer is responsible for providing the SAR measurement test report and declaration.
- You are responsible for observing your country's safety standards, and where applicable, the relevant wiring rules.

2. General Precautions

The MTX-GTW II-R Terminal as a standalone item is designed for indoor use only. For outdoor use it must be integrated into a weatherproof enclosure. Do not exceed the environmental and electrical limits as specified in “Technical Data”.

- Avoid exposing the device to lighted cigarettes, naked flames or to extreme hot or cold temperatures.
- Never try to dismantle the device yourself. There are no components inside the gateway that can be serviced by the user. If you attempt to dismantle the device, you may invalidate the warranty.
- The MTX-GTW II-R Terminal must not be installed nor located in areas where the surface temperature of the aluminium case could exceed 85 °C.

In order to provide strain relief and to avoid transmitting excessive vibration to the device during installation, all cables connected to the MTX-GTW II-R Terminal must be secured or clamped immediately adjacent to the device’s connectors.

- To protect the power supply cables, and in order to comply with the fire safety requirements, when the unit is powered from a battery or a high current supply, a fast 1.25A fuse should be connected in line with the positive supply.
- Any incompatible components or products must not be connected to the MTX-GTW II-R Terminal.

NOTE: MTX-GTW II-R distributors and sales offices may refuse warranty claims where evidence of product misuse is found.

3. SIM Card Precautions

Before handling the SIM card in your application, ensure that you are not charged with static electricity. Use proper precautions to avoid electrostatic discharges.

- When the SIM card hatch is opened, the SIM card connectors lie exposed under the SIM card holder.

CAUTION: Do not touch these connectors! If you do, you may release an electrical discharge that could damage the gateway or the SIM card.

- When designing your application, the SIM card's accessibility should be taken into account. We always recommend that you have the SIM card protected by a PIN code. This will ensure that the SIM card cannot be used by an unauthorized person.

4. Antenna Precautions

If the antenna is to be mounted outside, consider the risk of lightning. Follow the instructions provided by the antenna manufacturer.

- Never connect more than one gateway to a single antenna. The gateway can be damaged by radio frequency energy from the transmitter of another gateway.
- Like any mobile station, the antenna of the gateway emits radio frequency energy. To avoid EMI (electromagnetic interference), you must determine whether the application itself, or equipment in the application's proximity, needs further protection against radio emission and the disturbances it might cause. Protection is secured either by shielding the surrounding electronics or by moving the antenna away from the electronics and the external signal cable.
- The gateway and antenna may be damaged if either come into contact with ground potentials other than the one in your application. Beware: ground potentials are not always what they appear to be.

5. Radio Frequency (RF) Exposure and SAR

Your wireless gateway device is a low-power radio transmitter and receiver (transceiver). When it is turned on, it emits low levels of radio frequency energy (also known as radio waves or radio frequency fields).

Governments around the world have adopted comprehensive international safety guidelines, developed by scientific organizations such as ICNIRP (International Commission on Non-Ionizing Radiation Protection) and IEEE (The Institute of Electrical and Electronics Engineers Inc.), through periodic and thorough evaluation of scientific studies. These guidelines establish permitted levels of radio wave exposure for the general population. The levels include a safety margin designed to assure the safety of all persons, regardless of age and health, and to account for any variations in measurements.

Specific Absorption Rate (SAR) is the unit of measurement for the amount of radio frequency energy absorbed by the body when using a transceiver. The SAR value is determined at the highest certified power level in laboratory conditions, but the actual SAR level of the transceiver while operating can be well below this value. This is because the transceiver is designed to use the minimum power required to reach the network.

The MTX-GTW II-R wireless device has been approved for applications where the antenna is located more than 20cm from the body. In all other configurations the user is responsible for meeting the local SAR regulations.

Users of the MTX-GTW II-R wireless device are responsible for ensuring that they meet the SAR regulatory requirements of the countries in which they intend to operate the device and that their documentation contains the relevant SAR declaration, certification information and user guidance as appropriate.

6. Personal Medical Devices

Wireless devices may affect the operation of cardiac pacemakers, hearing aids and certain other implanted equipment. If a minimum distance of 15 cm (6 inches) is maintained between the MTX-GTW II-R radiating antenna and a pacemaker, the risk of interference is limited. If the user's application is likely to be situated in the vicinity of personnel, a suitable warning should be contained in the equipment manual to this effect.

CONFORMITY ASSESSMENT

1. RED 2014/53/EU Conformity Assessment

We, MATRIX ELECTRÓNICA S.L.U.: C/ Alejandro Sánchez 109, 28019 Madrid, Spain declare under our sole responsibility that the products:

PRODUCTS	
MTX-GTW II-R	199802303
MTX-GTW II-R-2	199802304
MTX-GTW II-R-1	199802305

object of the declaration described above is in conformity with the relevant Union harmonization Legislation: RED Directive 2014/53/EU and R&TTE Directive 99/5/EC.

The following harmonized standards and/or other normative documents were applied: are labeled with the CE conformity mark.

CE

- EMC (art 3.1.b): EN 301 489-1 V2.2.0 EN 301 489-52 V1.1.0, EN 301 489-3 V2.1.1
- RADIO SPECTRUM (art 3. 2): EN 301 511 V12.5.1, EN 301 908-1 V11.1.1, EN 301 908-2 V11.1.1, EN 300 440 V2.1.1
- SAFETY (art 3.1.a):EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
- RF SAFETY: EN62311:2008

The technical documentation relevant to the above equipment will be held at

MATRIX ELECTRÓNICA S.L.U.: C/ Alejandro Sánchez 109, 28019 Madrid, Spain

Madrid, 30/11/2018

Mr. J. Vicente

Managing Board

2. FCC Compliant

MTX-GTW II-R and any variants contain FCC ID: QIPEHS6. The FCC Equipment Authorization Certification for the EHS6 Module is listed under the FCC identifier QIPEHS6

Industry Canada Certification Number: 7830A-EHS6 granted to Gemalto M2M GmbH.

The Cinterion reference application of the EHS6 Module registered under the above identifier is certified to be in accordance with the following Rules and Regulations of the Federal Communications Commission (FCC). Power listed is ERP for Part 22 and EIRP for Part 24. It is compliant with FCC regulations.

Equipment class: PCS Licensed Transmitter

Notes: Quad band GSM/GPRS

2.1 SAR Information

Cinterion Wireless Modules models: EHS6 is marketed without a defined antenna.

The Maximum Antenna Gain when using indoor antennas depends on the distance from the antenna to any nearby persons when in normal operation. It should not exceed the values shown on the table below.

According to the limit in 47 CFR 1.1310, we get the value of the maximum antenna gain as follows:

The maximum measured power output in the 850 MHz band is 1866.38 mW (32.71 dBm, see 7layers test report MDE_Siem_0714_FCCb).

The maximum permissible exposure is defined as 47 CFR 1.1310 with 0.55773 mW/cm^2.

The maximum measured power output in the 1900 MHz band is 974.99 mW (29.89 dBm, see 7layers test report MDE_Siem_0714_FCCc).

The maximum permissible exposure is defined as 47 CFR 1.1310 with 1 mW/cm^2.

According to the limit in 47 CFR 1.1310, we get the value of the maximum antenna gain as follows:

$S = P*G/4\pi R^2$

$S = 0.55773\ mW/cm^2$ or $1\ mW/cm^2$

P = 1866.38 mW or 974.99 mW

R = 20 cm or 100cm

$\pi = 3.1416$

G(dBi) = 10*log10(G)

Solving for G; the maximum antenna gain is:

BAND	DISTANCE	MAXIMUM GAIN IN DBI
850MHz	20cm	1.7669
850MHz	50cm	9.7257
1900MHz	20cm	7.1227
1900MHz	50cm	15.0815

DECLARACIÓN DE CONFORMIDAD

1. Marcado CE - Directiva RED

Nosotros, MATRIX ELECTRÓNICA S.L.U.: C/ Alejandro Sánchez 109, 28019 Madrid, España declaramos bajo nuestra sola responsabilidad que los productos:

PRODUCTOS	
MTX-GTW II-R	199802303
MTX-GTW II-R-2	199802304
MTX-GTW II-R-1	199802305

objeto de la declaración descrita arriba está en conformidad con la legislación relevante: Directiva RED 2014/53/EU y R&TTE 99/5/EC.

Los siguientes estándares armonizados y/o otros documentos normativos han sido aplicados: están etiquetados con la marca de conformidad CE.

CE

- EMC (art 3.1.b): EN 301 489-1 V2.2.0 EN 301 489-52 V1.1.0, EN 301 489-3 V2.1.1
- RADIO SPECTRUM (art 3. 2): EN 301 511 V12.5.1, EN 301 908-1 V11.1.1, EN 301 908-2 V11.1.1, EN 300 440 V2.1.1
- SAFETY (art 3.1.a):EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
- RF SAFETY: EN62311:2008

La documentación técnica referente al equipo anterior está disponible en

MATRIX ELECTRÓNICA S.L.U.: C/ Alejandro Sánchez 109, 28019 Madrid, Spain

Madrid, 30/11/2018

Sr. J. Vicente

Managing Board

2. Conformidad FCC

MTX-GTW II-R y todas sus variantes contienen el FCC ID: QIPEHS6. El Certificado de Autorización de Equipo de la FCC para el módulo EHS6 está listado con el identificador FCC QIPEHS6

Número de Certificación de Industria en Canadá: 7830A-EHS6 asignado a Gemalto M2M GmbH.

El formulario de referencia del módulo EHS6 registrado bajo el anterior identificador está conforme con las siguientes Reglas y Regulaciones de la Comisión Federal de Comunicaciones (FCC). La potencia listada como ERP para la parte 22 y como EIRP para la parte 24 cumple con las regulaciones de la FCC.

Clase de equipo: Transmisor PCS Licenciado

Notas: Quad band GSM/GPRS

2.1 Tasa de absorción específica (SAR)

El modulo Cinterion EHS6 es comercializado sin una antena definida. La ganancia máxima de antena usando antenas de interior depende de la distancia de esta a las personas cercanas y en condiciones normales no debe sobrepasar los límites mostrados en la tabla siguiente.

La máxima potencia de salida medida en la banda de 850MHz es 1866.38 mW (32.71 dBm, ver el reporte de test de 7layers MDE_Siem_0714_FCCb).

La máxima exposición permisible se define en 47 CFR 1.1310 con un valor de 0.55773 mW/cm^2.

La máxima potencia de salida medida en la banda de 1900 MHz es 974.99 mW (29.89 dBm, ver el reporte de test de 7layers MDE_Siem_0714_FCCc).

La máxima exposición permisible se define en 47 CFR 1.1310 con un valor de 1 mW/cm^2.

De acuerdo al límite en 47 CFR 1.1310, obtenemos el valor de la máxima ganancia de antena como sigue:

$S = P*G/4\pi R^2$

S = 0.55773 mW/cm^2 o 1 mW/cm^2

P = 1866.38 mW o 974.99 mW

R = 20 cm o 100cm

$\pi = 3.1416$

G(dBi)=10*log10(G)

Despejando G; la máxima ganancia de antena es:

BANDA	DISTANCIA	GANANCIA MÁXIMA EN DBI
850MHz	20cm	1.7669
850MHz	50cm	9.7257
1900MHz	20cm	7.1227
1900MHz	50cm	15.0815

REGULATORY AND TYPE APPROVAL INFORMATION

1. Directives and Standards

The MTX-GTW II-R has been designed to comply with the directives and standards listed below.

It is the responsibility of the application manufacturer to ensure compliance of the final product with all provisions of the applicable directives and standards, as well as with the technical specifications provided in this document.

DIRECTIVES	
RED Directive 2014/53/EU and R&-TTE Directive 99/5/EC	Directive of the European Parliament on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity . The product is labeled with the CE conformity mark.
ECE-R 10	Economic Commission for Europe (ECE) Regulation No. 10: Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility.
2002/95/EC (RoHS 1) 2011/65/EC (RoHS 2)	Directive of the European Parliament and of the Council of 27 January 2003 (and revised on 8 June 2011) on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

STANDARDS OF NORTH AMERICAN TYPE APPROVAL	
CFR Title 47	Code of Federal Regulations, Part 22 and Part 24 (Telecommunications, PCS); US Equipment Authorization FCC.
OET Bulletin 65 (Edition 97-01)	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.
UL 60 950-1	Product Safety Certification (Safety requirements).
NAPRD.03 V5.15	Overview of PCS Type certification review board Mobile Equipment Type. Certification and IMEI control. PCS Type Certification Review board (PTCRB).
RSS132 (Issue2) RSS133 (Issue5)	Canadian Standard.

STANDARDS OF EUROPEAN TYPE APPROVAL	
3GPP TS 51.010-1	Digital cellular telecommunications system (Release 7); Mobile Station (MS) conformance specification.
ETSI EN 301 511 V9.0.2	Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC).
GCF-CC V3.49	Global Certification Forum - Certification Criteria.
ETSI EN 301 489-01 V1.9.2	Electromagnetic Compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common Tech. Requirements.
ETSI EN 301 489-07 V1.3.1	Electromagnetic Compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS).
ETSI EN 301 489-24 V1.5.1	Electromagnetic Compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile and portable (UE) radio and ancillary equipment.
EN 301 908-01 V5.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common requirements of article 3.2 of the R&TTE Directive.
EN 301 908-02 V5.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third Generation cellular networks; Part 2: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive.
EN 62311:2008	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz).
IEC/EN 60950-1:2006+A11:2009+A1:2010+A12:2011	Safety of information technology equipment.

REQUIREMENTS OF QUALITY	
IEC 60068	Environmental testing.
DIN EN 60529	IP codes.

STANDARDS OF THE MINISTRY OF INFORMATION INDUSTRY OF THE REPUBLIC OF CHINA	
SJ/T 11363-2006	“Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.” (2006-06)
SJ/T 11364-2006	“Marking for Control of Pollution Caused by Electronic Information Products.” (2006-06) According to the “Chinese Administration on the Control of Pollution caused by Electronic Information Products” (ACPEIP) the EPUP, i.e., Environmental Protection Use Period, of this product is 20 years as per the symbol shown here, unless otherwise marked. The EPUP is valid only as long as the product is operated within the operating limits described in the Gemalto M2M Hardware Interface Description? Please see next table for an overview of toxic or hazardous substances or elements that might be contained in product parts in concentrations above the limits defined by SJ/T 11363-2006.

部件名称 Name of the part	有毒有害物质或元素 Hazardous substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 (Metal Parts)	O	O	O	O	O	O
电路模块 (Circuit Modules)	X	O	O	O	O	O
电缆及电缆组件 (Cables and Cable Assemblies)	O	O	O	O	O	O
塑料和聚合物部件 (Plastic and Polymeric parts)	O	O	O	O	O	O

O:
表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X:
表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part *might exceed* the limit requirement in SJ/T11363-2006.

2. SAR Requirements Specific to Portable Mobiles

Mobile phones, PDAs or other portable transmitters and receivers incorporating a GSM module must be in accordance with the guidelines for human exposure to radio frequency energy. This requires the Specific Absorption Rate (SAR) of portable EHS6 based applications to be evaluated and approved for compliance with national and/or international regulations.

Since the SAR value varies significantly with the individual product design, manufacturers are advised to submit their product for approval if designed for portable use. For European markets the relevant directives are mentioned below. It is the responsibility of the manufacturer of the final product to verify whether or not further standards, recommendations or directives are in force outside these areas.

Products intended for sale in US markets

EN 59005/ANSI C95.1: Considerations for evaluation of human exposure to Electromagnetic Fields (EMFs) from Mobile Telecommunication Equipment (MTE) in the frequency range 30MHz – 6GHz

Products intended for sale in European markets

EN 50360: Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300MHz - 3GHz)

Please note that SAR requirements are specific only for portable devices and not for mobile devices as defined below:

- Portable device:
  A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the user's body.
- Mobile device:
  A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the user's body or that of nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and cannot be easily moved to another location.

3. SELV Requirements

The power supply connected to the MTX-GTW II-R shall be in compliance with the SELV requirements defined in EN 60950-1.

ROHS STATEMENT

The MTX-GTW II-R is compliant with the 2002/95/EC (RoHS 1) and 2011/65/EC (RoHS 2) directives of the European Parliament and of the Council of 27 January 2003 (and revised on 8 June 2011) on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT

This symbol, applied on our products and/or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.

SALES CONTACT

MATRIX MADRID

Matrix Electrónica S.L.
C/ Alejandro Sánchez 109
28019 Madrid, Spain

Phone 1: 902.19.81.46
Phone 2: +34-91.560.27.37
Fax 1: 902.99.54.14
Fax 2: +34-91.565.28.65

MATRIX BARCELONA

Matrix Electrónica S.L.
@SantCugat Business Park
Av. Via Augusta 15-25, B2- 8, oficinas 9-10
08174 Sant Cugat del Vallés, Barcelona, Spain

Phone: 902.19.81.46
Fax: 902.99.54.14

MATRIX DURANGO

Matrix Electrónica S.L.
Pol. Aliendalde 11, oficina 2G
48200 Durango, Vizcaya, Spain

Phone: 902.19.81.46
Fax: 902.99.54.14

MATRIX VALENCIA

Matrix Electrónica S.L.
Valencia, Spain

Phone: 902.19.81.46
Fax: 902.99.54.14

MATRIX SEVILLA

Matrix Electrónica S.L.
Sevilla, Spain

Phone: 902.19.81.46
Fax: 902.99.54.14

MATRIX LISBOA

LusoMatrix Lda.
Av. Coronel Eduardo Galhardo 7-1ºC
1170-105 Lisboa, Portugal

Phone: +351-218.162.625
Fax: +351-218.149.482

MATRIX CHICAGO

Matrix USA LLD
1112 W. Boughton Rd, Suite 346
Bolingbrook, IL 60440
USA

mtxm2m.com